5530 BROADWAY
BRONX, NEW YORK

Remedial Action Work Plan

NYC BCP Number: 14CVCP170X

Prepared for:

Equity One (Northeast Portfolio) Inc.
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Acronym	Definition
AOC	Area of Concern
AS/SVE	Air Sparging/Soil Vapor Extraction
BOA	Brownfield Opportunity Area
CAMP	Community Air Monitoring Plan
C/D	Construction/Demolition
COC	Certificate of Completion
CQAP	Construction Quality Assurance Plan
CSOP	Contractors Site Operation Plan
DCR	Declaration of Covenants and Restrictions
ECs/ICs	Engineering and Institutional Controls
HASP	Health and Safety Plan
IRM	Interim Remedial Measure
BCA	Brownfield Cleanup Agreement
MNA	Monitored Natural Attenuation
NOC	Notice of Completion
NYC BCP	New York City Brownfield Cleanup Program
NYC DEP	New York City Department of Environmental Protection
NYC DOHMH	New York State Department of Health and Mental Hygiene
NYCRR	New York Codes Rules and Regulations
NYC OER	New York City Office of Environmental Remediation
NYS DEC	New York State Department of Environmental Conservation
NYS DEC DER	New York State Department of Environmental Conservation Division of Environmental Remediation
NYS DOH	New York State Department of Health
NYS DOT	New York State Department of Transportation
ORC	Oxygen-Release Compound
OSHA	United States Occupational Health and Safety Administration
PE	Professional Engineer
PID	Photo Ionization Detector

Acronym	Definition
QEP	Qualified Environmental Professional
QHHEA	Qualitative Human Health Exposure Assessment
RAOs	Remedial Action Objectives
RAR	Remedial Action Report
RAWP	Remedial Action Work Plan or Plan
RCA	Recycled Concrete Aggregate
RD	Remedial Design
RI	Remedial Investigation
RMZ	Residual Management Zone
SCOs	Soil Cleanup Objectives
SCG	Standards, Criteria and Guidance
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SVOC	Semi-Volatile Organic Compound
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound

CERTIFICATION

I, Charles J. McGuckin, P.E., am a Professional Engineer licensed in the State of New York. I have primary direct responsibility for implementation of the remedial action for the 5530 Broadway Site, Site number 14CVCP170X.

I, Craig A. Werle, P.G., am a Qualified Environmental Professional as defined in §43-140. I have primary direct responsibility for implementation of the remedial action for the 5530 Broadway Site, Site number 14CVCP170X.

I certify that this Remedial Action Work Plan (RAWP) has a plan for handling, transport and disposal of soil, fill, fluids and other materials removed from the property in accordance with applicable City, State and Federal laws and regulations. Importation of all soil, fill, and other material from off-Site will be in accordance with all applicable City, State and Federal laws and requirements. This RAWP has provisions to control nuisances during the remediation and all invasive work, including dust and odor suppression.

Charles J. McGuckin, P.E. NYS Professional Engineer #069509	2/25/14 Date	 Signature
Craig A. Werle, P.G. QEP Name	2/25/14 Date	QEP Signature

EXECUTIVE SUMMARY

Equity One (Northeast Portfolio) Inc. (Equity One) has enrolled in the New York City Voluntary Brownfield Cleanup Program (NYC VCP) to investigate and remediate an 11,500-square foot site located at 5530 Broadway in Bronx, New York. A remedial investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP). The remedial action described in this document provides for the protection of public health and the environment consistent with the intended property use, complies with applicable environmental standards, criteria, and guidance, and conforms to applicable laws and regulations.

Site Location and Current Usage

The Site is located at 5530 Broadway in the Kingsbridge section of Bronx, New York and is identified as Block 3266 and Lot 23 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 11,500-square feet and is bounded by a de-mapped street (Kimberly Place) to the northeast, a former retail gasoline station to the southwest, the Broadway Plaza NYC VCP Site to the southeast, and Broadway to the northwest. A map of the site boundary is shown in Figure 2. Currently, the Site is vacant, mostly covered in vegetation, and contains only the abandoned and partially collapsed basement of the former building which was previously demolished.

Summary of Proposed Redevelopment Plan

The proposed future use of the Site will consist of retail redevelopment. Equity One will ground lease the site for 49 years with an option to purchase at the end. The site will be combined with the adjacent property located at 5510 Broadway and a two-story slab-on-grade building will be constructed. The new building will have a 19,000 sq. ft. footprint and 35,000 gross sq.ft. on two stories. The building will cover the entire Site, and there will be no open space or landscaped areas. The overall building height will be up to 40 feet. The site consists of one lot, Block 3266, Lot 23.

Construction plans for the Site will include excavation in limited areas to approximately four feet below grade to install pile caps, excavation for a 35 by 35 foot utility basement in the

southwest corner of the property, and the remedial excavation of two hot spots. The existing basement structure from the former building will be removed by excavation that will extend to a depth of approximately 9 feet below grade. This former basement area will be backfilled to meet the surrounding grade at the Site. Removal of the basement structure is the only demolition that will take place at the Site. A sub-slab depressurization system (SSDS) will be installed beneath the entire building slab (across both 5530 and 5510 Broadway). The layout of the proposed site development is presented in Figure 3.

The current zoning designation is commercial C 4-4, which allows for specialty and department stores, theatres and other commercial and office uses. The proposed use is consistent with existing zoning for the property.

Summary of the Remedy

The proposed remedial action achieves protection of public health and the environment for the intended use of the property. The proposed remedial action achieves all of the remedial action objectives established for the project and addresses applicable standards, criterion, and guidance; is effective in both the short-term and long-term and reduces mobility, toxicity and volume of contaminants; is cost effective and implementable; and uses, standards methods that are well established in the industry.

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan.

2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds.

3. Establishment of Track 2 Commercial SCOs.

4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.

5. Excavation and removal of soil/fill exceeding Track 2 SCOs in two hot spot locations (soil borings SB-1 and SB-3) in addition to excavation for cellar area.

6. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.

7. Removal of underground storage tanks (if encountered) and closure of petroleum spills (if evidence of a spill/leak is encountered during Site excavation) in compliance with applicable local, State and Federal laws and regulations.

8. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media onsite.

9. Collection and analysis of end-point soil samples to determine the performance of the remedy with respect to attainment of Track 2 SCOs.

10. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.

11. Installation of a vapor barrier system beneath the building slab and outside foundation sidewalls below grade.

12. Installation and operation of an active sub-slab depressurization system.

13. Construction and maintenance of an engineered composite cover consisting of the building slab and new structure covering the entire Site to prevent human exposure to residual soil/fill remaining under the Site;

14. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.

15. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.

16. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, lists any changes from this RAWP, and describes all Engineering and Institutional Controls to be implemented at the Site.

17. Submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection, and certification of Engineering and Institutional Controls and reporting at a specified frequency.

18. The property will continue to be registered with an E-Designation by the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls in this RAWP and a requirement that management of these controls must be in compliance with an approved SMP. Institutional Controls will include prohibition of

the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

COMMUNITY PROTECTION STATEMENT

The Office of Environmental Remediation created the New York City Voluntary Cleanup Program (NYC VCP) to provide governmental oversight for the cleanup of contaminated property in NYC. This Remedial Action Work Plan ("cleanup plan") describes the findings of prior environmental studies that show the location of contamination at the site, and describes the plans to clean up the site to protect public health and the environment.

This cleanup plan provides a very high level of protection for neighboring communities and also includes many other elements that address common community concerns, such as community air monitoring, odor, dust, and noise controls, hours of operation, good housekeeping and cleanliness, truck management and routing, and opportunities for community participation. The purpose of this Community Protection Statement is to explain these community protection measures in non-technical language to simplify community review.

Remedial Investigation and Cleanup Plan. Under the NYC VCP, a thorough cleanup study of this property (called a remedial investigation) has been performed to identify past property usage, to sample and test soils, groundwater and soil vapor, and identify contaminant sources present on the property. The cleanup plan has been designed to address all contaminant sources that have been identified during the study of this property.

Identification of Sensitive Land Uses. Prior to selecting a cleanup, the neighborhood was evaluated to identify sensitive land uses nearby, such as schools, day care facilities, hospitals, and residential areas. The cleanup program was then tailored to address the special conditions of this community.

Qualitative Human Health Exposure Assessment. An important part of the cleanup planning for the Site is the performance of a study to find all of the ways that people might come in contact with contaminants at the Site now or in the future. This study is called a Qualitative Human Health Exposure Assessment (QHHEA). A QHHEA was performed for this project. This assessment has considered all known contamination at the Site and evaluated the potential

for people to come in contact with this contamination. All identified public exposures will be addressed under this cleanup plan.

Health and Safety Plan. This cleanup plan includes a Construction Health and Safety Plan (CHASP) that is designed to protect community residents and on-Site workers. The elements of this plan are in compliance with safety requirements of the United States Occupational Safety and Health Administration (OSHA). This plan includes many protective elements including those discussed below.

Site Safety Coordinator. This project has a designated Site safety coordinator to implement the Health and Safety Plan. The safety coordinator maintains an emergency contact sheet and protocol for management of emergencies. The Site safety coordinator will be Joseph Gavin of Roux Associates.

Worker Training. Workers participating in cleanup of contaminated material on this project are required to be trained in a 40-hour hazardous waste operators training course and to take annual refresher training. This pertains to workers performing specific tasks including removing contaminated material and installing cleanup systems in contaminated areas.

Community Air Monitoring Plan. Community air monitoring will be performed during this cleanup project to ensure that the community is properly protected from contaminants, dust, and odors. Air samples will be tested in accordance with a detailed plan called the Community Air Monitoring Plan or CAMP. Results will be regularly reported to the NYC Office of Environmental Remediation. This cleanup plan also has a plan to address any unforeseen problems that might occur during the cleanup (called a 'Contingency Plan').

Odor, Dust and Noise Control. This cleanup plan includes actions for odor and dust control. These actions are designed to prevent off-Site odor and dust nuisances and include steps to be taken if nuisances are detected. Generally, dust is managed by application of physical covers and by water sprays. Odors are controlled by limiting the area of open excavations, physical covers, spray foams and by a series of other actions (called operational measures). The project is also required to comply with NYC noise control standards. If you observe problems in these

areas, please contact the onsite Project Manager Joseph Gavin at 631-245-5887 or NYC Office of Environmental Remediation Project Manager Eric Ilijevich at 212-341-2034.

Quality Assurance. This cleanup plan requires that evidence be provided to illustrate that all cleanup work required under the plan has been completed properly. This evidence will be summarized in the final report, called the Remedial Action Report. This report will be submitted to the NYC Office of Environmental Remediation and will be thoroughly reviewed.

Storm-Water Management. To limit the potential for soil erosion and discharge, this cleanup plan has provisions for storm-water management. The main elements of the storm water management include physical barriers such as tarp covers and erosion fencing, and a program for frequent inspection.

Hours of Operation. The hours for operation of cleanup will comply with the NYC Department of Buildings construction code requirements or according to specific variances issued by that agency. For this cleanup project, the hours of operation are 7 AM to 5 PM Monday through Friday.

Signage. While the cleanup is in progress, a placard will be prominently posted at the main entrance of the property with a laminated project Fact Sheet that states that the project is in the NYC Voluntary Cleanup Program, provides project contact names and numbers, and locations of project documents can be viewed.

Complaint Management. The contractor performing this cleanup is required to address all complaints. If you have any complaints, you can call the facility Project Manager (to be provided by the remedial contractor), the NYC Office of Environmental Remediation Project Manager Eric Ilijevich at 212-341-2034, or call 311 and mention the Site is in the NYC Voluntary Cleanup Program.

Utility Mark-outs. To promote safety during excavation in this cleanup, the contractor is required to first identify all utilities and must perform all excavation and construction work in compliance with NYC Department of Buildings regulations.

Soil and Liquid Disposal. All soil and liquid material removed from the Site as part of the cleanup will be transported and disposed of in accordance with all applicable City, State, and Federal regulations and required permits will be obtained.

Soil Chemical Testing and Screening. All excavations will be supervised by a trained and properly qualified environmental professional. In addition to extensive sampling and chemical testing of soils on the Site, excavated soil will be screened continuously using hand-held instruments, by sight, and by smell to ensure proper material handling and management, and community protection.

Stockpile Management. Soil stockpiles will be kept covered with tarps to prevent dust, odors, and erosion. Stockpiles will be frequently inspected. Damaged tarp covers will be promptly replaced. Stockpiles will be protected with silt fences. Hay bales will be used, as needed to protect storm water catch basins and other discharge points.

Trucks and Covers. Loaded trucks leaving the Site will be covered in compliance with applicable laws and regulations to prevent dust and odor. Trucks will be properly recorded in logs and records and placarded in compliance with applicable City, State, and Federal laws, including those of the New York State Department of Transportation. If loads contain wet material that can leak, truck liners will be used. All transport of materials will be performed by licensed truckers and in compliance with all laws and regulations.

Imported Material. All fill materials proposed to be brought onto the Site will comply with rules outlined in this cleanup plan and will be inspected and approved by a qualified worker located on-Site. Waste materials will not be brought onto the Site. Trucks entering the Site with imported clean materials will be covered in compliance with applicable laws and regulations.

Equipment Decontamination. All equipment used for cleanup work will be inspected and washed, if needed, before it leaves the Site. Trucks will be cleaned at a truck inspection station on the property before leaving the Site.

Housekeeping. Locations where trucks enter or leave the Site will be inspected every day and cleaned regularly to ensure that they are free of dirt and other materials from the Site.

Truck Routing. Truck routes have been selected to: (a) limit transport through residential areas and past sensitive nearby properties; (b) maximize use of city-mapped truck routes; (c) limit total distance to major highways; (d) promote safety in entry to highways; (e) promote overall safety in trucking; and (f) minimize off-Site line-ups (queuing) of trucks entering the property. Operators of loaded trucks leaving the Site will be instructed not to stop or idle in the local neighborhood.

Final Report. The results of all cleanup work will be fully documented in a final report (called a Remedial Action Report) that will be available for you to review in the public document repositories located at the Kingsbridge Branch of the New York Public Library.

Long-Term Site Management. To provide long-term protection after the cleanup is complete, the property owner will be required to comply with an ongoing Site Management Plan that calls for continued inspection of protective controls, such as Site covers. The Site Management Plan is evaluated and approved by the NYC Office of Environmental Remediation. Requirements that the property owner must comply with are defined in the property's deed or established through a city environmental designation. A certification of continued protectiveness of the cleanup will be required from time to time to show that the approved cleanup is still effective.

REMEDIAL ACTION WORK PLAN

1.0 SITE BACKGROUND

Equity One has enrolled in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 5530 Broadway in the Kingsbridge section of Bronx, New York (the "Site"). A Remedial Investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP) in a manner that will render the Site protective of public health and the environment consistent with the contemplated end use. This RAWP establishes remedial action objectives, provides a remedial alternative analysis that includes consideration of a permanent cleanup, and provides a description of the selected remedial action. The remedial action described in this document provides for the protection of public health and the environment, complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

1.1 Site Location and Current Usage

The Site is located at 5530 Broadway in the Kingsbridge section of Bronx, New York and is identified as Block 3266 and Lot 23 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 11,500-square feet and is bounded by a de-mapped street (Kimberly Place) to the northeast, a former retail gasoline station to the southwest, the Broadway Plaza NYC VCP Site to the southeast, and Broadway to the northwest. A map of the site boundary is shown in Figure 2. Currently, the Site is vacant, mostly covered in vegetation, and contains only the abandoned and partially collapsed basement of the former building which was previously demolished.

1.2 Proposed Redevelopment Plan

The proposed future use of the Site will consist of retail redevelopment. Equity One will ground lease the site for 49 years with an option to purchase at the end. The site will be combined with the adjacent property located at 5510 Broadway and a two -story slab-on-grade building will be constructed. The new building will have a 19,000 sq. ft. footprint and 35,000 gross sq.ft. on two stories. The building will cover the entire Site, and there will be no open space or landscaped areas. The overall building height will be up to 40 feet. The site consists of one lot, Block 3266, Lot 23.

Construction plans for the Site will include excavation in limited areas to approximately four feet below grade to install pile caps, excavation for a 35 by 35 foot utility basement in the southwest corner of the property, and the remedial excavation of two hot spots. The existing basement structure from the former building will be removed by excavation that will extend to a depth of approximately 9 feet below grade. This former basement area will be backfilled to meet the surrounding grade at the Site. Removal of the basement structure is the only demolition that will take place at the Site. A sub-slab depressurization system (SSDS) will be installed beneath the entire building slab (across both 5530 and 5510 Broadway). The layout of the proposed site development is presented in Figure 3.

The current zoning designation is commercial C 4-4, which allows for specialty and department stores, theatres and other commercial and office uses. The proposed use is consistent with existing zoning for the property.

The remedial action contemplated under this RAWP may be implemented independently of the proposed redevelopment plan.

1.3 Description of Surrounding Property

To the northwest the property is bounded by Broadway, along which the elevated Number 1 subway line runs. Further northwest across Broadway are retail/commercial spaces, residential properties including several apartment complexes, and Public School 207. To the northeast the property is bounded by the de-mapped street Kimberly Place. Further northeast across Kimberly Place are retail/commercial buildings, including a RadioShack, music store, 99 cents store, pet store, kitchen supply store and Verveelen Place. To the southwest the property is bounded by a former retail gasoline and service station, and West 230th Street. Across West 230th Street are commercial and light industrial buildings. To the southeast the property is bounded by the Broadway Plaza NYC VCP Site. Figure 4 shows the surrounding land usage.

1.4 Remedial Investigation

A remedial investigation was performed and the results are documented in a companion document called "*Remedial Investigation Report, 5530 Broadway*", dated July, 2013, and revised per NYC OER comments in November 2013 (RIR).

Summary of Past Uses of Site and Areas of Concern

The Site is currently owned by Equity One (Northeast Portfolio) Inc. and is vacant. A Phase I investigation performed in 2012 reported Sanborn fire insurance maps showing the Site to be undeveloped until at least 1950. There is a gap in the Sanborn map record from 1950 until 1978, when a single-story brick and concrete block structure is depicted in the northwest corner of the Site. The same building is depicted in subsequent Sanborn maps until 1998, where the Site is shown as a vacant lot. The gap in Sanborn maps between the years of 1914 to 1950 results in unknown use of the property during this time period.

No specific areas of concern (AOCs) were identified onsite other than fill blanketing the upper 5 to 10 feet of the Site, a closed spill number related to the adjacent Site (Spill No. 0904799), and an existing former basement filled with demolition building materials.

Summary of the Work Performed under the Remedial Investigation

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e., structures, buildings, etc.);
2. Installed seven soil borings across the entire project Site, and collected 15 soil samples for chemical analysis from the soil borings to evaluate soil quality;
3. To evaluate groundwater quality, three groundwater samples were collected from three temporary monitoring wells that were installed as part of the Phase II;
4. Installed four soil vapor probes around Site perimeter and collected four samples for chemical analysis.

Summary of Environmental Findings

1. Elevation of the property ranges from 18 to 20 feet above sea level.
2. Depth to groundwater ranges from 11 to 12 feet below land surface (bls) at the Site.
3. Groundwater flow is generally from northeast to southwest beneath the Site.
4. Depth to bedrock is unknown, as bedrock was not encountered during this RI. Bedrock is at least 20 feet or greater below the surface.
5. The stratigraphy of the site, from the surface down to the maximum soil boring depth of 20 feet bls, consists of fine sand, with some gravel. Most of the Site is covered with fill material that appears to have been historically used for grading purposes.
6. Analytical results were compared to NYSDEC 6NYCRR Part 375-6.8 Unrestricted Use Soil Cleanup Objectives (SCOs) and Restricted Residential Use SCOs. Results show

exceedances of four VOCs and included acetone (140 parts per billion (ppb)), benzene (1,800 ppb in 10-12 foot, and 330 ppb at 13-15 foot interval), methylene chloride (350 ppb), and total xylenes (560 ppb in 10-12 foot, 6.2 ppb in 3-15 foot interval) in two of the 15 samples from one soil boring (SB-5). The acetone and methylene chloride detections appear to be lab artifacts because they were also found in the associated lab blanks. Benzene and xylene exceed the Track 1 Unrestricted Use Soil Cleanup Objectives (SCOs), however, they do not exceed the Track 2 Restricted Commercial SCOs. No other VOCs exceeded any of the criteria. The elevated hydrocarbon concentration detected in this sample reflects impacts from the adjacent former Getty station. Several SVOCs, all polycyclic aromatic hydrocarbons (PAHs), including benzo[a]anthracene (max. of 21,000 ppb); benzo[a]pyrene (max. of 23,000 ppb); benzo[b]fluoranthene (max. of 25,000 ppb); benzo[k]fluoranthene (max. of 11,000 ppb); chrysene (max. of 20,000 ppb); dibenzo[a,h]anthracene (max. of 3,900 ppb); and Indeno[1,2,3-cd]pyrene (max. of 18,000 ppb) exceeded Unrestricted Use SCOs as well as Restricted Commercial SCOs. Several metals were detected above Unrestricted Use SCOs and included arsenic (19.5 ppm), barium (365 ppm), chromium (max of 49 ppm), copper (635 ppm), lead (max. of 601 ppm), mercury (max. of 0.31 ppm), nickel (40 ppm), and zinc (600 ppm) in multiple soil borings. Of these metals, arsenic and copper also exceeded the Restricted Commercial SCO. PCBs were not detected in any of the soil borings. The detections described above are evenly distributed across the Site. The random distribution of metals and SVOCs is typical of urban fill material.

7. Groundwater samples collected during the RI showed no PCBs in any sample. Several SVOCs were identified in groundwater (petroleum hydrocarbons); however, most concentrations were found at trace or estimated concentrations below 2 ppb and none exceeded Part 703.5 Class GA groundwater quality standards (GQS). Four VOCs were identified above GQS in two of the groundwater samples and included benzene (at 400 ppb), isopropylbenzene (at 16 ppb), and methyl tertiary butyl ether (at 42 ppb) and one chlorinated hydrocarbon (PCE) (at 7.1 ppb). There were several detections of metals in groundwater, but only sodium and manganese exceeded their respective GQS in dissolved groundwater samples. Overall, groundwater results are consistent with soil results and do not indicate a contaminant source on this property. Rather, the petroleum hydrocarbons detected in groundwater are consistent with the known (closed) petroleum spill at the neighboring former Getty gasoline station property.

8. Soil vapor samples collected during the RI showed a variety of VOCs, including petroleum hydrocarbons and chlorinated hydrocarbons. Tetrachloroethylene (PCE) was identified in all four soil vapor samples and ranged from 19 $\mu g/m^3$ to 1400 $\mu g/m^3$, and trichloroethylene (TCE) was detected at a maximum concentration of 9.2 $\mu g/m^3$. The PCE and TCE concentrations are above the monitoring level ranges established within the State DOH soil vapor guidance matrix.

For more detailed results, consult the RIR. A summary of the laboratory data collected during the RI is provided on Tables 2 through 10. Based on an evaluation of the data and information from the RIR and this RAWP, disposal of significant amounts of hazardous waste is not suspected at this site.

2.0 REMEDIAL ACTION OBJECTIVES

Based on the results of the RI, the following Remedial Action Objectives (RAOs) have been identified for this Site:

Groundwater

- Prevent direct exposure to contaminated groundwater.
- Prevent exposure to contaminants volatilizing from contaminated groundwater.

Soil

- Prevent direct contact with contaminated soil.
- Prevent migration of contaminants that would result in groundwater or surface water contamination.

Soil Vapor

- Prevent exposure to contaminants in soil vapor.
- Prevent migration of soil vapor into dwelling and other occupied structures.

3.0 REMEDIAL ALTERNATIVES ANALYSIS

The goal of the remedy selection process is to select a remedy that is protective of human health and the environment taking into consideration the current, intended, and reasonably anticipated future use of the property. The remedy selection process begins by establishing RAOs for media in which chemical constituents were found in exceedance of applicable standards, criteria, and guidance values (SCGs). A remedy is then developed based on the following ten criteria:

- Protection of human health and the environment;
- Compliance with SCGs;
- Short-term effectiveness and impacts;
- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, or volume of contaminated material;
- Implementability;
- Cost effectiveness;
- Community acceptance;
- Land use; and
- Sustainability

The following is a detailed description of the alternatives analysis and remedy selection to address impacted media at the Site. As required, a minimum of two remedial alternatives (Alternative 1 and Alternative 2) are considered for alternatives analysis for this site:

Alternative 1 involves:

- Establishment of Unrestricted Use (Track 1) SCOs.
- Based on the results of the Remedial Investigation, it is expected that this alternative would require excavation across the entire Site to a depth of more than 10 feet to removal all historic fill (to groundwater table). If soil/fill containing analytes at concentrations above Unrestricted Use SCOs is still present at the base of the excavation after removal of all soil required for construction of the new building is complete, additional excavation will be performed to ensure complete removal of soil that does not meet Track 1 Unrestricted Use SCOs.
- No engineering or institutional controls are required in a Track 1 cleanup, but a vapor barrier would be installed beneath the foundation slab and behind foundation sidewalls of

the new building as a part of development to prevent any potential future exposures from off-Site soil vapor or groundwater.

- Placement of a final cover over the entire Site as part of construction.

Alternative 2 involves:

- Establishment of Restricted Commercial (Track 2) SCOs;

- Removal of all soils exceeding Track 2 SCOs and confirmation that Track 2 has been achieved with post-excavation endpoint sampling. Excavation for development purposes would take place to a depth of approximately four feet below grade at pile cap locations, and for a small utility cellar. Two hotspots identified during Remedial Investigation would also be excavated. If soil/fill containing analytes at concentrations above Track 2 Commercial SCOs are still present at the base of the excavation after removal of all soil required for construction of the new building is complete, additional excavation will be performed to meet Track 2 Commercial SCOs;

- Placement of a vapor barrier beneath the foundation slab and along foundation side walls up to grade;

- Installation and operation of active sub-slab depressurization system (SSDS);

- Placement of a final cover over the entire site to eliminate exposure to remaining soil/fill;

- Establishment of use restrictions including prohibitions on the use of groundwater from the site and prohibitions on other sensitive site uses, such as farming or vegetable gardening, to eliminate future exposure pathways;

- Establishment of an approved Site Management Plan (SMP) to ensure long-term management of these engineering and institutional controls, including the performance of periodic inspections and certification that the controls are performing as they were intended; and

- The property will continue to be registered with an E-Designation by the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls in the RAWP and a requirement that management of these controls would be in compliance with an approved SMP. Institutional Controls would include prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

3.1 Threshold Criteria

Protection of Public Health and the Environment

This criterion is an evaluation of the remedy's ability to protect public health and the environment, and an assessment of how risks posed through each existing or potential pathway of exposure are eliminated, reduced, or controlled through removal, treatment, and implementation of Engineering Controls or Institutional Controls. Protection of public health and the environment must be achieved for all approved remedial actions.

Alternative 1 would be protective of human health and the environment by removing additional impacted soil at the Site, thus eliminating the potential for human and environmental exposure to contaminated soil/fill once construction is complete and eliminating the risk of contamination leaching into groundwater.

There is minimal potential for contact with contaminated groundwater as it is not used for potable purposes. Potential exposure from off-site soil vapors would be addressed by installing a vapor barrier beneath the foundation slab of the new building as part of development.

Alternative 2 would achieve comparable protection of human health and the environment by excavating and removing soil/fill above Track 2 SCOs, as well as by employing institutional and engineering controls, including a composite cover system, a vapor barrier, and a sub-slab depressurization system. The composite cover system would prevent direct contact with any remaining on-Site soil/fill. Implementing institutional controls including a Site Management Plan and continued "E" designation of property would ensure that the composite cover system remains intact and protective. Establishment of Track 2 Commercial SCOs would minimize the risk of contamination leaching into groundwater.

For both Alternatives, potential exposure to contaminated soils during construction would be minimized by implementing an approved Soil/Materials Management Plan (SMMP) and Community Air Monitoring Plan (CAMP). Potential contact with contaminated groundwater would be prevented as use for potable purposes is prohibited by city laws and regulations. Potential post-remediation exposure to soil vapors would be addressed by installing a vapor

barrier beneath the foundation slab and outside foundation walls and installing/operating a sub-slab depressurization system.

3.2 Balancing Criteria

Compliance with Standards, Criteria, and Guidance (SCGs)

This evaluation criterion assesses the ability of the alternative to achieve applicable standards, criteria, and guidance.

Alternative 1 would achieve compliance with the remedial goals, chemical-specific SCGs and RAOs for soil through removal of soil to achieve Track 1 Unrestricted Use SCOs and Groundwater Protection Standards. Compliance with SCGs for soil vapor would also be achieved by a SSDS and by installing a vapor barrier below the new building's basement slab and continuing the vapor barrier around foundation walls, as part of development.

Alternative 2 would achieve compliance with the remedial goals, chemical-specific SCGs and RAOs for soil through removal of soil to meet Track 2 Commercial SCOs. Compliance with SCGs for soil vapor would also be achieved by installing an active SSDS and by installing a vapor barrier below the new building's basement slab and continuing the vapor barrier around foundation walls. A Site Management Plan would ensure that these controls remained protective for the long term.

Health and safety measures contained in the CHASP and Community Air Monitoring Plan (CAMP) that comply with the applicable SCGs shall be implemented during Site redevelopment under this RAWP. For both Alternatives, focused attention on means and methods employed during the remedial action would ensure that handling and management of contaminated material would be in compliance with applicable SCGs. These measures would protect on-site workers and the surrounding community from exposure to Site-related contaminants.

Short-term effectiveness and impacts

This evaluation criterion assesses the effects of the alternative during the construction and implementation phase until remedial action objectives are met. Under this criterion, alternatives are evaluated with respect to their effects on public health and the environment during

implementation of the remedial action, including protection of the community, environmental impacts, time until remedial response objectives are achieved, and protection of workers during remedial actions.

Alternative 1 and 2 have similar-short term effectiveness during their respective implementations, as each requires excavation of impacted material. Alternative 1 and 2 would both employ appropriate measures to prevent short term impacts, including a CAMP and a SMMP, during all on-Site soil disturbance activities and would effectively prevent the release of significant contaminants into the environment. Both alternatives provide short term effectiveness in protecting the surrounding community by decreasing the risk of contact with on-Site contaminants. Construction workers operating under appropriate management procedures and a Health and Safety Plan (CHASP) will be protected from on-Site contaminants (personal protective equipment would be worn consistent with the documented risks within the respective work zones).

Long-term effectiveness and permanence

This evaluation criterion addresses the results of a remedial action in terms of its permanence and quantity/nature of waste or residual contamination remaining at the Site after response objectives have been met, such as permanence of the remedial alternative, magnitude of remaining contamination, adequacy of controls including the adequacy and suitability of ECs/ICs that may be used to manage contaminant residuals that remain at the Site and assessment of containment systems and ICs that are designed to eliminate exposures to contaminants, and long-term reliability of Engineering Controls.

Alternative 1 would achieve long-term effectiveness and permanence related to on-site contamination by permanently removing all impacted soils and enabling unrestricted usage of the property.

Alternative 2 would provide long-term effectiveness by removing most on-site contamination and attaining Track 2 Commercial SCOs, establishing engineering controls including a vapor barrier, operation of an active SSDS and a composite cover system across the entire site, establishing institutional controls to ensure long-term management including use restrictions, a

Site Management Plan, and continued registration with E designation to memorialize these controls for the long term. The Site Management Plan will ensure long-term effectiveness of all engineering controls and institutional controls by requiring periodic inspection and certification that these controls and restrictions continue to be in place and are functioning as they were intended to and assuring that protections designed in the remedy will provide continued high levels of protection, in perpetuity.

Reduction of toxicity, mobility, or volume of contaminated material

This evaluation criterion assesses the remedial alternative's use of remedial technologies that permanently and significantly reduce toxicity, mobility, or volume of contaminants as their principal element. The following is the hierarchy of source removal and control measures that are to be used to remediate a Site, ranked from most preferable to least preferable: removal and/or treatment, containment, elimination of exposure and treatment of source at the point of exposure. It is preferred to use treatment or removal to eliminate contaminants at a Site, reduce the total mass of toxic contaminants, cause irreversible reduction in contaminants mobility, or reduce of total volume of contaminated media.

Alternative 1 would permanently eliminate the toxicity, mobility, and volume of contaminants from on-site soil by removing all soil in excess of Track 1 SCOs.

Alternative 2 would permanently eliminate most of the toxicity, mobility, and volume of contaminants from on-site soil by removing soil in excess of Track 2 SCOs, and remaining soil/fill would meet Track 2 Commercial SCOs. The entire site would be capped to permanently eliminate exposures and associated toxicity.

Implementability

This evaluation criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of various services and materials required during its implementation, including technical feasibility of construction and operation, reliability of the selected technology, ease of undertaking remedial action, monitoring considerations, administrative feasibility (e.g., obtaining permits for remedial activities), and availability of services and materials.

Both Alternatives are feasible and implementable. The techniques, materials, and equipment to implement Alternative 1 and 2 are readily available and have been proven effective in remediating the contaminants associated with the Site. They use standard materials, services, and well-established technology. The reliability of these remedies is also high. There are no specific difficulties associated with any of the activities proposed, which utilize standard/industry methods.

Cost effectiveness

This evaluation criterion addresses the cost of alternatives, including capital costs (such as construction costs, equipment costs, and disposal costs, engineering expenses) and site management costs (costs incurred after remedial construction is complete) necessary to ensure the continued effectiveness of a remedial action.

Since historic fill at the Site was found during the RI to extend to a depth of up to 10 feet below grade, and the new building requires excavation of the part of the Site to a depth of 10 feet, the costs associated with Alternative 1 are significantly higher than Alternative 2 because additional excavation (including sheeting and shoring) and off-Site disposal would be required. Long-term costs for Alternative 2 include the costs for long term implementation of a Site Management Plan; however, total costs for Alternative 1 would still be higher.

Community Acceptance

This evaluation criterion addresses community opinion and support for the remedial action. Observations here will be supplemented by public comment received on the RAWP.

Based on the overall goals of the remedial program and initial observations by the project team, both of the alternatives are expected to be acceptable to the community. This RAWP will be subject to a public review under the NYC VCP and will provide the opportunity for detailed public input on the remedial alternatives and the selected remedial action. The public comments received, if any, related to site remediation will be considered by OER prior to approval of this plan. The Citizen Participation Plan for the project is provided in Appendix B.

Land Use

This evaluation criterion addresses the proposed use of the property. This evaluation has considered reasonably anticipated future uses of the Site and takes into account: current use and historical and/or recent development patterns; applicable zoning laws and maps; NYS Department of State's Brownfield Opportunity Areas (BOA) pursuant to section 970-r of the general municipal law; applicable land use plans; proximity to real property currently used for residential use, and to commercial, industrial, agricultural, and/or recreational areas; environmental justice impacts, Federal or State land use designations; population growth patterns and projections; accessibility to existing infrastructure; proximity of the site to important cultural resources and natural resources, potential vulnerability of groundwater to contamination that might emanate from the site, proximity to flood plains, geography and geology; and current Institutional Controls applicable to the site.

The proposed redevelopment of the Site is compatible with its current zoning and is consistent with recent development patterns. Following remediation, the Site will meet either Track 1 Unrestricted Use or Track 2 Commercial SCOs, both of which are appropriate for its planned use. Improvements in the current environmental condition of the property achieved by both alternatives are also consistent with the City's goals for cleanup of contaminated land and bringing such properties into productive reuse. Both alternatives are equally protective of natural resources and cultural resources.

Sustainability of the Remedial Action

This criterion evaluates the overall sustainability of the remedial action alternatives and the degree to which sustainable means are employed to implement the remedial action including those that take into consideration NYC's sustainability goals defined in *PlaNYC: A Greener, Greater New York*. Sustainability goals may include: maximizing the recycling and reuse of non-virgin materials; reducing the consumption of virgin and non-renewable resources; minimizing energy consumption and greenhouse gas emissions; improving energy efficiency; and promotion of the use of native vegetation and enhancing biodiversity during landscaping associated with Site development.

Both remedial alternatives are comparable with respect to the opportunity to achieve sustainable remedial action. To the extent practicable, energy efficient building materials, appliances, and equipment will be utilized to complete the development. A complete list of green remedial activities considered as part of the NYC VCP is included in the Sustainability Statement, included as Appendix C.

4.0 REMEDIAL ACTION

4.1 Summary of Preferred Remedial Action

The preferred remedial action alternative is the Track 2 Alternative. The preferred remedial action alternative achieves protection of public health and the environment for the intended use of the property. The preferred remedial action alternative will achieve all of the remedial action objectives established for the project and addresses applicable SCGs. The preferred remedial action alternative is effective in both the short-term and long-term and reduces mobility, toxicity, and volume of contaminants. The preferred remedial action alternative is cost effective and implementable and uses standards methods that are well established in the industry.

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan.

2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds.

3. Establishment of Track 2 Commercial SCOs.

4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.

5. Excavation and removal of soil/fill exceeding Track 2 SCOs in two hot spot locations (soil borings SB-1 and SB-3) in addition to excavation for cellar area.

6. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.

7. Removal of underground storage tanks (if encountered) and closure of petroleum spills (if evidence of a spill/leak is encountered during Site excavation) in compliance with applicable local, State and Federal laws and regulations.

8. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media onsite.

9. Collection and analysis of end-point soil samples to determine the performance of the remedy with respect to attainment of Track 2 SCOs.

10. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.

11. Installation of a vapor barrier system beneath the building slab and outside foundation sidewalls below grade.

12. Installation and operation of an active sub-slab depressurization system.

13. Construction and maintenance of an engineered composite cover consisting of the building slab and new structure covering the entire Site to prevent human exposure to residual soil/fill remaining under the Site;

14. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.

15. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.

16. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, lists any changes from this RAWP, and describes all Engineering and Institutional Controls to be implemented at the Site.

17. Submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection, and certification of Engineering and Institutional Controls and reporting at a specified frequency.

18. The property will continue to be registered with an E-Designation by the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls in this RAWP and a requirement that management of these controls must be in compliance with an approved SMP. Institutional Controls will include prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

4.2 Soil Cleanup Objectives and Soil/Fill Management

Track 2 Commercial Soil Cleanup Objectives (SCOs) are proposed for this project. The SCOs for this Site are listed in Table 1. Soil and materials management on-Site and off-Site, including excavation, handling, and disposal, will be conducted in accordance with the Soil/Materials Management Plan in Appendix 3. The location of planned excavations is shown in Figure 2.

Discrete contaminant sources (such as hotspots) identified during the remedial action will be identified by GPS or surveyed. This information will be provided in the Remedial Action Report.

Estimated Soil/Fill Removal Quantities

The total quantity of soil/fill expected to be excavated and disposed off-Site is approximately 1200 cubic yards (approximately 1800 tons).

Disposal facilities will be reported to OER when they are identified and prior to the start of remedial action.

End-Point Sampling

Removal actions for development purposes under this plan will be performed in conjunction with confirmation soil sampling. Four confirmation samples will be collected from the base of the excavation at locations to be determined by OER. For comparison to Track 1 SCOs, analytes will include VOCs, SVOC, pesticides, PCBs, and metals according to analytical methods described below. For comparison to Track 2 SCOs, analytes will only include trigger compounds and elements established on the Track 2 SCO list.

Hot-spot removal actions, whether established under this RAWP or identified during the remedial program, will be performed in conjunction with post remedial end-point samples to ensure that hot-spots are fully removed. Analytes for end-point sampling will be those parameters that are driving the hot-spot removal action and will be approved by OER. Frequency for hot-spot end-point sample collection is as follows:

1. For the two hot-spot excavations (10 x 10 x 15 feet deep at SB-1 and SB-3) one bottom sample and one sidewall sample will be collected and analyzed as follows:
    - SB-1 – SVOCs and copper
    - SB-3 – SVOCs
2. For the former basement area that was inaccessible during the RI, two soil samples will be collected and analyzed as follows:
    - Volatile organic compounds by EPA Method 8260;
    - Semivolatile organic compounds by EPA Method 8270;

- Target Analyte List metals; and
- Pesticides/PCBs by EPA Method 8081/8082.

Any soil beneath the former basement that is found to exceed Track 2 standards will be excavated.

3. For contaminated soil removal, post remediation soil samples for laboratory analysis should be taken immediately after contaminated soil removal. If the excavation is enlarged horizontally, additional soil samples will be taken.

Post-remediation end-point sample locations and depth will be biased towards the areas and depths of highest contamination identified during previous sampling episodes unless field indicators such as field instrument measurements or visual contamination identified during the remedial action indicate that other locations and depths may be more heavily contaminated. In all cases, post-remediation samples should be biased toward locations and depths of the highest expected contamination.

New York State ELAP certified labs will be used for all confirmation and end-point sample analyses. Labs performing confirmation and end-point sample analyses will be reported in the RAR. The RAR will provide a tabular and map summary of all confirmation and end-point sample results and will include all data including non-detects and applicable standards and/or guidance values. End-point samples and Confirmation samples will be analyzed for compounds and elements as described above utilizing the following methodology:

Soil analytical methods will include:

- Volatile organic compounds by EPA Method 8260;
- Semivolatile organic compounds by EPA Method 8270;
- Target Analyte List metals; and
- Pesticides/PCBs by EPA Method 8081/8082.

If either LNAPL and/or DNAPL are detected, appropriate samples will be collected for characterization and "finger print analysis" and required regulatory reporting (i.e., spills hotline) will be performed.

Quality Assurance/Quality Control

The fundamental QA objective with respect to accuracy, precision, and sensitivity of analysis for laboratory analytical data is to achieve the QC acceptance of the analytical protocol. The accuracy, precision and completeness requirements will be addressed by the laboratory for all data generated.

The end point sampling will follow the same procedures and protocols used during the RI. This will include one duplicate, field and laboratory blank sample.

Import and Reuse of Soils

Import of soils onto the property and reuse of soils already onsite will be performed in conformance with the Soil/Materials Management Plan in Appendix C.

4.3 Engineering Controls

The excavation required for the proposed Site development will achieve Track 2 Commercial Use SCOs. Engineering Controls were employed in the remedial action to address residual contamination remaining at the site. The Site has three primary Engineering Control Systems. These are:

- composite cover system consisting of concrete covered sidewalks, and the concrete building slabs;
- soil vapor barrier; and
- sub-slab depressurization system.

Composite Cover System

Exposure to residual soil/fill will be prevented by an engineered, composite cover system to be built on the Site. This composite cover system is comprised of:

- Newly constructed building slab, to cover the entire Site; and
- Concrete covered sidewalks adjacent to the Site on Broadway.

The composite cover system is a permanent engineering control for the Site. The system will be inspected and reported at specified intervals as required by this RAWP and the SMP. A Soil Management Plan will be included in the Site Management Plan and will outline the procedures

to be followed in the event that the composite cover system and underlying residual soil/fill is disturbed after the remedial action is complete. Maintenance of this composite cover system will be described in the Site Management Plan in the RAR.

Vapor Barrier

Migration of soil vapor will be mitigated with a combination of building slab and vapor barrier. A vapor barrier system consisting of a 20-mil geomembrane or its equivalent will be installed beneath the building slab and up the sidewalls according to manufacturer specifications. The RAR will include photographs (maximum of two photos per page) of the installation process, PE/RA certified letter (on company letterhead) from primary contractor responsible for installation oversight and field inspections, and a copy of the manufacturers certificate of warranty. A detailed description including manufacturer's specifications will be submitted as part of the building design.

The project's Professional Engineer licensed by the State of New York will have primary direct responsibility for overseeing the implementation of the vapor barrier.

Sub-Slab Depressurization System

Migration of soil vapor will be mitigated with the construction of an active SSDS. The SSDS will be incorporated into the design of the building and will be installed during construction. The SSDS will consist of 4-inch diameter perforated piping installed in gravel trenches beneath the concrete slab in a looped system around the interior edge of the building perimeter. The gravel trenches will be wrapped with a 7-ounce non-woven geo-textile fabric to prevent entry of fines into the piping. The perforated piping will be connected to a 6-inch diameter riser that will extend internally to the roof. The riser pipe will be connected to a 2-horsepower regenerative blower mounted on the roof. The blower cut sheet is provided in Appendix F. The configuration of the anticipated SSDS design for the site is shown in Plate 1. The design is based on a building that occupies both 5510 and 5530 Broadway. Modifications will be made to the SSDS layout when the building design is finalized.

The SSDS will be tested at startup to demonstrate that the system is performing adequately as designed. To simplify the verification of proper system operation, a low vacuum switch (with

manual reset) will be installed on the blower inlet to provide warning if a low vacuum situation were to occur. A warning light will be installed in the interior space of the proposed building (i.e., manager's office). Should a low vacuum situation occur, the warning light will turn on to notify the appropriate personnel.

Upon startup, an air sample will be collected from the exhaust of the depressurization system for analysis using USEPA method TO-15. The air test results will be used to perform a Division of Air Resources (DAR-1) analysis to estimate emissions. Emission levels based on the DAR-1 analysis will be compared to annual guidance concentrations and short term guidance concentrations to determine whether or not air emission control is required. The effluent of the blower and/or vapor phase treatment (if needed) will also be monitored using a photoionization detector (PID) during each O&M visit. A detailed description of the SSDS O&M plan will be contained in the SMP that will be submitted with the RAR.

4.4 Institutional Controls

Institutional Controls (IC) have been incorporated in this remedial action to manage residual soil/fill and other media and render the Site protective of public health and the environment. Institutional Controls are listed below. Long-term employment of EC/ICs will be implemented under a site-specific Site Management Plan (SMP) that will be included in the RAR. The property will continue to be registered with an E-Designation by the NYC Buildings Department.

Institutional Controls for this remedial action are:

- The property will continue to be registered with an E-Designation by the NYC Buildings Department. This RAWP includes a description of all ECs and ICs and summarizes the requirements of the Site Management Plan which will note that the property owner and property owner's successors and assigns must comply with the approved SMP;

- Submittal of a Site Management Plan in the RAR for approval by OER that provides procedures for appropriate operation, maintenance, monitoring, inspection, reporting and certification of ECs. SMP will require that the property owner and property owner's successors and assigns will submit to OER a periodic written statement that certifies that: (1) controls employed at the Site are unchanged from the previous certification or that any changes to the controls were approved by OER; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. OER retains the right to enter the Site in order to evaluate the continued maintenance of any controls. This certification

shall be submitted at a frequency to be determine by OER in the SMP and will comply with RCNY §43-1407(l)(3).

- Vegetable gardens and farming on the Site are prohibited in contact with residual soil materials;
- Use of groundwater underlying the Site is prohibited without treatment rendering it safe for its intended use;
- All future activities on the Site that will disturb residual material must be conducted pursuant to the soil management provisions in an approved SMP;
- The Site will be used for commercial use and will not be used for a higher level of use without prior approval by OER.

4.5 Site Management Plan

Site Management is the last phase of remediation and begins with the approval of the Remedial Action Report and issuance of the Notice of Completion (NOC) for the Remedial Action. The Site Management Plan (SMP) describes appropriate methods and procedures to ensure implementation of all ECs and ICs that are required by this RAWP. The Site Management Plan is submitted as part of the RAR but will be written in a manner that allows its use as an independent document. Site Management continues until terminated in writing by OER. The property owner is responsible to ensure that all Site Management responsibilities defined in the Site Management Plan are implemented.

The SMP will provide a detailed description of the procedures required to manage residual soil/fill left in place following completion of the remedial action in accordance with the Brownfield Cleanup Agreement with OER. This includes a plan for: (1) implementation of EC's and ICs; (2) implementation of monitoring programs; (3) operation and maintenance of EC's; (4) inspection and certification of EC's; and (5) reporting.

Site management activities, reporting, and EC/IC certification will be scheduled by OER on a periodic basis to be established in the SMP and will be subject to review and modification by OER. The Site Management Plan will be based on a calendar year and certification reports will be due for submission to OER by March 31 of the year following the reporting period.

4.6 Qualitative Human Health Exposure Assessment

The objective of the qualitative exposure assessment is to identify potential receptors and pathways for human exposure to the contaminants of concern (COC) that are present at, or migrating from, the Site. The identification of exposure pathways describes the route that the COC takes to travel from the source to the receptor. An identified pathway indicates that the potential for exposure exists; it does not imply that exposures actually occur.

Investigations reported in the Remedial Investigation Report (RIR) are sufficient to complete a Qualitative Human Health Exposure Assessment (QHHEA). As part of the VCP process, a QHHEA was performed to determine whether the Site poses an existing or future health hazard to the Site's exposed or potentially exposed population. The sampling data from the RI were evaluated to determine whether there is any health risk by characterizing the exposure setting, identifying exposure pathways, and evaluating contaminant fate and transport. This QHHEA was prepared in accordance with Appendix 3B and Section 3.3 (b) 8 of the NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation.

Known and Potential Sources

Based on the results of the RIR, the contaminants of concern are as listed below. Analytical results from samples collected during the RI are provided in Tables 2 through 10.

Soil:

- Four VOCs (acetone, benzene, methylene chloride, and xylenes) exceed Track 1 SCOs, but not Track 2 Restricted Commercial (RC) SCOs in one location on the southwestern side of the site, adjacent to the former Getty property;
- Seven SVOCs (all PAHs) exceed Track 1 SCOs, with five of these also exceeding Track 2 RC SCOs in several locations;
- PCBs were not detected in soil samples; and
- Five metals, including arsenic, chromium, copper, lead and mercury, exceed Track 1 SCOs, with arsenic and copper also exceeding the Track 2 RC SCOs in one and two locations, respectively.

Groundwater:

- Four VOCs, including benzene, isopropylbenzene, MTBE, and PCE, exceed Part 703.5 Class GA groundwater quality standards (GQS);
- Five metals, including, chromium, iron, lead, manganese and sodium, exceed GQS;
- One SVOC (phenol) exceed GQS; and
- PCBs were not detected in groundwater.

Soil Vapor:

- A variety of VOCs, including moderate concentrations of PCE (maximum 1400 $\mu g/m^3$) and low concentrations of TCE (maximum 9.2 $\mu g/m^3$), and lower levels of petroleum hydrocarbon compounds (generally under 50 $\mu g/m^3$) were detected in the soil vapor samples.

Nature, Extent, Fate and Transport of Contaminants

Contaminants identified in soil in this remedial investigation are generally associated with historical fill placed beneath the ground surface at this site. Historical fill is widespread and distributed throughout the property. In general, the exceedances in soil are restricted to the upper two-feet, with only two locations exceeding the Track 2 RC SCOs at depths of 12 to 14 feet bls. Soil samples collected near the water table at SB-5 contained VOC and SVOC detections that exceed the Track 1 SCOs, but not the Track 2 SCOs, consistent with previous investigations and the known former Spill at the adjacent former Getty property. Groundwater is not affected by onsite contaminants, but exhibits limited impacts near the former Getty property. Soil vapor impacts are widespread across the Site. The source of the elevated soil vapor concentrations is off site based on the total lack of chlorinated solvents in onsite soils.

Potential Routes of Exposure

The five elements of an exposure pathway are: 1) the source of contamination; 2) the environmental media and transport mechanisms; 3) the point of exposure; 4) the route of exposure; and 5) the receptor population. An exposure pathway is considered complete when all five elements of an exposure pathway are documented. A potential exposure pathway exists

when any one or more of the five elements comprising an exposure pathway cannot be documented. An exposure pathway may be eliminated from further evaluation when any one of the five elements comprising an exposure pathway has not existed in the past, does not exist in the present, and will never exist in the future. Three potential primary routes exist by which chemicals can enter the body:

- Ingestion of water, fill or soil;
- Inhalation of vapors and particulates; and,
- Dermal contact with water, fill, soil, or building materials.

Existence of Human Health Exposure

Current Conditions

The site is currently a vacant lot. In the areas where human exposure to contaminated soil is possible, potential migration pathway is likely complete for dermal absorption, ingestion, and inhalation. Groundwater is not exposed at the site and, because the site is served by the public water supply, groundwater is not used at the site.

Construction/ Remediation Activities

The potential exposure pathways to on-site contamination are by ingestion, dermal, or inhalation exposure by on-site workers during the remedial action. During the remedial action, on-site exposure pathways will be eliminated by preventing access to the site and through implementation of soil/materials management, stormwater pollution prevention, dust controls, employment of a community air monitoring plan, and implementation of a Construction Health and Safety Plan (CHASP).

Proposed Future Conditions

Under future remediated conditions, the site will be fully capped, limiting potential direct exposure to soil and groundwater remaining in place, and there will be a vapor barrier and SSDS to prevent potential for inhalation via soil vapor intrusion. There are no plausible off-site pathways for oral, inhalation, or dermal exposure to contaminants derived from the site.

Receptor Populations

On-Site Receptors

The Site is currently a vacant lot and there are human receptors under current conditions. During construction and remediation activities, receptors will include construction and remediation workers. Under future conditions, receptors will include employees and customers of the proposed commercial establishments.

Off-Site Receptors

Potential off-site receptors within a 0.25-mile radius of the Site include adult and child residents, commercial and construction workers, pedestrians, trespassers, and cyclists, based on the following:

1. Commercial Businesses (up to 0.25 mile) – existing and future
2. Residential Buildings (up to 0.25 mile) – existing and future
3. Building Construction/Renovation (up to 0.25 mile) – existing and future
4. Pedestrians, Trespassers, Cyclists (up to .25 mile) – existing and future
5. Schools (up to .25 mile) – existing and future

Overall Human Health Exposure Assessment

Complete on-site exposure pathways appear to be present only during the construction and remediation phase. During the remedial action, on-site exposure pathways will be eliminated by: preventing access to the site; through implementation of soil/materials management, stormwater pollution prevention, and dust controls; employment of a community air monitoring plan; and, implementation of a CHASP.

Investigations reported in the Remedial Investigation Report (RIR) are sufficient to complete a Qualitative Human Health Exposure Assessment (QHHEA).

5.0 REMEDIAL ACTION MANAGEMENT

5.1 Project Organization and Oversight

Principal personnel who will participate in the remedial action include:

- Michael Berfield – Executive Vice President - Equity One (Northeast Portfolio) Inc.
- Craig Werle, P.G. – Principal Hydrogeologist - Roux Associates, Inc.
- Wendy Monterosso – Project Manager - Roux Associates, Inc.
- Glenn Netuschil, P.E. – Senior Engineer - Roux Associates, Inc.
- Joseph Gavin, Project Hydrogeologist/Field Manager - Roux Associates, Inc.

The Professional Engineer (PE) and Qualified Environmental Professionals (QEP) for this project are:

- Charles McGuckin, P.E., Remedial Engineering
- Craig A. Werle, P.G., Roux Associates, Inc.

5.2 Site Security

Site access will be controlled by through gated entrances to the fenced property.

5.3 Work Hours

The hours for operation of remedial construction will be from 7 AM to 5 PM. These hours conform to the New York City Department of Buildings construction code requirements.

5.4 Construction Health and Safety Plan

The Health and Safety Plan is included in Appendix D. The Site Safety Coordinator will be provided by the remedial contractor. Remedial work performed under this RAWP will be in full compliance with applicable health and safety laws and regulations, including Site and OSHA worker safety requirements and HAZWOPER requirements. Confined space entry, if any, will comply with OSHA requirements and industry standards and will address potential risks. The parties performing the remedial construction work will ensure that performance of work is in compliance with the HASP and applicable laws and regulations. The HASP pertains to remedial and invasive work performed at the Site until the issuance of the Notice of Completion.

All field personnel involved in remedial activities will participate in training required under 29 CFR 1910.120, including 40-hour hazardous waste operator training and annual 8-hour refresher training. The Site Safety Officer will be responsible for maintaining workers training records.

Personnel entering any exclusion zone will be trained in the provisions of the HASP and be required to sign an HASP acknowledgment. Site-specific training will be provided to field personnel. Additional safety training may be added depending on the tasks performed. Emergency telephone numbers will be posted at the site location before any remedial work begins. A safety meeting will be conducted before each shift begins. Topics to be discussed include task hazards and protective measures (physical, chemical, environmental); emergency procedures; PPE levels and other relevant safety topics. Meetings will be documented in a log book or specific form.

An emergency contact sheet with names and phone numbers is included in the HASP. That document will define the specific project contacts for use in case of emergency.

5.5 Community Air Monitoring Plan

Real-time air monitoring for volatile organic compounds (VOCs) and particulate levels at the perimeter of the exclusion zone or work area will be performed. Continuous monitoring will be performed for all ground intrusive activities and during the handling of contaminated or potentially contaminated media. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pit excavation or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be performed during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. Periodic monitoring during sample collection, for instance, will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. Depending upon the proximity of potentially exposed individuals, continuous monitoring may be performed during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park,

or adjacent to a school or residence. Exceedances of action levels observed during performance of the Community Air Monitoring Plan (CAMP) will be reported to the OER Project Manager and included in the Daily Report.

VOC Monitoring, Response Levels, and Actions

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

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring 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, activities will be shutdown.

All 15-minute readings must be recorded and be available for OER personnel to review. 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 perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate

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

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

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

All readings will be recorded and be available for OER personnel to review.

5.6 Agency Approvals

All permits or government approvals required for remedial construction have been or will be obtained prior to the start of remedial construction. Approval of this RAWP by OER does not constitute satisfaction of these requirements and will not be a substitute for any required permit.

5.7 Site Preparation

Pre-Construction Meeting

OER will be invited to attend the pre-construction meeting at the Site with all parties involved in the remedial process prior to the start of remedial construction activities.

Mobilization

Mobilization will be conducted as necessary for each phase of work at the Site. Mobilization includes field personnel orientation, equipment mobilization (including securing all sampling equipment needed for the field investigation), marking/staking sampling locations and utility

mark-outs. Each field team member will attend an orientation meeting to become familiar with the general operation of the Site, health and safety requirements, and field procedures.

Utility Marker Layouts, Easement Layouts

The presence of utilities and easements on the Site will be fully investigated prior to the performance of invasive work such as excavation or drilling under this plan by using, at a minimum, the One-Call System (811). Underground utilities may pose an electrocution, explosion, or other hazard during excavation or drilling activities. All invasive activities will be performed incompliance with applicable laws and regulations to assure safety. Utility companies and other responsible authorities will be contacted to locate and mark the locations, and a copy of the Markout Ticket will be retained by the contractor prior to the start of drilling, excavation or other invasive subsurface operations. Overhead utilities may also be present within the anticipated work zones. Electrical hazards associated with drilling in the vicinity of overhead utilities will be prevented by maintaining a safe distance between overhead power lines and drill rig masts.

Proper safety and protective measures pertaining to utilities and easements, and compliance with all laws and regulations will be employed during invasive and other work contemplated under this RAWP. The integrity and safety of on-Site and off-Site structures will be maintained during all invasive, excavation or other remedial activity performed under the RAWP.

Dewatering

At present, intrusive work planned for the Site will take place above the observed groundwater table. Dewatering will not be required during the remedial construction or redevelopment of the Site.

Equipment and Material Staging

Equipment and materials will be stored and staged in a manner that complies with applicable laws and regulations.

Stabilized Construction Entrance

Steps will be taken to ensure that trucks departing the site will not track soil, fill, or debris off-Site. Such actions may include use of cleaned asphalt or concrete roads or use of stone or other aggregate-based egress paths between the truck inspection station and the property exit. Measures will be taken to ensure that adjacent roadways will be kept clean of project related soils, fill and debris.

Truck Inspection Station

An outbound-truck inspection station will be set up close to the Site exit. Before exiting the NYC VCP Site, trucks will be required to stop at the truck inspection station and will be examined for evidence of contaminated soil on the undercarriage, body, and wheels. Soil and debris will be removed. Brooms, shovels, and potable water will be utilized for the removal of soil from vehicles and equipment, as necessary.

Extreme Storm Preparedness and Response Contingency Plan

Damage from flooding or storm surge can include dislocation of soil and stockpiled materials, dislocation of site structures and construction materials and equipment, and dislocation of support of excavation structures. Damage from wind during an extreme storm event can create unsafe or unstable structures, damage safety structures and cause downed power lines creating dangerous site conditions and loss of power. In the event of emergency conditions caused by an extreme storm event, the enrollee will undertake the following steps for site preparedness prior to the event and response after the event.

Storm Preparedness

Preparations in advance of an extreme storm event will include the following: containerized hazardous materials and fuels will be removed from the property; lose materials will be secured to prevent dislocation and blowing by wind or water; heavy equipment such as excavators and generators will be removed from holes, trenches and depressions on the property to high ground or removed from the property; an inventory of the property with photographs will be performed to establish conditions for the site and equipment prior to the event; stockpile covers for soil and fill will be secured by adding weights such as sandbags for added security and worn or ripped stockpile covers will be replaced with competent covers; stockpiled hazardous wastes will be

removed from the property; stormwater management systems will be inspected and fortified, including, as necessary: clean and reposition silt fences, haybales; clean storm sewer filters and traps; and secure and protect pumps and hosing.

Storm Response

At the conclusion of an extreme storm event, as soon as it is safe to access the property, a complete inspection of the property will be performed. A site inspection report will be submitted to OER at the completion of site inspection and after the site security is assessed. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. Damage from storm conditions that result in acute public safety threats, such as downed power lines or imminent collapse of buildings, structures, or equipment will be reported to public safety authorities via appropriate means such as calling 911. Petroleum spills will be reported to NYS DEC within 2 hours of identification and consistent with State regulations. Emergency and spill conditions will also be reported to OER. Public safety structures, such as construction security fences will be repaired promptly to eliminate public safety threats. Debris will be collected and removed. Dewatering will be performed in compliance with existing laws and regulations and consistent with emergency notifications, if any, from proper authorities. Eroded areas of soil including unsafe slopes will be stabilized and fortified. Dislocated materials will by collected and appropriately managed. Support of excavation structure will be inspected and fortified as necessary. Impacted stockpiles will be contained and damaged stockpile covers will be replaced. Storm-water control systems and structures will be inspected and maintained as necessary. If soil or fill materials are discharged off site to adjacent properties, property owners and OER will be notified and corrective measure plan designed to remove and clean dislocated material will be submitted to OER and implemented following approval by OER and granting of site access by the property owner. Impacted offsite areas may require characterization based on site conditions, at the discretion of OER. If onsite petroleum spills are identified, a qualified environmental professional will determine the nature and extent of the spill and report to NYS DEC's spill hotline at DEC 800-457-7362. If the source of the spill is ongoing and can be identified, it should be stopped it this can be done safely. Potential hazards will be addressed immediately, consistent with guidance issued by NYS DEC.

Storm Response Reporting

A site inspection report will be submitted to OER at the completion of site inspection. An inspection report established by OER is available on OER's website (www.nyc.gov/oer) and will be used for this purpose. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. The site inspection report will be sent to the OER project manager and will include the site name, address, tax block and lot, site primary and alternate contact name and phone number. Damage and soil release assessment will include: whether the project had stockpiles; whether stockpiles were damaged; photographs of damage and notice of plan for repair; report of whether soil from the site was dislocated and whether any of the soil left the site; estimates of the volume of soil that left the site, nature of impact, and photographs; description of erosion damage; description of equipment damage; description of damage to the remedial program or the construction program, such as damage to the support of excavation; presence of onsite or offsite exposure pathways caused by the storm; presence of petroleum or other spills and status of spill reporting to NYS DEC; description of corrective actions; schedule for corrective actions. This report should be completed and submitted to OER project manager with photographs within 24 hours of the time of safe entry to the property after the storm event.

5.8 Traffic Control

Drivers of trucks leaving the NYC VCP Site with soil/fill will be instructed to proceed without stopping in the vicinity of the site to prevent neighborhood impacts. The planned route on local roads for trucks leaving the site is West 230thStreet to the Major Deegan Expressway.

5.9 Demobilization

Demobilization will include:

- As necessary, restoration of temporary access areas and areas that may have been disturbed to accommodate support areas (e.g., staging areas, decontamination areas, storage areas, temporary water management areas, and access area);
- Removal of sediment from erosion control measures and truck wash and disposal of materials in accordance with applicable laws and regulations;
- Equipment decontamination, and;
- General refuse disposal.

Equipment will be decontaminated and demobilized at the completion of all field activities. Investigation equipment and large equipment (*e.g.*, soil excavators) will be washed at the truck inspection station as necessary. In addition, all investigation and remediation derived waste will be appropriately disposed.

5.10 Reporting and Record Keeping

Daily Reports

Daily reports providing a general summary of activities for each day of *active remedial work* will be emailed to the OER Project Manager by the end of the following day. Those reports will include:

- Project number and statement of the activities and an update of progress made and locations of work performed;
- Quantities of material imported and exported from the Site;
- Status of on-Site soil/fill stockpiles;
- A summary of all citizen complaints, with relevant details (basis of complaint; actions taken; etc.);
- A summary of CAMP excursions, if any;
- Photograph of notable Site conditions and activities.

The frequency of the reporting period may be revised in consultation with OER project manager based on planned project tasks. Daily email reports are not intended to be the primary mode of communication for notification to OER of emergencies (accidents, spills), requests for changes to the RAWP or other sensitive or time critical information. However, such information will be included in the daily reports. Emergency conditions and changes to the RAWP will be communicated directly to the OER project manager by personal communication. Daily reports will be included as an Appendix in the Remedial Action Report.

Record Keeping and Photo-Documentation

Job-site record keeping for all remedial work will be performed. These records will be maintained on-Site during the project and will be available for inspection by OER staff. Representative photographs will be taken of the Site prior to any remedial activities and during

major remedial activities to illustrate remedial program elements and contaminant source areas. Photographs will be submitted at the completion of the project in the RAR in digital format (i.e., jpeg files).

5.11 Complaint Management

All complaints from citizens will be promptly reported to OER. Complaints will be addressed and outcomes will also be reported to OER in daily reports. Notices to OER will include the nature of the complaint, the party providing the complaint, and the actions taken to resolve any problems.

5.12 Deviations from the Remedial Action Work Plan

All changes to the RAWP will be reported to the OER Project Manager and will be documented in daily reports and reported in the Remedial Action Report. The process to be followed if there are any deviations from the RAWP will include a request for approval for the change from OER noting the following:

- Reasons for deviating from the approved RAWP;
- Effect of the deviations on overall remedy; and
- Determination that the remedial action with the deviation(s) is protective of public health and the environment.

5.13 Data Usability Summary Report

The primary objective of a Data Usability Summary Report (DUSR) is to determine whether or not data meets the site specific criteria for data quality and data use. The DUSR provides an evaluation of analytical data without third party data validation. The DUSR for post-remedial samples collected during implementation of this RAWP will be included in the Remedial Action Report (RAR).

6.0 REMEDIAL ACTION REPORT

A Remedial Action Report (RAR) will be submitted to OER following implementation of the remedial action defined in this RAWP. The RAR will document that the remedial work required under this RAWP has been completed and has been performed in compliance with this plan. The RAR will include:

- Information required by this RAWP;
- As-built drawings for all constructed remedial elements, required certifications, manifests and other written and photographic documentation of remedial work performed under this remedy;
- Site Management Plan;
- Description of any changes in the remedial action from the elements provided in this RAWP and associated design documents;
- Tabular summary of all end point sampling results and all material characterization results, QA/QC results for end-point sampling, and other sampling and chemical analysis performed as part of the remedial action and DUSR;
- Test results or other evidence demonstrating that remedial systems are functioning properly;
- Account of the source area locations and characteristics of all contaminated material removed from the Site including a map showing source areas;
- Account of the disposal destination of all contaminated material removed from the Site. Documentation associated with disposal of all material will include transportation and disposal records, and letters approving receipt of the material.
- Account of the origin and required chemical quality testing for material imported onto the Site.
- Recorded Declaration of Covenants and Restrictions.
- Continue registration of the property with an E-Designation by the NYC Department of Buildings.
- Reports and supporting material will be submitted in digital form.

Remedial Action Report Certification

The following certification will appear in front of the Executive Summary of the Remedial Action Report. The certification will include the following statements:

I, _____, am currently a professional engineer licensed by the State of New York. I had primary direct responsibility for implementation of the remedial program for the 5530 Broadway Site, Site number 14CVCP170X.

I, _____, am a qualified Environmental Professional. I had primary direct responsibility for implementation remedial program for the 5530 Broadway Site, Site number 14CVCP170X .

I certify that the OER-approved Remedial Action Work Plan dated month day year and Stipulations in a letter dated month day, year; if any were implemented and that all requirements in those documents have been substantively complied with. I certify that contaminated soil, fill, liquids or other material from the property were taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.

7.0 SCHEDULE

The table below presents a schedule for the proposed remedial action and reporting. If the schedule for remediation and development activities changes, it will be updated and submitted to OER. Currently, a six month remediation period is anticipated.

Schedule Milestone	Weeks from Remedial Action Start	Duration (weeks)
OER Approval of RAWP	0	-
Fact Sheet 2 announcing start of remedy	0	-
Mobilization	1	1
Remedial Excavation	3	1
Construction Excavation	3	8
Construct Sub-slab Depressurization System/Install Vapor Barrier	3	3
Demobilization	8	1
Record Declaration of Covenants and Restrictions	24	1
Submit Remedial Action Report	24	2

TABLES

Table 1. Summary of Soil Cleanup Objectives, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Commercial (µg/kg)
Volatile Organic Compounds	
1,1,1-Trichloroethane	500000
1,1,2,2-Tetrachloroethane	--
1,1,2-Trichloroethane	--
1,1-Dichloroethane	240000
1,1-Dichloroethene	500000
1,2,3-Trichlorobenzene	--
1,2,4-Trichlorobenzene	--
1,2-Dibromoethane	--
1,2-Dichlorobenzene	500000
1,2-Dichloroethane	30000
1,2-Dichloropropane	--
1,3-Dichlorobenzene	280000
1,4-Dichlorobenzene	130000
1,4-Dioxane	130000
2-Butanone (MEK)	500000
2-Hexanone	--
4-Methyl-2-pentanone (MIBK)	--
Acetone	500000
Benzene	44000
Bromochloromethane	--
Bromodichloromethane	--
Bromoform	--
Bromomethane	--
Carbon disulfide	--
Carbon tetrachloride	22000
Chlorobenzene	500000
Chloroethane	--
Chloroform	350000
Chloromethane	--
cis-1,2-Dichloroethene	500000
cis-1,3-Dichloropropene	--
Cyclohexane	--
Dibromochloromethane	--
Dibromochloropropane	--
Dichlorodifluoromethane	--
Ethylbenzene	390000
Freon 113	--
Isopropylbenzene	--
m+p-Xylene	--
Methyl acetate	--
Methylcyclohexane	--
Methylene chloride	500000
MTBE	500000
o-Xylene	--
Styrene	--
Tetrachloroethene	150000
Toluene	500000
trans-1,2-Dichloroethene	500000

Table 1. Summary of Soil Cleanup Objectives, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Commercial (µg/kg)
trans-1,3-Dichloropropene	--
Trichloroethene	200000
Trichlorofluoromethane	--
Vinyl chloride	13000
Xylenes (total)	500000
Semivolatile Organic Compounds	
1,1'-Biphenyl	--
1,2,4,5-Tetrachlorobenzene	--
2,2'-oxybis (1-chloropropane)	--
2,3,4,6-Tetrachlorophenol	--
2,4,5-Trichlorophenol	--
2,4,6-Trichlorophenol	--
2,4-Dichlorophenol	--
2,4-Dimethylphenol	--
2,4-Dinitrophenol	--
2,4-Dinitrotoluene	--
2,6-Dinitrotoluene	--
2-Chloronaphthalene	--
2-Chlorophenol	--
2-Methylnaphthalene	--
2-Methylphenol	500000
2-Nitroaniline	--
2-Nitrophenol	--
3&4-Methylphenol	--
3,3'-Dichlorobenzidine	--
3-Nitroaniline	--
4,6-Dinitro-2-methylphenol	--
4-Bromophenyl phenyl ether	--
4-Chloro-3-methylphenol	--
4-Chloroaniline	--
4-Chlorophenyl phenyl ether	--
4-Nitroaniline	--
4-Nitrophenol	--
Acenaphthene	500000
Acenaphthylene	500000
Acetophenone	--
Anthracene	500000
Atrazine	--
Benzaldehyde	--
Benzo[a]anthracene	5600
Benzo[a]pyrene	1000
Benzo[b]fluoranthene	5600
Benzo[g,h,i]perylene	500000
Benzo[k]fluoranthene	56000
Bis(2-chloroethoxy)methane	--
Bis(2-chloroethyl) ether	--
Bis(2-ethylhexyl) phthalate	--
Butylbenzyl phthalate	--
Caprolactam	--
Carbazole	--

Table 1. Summary of Soil Cleanup Objectives, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Commercial (µg/kg)
Chrysene	56000
Dibenzo[a,h]anthracene	560
Dibenzofuran	350000
Diethyl phthalate	--
Dimethyl phthalate	--
Di-n-butyl phthalate	--
Di-n-octyl phthalate	--
Fluoranthene	500000
Fluorene	500000
Hexachlorobenzene	6000
Hexachlorobutadiene	--
Hexachlorocyclopentadiene	--
Hexachloroethane	--
Indeno[1,2,3-cd]pyrene	5600
Isophorone	--
Naphthalene	500000
Nitrobenzene	--
n-Nitrosodi-n-propylamine	--
n-Nitrosodiphenylamine	--
Pentachlorophenol	6700
Phenanthrene	500000
Phenol	500000
Pyrene	500000
Metals	
Aluminum	--
Antimony	--
Arsenic	16
Barium	400
Beryllium	590
Cadmium	9.3
Calcium	--
Chromium	1500
Cobalt	--
Copper	270
Iron	--
Lead	1000
Magnesium	--
Manganese	10000
Mercury	2.8
Nickel	310
Potassium	--
Selenium	1500
Silver	1500
Sodium	--
Thallium	--
Vanadium	--
Zinc	10000
Polychlorinated Biphenyls	
Total PCBs	1000

Table 2. Summary of Volatile Organic Compounds in Soil, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Unrestricted Use	NYSDEC Part 375 Commercial (µg/kg)	**Sample Designation:**	SB-1	SB-1 DUP	SB-1	SB-2	SB-2	SB-3
			Sample Date:	5/21/2013	5/21/2013	5/22/2013	5/21/2013	5/21/2013	5/21/2013
			Sample Depth (ft bls):	0-2	0-2	12-14	0-2	11-13	0-2
1,1,1-Trichloroethane	680	500000		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
1,1,2,2-Tetrachloroethane	--	--		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
1,1,2-Trichloroethane	--	--		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
1,1-Dichloroethane	270	240000		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
1,1-Dichloroethene	330	500000		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
1,2,3-Trichlorobenzene	--	--		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
1,2,4-Trichlorobenzene	--	--		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
1,2-Dibromoethane	--	--		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
1,2-Dichlorobenzene	1100	500000		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
1,2-Dichloroethane	20	30000		1.1 U *	1.1 U *	1.2 U	1 U *	1.1 U *	1.1 U *
1,2-Dichloropropane	--	--		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
1,3-Dichlorobenzene	2400	280000		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
1,4-Dichlorobenzene	1800	130000		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
1,4-Dioxane	100	130000		54 U	53 U	58 U	52 U	56 U	53 U
2-Butanone (MEK)	120	500000		11 U *	11 U *	2.1 J	10 U *	11 U *	11 U *
2-Hexanone	--	--		11 U	11 U	12 U	10 U	11 U	11 U
4-Methyl-2-pentanone (MIBK)	--	--		11 U	11 U	12 U	10 U	11 U	11 U
Acetone	50	500000		11 B	10 J B	26 B	22 B	17 B	13 B
Benzene	60	44000		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
Bromochloromethane	--	--		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
Bromodichloromethane	--	--		1.1 U *	1.1 U *	1.2 U	1 U *	1.1 U *	1.1 U *
Bromoform	--	--		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
Bromomethane	--	--		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
Carbon disulfide	--	--		1.1 U	1.1 U	2	1 U	1.1 U	1.1 U
Carbon tetrachloride	760	22000		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
Chlorobenzene	1100	500000		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
Chloroethane	--	--		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
Chloroform	370	350000		1.1 U *	1.1 U *	1.2 U	1 U *	1.1 U *	1.1 U *
Chloromethane	--	--		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
cis-1,2-Dichloroethene	250	500000		1.1 U	1.1 U	0.73 J	1 U	1.1 U	1.1 U
cis-1,3-Dichloropropene	--	--		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
Cyclohexane	--	--		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
Dibromochloromethane	--	--		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
Dibromochloropropane	--	--		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U

Table 2. Summary of Volatile Organic Compounds in Soil, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Unrestricted Use	NYSDEC Part 375 Commercial (µg/kg)	**Sample Designation:**	SB-1	SB-1 DUP	SB-1	SB-2	SB-2	SB-3
			Sample Date:	5/21/2013	5/21/2013	5/22/2013	5/21/2013	5/21/2013	5/21/2013
			Sample Depth (ft bls):	0-2	0-2	12-14	0-2	11-13	0-2
Dichlorodifluoromethane	--	--		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
Ethylbenzene	1000	390000		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
Freon 113	--	--		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
Isopropylbenzene	--	--		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
Methyl acetate	--	--		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
Methylcyclohexane	--	--		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
Methylene chloride	50	500000		1.1 U	1.1 U	0.27 J	1 U	1.1 U	1.1 U
MTBE	930	500000		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
Styrene	--	--		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
Tetrachloroethene	1300	150000		8.1	5.6	37	0.72 J	1.1 U	0.33 J
Toluene	700	500000		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
trans-1,2-Dichloroethene	190	500000		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
trans-1,3-Dichloropropene	--	--		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
Trichloroethene	470	200000		1.1 U	1.1 U	1.2	1 U	1.1 U	1.1 U
Trichlorofluoromethane	--	--		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
Vinyl chloride	20	13000		1.1 U	1.1 U	1.2 U	1 U	1.1 U	1.1 U
Xylenes (total)	260	500000		3.2 U	3.2 U	3.5 U	3.1 U	3.4 U	3.2 U

J - Estimated value

U - Indicates that the compound was analyzed for but not detected

B - The analyte was found in an associated blank as well as in the sample

* - LCS or LCSP exceeds the control limits

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NYSDEC - New York State Department of Environmental Conservation

-- No NYSDEC Part 375 Standards available

Bold data indicates that parameter was detected above the NYSDEC Part 375 Unrestricted Use Standards

Shaded data indicates that parameter was detected above the NYSDEC Part 375 Commercial Standards

Table 2. Summary of Volatile Organic Compounds in Soil, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Unrestricted Use	NYSDEC Part 375 Commercial (µg/kg)	**Sample Designation:**	SB-3	SB-4	SB-4	SB-5	SB-5	SB-5
			Sample Date:	5/22/2013	5/22/2013	5/22/2013	5/21/2013	5/21/2013	5/21/2013
			Sample Depth (ft bls):	11-13	0-2	8-10	0-2	10-12	13-15
1,1,1-Trichloroethane	680	500000		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
1,1,2,2-Tetrachloroethane	--	--		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
1,1,2-Trichloroethane	--	--		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
1,1-Dichloroethane	270	240000		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
1,1-Dichloroethene	330	500000		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
1,2,3-Trichlorobenzene	--	--		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
1,2,4-Trichlorobenzene	--	--		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
1,2-Dibromoethane	--	--		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
1,2-Dichlorobenzene	1100	500000		1.1 U	1.1 U	1 U	1 U	94 J	0.84 J
1,2-Dichloroethane	20	30000		1.1 U	1.1 U	1 U	1 U *	120 U	1.2 U
1,2-Dichloropropane	--	--		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
1,3-Dichlorobenzene	2400	280000		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
1,4-Dichlorobenzene	1800	130000		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
1,4-Dioxane	100	130000		56 U	53 U	51 U	51 U	6200 U	59 U
2-Butanone (MEK)	120	500000		3.1 J	11 U	4.2 J	10 U *	620 U	29
2-Hexanone	--	--		11 U	11 U *	10 U *	10 U	620 U	12 U
4-Methyl-2-pentanone (MIBK)	--	--		11 U	11 U *	10 U *	10 U	620 U	12 U
Acetone	50	500000		21 B	11 U	30 B	17 B	620 U	**140 B**
Benzene	60	44000		1.1 U	0.25 J	0.16 J	1 U	**1800**	**330**
Bromochloromethane	--	--		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
Bromodichloromethane	--	--		1.1 U	1.1 U	1 U	1 U *	120 U	1.2 U
Bromoform	--	--		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
Bromomethane	--	--		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
Carbon disulfide	--	--		0.58 J	0.49 J	0.82 J	1 U	120 U	0.99 J
Carbon tetrachloride	760	22000		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
Chlorobenzene	1100	500000		1.1 U	1.1 U	1 U	1 U	160	1.3
Chloroethane	--	--		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
Chloroform	370	350000		1.1 U	1.1 U	1 U	1 U *	120 U	1.8
Chloromethane	--	--		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
cis-1,2-Dichloroethene	250	500000		0.95 J	1.1 U	1 U	1 U	120 U	1.2 U
cis-1,3-Dichloropropene	--	--		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
Cyclohexane	--	--		1.1 U	0.23 J	1 U	1 U	120 U	15
Dibromochloromethane	--	--		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
Dibromochloropropane	--	--		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U

Table 2. Summary of Volatile Organic Compounds in Soil, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Unrestricted Use	NYSDEC Part 375 Commercial (µg/kg)	**Sample Designation:**	SB-3	SB-4	SB-4	SB-5	SB-5	SB-5
			Sample Date:	5/22/2013	5/22/2013	5/22/2013	5/21/2013	5/21/2013	5/21/2013
			Sample Depth (ft bls):	11-13	0-2	8-10	0-2	10-12	13-15
Dichlorodifluoromethane	--	--		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
Ethylbenzene	1000	390000		1.1 U	0.35 J	0.6 J	1 U	900	7.9
Freon 113	--	--		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
Isopropylbenzene	--	--		1.1 U	0.57 J	0.61 J	1 U	6900	23
Methyl acetate	--	--		1.1 U	1.1 U	1 U	1 U	250 U	1.2 U
Methylcyclohexane	--	--		1.1 U	0.83 J	0.58 J	1 U	6700	18
Methylene chloride	50	500000		0.27 J	1.1 U	0.84 J	1.3 B	**350 B**	1.2 U
MTBE	930	500000		1.1 U	1.1 U	1 U	1 U	23 J	9.4
Styrene	--	--		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
Tetrachloroethene	1300	150000		4.5	68	15	1 U	120 U	1.2 U
Toluene	700	500000		0.3 J B	0.38 J B	0.98 J B	1 U	120	7.3 B
trans-1,2-Dichloroethene	190	500000		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
trans-1,3-Dichloropropene	--	--		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
Trichloroethene	470	200000		0.49 J	0.18 J	1 U	1 U	120 U	1.2 U
Trichlorofluoromethane	--	--		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
Vinyl chloride	20	13000		1.1 U	1.1 U	1 U	1 U	120 U	1.2 U
Xylenes (total)	260	500000		3.3 U	3.1 J	4.3	3.1 U	**560**	6.2

J - Estimated value

U - Indicates that the compound was analyzed for but not detected

B - The analyte was found in an associated blank as well as in the sample

* - LCS or LCSP exceeds the control limits

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NYSDEC - New York State Department of Environmental Conservation

-- No NYSDEC Part 375 Standards available

Bold data indicates that parameter was detected above the NYSDEC Part 375 Unrestricted Use Standards

Shaded data indicates that parameter was detected above the NYSDEC Part 375 Commercial Standards

Table 2. Summary of Volatile Organic Compounds in Soil, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Unrestricted Use	NYSDEC Part 375 Commercial (µg/kg)	**Sample Designation:**	SB-6	SB-6	SB-7	SB-7
			Sample Date:	5/21/2013	5/21/2013	5/21/2013	5/21/2013
			Sample Depth (ft bls):	0-2	11-12.5	0-2	8-10
1,1,1-Trichloroethane	680	500000		1.1 U	1.2 U	1.1 U	1.1 U
1,1,2,2-Tetrachloroethane	--	--		1.1 U	1.2 U	1.1 U	1.1 U
1,1,2-Trichloroethane	--	--		1.1 U	1.2 U	1.1 U	1.1 U
1,1-Dichloroethane	270	240000		1.1 U	1.2 U	1.1 U	1.1 U
1,1-Dichloroethene	330	500000		1.1 U	1.2 U	1.1 U	1.1 U
1,2,3-Trichlorobenzene	--	--		1.1 U	1.2 U	1.1 U	1.1 U
1,2,4-Trichlorobenzene	--	--		1.1 U	1.2 U	1.1 U	1.1 U
1,2-Dibromoethane	--	--		1.1 U	1.2 U	1.1 U	1.1 U
1,2-Dichlorobenzene	1100	500000		1.1 U	1.2 U	1.1 U	1.1 U
1,2-Dichloroethane	20	30000		1.1 U *	1.2 U	1.1 U *	1.1 U *
1,2-Dichloropropane	--	--		1.1 U	1.2 U	1.1 U	1.1 U
1,3-Dichlorobenzene	2400	280000		1.1 U	1.2 U	1.1 U	1.1 U
1,4-Dichlorobenzene	1800	130000		1.1 U	1.2 U	1.1 U	1.1 U
1,4-Dioxane	100	130000		53 U	61 U	54 U	54 U
2-Butanone (MEK)	120	500000		11 U *	3.9 J	11 U *	11 U *
2-Hexanone	--	--		11 U	12 U	11 U	11 U
4-Methyl-2-pentanone (MIBK)	--	--		11 U	12 U	11 U	11 U
Acetone	50	500000		14 B	32 B	10 J B	11 B
Benzene	60	44000		1.1 U	0.84 J	1.1 U	1.1 U
Bromochloromethane	--	--		1.1 U	1.2 U	1.1 U	1.1 U
Bromodichloromethane	--	--		1.1 U *	1.2 U	1.1 U *	1.1 U *
Bromoform	--	--		1.1 U	1.2 U	1.1 U	1.1 U
Bromomethane	--	--		1.1 U	1.2 U	1.1 U	1.1 U
Carbon disulfide	--	--		1.1 U	1.4	1.1 U	1.1 U
Carbon tetrachloride	760	22000		1.1 U	1.2 U	1.1 U	1.1 U
Chlorobenzene	1100	500000		1.1 U	1.2 U	1.1 U	1.1 U
Chloroethane	--	--		1.1 U	1.2 U	1.1 U	1.1 U
Chloroform	370	350000		1.1 U *	1.2 U	1.1 U *	1.1 U *
Chloromethane	--	--		1.1 U	1.2 U	1.1 U	1.1 U
cis-1,2-Dichloroethene	250	500000		1.1 U	1.2 U	1.1 U	1.1 U
cis-1,3-Dichloropropene	--	--		1.1 U	1.2 U	1.1 U	1.1 U
Cyclohexane	--	--		1.1 U	1.2 U	1.1 U	1.1 U
Dibromochloromethane	--	--		1.1 U	1.2 U	1.1 U	1.1 U
Dibromochloropropane	--	--		1.1 U	1.2 U	1.1 U	1.1 U

Table 2. Summary of Volatile Organic Compounds in Soil, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Unrestricted Use	NYSDEC Part 375 Commercial (µg/kg)	**Sample Designation:**	SB-6	SB-6	SB-7	SB-7
			Sample Date:	5/21/2013	5/21/2013	5/21/2013	5/21/2013
			Sample Depth (ft bls):	0-2	11-12.5	0-2	8-10
Dichlorodifluoromethane	--	--		1.1 U	1.2 U	1.1 U	1.1 U
Ethylbenzene	1000	390000		1.1 U	1.2 U	1.1 U	1.1 U
Freon 113	--	--		1.1 U	1.2 U	1.1 U	1.1 U
Isopropylbenzene	--	--		1.1 U	1.2 U	1.1 U	1.1 U
Methyl acetate	--	--		1.1 U	1.2 U	1.1 U	1.1 U
Methylcyclohexane	--	--		1.1 U	1.2 U	1.1 U	1.1 U
Methylene chloride	50	500000		1.1 U	1.7	1.1 U	1.1 U
MTBE	930	500000		1.1 U	1.2 U	1.1 U	1.1 U
Styrene	--	--		1.1 U	1.2 U	1.1 U	1.1 U
Tetrachloroethene	1300	150000		0.48 J	0.24 J	1.1 U	1.1 U
Toluene	700	500000		1.1 U	1.9 B	1.1 U	1.1 U
trans-1,2-Dichloroethene	190	500000		1.1 U	1.2 U	1.1 U	1.1 U
trans-1,3-Dichloropropene	--	--		1.1 U	1.2 U	1.1 U	1.1 U
Trichloroethene	470	200000		1.1 U	1.2 U	1.1 U	1.1 U
Trichlorofluoromethane	--	--		1.1 U	1.2 U	1.1 U	1.1 U
Vinyl chloride	20	13000		1.1 U	1.2 U	1.1 U	1.1 U
Xylenes (total)	260	500000		3.2 U	3.6 U	3.2 U	3.2 U

J - Estimated value

U - Indicates that the compound was analyzed for but not detected

B - The analyte was found in an associated blank as well as in the sample

* - LCS or LCSP exceeds the control limits

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NYSDEC - New York State Department of Environmental Conservation

-- No NYSDEC Part 375 Standards available

Bold data indicates that parameter was detected above the NYSDEC Part 375 Unrestricted Use Standards

Shaded data indicates that parameter was detected above the NYSDEC Part 375 Commercial Standards

Table 3. Summary of Semivolatile Organic Compounds in Soil, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Unrestricted Use	NYSDEC Part 375 Commercial (µg/kg)	**Sample Designation:**	SB-1	SB-1 DUP	SB-1	SB-2	SB-2	SB-3
			Sample Date:	5/21/2013	5/21/2013	5/22/2013	5/21/2013	5/21/2013	5/21/2013
			Sample Depth (ft bls):	0-2	0-2	12-14	0-2	11-13	0-2
1,1'-Biphenyl	--	--		370 U	370 U	400 U	370 U	390 U	370 U
1,2,4,5-Tetrachlorobenzene	--	--		370 U	370 U	400 U *	370 U	390 U	370 U
1,4-Dioxane	100	130000		370 U	370 U	400 U	370 U	390 U	370 U
2,2'-oxybis (1-chloropropane)	--	--		370 U	370 U	400 U	370 U	390 U	370 U
2,3,4,6-Tetrachlorophenol	--	--		370 U	370 U	400 U	370 U	390 U	370 U
2,4,5-Trichlorophenol	--	--		370 U	370 U	400 U	370 U	390 U	370 U
2,4,6-Trichlorophenol	--	--		370 U	370 U	400 U	370 U	390 U	370 U
2,4-Dichlorophenol	--	--		370 U	370 U	400 U	370 U	390 U	370 U
2,4-Dimethylphenol	--	--		370 U	370 U	400 U	370 U	390 U	370 U
2,4-Dinitrophenol	--	--		1100 U	1100 U	1200 U	1100 U	1200 U	1100 U
2,4-Dinitrotoluene	--	--		75 U	75 U	81 U	75 U	79 U	75 U
2,6-Dinitrotoluene	--	--		75 U	75 U	81 U	75 U	79 U	75 U
2-Chloronaphthalene	--	--		370 U	370 U	400 U	370 U	390 U	370 U
2-Chlorophenol	--	--		370 U	370 U	400 U	370 U	390 U	370 U
2-Methylnaphthalene	--	--		370 U	370 U	65 J	370 U	390 U	370 U
2-Methylphenol	330	500000		370 U	370 U	400 U	370 U	390 U	370 U
2-Nitroaniline	--	--		750 U	750 U	810 U	750 U	790 U	750 U
2-Nitrophenol	--	--		370 U	370 U	400 U	370 U	390 U	370 U
3,3'-Dichlorobenzidine	--	--		750 U	750 U	810 U	750 U	790 U	750 U
3-Nitroaniline	--	--		750 U	750 U	810 U	750 U	790 U	750 U
4,6-Dinitro-2-methylphenol	--	--		1100 U	1100 U	1200 U	1100 U	1200 U	1100 U
4-Bromophenyl phenyl ether	--	--		370 U	370 U	400 U	370 U	390 U	370 U
4-Chloro-3-methylphenol	--	--		370 U	370 U	400 U	370 U	390 U	370 U
4-Chloroaniline	--	--		370 U	370 U	400 U	370 U	390 U	370 U
4-Chlorophenyl phenyl ether	--	--		370 U	370 U	400 U	370 U	390 U	370 U
4-Methylphenol	330	500000		370 U	370 U	400 U	370 U	390 U	370 U
4-Nitroaniline	--	--		750 U	750 U	810 U	750 U	790 U	750 U
4-Nitrophenol	--	--		1100 U	1100 U	1200 U	1100 U	1200 U	1100 U
Acenaphthene	20000	500000		370 U	370 U	77 J	300 J	390 U	370 U
Acenaphthylene	100000	500000		370 U	370 U	120 J	370 U	390 U	370 U
Acetophenone	--	--		370 U	370 U	400 U	370 U	390 U	370 U
Anthracene	100000	500000		370 U	88 J	310 J	720	390 U	180 J

Table 3. Summary of Semivolatile Organic Compounds in Soil, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Unrestricted Use	NYSDEC Part 375 Commercial (µg/kg)	**Sample Designation:** / **Sample Date:** / **Sample Depth (ft bls):**	SB-1 5/21/2013 0-2	SB-1 DUP 5/21/2013 0-2	SB-1 5/22/2013 12-14	SB-2 5/21/2013 0-2	SB-2 5/21/2013 11-13	SB-3 5/21/2013 0-2
Atrazine	--	--		370 U	370 U	400 U	370 U	390 U	370 U
Benzaldehyde	--	--		370 U	370 U	400 U	370 U	390 U	370 U
Benzo[a]anthracene	1000	5600		200	290	**1400**	**1700**	13 J	540
Benzo[a]pyrene	1000	1000		260	320	**1400**	**1600**	39 U	500
Benzo[b]fluoranthene	1000	5600		340	410	**1700**	**1900**	10 J	640
Benzo[g,h,i]perylene	100000	500000		170 J	200 J	520	1300	390 U	290 J
Benzo[k]fluoranthene	800	56000		100	180	40 U	**1100**	39 U	230
Bis(2-chloroethoxy)methane	--	--		370 U	370 U	400 U	370 U	390 U	370 U
Bis(2-chloroethyl) ether	--	--		37 U	37 U	40 U	37 U	39 U	37 U
Bis(2-ethylhexyl) phthalate	--	--		370 U	370 U	400 U	370 U	390 U	370 U
Butylbenzyl phthalate	--	--		370 U	370 U	400 U	370 U	390 U	370 U
Caprolactam	--	--		370 U	370 U	400 U	370 U	390 U	370 U
Carbazole	--	--		370 U	370 U	99 J	250 J	390 U	77 J
Chrysene	1000	56000		260 J	360 J	**1400**	**1800**	390 U	530
Dibenzo[a,h]anthracene	330	560		46	55	160	260	39 U	69
Dibenzofuran	7000	350000		370 U	370 U	400 U	150 J	390 U	370 U
Diethyl phthalate	--	--		370 U	370 U	400 U	370 U	390 U	370 U
Dimethyl phthalate	--	--		370 U	370 U	400 U	370 U	390 U	370 U
Di-n-butyl phthalate	--	--		370 U	370 U	400 U	370 U	390 U	370 U
Di-n-octyl phthalate	--	--		370 U	370 U	400 U	370 U	390 U	370 U
Fluoranthene	100000	500000		410	730	2200	3200	390 U	1300
Fluorene	30000	500000		370 U	370 U	84 J	290 J	390 U	370 U
Hexachlorobenzene	330	6000		37 U	37 U	40 U	37 U	39 U	37 U
Hexachlorobutadiene	--	--		75 U	75 U	81 U	75 U	79 U	75 U
Hexachlorocyclopentadiene	--	--		370 U	370 U	400 U	370 U	390 U	370 U
Hexachloroethane	--	--		37 U	37 U	40 U	37 U	39 U	37 U
Indeno[1,2,3-cd]pyrene	500	5600		200	240	**620**	**1500**	39 U	330
Isophorone	--	--		370 U	370 U	400 U	97 J	390 U	370 U
Naphthalene	12000	500000		370 U	370 U	88 J	82 J	390 U	46 J
Nitrobenzene	--	--		37 U	37 U	40 U	37 U	39 U	37 U
n-Nitrosodi-n-propylamine	--	--		37 U	37 U	40 U	37 U	39 U	37 U
n-Nitrosodiphenylamine	--	--		370 U	370 U	400 U	370 U	390 U	370 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Unrestricted Use	NYSDEC Part 375 Commercial (µg/kg)	**Sample Designation:**	SB-1	SB-1 DUP	SB-1	SB-2	SB-2	SB-3
			Sample Date:	5/21/2013	5/21/2013	5/22/2013	5/21/2013	5/21/2013	5/21/2013
			Sample Depth (ft bls):	0-2	0-2	12-14	0-2	11-13	0-2
Pentachlorophenol	800	6700		1100 U	1100 U	1200 U	1100 U	1200 U	1100 U
Phenanthrene	100000	500000		120 J	370	800	2900	390 U	690
Phenol	330	500000		370 U	370 U	400 U	370 U	390 U	370 U
Pyrene	100000	500000		210 J	330 J	1800	3300	390 U	590

J - Estimated value

U - Indicates that the compound was analyzed for but not detected

B - The analyte was found in an associated blank as well as in the sample

* - LCS or LCSP exceeds the control limits

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NYSDEC - New York State Department of Environmental Conservation

-- No NYSDEC Part 375 Standards available

Bold data indicates that parameter was detected above the NYSDEC Part 375 Unrestricted Use Standards

Shaded data indicates that parameter was detected above the NYSDEC Part 375 Commercial Standards

Table 3. Summary of Semivolatile Organic Compounds in Soil, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Unrestricted Use	NYSDEC Part 375 Commercial (µg/kg)	**Sample Designation:** **Sample Date:** **Sample Depth (ft bls):**	SB-3 5/22/2013 11-13	SB-4 5/22/2013 0-2	SB-4 5/22/2013 8-10	SB-5 5/21/2013 0-2	SB-5 5/21/2013 10-12	SB-5 5/21/2013 13-15
1,1'-Biphenyl	--	--		3800 U DIL	160 J	370 U	730 U	4500 U DIL	450 U
1,2,4,5-Tetrachlorobenzene	--	--		3800 U * DIL	740 U *	370 U *	730 U	4500 U * DIL	450 U *
1,4-Dioxane	100	130000		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
2,2'-oxybis (1-chloropropane)	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
2,3,4,6-Tetrachlorophenol	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
2,4,5-Trichlorophenol	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
2,4,6-Trichlorophenol	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
2,4-Dichlorophenol	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
2,4-Dimethylphenol	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
2,4-Dinitrophenol	--	--		12000 U DIL	2200 U	1100 U	2200 U	14000 U DIL	1400 U
2,4-Dinitrotoluene	--	--		780 U DIL	150 U	74 U	150 U	910 U DIL	91 U
2,6-Dinitrotoluene	--	--		780 U DIL	150 U	74 U	150 U	910 U DIL	91 U
2-Chloronaphthalene	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
2-Chlorophenol	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
2-Methylnaphthalene	--	--		3800 U DIL	820	460	730 U	6900 DIL	1300
2-Methylphenol	330	500000		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
2-Nitroaniline	--	--		7800 U DIL	1500 U	740 U	1500 U	9100 U DIL	910 U
2-Nitrophenol	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
3,3'-Dichlorobenzidine	--	--		7800 U DIL	1500 U	740 U	1500 U	9100 U DIL	910 U
3-Nitroaniline	--	--		7800 U DIL	1500 U	740 U	1500 U	9100 U DIL	910 U
4,6-Dinitro-2-methylphenol	--	--		12000 U DIL	2200 U	1100 U	2200 U	14000 U DIL	1400 U
4-Bromophenyl phenyl ether	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
4-Chloro-3-methylphenol	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
4-Chloroaniline	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
4-Chlorophenyl phenyl ether	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
4-Methylphenol	330	500000		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
4-Nitroaniline	--	--		7800 U DIL	1500 U	740 U	1500 U	9100 U DIL	910 U
4-Nitrophenol	--	--		12000 U DIL	2200 U	1100 U	2200 U	14000 U DIL	1400 U
Acenaphthene	20000	500000		3800 U DIL	460 J	90 J	730 U	4500 U DIL	450 U
Acenaphthylene	100000	500000		2500 J DIL	420 J	94 J	730 U	4500 U DIL	450 U
Acetophenone	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
Anthracene	100000	500000		2800 J DIL	1700	230 J	730 U	4500 U DIL	450 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Unrestricted Use	NYSDEC Part 375 Commercial (µg/kg)	**Sample Designation:** **Sample Date:** **Sample Depth (ft bls):**	SB-3 5/22/2013 11-13	SB-4 5/22/2013 0-2	SB-4 5/22/2013 8-10	SB-5 5/21/2013 0-2	SB-5 5/21/2013 10-12	SB-5 5/21/2013 13-15
Atrazine	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
Benzaldehyde	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
Benzo[a]anthracene	1000	5600		**21000 DIL**	**4800**	730	73 U	450 U DIL	200
Benzo[a]pyrene	1000	1000		**23000 DIL**	**4100**	690	73 U	460 DIL	200
Benzo[b]fluoranthene	1000	5600		**25000 DIL**	**4600**	790	73 U	480 DIL	260
Benzo[g,h,i]perylene	100000	500000		16000 DIL	2200	350 J	140 J	470 J DIL	160 J
Benzo[k]fluoranthene	800	56000		**11000 DIL**	**2000**	360	73 U	450 U DIL	120
Bis(2-chloroethoxy)methane	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
Bis(2-chloroethyl) ether	--	--		380 U DIL	74 U	37 U	73 U	450 U DIL	45 U
Bis(2-ethylhexyl) phthalate	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
Butylbenzyl phthalate	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
Caprolactam	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
Carbazole	--	--		620 J DIL	760	100 J	730 U	4500 U DIL	450 U
Chrysene	1000	56000		**20000 DIL**	**5300**	850	730 U	4500 U DIL	240 J
Dibenzo[a,h]anthracene	330	560		**3900 DIL**	**690**	100	73 U	110 J DIL	40 J
Dibenzofuran	7000	350000		3800 U DIL	470 J	54 J	730 U	4500 U DIL	450 U
Diethyl phthalate	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
Dimethyl phthalate	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
Di-n-butyl phthalate	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
Di-n-octyl phthalate	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
Fluoranthene	100000	500000		36000 DIL	7200	1300	730 U	820 J DIL	390 J
Fluorene	30000	500000		920 J DIL	740	100 J	730 U	910 J DIL	99 J
Hexachlorobenzene	330	6000		380 U DIL	74 U	37 U	73 U	450 U DIL	45 U
Hexachlorobutadiene	--	--		780 U DIL	150 U	74 U	150 U	910 U DIL	91 U
Hexachlorocyclopentadiene	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
Hexachloroethane	--	--		380 U DIL	74 U	37 U	73 U	450 U DIL	45 U
Indeno[1,2,3-cd]pyrene	500	5600		**18000 DIL**	**2400**	380	73 U	250 J DIL	150
Isophorone	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
Naphthalene	12000	500000		3800 U DIL	840	210 J	730 U	1400 J DIL	1500
Nitrobenzene	--	--		380 U DIL	74 U	37 U	73 U	450 U DIL	45 U
n-Nitrosodi-n-propylamine	--	--		380 U DIL	74 U	37 U	73 U	450 U DIL	45 U
n-Nitrosodiphenylamine	--	--		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Unrestricted Use	NYSDEC Part 375 Commercial (µg/kg)	**Sample Designation:** / **Sample Date:** / **Sample Depth (ft bls):**	SB-3 5/22/2013 11-13	SB-4 5/22/2013 0-2	SB-4 5/22/2013 8-10	SB-5 5/21/2013 0-2	SB-5 5/21/2013 10-12	SB-5 5/21/2013 13-15
Pentachlorophenol	800	6700		12000 U DIL	2200 U	1100 U	2200 U	14000 U DIL	1400 U
Phenanthrene	100000	500000		8100 DIL	8400	1100	730 U	1300 J DIL	250 J
Phenol	330	500000		3800 U DIL	740 U	370 U	730 U	4500 U DIL	450 U
Pyrene	100000	500000		43000 DIL	7300	1200	730 U	1100 J DIL	400 J

J - Estimated value

U - Indicates that the compound was analyzed for but not detected

B - The analyte was found in an associated blank as well as in the sample

* - LCS or LCSP exceeds the control limits

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NYSDEC - New York State Department of Environmental Conservation

-- No NYSDEC Part 375 Standards available

Bold data indicates that parameter was detected above the NYSDEC Part 375 Unrestricted Use Standards

Shaded data indicates that parameter was detected above the NYSDEC Part 375 Commercial Standards

Table 3. Summary of Semivolatile Organic Compounds in Soil, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Unrestricted Use	NYSDEC Part 375 Commercial (µg/kg)	**Sample Designation:**	SB-6	SB-6	SB-7	SB-7
			Sample Date:	5/21/2013	5/21/2013	5/21/2013	5/21/2013
			Sample Depth (ft bls):	0-2	11-12.5	0-2	8-10
1,1'-Biphenyl	--	--		370 U	410 U	370 U	360 U
1,2,4,5-Tetrachlorobenzene	--	--		370 U	410 U *	370 U	360 U
1,4-Dioxane	100	130000		370 U	410 U	370 U	360 U
2,2'-oxybis (1-chloropropane)	--	--		370 U	410 U	370 U	360 U
2,3,4,6-Tetrachlorophenol	--	--		370 U	410 U	370 U	360 U
2,4,5-Trichlorophenol	--	--		370 U	410 U	370 U	360 U
2,4,6-Trichlorophenol	--	--		370 U	410 U	370 U	360 U
2,4-Dichlorophenol	--	--		370 U	410 U	370 U	360 U
2,4-Dimethylphenol	--	--		370 U	410 U	370 U	360 U
2,4-Dinitrophenol	--	--		1100 U	1200 U	1100 U	1100 U
2,4-Dinitrotoluene	--	--		76 U	82 U	74 U	74 U
2,6-Dinitrotoluene	--	--		76 U	82 U	74 U	74 U
2-Chloronaphthalene	--	--		370 U	410 U	370 U	360 U
2-Chlorophenol	--	--		370 U	410 U	370 U	360 U
2-Methylnaphthalene	--	--		370 U	410 U	370 U	360 U
2-Methylphenol	330	500000		370 U	410 U	370 U	360 U
2-Nitroaniline	--	--		760 U	820 U	740 U	740 U
2-Nitrophenol	--	--		370 U	410 U	370 U	360 U
3,3'-Dichlorobenzidine	--	--		760 U	820 U	740 U	740 U
3-Nitroaniline	--	--		760 U	820 U	740 U	740 U
4,6-Dinitro-2-methylphenol	--	--		1100 U	1200 U	1100 U	1100 U
4-Bromophenyl phenyl ether	--	--		370 U	410 U	370 U	360 U
4-Chloro-3-methylphenol	--	--		370 U	410 U	370 U	360 U
4-Chloroaniline	--	--		370 U	410 U	370 U	360 U
4-Chlorophenyl phenyl ether	--	--		370 U	410 U	370 U	360 U
4-Methylphenol	330	500000		370 U	410 U	370 U	360 U
4-Nitroaniline	--	--		760 U	820 U	740 U	740 U
4-Nitrophenol	--	--		1100 U	1200 U	1100 U	1100 U
Acenaphthene	20000	500000		370 U	410 U	110 J	360 U
Acenaphthylene	100000	500000		370 U	410 U	370 U	360 U
Acetophenone	--	--		370 U	410 U	370 U	360 U
Anthracene	100000	500000		92 J	410 U	230 J	96 J

Table 3. Summary of Semivolatile Organic Compounds in Soil, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Unrestricted Use	NYSDEC Part 375 Commercial (µg/kg)	**Sample Designation:**	SB-6	SB-6	SB-7	SB-7
			Sample Date:	5/21/2013	5/21/2013	5/21/2013	5/21/2013
			Sample Depth (ft bls):	0-2	11-12.5	0-2	8-10
Atrazine	--	--		370 U	410 U	370 U	360 U
Benzaldehyde	--	--		370 U	410 U	370 U	360 U
Benzo[a]anthracene	1000	5600		400	41 U	610	260
Benzo[a]pyrene	1000	1000		460	51	560	240
Benzo[b]fluoranthene	1000	5600		550	65	720	290
Benzo[g,h,i]perylene	100000	500000		320 J	48 J	560	150 J
Benzo[k]fluoranthene	800	56000		230	41 U	330	140
Bis(2-chloroethoxy)methane	--	--		370 U	410 U	370 U	360 U
Bis(2-chloroethyl) ether	--	--		37 U	41 U	37 U	36 U
Bis(2-ethylhexyl) phthalate	--	--		370 U	410 U	370 U	360 U
Butylbenzyl phthalate	--	--		370 U	410 U	370 U	360 U
Caprolactam	--	--		370 U	410 U	370 U	360 U
Carbazole	--	--		44 J	410 U	140 J	57 J
Chrysene	1000	56000		440	50 J	730	290 J
Dibenzo[a,h]anthracene	330	560		97	41 U	76	21 J
Dibenzofuran	7000	350000		370 U	410 U	68 J	360 U
Diethyl phthalate	--	--		370 U	410 U	370 U	360 U
Dimethyl phthalate	--	--		370 U	410 U	370 U	360 U
Di-n-butyl phthalate	--	--		370 U	410 U	370 U	360 U
Di-n-octyl phthalate	--	--		370 U	410 U	370 U	360 U
Fluoranthene	100000	500000		860	70 J	1300	580
Fluorene	30000	500000		370 U	410 U	120 J	360 U
Hexachlorobenzene	330	6000		37 U	41 U	37 U	36 U
Hexachlorobutadiene	--	--		76 U	82 U	74 U	74 U
Hexachlorocyclopentadiene	--	--		370 U	410 U	370 U	360 U
Hexachloroethane	--	--		37 U	41 U	37 U	36 U
Indeno[1,2,3-cd]pyrene	500	5600		350	41	**630**	170
Isophorone	--	--		370 U	410 U	370 U	360 U
Naphthalene	12000	500000		370 U	410 U	50 J	360 U
Nitrobenzene	--	--		37 U	41 U	37 U	36 U
n-Nitrosodi-n-propylamine	--	--		37 U	41 U	37 U	36 U
n-Nitrosodiphenylamine	--	--		370 U	410 U	370 U	360 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Unrestricted Use	NYSDEC Part 375 Commercial (µg/kg)	**Sample Designation:**	SB-6	SB-6	SB-7	SB-7
			Sample Date:	5/21/2013	5/21/2013	5/21/2013	5/21/2013
			Sample Depth (ft bls):	0-2	11-12.5	0-2	8-10
Pentachlorophenol	800	6700		1100 U	1200 U	1100 U	1100 U
Phenanthrene	100000	500000		310 J	55 J	1200	530
Phenol	330	500000		370 U	410 U	370 U	360 U
Pyrene	100000	500000		390	100 J	1100	530

J - Estimated value

U - Indicates that the compound was analyzed for but not detected

B - The analyte was found in an associated blank as well as in the sample

* - LCS or LCSP exceeds the control limits

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NYSDEC - New York State Department of Environmental Conservation

-- No NYSDEC Part 375 Standards available

Bold data indicates that parameter was detected above the NYSDEC Part 375 Unrestricted Use Standards

Shaded data indicates that parameter was detected above the NYSDEC Part 375 Commercial Standards

Table 4. Summary of Metals in Soil, 5530 Broadway, Bronx, New York

Parameter (Concentrations in mg/kg)	NYSDEC Part 375 Unrestricted Use	NYSDEC Part 375 Commercial (mg/kg)	**Sample Designation:**	SB-1	SB-1 DUP	SB-1	SB-2	SB-2	SB-3	SB-3
			Sample Date:	5/21/2013	5/21/2013	5/22/2013	5/21/2013	5/21/2013	5/21/2013	5/22/2013
			Sample Depth (ft bls):	0-2	0-2	12-14	0-2	11-13	0-2	11-13
Aluminum	--	--		6360	5240	4240	9870	12200	5920	8560
Antimony	--	--		2.2 U	2.1 U	1.8 U	2.2 U	1.8 U	2 U	1.7 U
Arsenic	13	16		5.1	5.6	5.2	5	3	12.5	2.9
Barium	350	400		79.8	97	184	315	76.3	**365**	87.1
Beryllium	7.2	590		0.27 J	0.27 J	0.13 J	0.26 J	0.32 J	0.41	0.22 J
Cadmium	2.5	9.3		0.46 J	0.48 J	0.72 J	0.67 J	0.91 U	0.93 J	0.21 J
Calcium	--	--		30300	29200	23500	31900	2670	29800	36200
Chromium	30	1500		15.1	11.6	13.1	21.9	24.1	19.9	15.5
Cobalt	--	--		4.6 J	3.9 J	4.1 J	7.4 J	7.3 J	6.3 J	5.6 J
Copper	50	270		**79.6**	**53.8**	**635**	**117**	22.1	**199**	28.1
Cyanide, Free	27	27		0.069 J	0.11 U	0.12 U	0.11 U	0.12 U	0.31	0.12 U
Iron	--	--		11400	10200	10000	16800	18000	24700	13300
Lead	63	1000		**85.9**	**87.2**	**143**	**153**	46.2	**299**	**269**
Magnesium	--	--		13600	11000	7240	11200	5060	8340	21200
Manganese	1600	10000		236	190	169	356	227	233	133
Mercury	0.18	2.8		0.13	0.13	0.17	0.13	0.032	**0.31**	0.11
Nickel	30	310		12.2	11.3	18.9	19.5	16.3	25.3	14.4
Potassium	--	--		1060 J	796 J	751 J	1800	1340	1010 J	923
Selenium	3.9	1500		2.2 U	2.1 U	1.8 U	2.2 U	1.8 U	2 U	1.7 U
Silver	2	1500		2.2 U	2.1 U	1.8 U	2.2 U	1.8 U	0.41 J	1.7 U
Sodium	--	--		1090 U	1070 U	923 U	1080 U	911 U	1020 U	846 U
Thallium	--	--		2.2 U	2.1 U	1.8 U	2.2 U	1.8 U	2 U	1.7 U
Vanadium	--	--		24.8	23.3	16.4	28.7	30.1	40.3	25.9
Zinc	109	10000		**118**	**111**	**600**	**299**	70.2	**367**	**115**

J - Estimated value

U - Indicates that the compound was analyzed for but not detected

mg/kg - Milligrams per kilogram

ft bls - Feet below land surface

NYSDEC - New York State Department of Environmental Conservation

-- No NYSDEC Part 375 Standards available

Bold data indicates that parameter was detected above the NYSDEC Part 375 Unrestricted Use Standards

Shaded data indicates that parameter was detected above the NYSDEC Part 375 Commercial Standards

Table 4. Summary of Metals in Soil, 5530 Broadway, Bronx, New York

Parameter (Concentrations in mg/kg)	NYSDEC Part 375 Unrestricted Use	NYSDEC Part 375 Commercial (mg/kg)	**Sample Designation:**	SB-4	SB-4	SB-5	SB-5	SB-6	SB-6	SB-7
			Sample Date:	5/22/2013	5/22/2013	5/21/2013	5/21/2013	5/21/2013	5/21/2013	5/21/2013
			Sample Depth (ft bls):	0-2	8-10	0-2	10-12	0-2	11-12.5	0-2
Aluminum	--	--		10800	27700	12700	12300	8410	7770	10200
Antimony	--	--		1.6 U	2.2 U	2.1 U	2.1 U	1.8 U	1.7 U	1.9 U
Arsenic	13	16		8.2	4.3	2.1	3.9	**19.5**	2.9	6.4
Barium	350	400		192	342	116	66.6	278	**352**	141
Beryllium	7.2	590		0.31 U	0.44 U	0.41 U	0.27 J	0.5	0.33 U	0.29 J
Cadmium	2.5	9.3		0.57 J	1.1 U	1 U	1.1 U	1.2	0.25 J	1.3
Calcium	--	--		29800	32600	6360	4110	31200	63500	42300
Chromium	30	1500		28.6	**49.3**	28	19.2	18.8	14.7	27.7
Cobalt	--	--		8.7	13.6	11.1	7.6 J	6.5 J	4.7 J	7.2 J
Copper	50	270		**464**	**57.8**	26.9	21	**124**	18.1	**122**
Cyanide, Free	27	27		0.08 J	0.11 U	0.13	0.14 U	0.082 J	0.12 U	0.31
Iron	--	--		22200	37900	22800	17300	17500	13400	20600
Lead	63	1000		**243**	**139**	**74.6**	**80.5**	**382**	**601**	**236**
Magnesium	--	--		12200	18100	8330	4140	10800	25300	11100
Manganese	1600	10000		337	350	340	263	284	189	332
Mercury	0.18	2.8		0.17	0.091	0.089	0.11	**0.28**	0.074	0.13
Nickel	30	310		**35.5**	**36**	21.1	14.5	**40.4**	12.5	23.5
Potassium	--	--		2980	8800	3050	894 J	1160	1360	1710
Selenium	3.9	1500		1.6 U	2.2 U	2.1 U	2.1 U	1.9	1.7 U	1.9 U
Silver	2	1500		1.6 U	2.2 U	2.1 U	2.1 U	0.18 J	1.7 U	1.9 U
Sodium	--	--		126 J	382 J	1030 U	1060 U	186 J	205 J	946 U
Thallium	--	--		1.6 U	2.2 U	2.1 U	2.1 U	1.8 U	1.7 U	1.9 U
Vanadium	--	--		33.6	83	41.8	23.4	138	19.2	36.6
Zinc	109	10000		**260**	**164**	90.5	80.6	**376**	**243**	**225**

J - Estimated value

U - Indicates that the compound was analyzed for but not detected

mg/kg - Milligrams per kilogram

ft bls - Feet below land surface

NYSDEC - New York State Department of Environmental Conservation

-- No NYSDEC Part 375 Standards available

Bold data indicates that parameter was detected above the NYSDEC Part 375 Unrestricted Use Standards

Shaded data indicates that parameter was detected above the NYSDEC Part 375 Commercial Standards

Table 4. Summary of Metals in Soil, 5530 Broadway, Bronx, New York

Parameter (Concentrations in mg/kg)	NYSDEC Part 375 Unrestricted Use	NYSDEC Part 375 Commercial (mg/kg)	**Sample Designation:**	SB-7
			Sample Date:	5/21/2013
			Sample Depth (ft bls):	8-10
Aluminum	--	--		9580
Antimony	--	--		2.1 U
Arsenic	13	16		8.7
Barium	350	400		95.1
Beryllium	7.2	590		0.29 J
Cadmium	2.5	9.3		0.29 J
Calcium	--	--		11300
Chromium	30	1500		24.9
Cobalt	--	--		9.5 J
Copper	50	270		**54.3**
Cyanide, Free	27	27		0.11 U
Iron	--	--		22600
Lead	63	1000		**178**
Magnesium	--	--		8340
Manganese	1600	10000		308
Mercury	0.18	2.8		0.19
Nickel	30	310		20.1
Potassium	--	--		1950
Selenium	3.9	1500		2.1 U
Silver	2	1500		2.1 U
Sodium	--	--		1040 U
Thallium	--	--		2.1 U
Vanadium	--	--		32.7
Zinc	109	10000		**171**

J - Estimated value

U - Indicates that the compound was analyzed for but not detected

mg/kg - Milligrams per kilogram

ft bls - Feet below land surface

NYSDEC - New York State Department of Environmental Conservation

-- No NYSDEC Part 375 Standards available

Bold data indicates that parameter was detected above the NYSDEC Part 375 Unrestricted Use Standards

Shaded data indicates that parameter was detected above the NYSDEC Part 375 Commercial Standards

Table 5. Summary of Polychlorinated Biphenyls in Soil, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Unrestricted Use	NYSDEC Part 375 Commercial (µg/kg)	**Sample Designation:** / **Sample Date:** / **Sample Depth (ft bls):**	FB052113-Soil 5/21/2013 -	SB-1 5/21/2013 0-2	SB-1 DUP 5/21/2013 0-2	SB-1 5/22/2013 12-14	SB-2 5/21/2013 0-2	SB-2 5/21/2013 11-13
Aroclor-1016	--	--		0.4 U	75 U	75 U	81 U	75 U	79 U
Aroclor-1221	--	--		0.4 U	75 U	75 U	81 U	75 U	79 U
Aroclor-1232	--	--		0.4 U	75 U	75 U	81 U	75 U	79 U
Aroclor-1242	--	--		0.4 U	75 U	75 U	81 U	75 U	79 U
Aroclor-1248	--	--		0.4 U	75 U	75 U	81 U	75 U	79 U
Aroclor-1254	--	--		0.4 U	75 U	75 U	81 U	75 U	79 U
Aroclor-1260	--	--		0.4 U	75 U	75 U	81 U	75 U	79 U
Aroclor-1262	--	--		0.4 U	75 U	75 U	81 U	75 U	79 U
Aroclor-1268	--	--		0.4 U	75 U	75 U	81 U	75 U	79 U
Aroclor (Total)	100	1000		0.4 U	75 U	75 U	81 U	75 U	79 U

J - Estimated value

U - Indicates that the compound was analyzed for but not detected

B - The analyte was found in an associated blank as well as in the sample

* - LCS or LCSP exceeds the control limits

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NYSDEC - New York State Department of Environmental Conservation

-- No NYSDEC Part 375 Standards available

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Shaded data indicates that parameter was detected above the NYSDEC Part 375 Commercial Standards

Table 5. Summary of Polychlorinated Biphenyls in Soil, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Unrestricted Use	NYSDEC Part 375 Commercial (µg/kg)	**Sample Designation:**	SB-3	SB-3	SB-4	SB-4	SB-5	SB-5	SB-6
			Sample Date:	5/21/2013	5/22/2013	5/22/2013	5/22/2013	5/21/2013	5/21/2013	5/21/2013
			Sample Depth (ft bls):	0-2	11-13	0-2	8-10	0-2	10-12	0-2
Aroclor-1016	--	--		75 U	78 U	75 U	74 U	74 U	90 U	76 U
Aroclor-1221	--	--		75 U	78 U	75 U	74 U	74 U	90 U	76 U
Aroclor-1232	--	--		75 U	78 U	75 U	74 U	74 U	90 U	76 U
Aroclor-1242	--	--		75 U	78 U	75 U	74 U	74 U	90 U	76 U
Aroclor-1248	--	--		75 U	78 U	75 U	74 U	74 U	90 U	76 U
Aroclor-1254	--	--		75 U	78 U	75 U	74 U	74 U	90 U	76 U
Aroclor-1260	--	--		75 U	78 U	75 U	74 U	74 U	90 U	76 U
Aroclor-1262	--	--		75 U	78 U	75 U	74 U	74 U	90 U	76 U
Aroclor-1268	--	--		75 U	78 U	75 U	74 U	74 U	90 U	76 U
Aroclor (Total)	100	1000		75 U	78 U	75 U	74 U	74 U	90 U	76 U

J - Estimated value

U - Indicates that the compound was analyzed for but not detected

B - The analyte was found in an associated blank as well as in the sample

* - LCS or LCSP exceeds the control limits

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NYSDEC - New York State Department of Environmental Conservation

-- No NYSDEC Part 375 Standards available

Bold data indicates that parameter was detected above the NYSDEC Part 375 Unrestricted Use Standards

Shaded data indicates that parameter was detected above the NYSDEC Part 375 Commercial Standards

Table 5. Summary of Polychlorinated Biphenyls in Soil, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/kg)	NYSDEC Part 375 Unrestricted Use	NYSDEC Part 375 Commercial (µg/kg)	**Sample Designation:**	SB-6	SB-7	SB-7
			Sample Date:	5/21/2013	5/21/2013	5/21/2013
			Sample Depth (ft bls):	11-12.5	0-2	8-10
Aroclor-1016	--	--		82 U	74 U	74 U
Aroclor-1221	--	--		82 U	74 U	74 U
Aroclor-1232	--	--		82 U	74 U	74 U
Aroclor-1242	--	--		82 U	74 U	74 U
Aroclor-1248	--	--		82 U	74 U	74 U
Aroclor-1254	--	--		82 U	74 U	74 U
Aroclor-1260	--	--		82 U	74 U	74 U
Aroclor-1262	--	--		82 U	74 U	74 U
Aroclor-1268	--	--		82 U	74 U	74 U
Aroclor (Total)	100	1000		82 U	74 U	74 U

J - Estimated value

U - Indicates that the compound was analyzed for but not detected

B - The analyte was found in an associated blank as well as in the sample

* - LCS or LCSP exceeds the control limits

µg/kg - Micrograms per kilogram

ft bls - Feet below land surface

NYSDEC - New York State Department of Environmental Conservation

-- No NYSDEC Part 375 Standards available

Bold data indicates that parameter was detected above the NYSDEC Part 375 Unrestricted Use Standards

Shaded data indicates that parameter was detected above the NYSDEC Part 375 Commercial Standards

Table 6. Summary of Volatile Organic Compounds in Groundwater, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/L)	NYSDEC AWQSGVs (µg/L)	**Sample Designation:** / **Sample Date:**	SB-1/MW-1 5/22/2013	SB-5/MW-5 5/22/2013	SB-6/MW-6 5/22/2013	SB-6/MW-6 DUP 5/22/2013	FB052213-Water 5/22/2013
1,1,1-Trichloroethane	5		1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	5		1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1		1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	5		1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	5		1 U	1 U	1 U	1 U	1 U
1,2,3-Trichlorobenzene	5		1 U	1 U	1 U	1 U	1 U
1,2,4-Trichlorobenzene	5		1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	--		1 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	3		1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	0.6		1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	1		1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	3		1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	3		1 U	1 U	1 U	1 U	1 U
1,4-Dioxane	--		50 U	50 U	50 U	50 U	50 U
2-Butanone (MEK)	50		5 U	3.9 J	5 U	5 U	**77**
2-Hexanone	50		5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone (MIBK)	--		5 U	5 U	5 U	5 U	5 U
Acetone	50		5 U	17	5 U	5 U	44
Benzene	1		1 U	**400**	1 U	1 U	1 U
Bromochloromethane	5		1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	50		1 U	1 U	1 U	1 U	1 U
Bromoform	50		1 U	1 U	1 U	1 U	1 U
Bromomethane	5		1 U	1 U	1 U	1 U	1 U
Carbon disulfide	60		1 U	1 U	1 U	1 U	1 U
Carbon tetrachloride	5		1 U	1 U	1 U	1 U	1 U
Chlorobenzene	5		1 U	2.3	1 U	1 U	1 U
Chloroethane	5		1 U	1 U	1 U	1 U	1 U
Chloroform	7		1 U	1 U	0.32 J	0.33 J	1 U
Chloromethane	--		1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	5		0.83 J	1 U	0.31 J	0.25 J	1 U
cis-1,3-Dichloropropene	5		1 U	1 U	1 U	1 U	1 U
Cyclohexane	--		1 U	5.2	1 U	1 U	1 U
Dibromochloromethane	50		1 U	1 U	1 U	1 U	1 U
Dibromochloropropane	--		1 U	1 U	1 U	1 U	1 U

Table 6. Summary of Volatile Organic Compounds in Groundwater, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/L)	NYSDEC AWQSGVs (µg/L)	**Sample Designation:** / **Sample Date:**	SB-1/MW-1 5/22/2013	SB-5/MW-5 5/22/2013	SB-6/MW-6 5/22/2013	SB-6/MW-6 DUP 5/22/2013	FB052213-Water 5/22/2013
Dichlorodifluoromethane	5		1 U	1 U	1 U	1 U	1 U
Ethylbenzene	5		1 U	3.2	1 U	1 U	1 U
Freon 113	--		1 U	1 U	1 U	1 U	1 U
Isopropylbenzene	5		1 U	**16**	1 U	1 U	1 U
Methyl acetate	--		2 U	2 U	2 U	2 U	2 U
Methylcyclohexane	--		1 U	5.7	1 U	1 U	1 U
Methylene chloride	5		1 U	1 U	1 U	1 U	1
MTBE	10		0.44 J	**42**	1 U	1 U	1 U
Styrene	5		1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	5		**7.1**	1 U	0.24 J	0.18 J	1 U
Toluene	5		1 U	3.1	1 U	1 U	1 U
trans-1,2-Dichloroethene	5		1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	--		1 U	1 U	1 U	1 U	1 U
Trichloroethene	5		0.55 J	1 U	0.18 J	0.23 J	1 U
Trichlorofluoromethane	5		1 U	1 U	1 U	1 U	1 U
Vinyl chloride	2		0.27 J	1 U	1 U	1 U	1 U
Xylenes (total)	5		3 U	2.4 J	3 U	3 U	3 U

NYSDEC - New York State Department of Environmental Conservation
AWQSGVs - Ambient Water-Quality Standards and Guidance Values
µg/L -Micrograms per liter
J - Estimated Value
U - Compound was analyzed for but not detected
DUP - Duplicate
- - No NYSDEC AWQSGV available
Bold data indicates that parameter was detected above the NYSDEC AWQSGVs

Table 6. Summary of Volatile Organic Compounds in Groundwater, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/L)	NYSDEC AWQSGVs (µg/L)	**Sample Designation:** **Sample Date:**	Trip Blank 5/21/2013	TRIP 5/21/2013
1,1,1-Trichloroethane	5		1 U	1 U
1,1,2,2-Tetrachloroethane	5		1 U	1 U
1,1,2-Trichloroethane	1		1 U	1 U
1,1-Dichloroethane	5		1 U	1 U
1,1-Dichloroethene	5		1 U	1 U
1,2,3-Trichlorobenzene	5		1 U	1 U
1,2,4-Trichlorobenzene	5		1 U	1 U
1,2-Dibromoethane	--		1 U	1 U
1,2-Dichlorobenzene	3		1 U	1 U
1,2-Dichloroethane	0.6		1 U	1 U
1,2-Dichloropropane	1		1 U	1 U
1,3-Dichlorobenzene	3		1 U	1 U
1,4-Dichlorobenzene	3		1 U	1 U
1,4-Dioxane	--		50 U	50 U
2-Butanone (MEK)	50		5 U	5 U
2-Hexanone	50		5 U	5 U
4-Methyl-2-pentanone (MIBK)	--		5 U	5 U
Acetone	50		35	33
Benzene	1		1 U	1 U
Bromochloromethane	5		1 U	1 U
Bromodichloromethane	50		1 U	1 U
Bromoform	50		1 U	1 U
Bromomethane	5		1 U	1 U
Carbon disulfide	60		1 U	1 U
Carbon tetrachloride	5		1 U	1 U
Chlorobenzene	5		1 U	1 U
Chloroethane	5		1 U	1 U
Chloroform	7		1 U	1 U
Chloromethane	--		1 U	1 U
cis-1,2-Dichloroethene	5		1 U	1 U
cis-1,3-Dichloropropene	5		1 U	1 U
Cyclohexane	--		1 U	1 U
Dibromochloromethane	50		1 U	1 U
Dibromochloropropane	--		1 U	1 U

Table 6. Summary of Volatile Organic Compounds in Groundwater, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/L)	NYSDEC AWQSGVs (µg/L)	**Sample Designation:** **Sample Date:**	Trip Blank 5/21/2013	TRIP 5/21/2013
Dichlorodifluoromethane	5		1 U	1 U
Ethylbenzene	5		1 U	1 U
Freon 113	--		1 U	1 U
Isopropylbenzene	5		1 U	1 U
Methyl acetate	--		2 U	2 U
Methylcyclohexane	--		1 U	1 U
Methylene chloride	5		1 U	1 U
MTBE	10		1 U	1 U
Styrene	5		1 U	1 U
Tetrachloroethene	5		1 U	1 U
Toluene	5		1 U	1 U
trans-1,2-Dichloroethene	5		1 U	1 U
trans-1,3-Dichloropropene	--		1 U	1 U
Trichloroethene	5		1 U	1 U
Trichlorofluoromethane	5		1 U	1 U
Vinyl chloride	2		1 U	1 U
Xylenes (total)	5		3 U	3 U

NYSDEC - New York State Department of Environmental Conservation
AWQSGVs - Ambient Water-Quality Standards and Guidance Values
µg/L -Micrograms per liter
J - Estimated Value
U - Compound was analyzed for but not detected
DUP - Duplicate
- - No NYSDEC AWQSGV available
Bold data indicates that parameter was detected above the NYSDEC AWQSGVs

Table 7. Summary of Semivolatile Organic Compounds in Groundwater, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/L)	NYSDEC AWQSGVs (µg/L)	**Sample Designation:** **Sample Date:**	SB-1/MW-1 5/22/2013	SB-5/MW-5 5/22/2013	SB-6/MW-6 5/22/2013	SB-6/MW-6 DUP 5/22/2013	FB052213-Water 5/22/2013
1,1'-Biphenyl	--		10 U	10 U	10 U	10 U	10 U
1,2,4,5-Tetrachlorobenzene	--		10 U	10 U	10 U	10 U	10 U
2,2'-oxybis (1-chloropropane)	5		10 U	10 U	10 U	10 U	10 U
2,3,4,6-Tetrachlorophenol	--		10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	--		10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol	--		10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	5		10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	50		10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	10		30 U	30 U	30 U	30 U	30 U
2,4-Dinitrotoluene	5		2 U	2 U	2 U	2 U	2 U
2,6-Dinitrotoluene	5		2 U	2 U	2 U	2 U	2 U
2-Chloronaphthalene	10		10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	--		10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	--		10 U	3.4 J	10 U	10 U	10 U
2-Methylphenol	--		10 U	10 U	10 U	10 U	10 U
2-Nitroaniline	5		20 U	20 U	20 U	20 U	20 U
2-Nitrophenol	--		10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	5		20 U	20 U	20 U	20 U	20 U
3-Nitroaniline	5		20 U	20 U	20 U	20 U	20 U
4,6-Dinitro-2-methylphenol	--		30 U	30 U	30 U	30 U	30 U
4-Bromophenyl phenyl ether	--		10 U	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	--		10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	5		10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl phenyl ether	--		10 U	10 U	10 U	10 U	10 U
4-Methylphenol	--		10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	5		20 U	20 U	20 U	20 U	20 U
4-Nitrophenol	--		30 U	30 U	30 U	30 U	30 U
Acenaphthene	20		10 U	10 U	10 U	10 U	10 U
Acenaphthylene	20		10 U	10 U	10 U	10 U	10 U
Acetophenone	--		10 U	10 U	10 U	10 U	10 U
Anthracene	50		10 U	10 U	10 U	10 U	10 U
Atrazine	--		10 U	10 U	10 U	10 U	10 U

Table 7. Summary of Semivolatile Organic Compounds in Groundwater, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/L)	NYSDEC AWQSGVs (µg/L)	**Sample Designation:** / **Sample Date:**	SB-1/MW-1 5/22/2013	SB-5/MW-5 5/22/2013	SB-6/MW-6 5/22/2013	SB-6/MW-6 DUP 5/22/2013	FB052213-Water 5/22/2013
Benzaldehyde	--		10 U	10 U	10 U	10 U	10 U
Benzo[a]anthracene	0.002		1 U	1 U	1 U	1 U	1 U
Benzo[a]pyrene	0		1 U	1 U	1 U	1 U	1 U
Benzo[b]fluoranthene	0.002		1 U	1 U	1 U	1 U	1 U
Benzo[g,h,i]perylene	--		10 U	10 U	10 U	10 U	10 U
Benzo[k]fluoranthene	0.002		1 U	1 U	1 U	1 U	1 U
Bis(2-chloroethoxy)methane	5		10 U	10 U	10 U	10 U	10 U
Bis(2-chloroethyl) ether	--		1 U	1 U	1 U	1 U	1 U
Bis(2-ethylhexyl) phthalate	5		10 U	10 U	10 U	10 U	10 U
Butylbenzyl phthalate	50		10 U	10 U	10 U	10 U	10 U
Caprolactam	--		10 U	10 U	10 U	10 U	10 U
Carbazole	--		10 U	10 U	10 U	10 U	10 U
Chrysene	0.002		10 U	10 U	10 U	10 U	10 U
Dibenzo[a,h]anthracene	--		1 U	1 U	1 U	1 U	1 U
Dibenzofuran	--		10 U	10 U	10 U	10 U	10 U
Diethyl phthalate	50		10 U	1.7 J	10 U	10 U	10 U
Dimethyl phthalate	50		10 U	10 U	10 U	10 U	10 U
Di-n-butyl phthalate	50		10 U	10 U	10 U	1.6 J	1.1 J
Di-n-octyl phthalate	--		10 U	10 U	10 U	10 U	10 U
Fluoranthene	50		10 U	10 U	10 U	10 U	10 U
Fluorene	50		10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	0.04		1 U	1 U	1 U	1 U	1 U
Hexachlorobutadiene	0.5		2 U	2 U	2 U	2 U	2 U
Hexachlorocyclopentadiene	5		10 U *	10 U *	10 U *	10 U *	10 U *
Hexachloroethane	5		1 U	1 U	1 U	1 U	1 U
Indeno[1,2,3-cd]pyrene	0.002		1 U	1 U	1 U	1 U	1 U
Isophorone	50		10 U	10 U	10 U	10 U	10 U
Naphthalene	10		10 U	7.4 J	10 U	10 U	10 U
Nitrobenzene	0.4		1 U	1 U	1 U	1 U	1 U
n-Nitrosodi-n-propylamine	--		1 U	1 U	1 U	1 U	1 U
n-Nitrosodiphenylamine	50		10 U	10 U	10 U	10 U	10 U
Pentachlorophenol	1		30 U	30 U	30 U	30 U	30 U

Table 7. Summary of Semivolatile Organic Compounds in Groundwater, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/L)	NYSDEC AWQSGVs (µg/L)	**Sample Designation:** **Sample Date:**	SB-1/MW-1 5/22/2013	SB-5/MW-5 5/22/2013	SB-6/MW-6 5/22/2013	SB-6/MW-6 DUP 5/22/2013	FB052213-Water 5/22/2013
Phenanthrene	50		10 U	10 U	10 U	10 U	10 U
Phenol	1		10 U	**6.4 J**	10 U	10 U	10 U
Pyrene	50		10 U	10 U	10 U	10 U	10 U

NYSDEC - New York State Department of Environmental Conservation
AWQSGVs - Ambient Water-Quality Standards and Guidance Values
µg/L -Micrograms per liter
J - Estimated Value
U - Compound was analyzed for but not detected
DUP - Duplicate
- - No NYSDEC AWQSGV available
Bold data indicates that parameter was detected above the NYSDEC AWQSGVs

Table 8. Summary of Metals in Groundwater, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/L)	NYSDEC AWQSGVs (µg/L)	**Sample Designation:** **Sample Date:**	FB052213-Water 5/22/2013 Filtered	SB-1/MW-1 5/22/2013	SB-1/MW-1 5/22/2013 Filtered	SB-5/MW-5 5/22/2013	SB-5/MW-5 5/22/2013 Filtered	SB-6/MW-6 5/22/2013
Aluminum	--		200 U	830	200 U	7940 B	200 U	6030 B
Antimony	3		10 U	10 U	10 U	10 U	10 U	10 U
Arsenic	25		5 U	5 U	5 U	5.1	5 U	5 U
Barium	1000		200 U	187 J	159 J	172 J	54.7 J	88.9 J
Beryllium	3		2 U	2 U	2 U	2 U	2 U	2 U
Cadmium	5		5 U	0.89 J	5 U	5 U	5 U	5 U
Calcium	--		5000 U	206000	209000	169000	163000	87500
Chromium	50		10 U	10 U	10 U	20	10 U	11.1
Cobalt	--		50 U	50 U	50 U	5.5 J	50 U	50 U
Copper	200		25 U	167	48.3	23.2 J	25 U	11.3 J
Cyanide, Free	200					10 U		10 U
Iron	300		150 U	**2440**	150 U	**40600**	150 U	**9080**
Lead	25		5 U	**31.6**	5 U	**53.4**	5 U	**46.1**
Magnesium	--		5000 U	22700	22900	38300	34500	12200
Manganese	300		15 U	**682**	**691**	**1910**	**1690**	**503**
Mercury	0.7		0.2 U	0.2 U	0.2 U	0.3	0.2 U	0.2 U
Nickel	100		40 U	25 J	21.8 J	14.7 J	40 U	9 J
Potassium	--		5000 U	9640	9650	15100	14000	6390
Selenium	10		10 U	7.5 J	6.7 J	10 U	10 U	10 U
Silver	50		10 U	10 U	10 U	10 U	10 U	10 U
Sodium	20000		5000 U	**132000**	**136000**	**50200**	**49500**	17100
Thallium	0.5		10 U	10 U	10 U	10 U	10 U	10 U
Vanadium	--		50 U	4.9 J	50 U	20.4 J	50 U	12.4 J
Zinc	2000		30 U	589	493	73.3	30 U	38.6

NYSDEC - New York State Department of Environmental Conservation
AWQSGVs - Ambient Water-Quality Standards and Guidance Values
µg/L -Micrograms per liter
J - Estimated Value
U - Compound was analyzed for but not detected
DUP - Duplicate
- - No NYSDEC AWQSGV available
Bold data indicates that parameter was detected above the NYSDEC AWQSGVs
NA - Compound was not analyzed by laboratory

Table 8. Summary of Metals in Groundwater, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/L)	NYSDEC AWQSGVs (µg/L)	**Sample Designation:** **Sample Date:**	SB-6/MW-6 5/22/2013 Filtered	SB-6/MW-6 DUP 5/22/2013	SB-6/MW-6 DUP 5/22/2013 Filtered	FB052213-Water 5/22/2013
Aluminum	--		200 U	28800	83.8 J	200 U
Antimony	3		10 U	10 U	10 U	10 U
Arsenic	25		5 U	4.5 J	5 U	5 U
Barium	1000		30.2 J	269	35.4 J	200 U
Beryllium	3		2 U	0.99 J	2 U	2 U
Cadmium	5		5 U	5 U	5 U	5 U
Calcium	--		83000	84500	84000	5000 U
Chromium	50		10 U	**55.3**	10 U	10 U
Cobalt	--		50 U	14.6 J	50 U	50 U
Copper	200		25 U	47.2	25 U	25 U
Cyanide, Free	200			10 U		10 U
Iron	300		150 U	**35000**	150 U	150 U
Lead	25		5 U	**148**	5 U	5 U
Magnesium	--		9610	18900	9770	5000 U
Manganese	300		**380**	**756**	**363**	15 U
Mercury	0.7		0.2 U	0.2 U	0.2 U	0.2 U
Nickel	100		40 U	39.6 J	40 U	40 U
Potassium	--		5500	9910	5690	5000 U
Selenium	10		10 U	10 U	10 U	10 U
Silver	50		10 U	10 U	10 U	10 U
Sodium	20000		15500	15200	16300	5000 U
Thallium	0.5		10 U	10 U	10 U	10 U
Vanadium	--		50 U	58.8	50 U	50 U
Zinc	2000		30 U	148	30 U	30 U

NYSDEC - New York State Department of Environmental Conservation
AWQSGVs - Ambient Water-Quality Standards and Guidance Values
µg/L -Micrograms per liter
J - Estimated Value
U - Compound was analyzed for but not detected
DUP - Duplicate
- - No NYSDEC AWQSGV available
Bold data indicates that parameter was detected above the NYSDEC AWQSGVs
NA - Compound was not analyzed by laboratory

Table 9. Summary of Polychlorinated Biphenyls in Groundwater, 5530 Broadway, Bronx, New York

Parameter (Concentrations in µg/L)	NYSDEC AWQSGVs (µg/L)	**Sample Designation:** **Sample Date:**	SB-1/MW-1 5/22/2013	SB-5/MW-5 5/22/2013	SB-6/MW-6 5/22/2013	SB-6/MW-6 DUP 5/22/2013	FB052213-Water 5/22/2013
Aroclor-1016	--		0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Aroclor-1221	--		0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Aroclor-1232	--		0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Aroclor-1242	--		0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Aroclor-1248	--		0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Aroclor-1254	--		0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Aroclor-1260	--		0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Aroclor-1262	--		0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Aroclor-1268	--		0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Aroclor (Total)	0.09		0.4 U	0.4 U	0.4 U	0.4 U	0.4 U

NYSDEC - New York State Department of Environmental Conservation
AWQSGVs - Ambient Water-Quality Standards and Guidance Values
µg/L -Micrograms per liter
J - Estimated Value
U - Compound was analyzed for but not detected
DUP - Duplicate
- - No NYSDEC AWQSGV available
Bold data indicates that parameter was detected above the NYSDEC AWQSGVs

Table 10. Summary of Volatile Organic Compounds in Soil Vapor, 5530 Broadway, Bronx, New York

Parameter (Concentrations in ug/m^3)	**Sample Designation:** / **Sample Date:**	SV-1 5/21/2013	SV-3 5/21/2013	SV-5 5/21/2013	SV-6 5/21/2013
Carbon tetrachloride		10 U	25 U	1.3 U	2.8 U
Trichloroethene		**9.2**	21 U	**0.39 J**	2.4 U
Vinyl chloride		4.1 U	10 U	0.51 U	1.1 U
1,1,1-Trichloroethane		8.7 U	22 U	1.1 U	2.4 U
1,1-Dichloroethene		6.3 U	16 U	0.79 U	1.7 U
cis-1,2-Dichloroethene		6.3 U	16 U	0.79 U	1.7 U
Tetrachloroethene		**1400**	**52**	**19**	**150**
1,1,2,2-Tetrachloroethane		11 U	27 U	1.4 U	3 U
1,1,2-Trichloroethane		8.7 U	22 U	1.1 U	2.4 U
1,1-Dichloroethane		6.5 U	16 U	0.81 U	1.8 U
1,2,4-Trichlorobenzene		30 U	73 U	3.7 U	8.2 U
1,2,4-Trimethylbenzene		**9.2**	**12 J**	0.98 U	**12**
1,2-Dibromoethane		12 U	30 U	1.5 U	3.4 U
1,2-Dichlorobenzene		9.6 U	24 U	1.2 U	2.6 U
1,2-Dichloroethane		6.5 U	16 U	0.81 U	1.8 U
1,2-Dichloroethene (total)		6.3 U	16 U	0.79 U	1.7 U
1,2-Dichloropropane		7.4 U	18 U	0.92 U	2 U
1,3,5-Trimethylbenzene		**2.7 J**	19 U	0.98 U	**3.4**
1,3-Butadiene		**9.3**	8.8 U	**1.4**	0.97 U
1,3-Dichlorobenzene		9.6 U	24 U	1.2 U	**2 J**
1,4-Dichlorobenzene		9.6 U	24 U	1.2 U	2.6 U
1,4-Dioxane		140 U	360 U	18 U	40 U
2-Butanone (MEK)		12 U	29 U	**4.7**	3.2 U
2-Chlorotoluene		8.3 U	21 U	1 U	2.3 U
2-Hexanone		16 U	41 U	**3**	**1.8 J**
3-Chloropropene		13 U	31 U	1.6 U	3.4 U
4-Ethyltoluene		**2.9 J**	**4.8 J**	0.98 U	**3.8**
4-Methyl-2-pentanone (MIBK)		**1.2 J**	41 U	**1.8 J**	**1.7 J**
Acetone		**42 J**	**69 J**	**18**	**36**
Benzene		**3.8 J**	**27**	**3.5**	**4.4**
Benzyl chloride		8.3 U	21 U	1 U	2.3 U
Bromodichloromethane		11 U	27 U	1.3 U	2.9 U
Bromoethene		7 U	17 U	0.87 U	1.9 U
Bromoform		17 U	41 U	2.1 U	4.5 U
Bromomethane		6.2 U	15 U	0.78 U	1.7 U
Butane		**55**	**690**	**13**	**72**
Carbon disulfide		**13**	**17 J**	**3.5**	**3.5**
Chlorobenzene		7.3 U	18 U	0.92 U	2 U
Chlorodifluoromethane		14 U	**28 J**	**1.6 J**	3.9 U
Chloroethane		11 U	26 U	1.3 U	2.9 U
Chloroform		7.8 U	19 U	**1.1**	2.1 U
Chloromethane		8.3 U	20 U	**0.63 J**	2.3 U
cis-1,3-Dichloropropene		7.3 U	18 U	0.91 U	2 U
Cyclohexane		5.5 U	**58**	0.69 U	1.5 U
Dibromochloromethane		14 U	34 U	1.7 U	3.7 U

Table 10. Summary of Volatile Organic Compounds in Soil Vapor, 5530 Broadway, Bronx, New York

Parameter (Concentrations in ug/m^3)	**Sample Designation:** / **Sample Date:**	SV-1 5/21/2013	SV-3 5/21/2013	SV-5 5/21/2013	SV-6 5/21/2013
Dichlorodifluoromethane		**3.8 J**	**5.8 J**	**2.2 J**	5.4 U
Ethylbenzene		**5.4 J**	**12 J**	**2.9**	**9**
Freon 113		12 U	30 U	**0.57 J**	3.4 U
Freon 114		11 U	28 U	1.4 U	3.1 U
Hexachlorobutadiene		17 U	42 U	2.1 U	4.7 U
Isooctane		7.5 U	19 U	**5.9**	2.1 U
Isopropanol		98 U	240 U	12 U	27 U
Isopropylbenzene		7.9 U	19 U	0.98 U	2.2 U
m+p-Xylene		**14 J**	**26 J**	**8.5**	**21**
Methyl Methacrylate		16 U	41 U	2 U	4.5 U
Methylene chloride		**4.3 J**	**14 J**	**1.4 J**	**1.6 J**
MTBE		5.8 U	14 U	0.72 U	1.6 U
Naphthalene		21 U	52 U	**0.92 J**	5.8 U
n-Butylbenzene		8.8 U	22 U	1.1 U	2.4 U
n-Heptane		**37**	**15 J**	**2.3**	**45**
n-Hexane		**53**	**50**	**4.4**	**60**
n-Propylbenzene		**2.1 J**	19 U	**1.2**	**3.2**
o-Xylene		**6.1 J**	**11 J**	**2.9**	**9**
p-Isopropyltoluene		8.8 U	22 U	**3.5**	**0.59 J**
sec-Butylbenzene		8.8 U	22 U	**0.8 J**	2.4 U
Styrene		6.8 U	17 U	0.85 U	1.9 U
t-Butyl Alcohol		120 U	300 U	**5.4 J**	**11 J**
tert-Butylbenzene		8.8 U	22 U	1.1 U	2.4 U
Tetrahydrofuran		120 U	290 U	15 U	32 U
Toluene		**16**	**29**	**8.7**	**19**
trans-1,2-Dichloroethene		6.3 U	16 U	0.79 U	1.7 U
trans-1,3-Dichloropropene		7.3 U	18 U	0.91 U	2 U
Trichlorofluoromethane		**2.5 J**	**4.5 J**	**1.4**	**2 J**
Xylenes (total)		**20**	**37**	**11**	**30**

J - Estimated value
U - Indicates that the compound was analyzed for but not detected
ug/m^3 - Micrograms per cubic meter
Bold data indicates that parameter was detected

FIGURES

1. Site Location
2. Site Plan
3. Proposed Redevelopment Plan
4. Surrounding Land Use

QUADRANGLE LOCATION

SOURCE:
USGS; Yonkers, NY-NJ (1998)
and Central Park, NY-NJ (1995)
7.5 Minute Topographic Quadrangles

N

0 2000'

Title:

SITE LOCATION MAP

5530 BROADWAY
BRONX, NEW YORK 10463

REMEDIAL ACTION WORK PLAN

Prepared for:

EQUITY ONE, INC.

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: W.M.	Date: 04FEB14	FIGURE
Prepared by: J.A.D.	Scale: AS SHOWN	1
Project Mgr.: W.M.	Project No.: 1924.0006Y	
File: 1924.0006Y104.01.CDR		

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LEGEND

- Boundary of Equity One Site
- Basement boundary
- Chain link fence
- Soil boring location
- Soil vapor sample location
- Groundwater sample location
- Existing monitoring well

Title:

SITE PLAN

5530 BROADWAY
BRONX, NEW YORK 10463
REMEDIAL ACTION WORK PLAN

Prepared for:
EQUITY ONE, INC.

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: W.M.	Date: 04FRB14	FIGURE
Prepared by: J.A.D.	Scale: AS SHOWN	2
Project Mgr.: W.M.	Project No.: 1924.0006Y	
File: 1924.0006Y104.02.CDR		

V:\CAD\PROJECTS\1924\Y0006Y\104\1924.0006Y104.02.CDR

LEGEND

Proposed 2-story retail building to cover entire site and neighboring property

Title:

REDEVELOPMENT PLAN

5530 BROADWAY
BRONX, NEW YORK 10463

REMEDIAL ACTION WORK PLAN

Prepared for:

EQUITY ONE, INC.

ROUX ASSOCIATES, INC. *Environmental Consulting & Management*	Compiled by: W.M.	Date: 04FEB14	FIGURE 3
	Prepared by: J.A.D.	Scale: AS SHOWN	
	Project Mgr.: W.M.	Project No.: 1924.0006Y	
	File: 1924.0006Y104.02.CDR		

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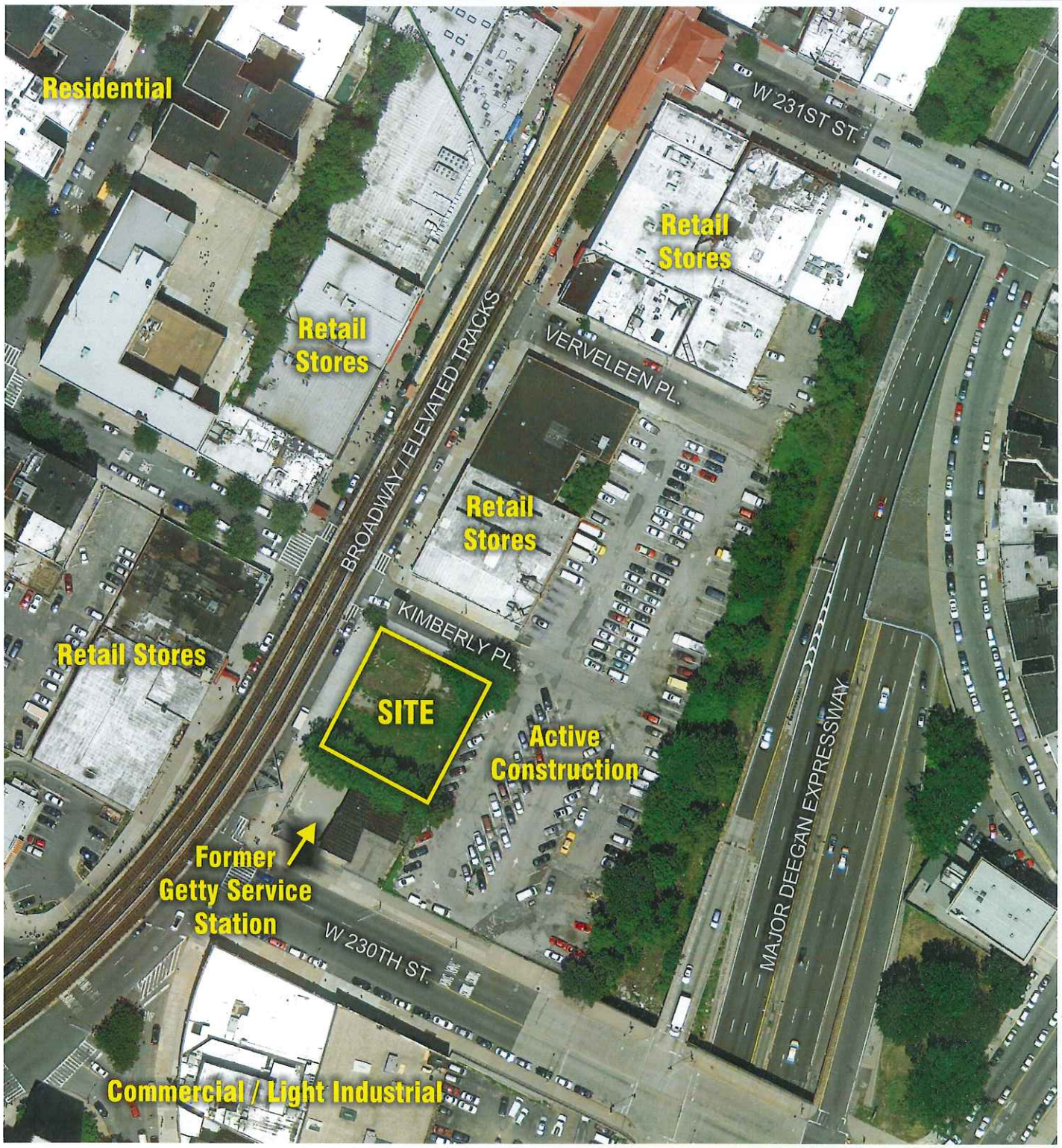

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0 100'

Title:

SITE PLAN WITH SURROUNDING PROPERTIES

5530 BROADWAY
BRONX, NEW YORK 10463

REMEDIAL ACTION WORK PLAN

Prepared for:

EQUITY ONE, INC.

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: W.M.	Date: 04FEB14	FIGURE
Prepared by: J.A.D.	Scale: AS SHOWN	4
Project Mgr.: W.M.	Project No.: 1924.0006Y	
File: 1924.0006Y104.03.CDR		

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APPENDICES

A. Citizen Participation Plan

B. Sustainability Statement

C. Soil/Materials Management Plan

D. Construction Health and Safety Plan

E. Proposed Redevelopment Plans

F. Design Diagrams and Specifications for Vapor Barrier/Waterproofing Membrane

Citizen Participation Plan

APPENDIX A

CITIZEN PARTICIPATION PLAN

The NYC Office of Environmental Remediation and Equity One have established this Citizen Participation Plan because the opportunity for citizen participation is an important component of the NYC Voluntary Cleanup Program. This Citizen Participation Plan describes how information about the project will be disseminated to the Community during the remedial process. As part of its obligations under the NYC VCP, Equity One will maintain a repository for project documents and provide public notice at specified times throughout the remedial program. This Plan also takes into account potential environmental justice concerns in the community that surrounds the project Site. Under this Citizen Participation Plan, project documents and work plans are made available to the public in a timely manner. Public comment on work plans is strongly encouraged during public comment periods. Work plans are not approved by the NYC Office of Environmental Remediation (OER) until public comment periods have expired and all comments are formally reviewed. An explanation of cleanup plans in the form of a public meeting or informational session is available upon request to OER's project manager assigned to this Site, Eric Ilijevich, who can be contacted about these issues or any others questions, comments or concerns that arise during the remedial process at (212) 788-8841.

Project Contact List. OER has established a Site Contact List for this project to provide public notices in the form of fact sheets to interested members of the Community. Communications will include updates on important information relating to the progress of the cleanup program at the Site as well as to request public comments on the cleanup plan. The Project Contact List includes owners and occupants of adjacent buildings and homes, principal administrators of nearby schools, hospitals and day care centers, the public water supplier that serves the area, established document repositories, the representative Community Board, City Council members, other elected representatives and any local Brownfield Opportunity Area (BOA) grantee organizations. Any member of the public or organization will be added to the Site Contact List on request. A copy of the Site Contact List is maintained by OER's project manager. If you would like to be added to the Project Contact List, contact NYC OER at (212) 788-8841 or by email at brownfields@cityhall.nyc.gov.

Repositories. A document repository is maintained in the nearest public library that maintains evening and weekend hours. This document repository is intended to house, for community review, all principal documents generated during the cleanup program including Remedial Investigation plans and reports, Remedial Action work plans and reports, and all public notices and fact sheets produced during the lifetime of the remedial project. Equity One will inspect the repositories to ensure that they are fully populated with project information. The repository for this project is:

New York Public Library – Kingsbridge Library

291 West 230th Street, Bronx, New York 10463(718) 548-5656

Repository Hours of Operation

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
11:00 AM - 7:00 PM	10:00 AM - 6:00 PM	11:00 AM - 7:00 PM	10:00 AM - 6:00 PM	10:00 AM - 5:00 PM	10:00 AM - 5:00 PM	CLOSED

Digital Documentation. NYC OER strongly encourages the use of digital documents in repositories as a means of minimizing paper use while also increasing convenience in access and ease of use.

Public Notice and Public Comment. Public notice to all members of the Project Contact List is required at three major steps during the performance of the cleanup program (listed below) and at other points that may be required by OER. Notices will include Fact Sheets with descriptive project summaries, updates on recent and upcoming project activities, repository information, and important phone and email contact information. All notices will be prepared by Equity One, reviewed and approved by OER prior to distribution and mailed by Equity One. Public comment is solicited in public notices for all work plans developed under the NYC Voluntary Cleanup Program. Final review of all work plans by OER will consider all public comments. Approval will not be granted until the public comment period has been completed.

Citizen Participation Milestones. Public notice and public comment activities occur at several steps during a typical NYC VCP project. See flow chart on the following page, which identifies when during the NYC VCP public notices are issued: These steps include:

- **Public Notice of the availability of the Remedial Investigation Report and Remedial Action Work Plan and a 30-day public comment period on the Remedial Action Work Plan.**

  Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the availability of the Remedial Investigation Report and Remedial Action Work Plan and the initiation of a 30-day public comment period on the Remedial Action Work Plan. The Fact Sheet summarizes the findings of the RIR and provides details of the RAWP. The public comment period will be extended an additional 15 days upon public request. A public meeting or informational session will be conducted by OER upon request.

- **Public Notice announcing the approval of the RAWP and the start of remediation**

  Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the approval of the RAWP and the start of remediation.

- **Public Notice announcing the completion of remediation, designation of Institutional and Engineering Controls and issuance of the Notice of Completion**

Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the completion of remediation, providing a list of all Institutional and Engineering Controls implemented for to the Site and announcing the issuance of the Notice of Completion.

Sustainability Statement

APPENDIX B

SUSTAINABILITY STATEMENT

This Sustainability Statement documents sustainable activities and green remediation efforts planned under this remedial action.

Reuse of Clean, Recyclable Materials. Reuse of clean, locally-derived recyclable materials reduces consumption of non-renewable virgin resources and can provide energy savings and greenhouse gas reduction.

Recylced concrete aggregate will be used in the sub-base beneath the new building slab. An estimate of the quantity (in tons) of clean, non-virgin materials (reported by type of material) reused under this plan will be quantified and reported in the RAR.

Reduce Consumption of Virgin and Non-Renewable Resources. Reduced consumption of virgin and non-renewable resources lowers the overall environmental impact of the project on the region by conserving these resources.

An estimate of the quantity (in tons) of virgin and non-renewable resources, the use of which will be avoided under this plan, will be quantified and reported in the RAR.

Reduced Energy Consumption and Promotion of Greater Energy Efficiency. Reduced energy consumption lowers greenhouse gas emissions, improves local air quality, lessens in-city power generation requirements, can lower traffic congestion, and provides substantial cost savings.

The selection of the disposal facility for the excavated soil will be based, in part, on proximity to the Site to reduce the fuel usage of the transportation vehicles.

Best efforts will be made to quantify energy efficiencies achieved during the remediation and will be reported in the Remedial Action Report (RAR). Where energy savings cannot be easily quantified, a gross indicator of the amount of energy saved or the means by which energy savings was achieved will be reported.

Recontamination Control. Recontamination after cleanup and redevelopment is completed undermines the value of work performed, may result in a property that is less protective of public health or the environment, and may necessitate additional cleanup work later or impede future redevelopment. Recontamination can arise from future releases that occur within the property or by influx of contamination from off-Site.

Recontamination controls including the installation of a vapor barrier and sub-slab depressurization system are planned for this project Site and the adjacent property at 5510 Broadway.

An estimate of the area of the Site that utilizes recontamination controls under this plan will be reported in the RAR in square feet.

Linkage with Green Building. Green buildings provide a multitude of benefits to the city across a broad range of areas, such as reduction of energy consumption, conservation of resources, and reduction in toxic materials use.

The number of Green Buildings that are associated with this brownfield redevelopment property will be reported in the RAR. The total square footage of green building space created as a function of this brownfield redevelopment will be quantified for residential, commercial and industrial/manufacturing uses.

Paperless Brownfield Cleanup Program. Equity One is participating in OER's Paperless Brownfield Cleanup Program. Under this program, submission of electronic documents will replace submission of hard copies for the review of project documents, communications and milestone reports.

Low-Energy Project Management Program. Equity One is participating in OER's low-energy project management program. Under this program, whenever possible, meetings are held using remote communication technologies, such as videoconferencing and teleconferencing to reduce energy consumption and traffic congestion associated with personal transportation.

Soil/Materials Management Plan

APPENDIX C

SOIL/MATERIALS MANAGEMENT PLAN

1.1 SOIL SCREENING METHODS

Visual, olfactory and PID soil screening and assessment will be performed under the supervision of a Qualified Environmental Professional and will be reported in the RAR. Soil screening will be performed during invasive work performed during the remedy and development phases prior to issuance of the Notice of Completion.

1.2 STOCKPILE METHODS

Excavated soil from suspected areas of contamination (e.g., hot spots, USTs, drains, etc.) will be stockpiled separately and will be segregated from clean soil and construction materials. Stockpiles will be used only when necessary and will be removed as soon as practicable. While stockpiles are in place, they will be inspected daily, and before and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by OER. Excavated soils will be stockpiled on, at minimum, double layers of 8-mil minimum sheeting, will be kept covered at all times with appropriately anchored plastic tarps, and will be routinely inspected. Broken or ripped tarps will be promptly replaced.

All stockpile activities will be compliant with applicable laws and regulations. Soil stockpile areas will be appropriately graded to control run-off in accordance with applicable laws and regulations. Stockpiles of excavated soils and other materials shall be located at least of 50 feet from the property boundaries, where possible. Hay bales or equivalent will surround soil stockpiles except for areas where access by equipment is required. Silt fencing and hay bales will be used as needed near catch basins, surface waters and other discharge points.

1.3 CHARACTERIZATION OF EXCAVATED MATERIALS

Soil/fill or other excavated media that is transported off-Site for disposal will be sampled in a manner required by the receiving facility, and in compliance with applicable laws and regulations. Soils proposed for reuse on-Site will be managed as defined in this plan.

1.4 MATERIALS EXCAVATION, LOAD-OUT AND DEPARTURE

The PE/QEP overseeing the remedial action will:

- oversee remedial work and the excavation and load-out of excavated material;
- ensure that there is a party responsible for the safe execution of invasive and other work performed under this work plan;
- ensure that Site development activities and development-related grading cuts will not interfere with, or otherwise impair or compromise the remedial activities proposed in this RAWP;
- ensure that the presence of utilities and easements on the Site has been investigated and that any identified risks from work proposed under this plan are properly addressed by appropriate parties;
- ensure that all loaded outbound trucks are inspected and cleaned if necessary before leaving the Site;
- ensure that all egress points for truck and equipment transport from the Site will be kept clean of Site-derived materials during Site remediation.

Locations where vehicles exit the Site shall be inspected daily for evidence of soil tracking off premises. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site-derived materials.

Open and uncontrolled mechanical processing of historical fill and contaminated soil on-Site will not be performed without prior OER approval.

1.5 OFF-SITE MATERIALS TRANSPORT

Loaded vehicles leaving the Site will comply with all applicable materials transportation requirements (including appropriate covering, manifests, and placards) in accordance with applicable laws and regulations, including use of licensed haulers in accordance with 6 NYCRR Part 364. If loads contain wet material capable of causing leakage from trucks, truck liners will be used. Queuing of trucks will be performed on-Site, when possible in order to minimize off Site disturbance. Off-Site queuing will be minimized.

Outbound truck transport routes are (1) leave site and turn east on West 230 Street; (2) turn right and take the Major Deegan Expressway south; 3) go west on Cross Bronx Expressway and cross George Washington Bridge.

This routing takes into account the following factors: (a) limiting transport through residential areas and past sensitive sites; (b) use of mapped truck routes; (c) minimizing off-Site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport. To the extent possible, all trucks loaded with Site materials will travel from the Site using these truck routes. Trucks will not stop or idle in the neighborhood after leaving the project Site.

1.6 MATERIALS DISPOSAL OFF-SITE

The following documentation will be established and reported by the PE/QEP for each disposal destination used in this project to document that the disposal of regulated material exported from the Site conforms with applicable laws and regulations: (1) a letter from the PE/QEP or Enrollee to each disposal facility describing the material to be disposed and requesting written acceptance of the material. This letter will state that material to be disposed is regulated material generated at an environmental remediation Site in the Bronx, New York under a governmental remediation program. The letter will provide the project identity and the name and phone number of the PE/QEP or Enrollee. The letter will include as an attachment a summary of all chemical data for the material being transported; and (2) a letter from each disposal facility stating it is in receipt of the correspondence (1, above) and is approved to accept the material. These documents will be included in the RAR.

The Remedial Action Report will include an itemized account of the destination of all material removed from the Site during this remedial action. Documentation associated with disposal of all material will include records and approvals for receipt of the material. This information will be presented in the RAR.

All impacted soil/fill or other waste excavated and removed from the Site will be managed as regulated material and will be disposed in accordance with applicable laws and regulations. Historic fill and contaminated soils taken off-Site will be handled as solid waste and will not be disposed at a Part 360-16 Registration Facility (also known as a Soil Recycling Facility).

Waste characterization will be performed for off-Site disposal in a manner required by the receiving facility and in conformance with its applicable permits. Waste characterization sampling and analytical methods, sampling frequency, analytical results and QA/QC will be reported in the RAR. A manifest system for off-Site transportation of exported materials will be employed. Manifest information will be reported in the RAR. Hazardous wastes derived from on-Site will be stored, transported, and disposed of in compliance with applicable laws and regulations.

1.7 IMPORT OF BACKFILL SOIL FROM OFF-SITE SOURCES

This Section presents the requirements for imported fill materials to be used below the cover layer and within the clean soil cover layer. All imported soils will meet OER-approved backfill and cover soil quality objectives for this Site. The backfill and cover soil quality objectives are listed in Table 1.

A process will be established to evaluate sources of backfill and cover soil to be imported to the Site, and will include an examination of source location, current and historical use(s), and any applicable documentation. Material from industrial sites, spill sites, environmental remediation sites or other potentially contaminated sites will not be imported to the Site.

The following potential sources may be used pending attainment of backfill and cover soil quality objectives:

- Clean soil from construction projects at non-industrial sites in compliance with applicable laws and regulations;
- Clean soil from roadway or other transportation-related projects in compliance with applicable laws and regulations;
- Clean recycled concrete aggregate (RCA) from facilities permitted or registered by the regulations of NYS DEC.

All materials received for import to the Site will be approved by a PE/QEP and will be in compliance with provisions in this RAWP. The RAR will report the source of the fill, evidence that an inspection was performed on the source, chemical sampling results, frequency of testing, and a Site map indicating the locations where backfill or soil cover was placed.

Source Screening and Testing

Inspection of imported fill material will include visual, olfactory and PID screening for evidence of contamination. Materials imported to the Site will be subject to inspection, as follows:

- Trucks with imported fill material will be in compliance with applicable laws and regulations and will enter the Site at designated locations;
- The PE/QEP is responsible to ensure that every truck load of imported material is inspected for evidence of contamination; and
- Fill material will be free of solid waste including pavement materials, debris, stumps, roots, and other organic matter, as well as ashes, oil, perishables or foreign matter.

Composite samples of imported material will be taken at a minimum frequency of one sample for every 500 cubic yards of material. Once it is determined that the fill material meets imported backfill or cover soil chemical requirements and is non-hazardous, and lacks petroleum contamination, the material will be loaded onto trucks for delivery to the Site.

Recycled concrete aggregate (RCA) will be imported from facilities permitted or registered by NYSDEC. Facilities will be identified in the RAR. A PE/QEP is responsible to ensure that the facility is compliant with 6NYCRR Part 360 registration and permitting requirements for the period of acquisition of RCA. RCA imported from compliant facilities will not require additional testing, unless required by NYSDEC under its terms for operation of the facility. RCA imported to the Site must be derived from recognizable and uncontaminated concrete. RCA material is not acceptable for, and will not be used as cover material.

1.8 FLUIDS MANAGEMENT

Dewatering will not be conducted during construction and management of fluids is not anticipated.

Discharge of water generated during remedial construction to surface waters (i.e. a stream or river) is prohibited without a SPDES permit issued by New York State Department of Environmental Conservation.

1.9 STORM-WATER POLLUTION PREVENTION

Applicable laws and regulations pertaining to storm-water pollution prevention will be addressed during the remedial program. Erosion and sediment control measures identified in this RAWP (silt fences and barriers, and hay bale checks) will be installed around the entire perimeter of the remedial construction area and inspected once a week and after every storm event to ensure that they are operating appropriately. Discharge locations will be inspected to determine whether erosion control measures are effective in preventing significant impacts to receptors. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by OER. All necessary repairs shall be made immediately. Accumulated sediments will be removed as required to keep the barrier and hay bale check functional. Undercutting or erosion of the silt fence toe anchor will be repaired immediately with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

1.10 CONTINGENCY PLAN

This contingency plan is developed for the remedial construction to address the discovery of unknown structures or contaminated media during excavation. Identification of unknown contamination source areas during invasive Site work will be promptly communicated to OER's Project Manager. Petroleum spills will be reported to the NYS DEC Spill Hotline. These findings will be included in the daily report. If previously unidentified contaminant sources are found during on-Site remedial excavation or development-related excavation, sampling will be performed on contaminated source material and surrounding soils and reported to OER. Chemical analytical testing will be performed for TAL metals, TCL volatiles and semi-volatiles, TCL pesticides and PCBs, as appropriate.

1.11 ODOR, DUST AND NUISANCE CONTROL

Odor Control

All necessary means will be employed to prevent on- and off-Site odor nuisances. At a minimum, procedures will include: (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; and (c) use of foams to cover exposed odorous soils. If

odors develop and cannot otherwise be controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-Site disposal; and (e) use of chemical odorants in spray or misting systems.

This odor control plan is capable of controlling emissions of nuisance odors. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. OER will be notified of all odor complaint events. Implementation of all odor controls, including halt of work, will be the responsibility of the PE/QEP's certifying the Remedial Action Report.

Dust Control

Dust management during invasive on-Site work will include, at a minimum:

- Use of a dedicated water spray methodology for roads, excavation areas and stockpiles.
- Use of properly anchored tarps to cover stockpiles.
- Exercise extra care during dry and high-wind periods.
- Use of gravel or recycled concrete aggregate on egress and other roadways to provide a clean and dust-free road surface.

This dust control plan is capable of controlling emissions of dust. If nuisance dust emissions are identified, work will be halted and the source of dusts will be identified and corrected. Work will not resume until all nuisance dust emissions have been abated. OER will be notified of all dust complaint events. Implementation of all dust controls, including halt of work, will be the responsibility of the PE/QEP's responsible for certifying the Remedial Action Report.

Other Nuisances

Noise control will be exercised during the remedial program. All remedial work will conform, at a minimum, to NYC noise control standards.

Rodent control will be provided, during Site clearing and grubbing, and during the remedial program, as necessary, to prevent nuisances.

Construction Health and Safety Plan

July 8, 2013

HEALTH AND SAFETY PLAN

5530 Broadway
Bronx, New York

Prepared for

EQUITY ONE (NORTHEAST PORTFOLIO) INC.
410 Park Avenue, 12th Floor
New York, New York 10022

ROUX ASSOCIATES, INC.

Environmental Consulting & Management

ROUX

209 Shafter Street, Islandia, New York 11749 ♦ 631-232-2600

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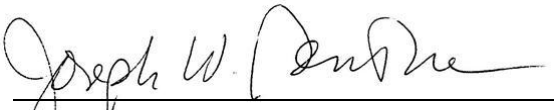
APPENDICES

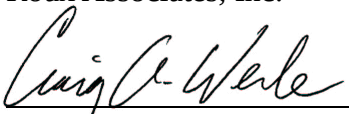
APPROVALS

By their signature, the undersigned certify that this Health and Safety Plan (HASP) is approved and will be utilized at the project site located at 5530 Broadway, Bronx, New York.



Joseph Gentile — Date
Corporate Health and Safety Manager
Roux Associates, Inc.

Joseph Gavin — Date
Site Health and Safety Officer
Roux Associates, Inc.



Craig Werle — Date
Project Principal
Roux Associates, Inc.

Note: This HASP was updated July, 2012.

1.0 INTRODUCTION

This Site-specific and Safety Plan (HASP) has been prepared in accordance with 29 CFR 1910.120 Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) and Roux Associates, Inc. (Roux Associates) Standard Operating Procedures (SOPs). It addresses all activities to be performed during the implementation of Remedial Investigation (RI) activities, and Remedial Actions (RA) at 5530 Broadway, Bronx, New York (Site) (Figure 1). The HASP will be implemented by the designated Site Health and Safety Officer (SSO) during work at the Site. The HASP attempts to identify all potential hazards at the Site; however, Site conditions are dynamic and new hazards may appear constantly. Personnel must remain alert to existing and potential hazards as Site conditions change and protect themselves accordingly.

Compliance with this HASP is required of all persons and subcontractors who perform fieldwork or enter the Site. The contents of this HASP may change or undergo revision based upon additional information made available to health and safety personnel, monitoring results, or changes in the technical scope of work. Any changes proposed must be reviewed and approved by the Corporate Health and Safety Manager (CHSM), with the SSO implementing the changes to the HASP.

Upon entering the Site, all visitors are required to sign in. All visitors entering the Contamination Reduction Zone (CRZ) (defined in Section 8.1.2), the Contamination Reduction Corridor (CRC) (defined in Section 8.1.2), or the Exclusion Zone (EZ) (defined in Section 8.1.3) will be required to read and comply with the provisions of this HASP. Visitors will be required to comply with applicable OSHA requirements such as training, medical monitoring, and respiratory protection.

In the event that a visitor does not adhere to the provisions of this HASP, he or she will be required to leave the Site. Mobilization activities not requiring intrusive activities (e.g., survey, equipment staging, etc.) or exposure to potentially impacted areas may only be performed if supervised by a competent Roux Associates employee.

1.1 Scope of Work

The Scope of Work activities will include the implementation of RI activities.

The Scope of Work activities are as follows:

1. Obtain necessary permits and approvals.
2. Preparation and implementation of an approved Health and Safety Plan (HASP).
3. Implementation of RI activities, consisting of site inspection/reconnaissance, geophysical survey, drilling, soil boring and sampling, groundwater sampling, and soil vapor sampling.
4. Implementation of the Remedial Action Work Plan (RAWP).
5. Mobilization and demobilization.
6. Maintain good site housekeeping procedures at all times.
7. Identification, protection, and/or relocation of any utilities within the work area.
8. Construct a decontamination pad with proper containment and collection system, if necessary.

1.2 Emergency Numbers

1.2.1 Emergency Phone Numbers

Emergency Medical Service 911

Police: New York Police Department (NYPD).....911

Fire: Fire Department of New York (FDNY) 911

Hospital: New York Presbyterian Hospital 212-932-4461

National Response Center.....800-424-8802

Poison Control Center.....800-222-1222

Chemtrec.....800-262-8200

Center for Disease Control.....800-311-3435

USEPA (Region II).....212-637-5000

NYSDEC Emergency Spill Response 800-457-7362

1.2.2 Project Management/Health and Safety Personnel

Title	Contact	Telephone/Cell
Roux Associates		
Project Director	Craig Werle	631-232-2600 Cell – 631-793-1535
Site Health and Safety Officer	Joseph Gavin	631-232-2600 Cell – 631-245-5887
Corporate Health and Safety Manager	Joseph Gentile	856-423-8800 Cell – 610-844-6911

1.2.3 Other Important Phone Numbers

No additional numbers

1.2.4 Directions to New York Presbyterian Hospital

See Figure 2 for street map.

- Start at 5530 Broadway, Bronx, New York
- Turn Left on Broadway to head south, towards West 230th Street
- Arrive at 5141 Broadway, New York Presbyterian Hospital on your right

2.0 HEALTH AND SAFETY STAFF

This section briefly describes all site personnel and their health and safety responsibilities for the RI work to be implemented at the Site. All personnel are responsible for ensuring compliance with the HASP.

2.1 Project Principal (PP) – Craig Werle – Roux Associates

- Has the overall responsibility for the health and safety of Site personnel.
- Ensures that adequate resources are provided to the field health and safety staff to carry out their responsibilities as outlined below.

2.2 Corporate Health and Safety Manager (CHSM) – Joe Gentile – Roux Associates

- Implements the HASP.
- Performs or oversees site-specific training and approves revised or new safety protocols or field operations.
- Coordinates revisions of this HASP with Project Principal.
- Responsible for the development of new task safety protocols and procedures and resolution of any outstanding safety issues which may arise during the conduction of site work.
- Review and approve all health and safety training and medical surveillance records for personnel and subcontractors.

2.3 Site Safety and Health Officer (SSO) – Joseph Gavin – Roux Associates

- Directs and coordinates health and safety monitoring activities.
- Ensures that field teams utilize proper personal protective equipment.
- Conducts initial onsite specific training prior to personnel and/or subcontractors commencing work.
- Conducts and documents periodic safety briefings.
- Ensures that field team members comply with this HASP.
- Completes and maintains Accident Report and Investigation Forms.
- Notifies PP and CHSM of all accident/incidents.

- Notifies PP of daily field operations and work progress, who will then communicate at the end of the day to the designated representative the following:
    1. End of day tasks completed
    2. Next day's planned activities
    3. Third party issues
    4. Change of Plans – approvals
- Change in level of personal protective equipment (PPE).
- Maintains contact with Contractors.
- Determines upgrade or downgrade of PPE based on Site conditions and/or real time monitoring results.
- Ensures that monitoring instruments are calibrated daily or as manufacturers suggested instructions determine.
- Submits and maintains health and safety field log books, daily safety logs, training logs, air monitoring result reports, weekly safety report.

2.4 Field Personnel and Subcontractors

- Report any unsafe or potentially hazardous conditions to the SSO.
- Maintain knowledge of the information, instructions, and emergency response actions contained in the HASP.
- Comply with rules, regulations, and procedures as set forth in this HASP and any revisions, which are instituted.
- Prevent admittance to work Site by unauthorized personnel.

3.0 SITE LOCATION, DESCRIPTION, AND HISTORY

Descriptions of the Site and surrounding property usage are included in the following sections. The location of the Site is presented in Figure 1.

3.1 Property Location and Description

The Site is located at 5530 Broadway in the Kingsbridge section of Bronx, New York. Figure 1 shows the Site location. The Site is 11,500-square feet and is bounded by a de-mapped street (Kimberly Place) to the northeast, a former retail gasoline station to the southwest, the Broadway Plaza NYC VCP Site to the southeast, and Broadway to the northwest. Currently, the Site is vacant, mostly covered in vegetation, and contains only the abandoned and partially collapsed basement of the former building which was previously demolished.

4.0 WASTE DESCRIPTION/CHARACTERIZATION

4.1 General

The following information is presented in order to identify the types of materials that may be encountered at the Site. The detailed information on these materials was obtained from:

- SAX's Dangerous Properties of Industrial Materials – Lewis Eight Edition
- Chemical Hazards of the Workplace – Proctor/Hughes
- Condensed Chemical Dictionary – Hawley
- Rapid Guide to Hazardous Chemical in the Workplace – Lewis 1990
- NIOSH Pocket Guide to Chemical Hazards – 2005
- ACGIH TLV Values and Biological Exposure Indices
- OSHA 29 CFR 1910.1000

4.2 Chemical Data Sheets

Several chemicals that may potentially be present in soils and groundwater at the Site, based on previous soil, soil vapor and groundwater sampling results and historic operations conducted at the Site that have been identified. The Summary of Toxicological Data is found in Table 1 and is provided for review of chemicals that may be encountered. The Summary of Toxicological Data Sheets provides information such as the chemicals characteristics, health hazards, protection, and exposure limits.

4.2.1 Contaminants of Concern

Soil and groundwater contaminants that may be encountered during drilling and sampling activities include both organic and inorganic compounds.

According to previous investigation reports, volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) were detected above guidance values in soil, and groundwater due to a known petroleum spill at the neighboring property. A closed NYSDEC Spill Number exists for the neighboring former Getty gasoline station.

According to Roux investigations at the Site, VOCs, SVOCs, and metals were detected in soil and/or groundwater at the Site. No detections of polychlorinated biphenyls (PCBs), were noted in

soil and groundwater analytical data. Exceedances of NYSDEC Part 375 Unrestricted Use Criteria in soil analytical results were noted for several metals, SVOCs and VOCs. There were several detections that exceeded the NYSDEC Part 375 Commercial Criteria. VOCs, SVOCs and metals were detected in groundwater analytical results; no detections of PCBs were noted. The groundwater exceedances were restricted to VOCs and SVOCs found in typical gasoline spills, and several metals including sodium, manganese and lead. In addition, several VOCs were detected in soil vapor samples.

The toxicological, physical, and chemical properties of potential contaminants are presented in Table 1.

5.0 HAZARD ASSESSMENT

The potential to encounter chemical hazards is dependent upon the work activity performed (intrusive versus non-intrusive), and the duration and location of the work activity. Such hazards could include inhalation and/or skin contact with chemicals/gases that could cause: dermatitis, skin burns, being overcome by vapors or asphyxiation.

Physical hazards that may be encountered during Site work include; heat and cold stress, exposure to excessive noise, loss of limbs, being crushed, head injuries, punctures, cuts, falls, electrocution, and bruises, structural integrity of buildings, asbestos and lead paint exposure, and other physical hazards due to motor vehicle operation, heavy equipment and power tools.

Biological hazards may exist during Site activities. These hazards include exposure to insect bites/stings, animals and animal wastes, mold and bloodborne pathogens.

Prior to the beginning of each new phase of work, an activity hazard analysis will be prepared by the SSO with assistance from the CHSM. The analysis will address the hazards for each activity performed in the phase and will present the procedures and safeguards necessary to eliminate the hazards or reduce the risk. The Activity Hazard Analysis Sheets are located in Appendix A.

5.1 Chemical Hazards

The potential for personnel and subcontractors to come in contact with chemical hazards may occur during the following tasks:

- Drilling Activities
- *In situ* Chemical Injection Activities
- Decontamination Activities

For chronic and acute toxicity data, refer to Summary of Toxicological Data Sheets in Table 1 for further details on compound characteristics. The Material Safety Data Sheets for the injection chemicals are also included in Appendix A.

5.1.1 Exposure Pathways

Exposure to these compounds during ongoing activities may occur through inhalation of contaminated dust particles, inhalation of VOCs, SVOCs or inorganics, dermal absorption, and accidental ingestion of the contaminant by either direct or indirect cross-contamination activities.

Inhalation of contaminated dust particles (VOCs, SVOCs, and inorganics) can occur during adverse weather conditions (high or changing wind directions) or during operations that may generate airborne dust such as excavation and loading of contaminated soils. Dust control measures such as applying water to roadways and excavations will be implemented where visible dust is generated. Where dust control measures are not feasible or effective, respiratory protection will be used when necessary (see Section 9.2.2 for monitoring procedures and action levels).

5.1.2 Operational Action Levels

A decision-making protocol for an upgrade in levels of protection and/or withdrawal of personnel from an area based on atmospheric hazards is outlined in Table 2.

5.1.3 Additional Precautions

Dermal absorption or skin contact with chemical compounds is possible during intrusive activities or *in situ* chemical injections at the Site. The use of PPE in accordance with Section 8.2 and strict adherence to proper decontamination procedures should significantly reduce the risk of skin contact.

The potential for accidental ingestion of potentially hazardous chemicals is expected to be remote, when good hygiene practices are used.

5.2 Physical Hazards

A variety of physical hazards may be present during Site activities. These hazards include typical construction activities: operation of motor vehicles and heavy equipment operation, the use of power and hand tools, the use of pressurized pumps for *in situ* injections, roping and rigging of steel sheeting, walking on objects, tripping over objects, working on surfaces which have the potential to promote falling, skin burns, crushing of fingers, toes, limbs, head injuries caused by falling objects, temporary loss of one's hearing and/or eyesight. The referenced hazards are not

unique and are generally familiar to most hazardous waste site workers at construction sites. Task specific safety requirements for each phase will be covered during safety briefings. Activity Hazard Analysis summaries are contained in Appendix A.

5.2.1 Noise

Noise is a potential hazard associated with operation of heavy equipment, power tools, pumps, and generators. High noise equipment operators will be evaluated at the discretion of the SSO. Employees with an 8-hour time weighted average exposure exceeding 85 dBA will be included in the hearing conservation program in accordance with 29 CFR 1910.95 and 1926.52.

It is mandated that employees working around heavy equipment or using power tools that produce noise levels exceeding 90 dBA are to wear hearing protection that shall consist of earplugs or protective earmuffs.

5.2.2 Heat Stress

Heat stress is a significant potential hazard, associated with the use of protective equipment in a hot weather environment. The human body is designed to function at a certain internal temperature. When metabolism or external sources (fire or hot summer day) cause the body temperature to rise, the body seeks to protect itself by triggering cooling mechanisms. The SSO will monitor the air temperature (as described later in this section) to determine potential adverse effects the weather can cause onsite personnel. Excess heat is dissipated by two means:

- Changes in blood flow to dissipate heat by convection, which can be seen as "flushing" or reddening of the skin in extreme cases.
- Perspiration is the release of water through skin and sweat glands. While working in hot environments, evaporation of perspiration is the primary cooling mechanism.

Protective clothing worn to guard against chemical contact effectively stops the evaporation of perspiration. Thus the use of protective clothing increases heat stress problems.

The major disorders due to heat stress are heat cramps, heat exhaustion, and heat stroke. Heat cramps are painful spasms, which occur in the skeletal muscles of workers who sweat profusely in the heat and drink large quantities of water, but fail to replace the bodies lost salts or electrolytes. Drinking water while continuing to lose salt tends to dilute the body's extracellular fluids.

Soon water seeps by osmosis into active muscles and causes pain. Muscles fatigued from work are usually most susceptible to cramps.

Extreme weakness or fatigue, dizziness, nausea, and headache characterize heat exhaustion. In serious cases, a person may vomit or lose consciousness. The skin is clammy and moist, complexion pale or flushed, and body temperature normal or slightly higher than normal. Treatment is rest in a cool place and replacement of body water lost by perspiration. Mild cases may recover spontaneously with this treatment; severe cases may require care for several days. There are no permanent effects.

Heat stroke is a very serious condition caused by the breakdown of the body's regulating mechanisms. The skin is very dry and hot with red mottled or bluish appearance. Unconsciousness, mental confusion, or convulsions may occur. Without quick and adequate treatment, the result can be death or permanent brain damage. As first aid treatment, the person should be moved to a cool place. Body heat should be reduced artificially, but not too rapidly, by soaking the person's clothes in water and fanning them.

Steps that can be taken to reduce heat stress are:

- Acclimate the body. Allow a period of adjustment to make further heat exposure endurable.
- Drink more liquids to replace the body water lost during sweating.
- Rest is necessary and should be conducted under the direction of the SSO.
- Wear personal cooling devices. These are two basic designs; units with pockets for holding frozen packets and units that circulate fluid from a reservoir through tubes to different parts of the body. Both designs can be in the form of a vest, jacket, or coverall. Some circulating units also have a cap for cooling the head.
- Wear long cotton underwear under chemical protective clothing. The cotton will absorb perspiration and will hold it close to the skin. This will provide the body with the maximum cooling available from the limited evaporation that takes place beneath chemical resistant clothing. It also allows for rapid cooling of the body when the protective clothing is removed.

Heat stress is a significant hazard associated with using protective equipment in hot weather environments. Local weather conditions may produce conditions, which will require restricted work schedules in order to protect employees.

Appendix B contains procedures for heat stress; these will be used as a guideline and to provide additional information.

5.2.3 Cold Stress

Cold temperatures are a significant potential hazard. Examples of cold temperature hazards are frostbite and hypothermia.

Frostbite is the most common injury resulting from exposure to cold. The extremities of the body are most often affected. The signs of frostbite are:

- The skin turns white or grayish-yellow.
- Pain is sometimes felt early but subsides later. Often there is no pain.
- The affected parts feel intensely cold and numb.

Hypothermia is characterized by shivering, numbness, drowsiness, muscular weakness, and a low internal body temperature when the body feels extremely warm. This can lead to unconsciousness and death. With both frostbite and hypothermia, the affected areas need to be warmed quickly. Immersion in warm water is an effective means of warming the affected areas quickly. In such cases, medical assistance will be sought.

To prevent these effects from occurring, persons working in the cold should wear adequate clothing and reduce the time spent in the cold area. The field SSO is responsible for determining appropriate time personnel should spend in adverse weather conditions and will monitor this.

Appendix B, which contains the Heat and Cold Stress Guidelines, provides additional information.

5.2.4 Asbestos

Asbestos is a widely used, mineral-based material that is resistant to heat and corrosive chemicals. Depending on the chemical composition, fibers may range from course to silky. The properties

that make asbestos fibers valuable to industry are its high-tensile strength, flexibility, heat and chemical resistance, and good frictional properties. Asbestos is a common naturally occurring group of fibrous minerals. Asbestos fibers have been used in a variety of building materials; generally, most asbestos is found in pipe insulation, doors, textures paints and plasters, structural fireproofing, and floor tiles. Friable asbestos (that is, material that contains more than 0.1% asbestos by weight and can be crumbled by hand) is a potential hazard because it can release fibers into the air if damaged. Roux Associates' personnel will not disturb any suspected asbestos material.

5.2.5 Structural Integrity

The structural integrity of a building and the safety of the individuals inside depend on meeting and maintaining national and local building codes. Structural integrity can range from minor defects such as loose floorboards and roof leaks to major defects such as floors and walls sagging and collapsed roofs. Numerous other structural defects can exist with or without consequence to the occupants. If Roux Associates personnel detect a problem, they should notify their supervisor, who in turn, should seek the opinion of a qualified structural engineer to offer and opinion regarding the integrity of the building. If in the opinion of the qualified engineer it is unsafe, no work can proceed until a solution to rectify the situation has been performed.

The only structures present at the site are the former basement of the demolished former site building. This basement may be utilized as part of the new constructing during redevelopment at the Site.

5.2.6 Lockout/Tagout

Roux Associates and all Site contractors will develop a lockout/tagout plan in the event of the repair of electrical, pneumatic, hydraulic, mechanical systems, per OSHA requirements under 29 CFR 1910.147.

5.3 Biological Hazards

The biological hazards, which have the potential to cause adverse health effects, are from exposure to domestic flies, mosquitoes, insects, animals and animal wastes, mold and bloodborne

pathogens. The Activity Hazard Analysis (Appendix A) suggests controls for various hazards to be potentially encountered onsite.

5.3.1 Insect Stings

Stings from insects are often painful, cause swelling and can be fatal if a severe allergic reaction such as anaphylactic shock occurs. If a sting occurs, the stinger should be scraped out of the skin, opposite of the sting direction. The area should be washed with soap and water followed by application of an ice pack.

If the victim has a history of allergic reaction, he should be taken to the nearest medical facility. If the victim has medication to reverse the effects of the sting, it should be taken immediately.

If the victim experiences a severe reaction, a constricting band should be placed between the sting and the heart. The bitten area should be kept below the heart if possible. A physician should be contacted immediately for further instructions.

5.3.2 Animals and Animal Wastes

Due to most of the onsite structures being abandoned for several years, there lies the potential for various wildlife to reside within the structures, including, but not limited to, pigeons, bats, mice, rats, squirrels, raccoons, and feral cats. Certain animals can represent significant sources (vectors) of disease transmission. Precautions to avoid or minimize potential contact with (biting) animals (such as some of the above listed) or animal waste and/or deceased animals should be considered prior to all field activities. Rats, squirrels, raccoons, feral cats, and other wild animals can inflict painful bites which can also cause disease (as in the case of rabid animals). Site personnel should avoid contact with any of the above.

If contact occurs, be sure to clean the area thoroughly with soap and water as soon as possible. If a bite occurs, the area should be cleaned thoroughly immediately with soap and water and medical attention should be sought.

5.3.3 Mold

Although mold affects individuals differently and to different degrees, the following are some of the most common adverse health effects:

- Respiratory problems – wheezing, difficulty breathing;
- Nasal and sinus congestion;
- Eyes – burning, watery, reddened, blurry vision, light sensitivity;
- Dry, hacking cough;
- Sore throat;
- Nose and throat irritation;
- Shortness of breath and lung disease;
- Chronic fatigue;
- Skin irritation;
- Central nervous system (headaches, loss of memory, and mood changes);
- Aches and pains;
- Fever;
- Headaches;
- Diarrhea; and
- Immune suppression.

Decisions about removing individuals from an affected area must be based on the results of a medical evaluation, and be made on a case-by-case basis.

Workers that discover the visible presence of mold in excess of 10 sq. feet need to notify the SSO for consultation. If a worker smells mold and feels that he/she is experiencing symptoms of exposure, he/she should retreat and report the symptoms to the SSO.

5.3.4 Bloodborne Pathogens

The majority of the occupational tasks onsite will not involve a significant risk of exposure to blood, blood components, or body fluids. The highest risk of acquiring any bloodborne pathogen for employees onsite will be following an injury. When administering first aid care, there are potential hazards associated with bloodborne pathogens that cause diseases such as Human Immunodeficiency Virus (HIV), Hepatitis B (HBV), Hepatitis A (HAV), Hepatitis C (HCV), or the Herpes Simplex Virus (HSV). An employee who has not received the appropriate certification should never execute first aid and/or CPR.

In order to minimize any potential pathogen exposure, all employees should use the hand washing facilities on a regular basis. Additionally, the following universal precautions should be followed to prevent further potential risk:

- Direct skin or mucous membrane contact with blood should be avoided.
- Open skin cuts or sores should be covered to prevent contamination from infectious agents.
- Body parts should be washed immediately after contact with blood or body fluids that might contain blood, even when gloves or other barriers have been used.
- Gloves and disposable materials used to clean spilled blood shall be properly disposed of in an approved hazardous waste container.
- First aid responders shall wear latex or thin mil nitrile gloves when performing any procedure risking contact with blood or body substances.
- Safety glasses will be worn to protect the eyes from splashing or aerosolization of body fluids.
- A CPR mask will be worn when performing CPR to avoid mouth-to-mouth contact.
- Work gloves will be worn to minimize the risk of injury to the hands and fingers when working on all equipment with sharp or rough edges.
- Never pick up broken glass or possible contaminated material with your unprotected hands.
- Never handle wildlife (living or deceased) encountered onsite.

5.4 Hazard Assessment

Task	Hazards	Risk of Exposure
Decontamination	Inhalation/Skin Contact	Moderate
	Heat Stress/Cold Stress	Moderate
	Physical Injury	Moderate
	Noise	Low
In situ Injections	Inhalation/ Skin Contact	Moderate
	Heat Stress/Cold Stress	Moderate
	Physical Injury	Moderate
	Noise	Low/Moderate
Drilling/Sampling	Inhalation/ Skin Contact	Moderate
	Heat Stress/Cold Stress	Moderate
	Noise	Moderate/High
	Physical Injury	Moderate

6.0 TRAINING

6.1 General Health and Safety Training

In accordance with Roux Associates' corporate policies, and pursuant to 29 CFR 1910.120, hazardous waste site workers shall, at the time of the job assignment, have received a minimum of 40 hours of initial health and safety training for hazardous waste site operations. As a minimum, the training shall have consisted of instruction in the topics outlined in the above reference. Personnel who have not met the requirements for initial training will not be allowed to work in any Site activities in which they may be exposed to hazards (chemical or physical).

Completion of a 40-hour Health and Safety Training Course for Hazardous Waste Operations or an approved equivalent will fulfill the requirements of this section.

In addition to the required initial training, each employee shall have received 3 days of directly supervised on-the-job training. This training will address the duties the employees are expected to perform.

Roux Associates' SSO has the responsibility of ensuring that personnel assigned to this project comply with these requirements.

6.2 Annual Eight-Hour Refresher Training

Annual 8-hour refresher training will be required of all hazardous waste site field personnel in order to maintain their qualifications for fieldwork. The following topics will be reviewed; toxicology, respiratory protection, including air purifying devices and self-contained breathing apparatus (SCBA), medical surveillance, decontamination procedures, and personal protective clothing. In addition, topics deemed necessary by Roux Associates' Health and Safety Director may be added to the above list.

6.3 Site-Specific Training

Site personnel will receive training that will specifically address the activities, procedures, monitoring, and equipment for Site operations. It will include Site and facility layout, hazards, first aid equipment locations and emergency services at the Site, and will highlight all provisions contained within this HASP. This training will also allow field workers to clarify anything they do

not understand and to reinforce their responsibilities regarding safety and operations for their particular activity.

6.4 Onsite Safety Meetings

Daily safety meetings will be presented each morning to discuss potential safety concerns for the upcoming activities.

The briefings will also provide a forum to facilitate conformance with safety requirements and to identify performance deficiencies related to safety during daily activities or as a result of safety audits by Roux Associates or other involved parties.

6.5 First Aid and CPR

The SSO will identify those individuals having first aid and CPR training in order to ensure that emergency medical treatment is available during field activities. The training will be consistent with the requirements of the American Red Cross Association. Certification and appropriate training documentation will be kept with the Site personnel records.

6.6 Additional Training

The CHSM may require additional or specialized training throughout the project. Such training shall be in the safe operation of heavy or power tool equipment or hazard communication training or other topic deemed Site appropriate.

6.7 Subcontractor Training

All subcontractor personnel working on the Site shall have completed the 40-hour training requirement and meet the medical surveillance requirements found in Section 7.1. Subcontractor training shall be performed in accordance with 29 CFR 1910.120 and HASP specifications. In certain unique situations (e.g., mechanical failure of equipment), the non-trained individual performing emergency repairs may be allowed, at the discretion of the SSO, to perform repairs when no intrusive activities are being performed, and provisions have been made to mitigate potential exposure.

7.0 MEDICAL SURVEILLANCE PROCEDURES

7.1 General

A Medical Surveillance Program has been established as part of this plan and is included in Appendix C. Roux Associates and subcontractor personnel performing field work at the Site are required to have passed a complete medical surveillance examination in accordance with 29 CFR 1910.120(f). A physician's medical release for work will be confirmed by the SSO before an employee can begin Site activities. Such examinations shall include a statement as to the worker's present health status, the ability to work in a hazardous environment (including any required PPE, which may be used during temperature extremes), and the worker's ability to wear respiratory protection.

Appendix C, "Medical Data Sheet," will be completed by all permanent, onsite personnel and will be kept in Roux Associates offices during the conduct of Site operations. Completion is required in addition to compliance with Roux Associates' Health and Safety Program. This data sheet will be available through the Roux Associates Human Resources Department if medical assistance is needed or if transport to hospital facilities is required.

8.0 SITE CONTROL, PERSONAL PROTECTIVE EQUIPMENT, AND COMMUNICATIONS

A modified Site control approach may be utilized since activities will be limited to site inspection/geophysical survey, drilling and sampling only during this phase of work. If remedial work is necessary, the following four-zone approach will be used.

8.1 Site Control

Based on the Site history and operations, a potential for the presence of hazardous material does exist. During drilling and sampling, work areas will be delineated with high visibility cones and/or caution tape. A dedicated decontamination area will be established to decontaminate all equipment used for sampling.

If remedial activities are necessary, a four-zone approach will be employed in order to prevent the spread of contamination from the disturbed areas onsite. The four zones include: the Exclusion Zone (EZ), the Contamination Reduction Zone (CRZ), Contamination Reduction Corridor (CRC) and the Support Zone (SZ). A stepped remedial approach will be managed, and the zones modified as the work progresses. Each of the areas will be defined through the use of control barricades and/or construction/hazard fencing. A clearly marked delineation between the SZ and the remaining three zones, the CRZ and CRC and the EZ will be maintained. The preferred method will utilize high visibility orange fencing and hand driven metal posts, or orange cones. Signage will be posted to further identify and delineate these areas.

8.1.1 Support Zone

The Support Zone (SZ) is an uncontaminated area that will be the field support area for the Site operations. The SZ will contain the temporary project trailers and provides for field team communications and staging for emergency response. Appropriate sanitary facilities and safety equipment will be located in this zone. Potentially contaminated personnel or materials are not allowed in this zone. The only exception will be appropriately packaged/decontaminated and labeled samples. Meteorological conditions will be observed and noted from this zone, as well as those factors pertinent to heat and cold stress.

8.1.2 Contamination Reduction Zone

A Contamination Reduction Zone (CRZ) is established between the exclusion zone and the support zone. The CRZ contains the Contamination Reduction Corridor (CRC) and provides an area for decontamination of personnel and equipment. The CRZ will be used for general Site entry and egress in addition to access for heavy equipment and emergency support services. Personnel are not allowed in the CRZ without:

- A buddy (co-worker);
- Appropriate PPE;
- Medical authorization;
- Training certification; and
- A need to be in the zone.

8.1.3 Exclusion Zone

The area where contamination exists is considered to be the Exclusion Zone (EZ). All areas where excavation and handling of contaminated materials take place are considered the EZ. This zone will be clearly delineated by orange high visibility fencing. Safety tape may be used as a secondary delineation within the EZ. The zone delineation markings may be opened in areas for varying lengths of time to accommodate equipment operation or specific construction activities. The SSO may establish more than one EZ where different levels of protection may be employed or where different hazards exist. Personnel are not allowed in the EZ without:

- A buddy (co-worker);
- Appropriate PPE;
- Medical authorization;
- Training certification; and
- A need to be in the zone.

8.2 Personal Protective Equipment

8.2.1 General

The level of protection worn by field personnel will be enforced by the SSO. Levels of protection for general operations are provided below and are defined in this section. Levels of protection

may be upgraded at the discretion of the SSO. All decisions on the level of protection will be based upon a conservative interpretation by the SSO of the information provided by air monitoring results, environmental results and other appropriate information. Any changes in the level of protection shall be recorded in the health and safety field logbook.

8.2.2 Personal Protective Equipment Specifications

The initial level of personal protective equipment is Level D. It is not anticipated that either Level B or Level C protection will be necessary.

Although not anticipated, any tasks requiring Level B personal protective equipment (PPE) will utilize the following equipment:

- Positive pressure, full facepiece, self-contained breathing apparatus (SCBA) or positive pressure, supplied air respirator with escape SCBA (NIOSH approved)
- Disposable coveralls (Tyvek, Poly-coated Tyvek, or Saranex)
- Gloves, inner: latex or nitrile
- Gloves, outer: nitrile or neoprene
- Chemical resistant boots over the work boots
- Steel toe work boots
- Hard hat
- Hearing protection (as needed)
- Boot cover (as needed)

For tasks requiring Level C PPE, the following equipment may be used in any combination:

- Full-face, air purifying, canister-equipped respirators (NIOSH approved) utilizing Organic Vapor/Acid Gas and P-100 filters (half-face if approved by SSO)
- Disposable coveralls (Tyvek, Poly-coated Tyvek, or Saranex) as required
- Gloves, inner: latex or nitrile as required
- Gloves, outer: nitrile or neoprene as required
- Chemical resistant boots over the work boots as required

- Steel toe work boots
- Hard hat
- Hearing protection (as needed)
- Safety glasses (if half-mask is utilized)
- Boot covers (as needed)

The Minimum level of PPE for entry onto the Site is Level D PPE. The following equipment shall be used:

- Work uniform (long pants, sleeved shirt)
- Hard hat
- Steel toe work boots
- Safety glasses
- Boot covers (as needed)
- Hearing protection (as needed)
- Reflective safety vest

Modified Level D PPE consists of the following:

- Regular Tyvek coveralls (Poly-coated Tyvek as required)
- Outer gloves: leather, cotton, neoprene or nitrile (as required)
- Inner gloves: latex or nitrile (doubled) as required
- Chemical resistant boots over work boots (as required)
- Steel toe work boots
- Hard hat
- Safety glasses
- Hearing protection as needed
- Reflective safety vest

8.2.3 Initial Levels of Protection

Levels of protection for the proposed scope of work may be upgraded or downgraded depending on direct-reading instruments or personnel monitoring. The following are the initial levels of protection that shall be used for each planned field activity:

Activity	Initial level of PPE
Mobilization/Demobilization	D
Site Inspection/Geophysical Survey	D
Decontamination	D
Drilling	D
In situ Chemical Injections	D
Groundwater Sampling	D

8.3 Communications

If working in level C/B respiratory protection is required, personnel may find that communication becomes a more difficult task and process to accomplish. Distance and space further complicate this. In order to address this problem, electronic instruments, mechanical devices, or hand signals will be used as follows:

Telephones – Mobile telephones will be carried by designated personnel for communication with emergency support services/facilities.

Radios – Two-way radios will be utilized onsite for communications between field personnel in areas where visual contact cannot be maintained and where hand signals cannot be employed.

Air Horn – Available as posted in the Site trailer or support zone to alert field personnel to an emergency situation. The emergency signal will be the sharp blasts of the air horn.

Hand Signals – This communication method will be employed by members of the field team along with use of the buddy system. Signals become especially important when in the vicinity of heavy moving equipment and when using Level B respiratory equipment. The signals shall become familiar to the entire field team before Site operations commence, and will be reinforced and reviewed during site-specific training.

Signal	Meaning
Hand gripping throat	Out of air; can't breathe
Grip partner's wrist	Leave area immediately; no debate
Hands on top of head	Need assistance
Thumbs up	OK; I'm all right; I understand
Thumbs down	No; Unable to understand you, I'm not all right

9.0 MONITORING PROCEDURES

9.1 General

Monitoring will be performed to verify the adequacy of respiratory protection, to aid in Site layout, and to document worker exposure. If air monitoring in these areas indicates the presence of potentially hazardous materials, control measures will be implemented. All monitoring instruments shall be operated by qualified personnel only and will be calibrated daily prior to use or, more often, as necessary. General monitoring during intrusive site activities will be performed in accordance with the Community Air Monitoring Plan included as Appendix D.

9.2 Exclusion Zone Monitoring

9.2.1 Instrumentation

The following monitoring instruments will be available for use during field operations as necessary. There will be a minimum of one of each piece of equipment on the Site at all times:

- Photoionization Detector (PID) with 10.6 EV probe or Flame Ionization Detector (FID) or equivalent.
- Dust/Particulate Monitor (DM), MIE Miniram, or equivalent.

A PID will be used to monitor VOCs in active work areas, during intrusive activities. VOCs shall also be measured upwind of the work areas to determine background concentrations.

A particulate monitor shall be used to measure concentrations of dust and particulate matter.

When deemed necessary, a CGI/O_2 meter shall be used to monitor for combustible gases and oxygen content during confined space entry or when the HSO deems necessary.

Calibration records shall be documented and recorded daily and included in the daily air monitoring report. This report will be specific to work area monitoring. All instruments shall be calibrated before and after each daily use in accordance with manufacturer's procedures (Appendix E).

9.2.2 Action Levels

Action levels for the upgrading of PPE requirements in the HASP will apply to all Site work during investigation and remediation activities at the Site. Action levels are for known contaminants using direct reading instruments in the Breathing Zone (BZ) for VOCs and particulates, and at the source for combustible gases. The BZ will be determined by the SSO, but is typically 4 to 5 feet above the work area surface or elevation. The action levels to be utilized for the Site are found in Table 2.

9.2.3 Monitoring During Field Activities

Intrusive Operations – Continuous Personnel Breathing Zone Air Monitoring will be performed by the SSO during drilling activities. Real-time monitoring for all onsite activities will be accomplished as follows:

- Monitoring of VOCs in and around the work zones.
- Monitoring for particulates in and around the work zones, when necessary.

The frequency of monitoring may be modified by the SSO, after consultation with the Project Manager. The rationale for any modification must be documented in the HASP.

10.0 SAFETY CONSIDERATIONS

10.1 General

In addition to the specific requirements of this HASP, common sense should be used at all times.

The following general safety rules and practices will be in effect at the site.

- All open holes, trenches, and obstacles will be properly barricaded in accordance with local Site needs and requirements. Proximity to traffic ways, both pedestrian and vehicular, and location of the open hole, trench, or obstacle will determine these needs.

- All excavation and other Site work will be planned and performed with consideration for underground lines.

- Smoking and ignition sources in the vicinity of potentially flammable or contaminated material are strictly prohibited.

- Drilling, boring, and use of cranes and drilling rigs, erection of towers, movement of vehicles and equipment, and other activities will be planned and performed with consideration for the location, height, and relative position of aboveground utilities and fixtures, including signs; lights; canopies; buildings and other structures and construction; and natural features such as trees, boulders, bodies of water, and terrain.

- When working in areas where flammable vapors may be present, particular care shall be exercised with tools and equipment that may be sources of ignition. All tools and equipment provided must be properly bonded and/or grounded.

- Approved and appropriate safety equipment (as specified in this HASP), such as eye protection, hard hats, hand protection (nitrile, leather and/or cut resistant gloves as necessary), foot protection, and respirators, must be worn in areas where required. In addition, eye protection must be worn when sampling soil or water that may be contaminated.

- All site personnel may be called upon to use respirator protection in some situations. Fit testing will be necessary for all persons using respirators. The criteria for facial hair will be determined by the SSO. In general, the guideline is that facial hair cannot impede the fit of the respirator.

- No smoking, eating, chewing tobacco, gum chewing or drinking will be allowed outside the SZ.

- Contaminated tools and hands must be kept away from the face.

- Personnel must use personal hygiene safe guards (washing up) at the end of the shift.

- Each sample must be treated and handled as though it were contaminated.

- Persons with long hair and/or loose-fitting clothing that could become entangled in power equipment must take adequate precautions.

- Horseplay is prohibited in the work area.
- Work while under the influence of intoxicants, narcotics, or controlled substances is strictly prohibited.

10.2 Traffic Control

Traffic control methods and barricades will be used as needed when working in areas of vehicular traffic. Since the site is fenced off and the areas of investigation are not in current use, outside vehicular and pedestrian traffic is not considered to be an issue.

10.3 Sample Handling

Personnel responsible for handling of samples will wear the prescribed level of protection. Samples are to be identified as to their hazard and packaged as to prevent spillage or breakage. Any unusual sample conditions shall be noted. Laboratory personnel and all field personnel shall be advised of sample hazard levels and the potential contaminants present. This can be accomplished by a phone call to the lab coordinator and/or including a written statement with the samples reviewing lab safety procedures in handling in order to assure that the practices are appropriate for the suspected contaminants in the sample.

11.0 DECONTAMINATION AND DISPOSAL PROCEDURES

11.1 Contamination Prevention

Contamination prevention should minimize worker exposure and help ensure valid sample results by precluding cross-contamination. Procedures for contamination avoidance include:

Personnel

- Do not walk through areas of obvious or known contamination.
- Do not directly handle or touch contaminated materials.
- Make sure that there are no cuts or tears on PPE.
- Fasten all closures in suits; cover with tape, if necessary.
- Particular care should be taken to protect any skin injuries.
- Stay upwind of airborne contaminants.
- Do not carry cigarettes, cosmetics, gum, etc., into contaminated areas.

Sampling/Monitoring

- When required by the SSO, cover instruments with clear plastic, leaving openings for sampling ports.
- Bag sample containers prior to emplacement of sample material.

Heavy Equipment

- Care should be taken to limit the amount of contamination that comes in contact with heavy equipment (tires, contaminated augers).
- If contaminated tools are to be placed on non-contaminated equipment for transport to a decontamination area, plastic should be used to keep the equipment clean.
- Dust control measures including water misting will be used on roads inside the Site boundaries.

11.2 Personnel Decontamination

A field wash for equipment and PPE shall be set up and maintained for all persons exiting the EZ. The system will include a gross wash and rinse for all disposable clothing and boots worn in the EZ. As necessary, equipment and facilities will be available for personnel to wash their hands, arms, neck, and face.

11.3 Equipment Decontamination

All potentially contaminated equipment used at the Site will be decontaminated to prevent contaminants from leaving the Site. The decontamination area will provide for the containment of all wastewater from the decontamination process. Respirators and any other PPE that comes in contact with contaminated materials shall pass through a field wash in the decontamination area, and a thorough decontamination at the end of the day. All decontamination rinse water will be collected and managed in accordance with all applicable regulations.

11.4 Decontamination during Medical Emergencies

If emergency life-saving first aid and/or medical treatment are required, normal decontamination procedures may need to be abbreviated or omitted. The Site SSO or designee will accompany contaminated victims to the medical facility to advise on matters involving decontamination, when necessary. The outer garments can be removed if they do not cause delays, interfere with treatment, or aggravate the problem. Respiratory equipment must always be removed. Protective clothing can be cut away. If the outer contaminated garments cannot be safely removed, a plastic barrier between the individual and clean surfaces should be used to help prevent contaminating the inside of ambulances and/or medical personnel. Outer garments are then removed at the medical facility. No attempt will be made to wash or rinse the victim, unless it is known that the individual has been contaminated with an extremely toxic or corrosive material, which could also cause severe injury or loss of life to emergency response personnel. For minor medical problems (ambulatory) or injuries, the normal decontamination procedures will be followed. Note that heat stroke requires prompt treatment to prevent irreversible damage or death. Protective clothing must be promptly removed. Less serious forms of heat stress also require prompt attention and removal of protective clothing immediately. Unless the victim is obviously contaminated, decontamination should be omitted or minimized, and treatment begun immediately.

11.5 Disposal Procedures

A system of segregating all waste will be developed by the SSO.

All discarded materials, waste materials, or other objects shall be handled in such a way as to preclude the potential for spreading contamination, creating a sanitary hazard, or causing litter to

be left onsite. All potentially contaminated materials (e.g., clothing, gloves, etc.,) will be bagged or drummed as necessary, labeled and segregated for disposal. All non-contaminated materials shall be collected and bagged for appropriate disposal as domestic waste.

12.0 EMERGENCY PLAN

Should an emergency situation occur, the emergency plan, outlined in this section, shall be known by Roux Associates and all Subcontractors prior to the start of work. The emergency plan will be available for use at all times during Site work. The plan provides the phone numbers for the fire, police, ambulance, hospital, poison control centers, and directions to the hospital from the Site. This information is to be found in Section 1.2 of the HASP.

Various individual Site characteristics will determine preliminary actions taken to assure that this emergency plan is successfully implemented in the event of a Site emergency. Careful consideration must be given to the proximity of neighborhood housing or places of employment, and to the relative possibility of Site release of vapors, which could affect the surrounding community.

The emergency coordinator shall implement the contingency plan whenever conditions at the Site warrant such action. The coordinator will be responsible for coordination of the evacuation, emergency treatment, and transport of Site personnel as necessary, and notification of emergency response units and the appropriate management staff.

In cases where the project manager is not available, the SSO shall serve as the alternate emergency coordinator.

The SSO during an emergency will perform air monitoring as needed, as well as lend assistance and provide health and safety information to responding emergency personnel.

Site Personnel will endeavor to keep non-essential personnel away from the incident until the appropriate emergency resources arrive. At that time, the responders will take control of the Site. Site personnel may be asked to lend assistance to emergency personnel such as during evacuations, help with the injured, etc.

12.1 Evacuation

Evacuation procedures will be discussed prior to the start of work and periodically during safety meetings. In the event of an emergency situation, such as fire, or explosion, an air horn,

automobile horn, or other appropriate device will be sounded for three (3) sharp blasts indicating the initiation of evacuation procedures. The emergency evacuation route shall be known by all site workers. Under no circumstances will incoming personnel or visitors be allowed to proceed into the area once the emergency signal has been given. The SSO or project manager must ensure that access for emergency equipment is provided and that all combustion apparatuses have been shut down once the alarm has been sounded. All Site personnel will assemble in the designated nearest safe location. Once the safety of all personnel is established, the fire department and other emergency response groups will be notified by telephone of the emergency.

12.2 Personnel Injury

Emergency first aid shall be applied onsite as appropriate. If necessary, the individual shall be decontaminated and transported to the nearest hospital. The SSO will supply medical data sheets to medical personnel and complete the accident/incident reports in accordance with Section 13.4 of the HASP.

The ambulance/rescue squad shall be contacted for transport as necessary in an emergency. However, since some situations may require transport of an injured party by other means, the injured person shall be escorted to the hospital. A map to this facility is shown in Figure 2.

12.3 Accident/Incident Reporting

As soon as first aid and/or emergency response needs have been met, the following parties are to be contacted by telephone: (Direct contact, no phone messages).

		Office:	**Cell:**
1. Project Director:	Craig Werle	631-232-2600	631-793-1535
2. Office Health and Safety Manager:	Joe Gentile	856-423-8800	610-844-6911
3. Site Health and Safety Officer:	Joseph Gavin	631-232-2600	631-245-5887

4. The employer of any injured worker, if not a Roux Associates employee.

Written confirmation of verbal reports are to be submitted within 24 hours. The report form entitled "Accident Report and Investigation Form" (Appendix F) is to be used for this purpose.

All representatives contacted by telephone are to receive a copy of this report. If the employee involved is not a Roux Associates employee, his employer shall receive a copy of the report. In addition to filling out the Accident Report and Investigation Form, if a Roux employee is involved in a vehicle accident, the employee must also complete the Acord form (Appendix G).

For reporting purposes, the term accident refers to fatalities, lost time injuries, spill or exposure to hazardous materials (radioactive materials, toxic materials, explosive or flammable materials), fire, explosion, property damage, or potential occurrence (i.e., near miss) of the above.

Any information released from the health care provider, which is not deemed confidential patient information, is to be attached to the appropriate form. Any medical information, which is released by patient consent, is to be filed in the individual's medical record and treated as confidential.

12.4 Personnel Exposure

Skin Contact:	Use copious amounts of soap and water. Wash/rinse affected area thoroughly, then provide appropriate medical attention. Eyes should be rinsed for 15 minutes upon chemical contamination.
Inhalation:	Move to fresh air and/or, if necessary, decontaminate/transport to hospital.
Ingestion:	Decontamination and transport to emergency medical facility.
Puncture Wound or Laceration:	Decontamination and transport to emergency medical facility.

12.5 Adverse Weather Conditions

In the event of adverse weather conditions, the SSO or project manager will determine if work can continue without sacrificing the health and safety of all field workers. Some of the items to be considered prior to determining if work should continue are:

- Potential for heat stress and heat-related injuries.
- Potential for cold stress and cold-related injuries.
- Treacherous weather-related conditions.
- Limited visibility.
- Electrical storm potential.

Site activities will be limited to daylight hours and acceptable weather conditions. Inclement working conditions include heavy rain, fog, high winds, and lightning. Observe daily weather reports and evacuate if necessary in case of inclement weather conditions.

13.0 LOGS, REPORTS AND RECORD KEEPING

The following is a summary of required health and safety logs, reports, and record keeping for this project.

13.1 Medical and Training Records

The employer keeps medical and training records. The subcontractor employer must provide verification of training and medical qualifications to the SSO. The SSO will keep a log of personnel meeting appropriate training and medical qualifications for Site work. The log will be kept in the project file. Roux Associates will maintain medical records in accordance with 29 CFR 1910.20.

13.2 Onsite Log

The SSO or project manager will keep a log of onsite personnel daily in the designated field book.

13.3 Exposure Records

Any personal monitoring results, laboratory reports, calculations, and air sampling data sheets are part of an employee exposure record. These records will be kept by Roux Associates in accordance with 29 CFR 1910.20.

13.4 Accident/Incident Reports

An accident/incident report must be completed following procedures given in Appendix F. The originals will be sent to Roux Associates for maintenance. Copies will be distributed as stated. A copy of the forms will be kept in the project file.

13.5 OSHA Form 300

An OSHA Form 300 (Log of Occupational Injuries and Illnesses) (Appendix H) will be kept at the Site. All reportable injuries or illnesses will be recorded on this form. At the end of the project, the original will be sent to Roux Associates for maintenance. Subcontractor employers must also meet the requirements of maintaining an OSHA 300 form.

13.6 Daily Safety Logs

The Daily Safety Log form in Appendix E will be completed daily by the SSO and submitted to the project manager.

13.7 Weekly Safety Reports

The Weekly Safety Reports in Appendix I will be completed by the SSO and submitted to the designated Owner's representative, if requested.

13.8 Close-Out Safety Report

At the completion of the work, Roux Associates will submit a closeout Safety Report that will include all logs and reports generated during the project. The report will be signed and dated by the SSO and submitted to the Safety Manager and/or Owner's representative, if requested.

14.0 FIELD TEAM REVIEW

Each Roux Associates employee or subcontractor shall sign this section after site-specific training is completed and before being permitted to work at the Site.

I have read and reviewed the Site Health and Safety Plan prepared for this Site. I understand and will comply with the provisions contained therein.

Site/Project: Equity One (Northeast Portfolio) Inc.
5530 Broadway
Bronx, New York

Date	Name	Signature	Company

SSO CERTIFICATION OF HOSPITAL DIRECTIONS

Name of Roux Associates SSO:

Date:_____

This is to certify that on _____, I personally drove the route to New York Presbyterian Hospital as listed in the HASP. The Map Routing and Directions were/were not as listed in the plan. Listed below were conditions that resulted in different directions.

_____
Roux Associates Site Health and Safety Officer

FIGURE 1

Site Location Map

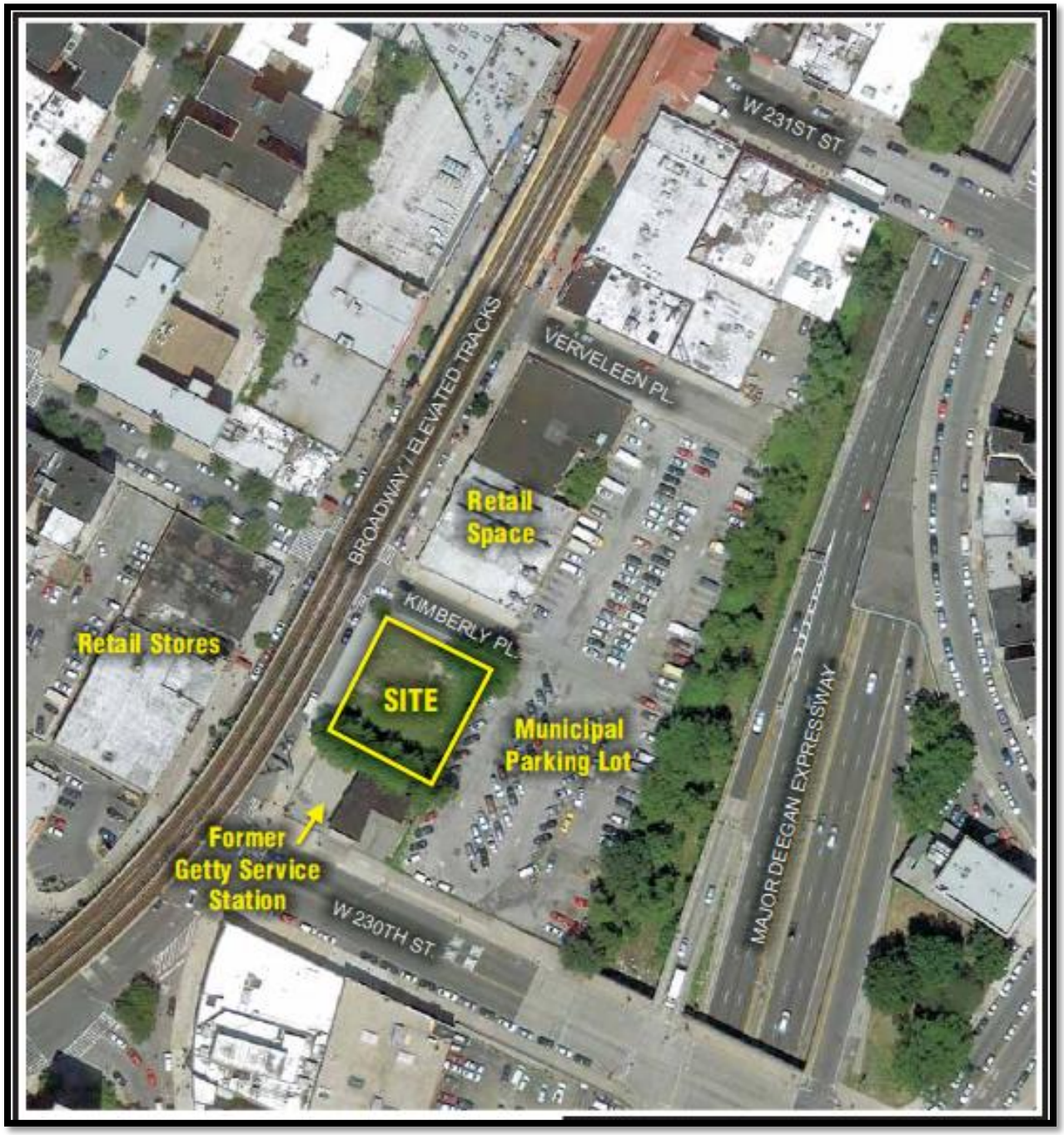


FIGURE 2

Directions to New York Presbyterian Hospital – 5141 Broadway, Bronx, NY 10034

- Start at 5530 Broadway, Bronx, New York
- Head south on Broadway, towards West 230th Street
- Arrive at 5141 Broadway, New York Presbyterian Hospital on your right

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 5530 Broadway, Bronx, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
1,1,1-Trichloroethane	71-55-6	TWA 350 ppm STEL 440 ppm C 440 ppm	C 350 ppm (1900 mg/m^3) [15-minute]	TWA 350 ppm (1900 mg/m^3)	700 ppm	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin; headache, lassitude (weakness, exhaustion), central nervous system depression, poor equilibrium; dermatitis; cardiac arrhythmias;	Eyes, skin, central nervous system, cardiovascular system, liver	Colorless liquid with a mild, chloroform-like odor. BP: 165°F UEL: 12.5% LEL: 7.5%
1,1,2-Trichloroethane	79-00-5	TWA 10 ppm	Ca TWA 10 ppm (45 mg/m^3) [skin]	TWA 10 ppm (45 mg/m^3) [skin]	Ca [100 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, nose; central nervous system depression; liver, kidney damage; dermatitis; [potential occupational carcinogen]	Eyes, respiratory system, central nervous system, liver, kidneys	Colorless liquid with a sweet, chloroform-like odor. BP: 237°F UEL: 15.5% LEL: 6%
1,1-Dichloroethane	75-34-3	TWA 100 ppm	TWA 100 ppm (400 mg/m^3)	TWA 100 ppm (400 mg/m^3)	3000 ppm	inhalation, ingestion, skin and/or eye contact	Irritation skin; central nervous system depression; liver, kidney, lung damage	Skin, liver, kidneys, lungs, central nervous system	Colorless, oily liquid with a chloroform-like odor. BP: 135°F Fl.P: 2°F UEL: 11.4% LEL: 5.4%
1,1-Dichloroethene	75-35-4	TWA 5 ppm	Ca (lowest feasible concentration	TWA 1ppm	Ca [N.D.]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, throat; dizziness, headache, nausea, dyspnea (breathing difficulty); liver, kidney disturbance; pneumonitis; [potential occupational carcinogen]	Eyes, skin, respiratory system, central nervous system, liver, kidneys	Colorless liquid or gas (above 89°F) with a mild, sweet, chloroform-like odor. BP: 89°F Fl.P: -2°F UEL: 15.5% LEL: 6.5% Class IA Flammable Liquid
1,2,4-Trimethylbenzene	95-63-6	None established	TWA 25 ppm (125mg/m^3)	None established	N.D.	Inhalation; ingestion; skin and/or eye contact	Eye, skin, nose, and throat, resp syst irritation; bronchitis; hypochromic anemia; headache, drowsiness, weakness, dizziness, nausea, incoordination, vomit, confusion; chemical pneumonitis	Eyes, skin, resp sys, CNS, blood	Clear, colorless liquid with a distinctive, aromatic odor BP: 337°F FL.P: 112°F UEL: 6.4% LEL: 0.9% Class II Flammable liquid
1,2,4-Trimethylbenzene	95-63-6	TWA 25 ppm (125 m	TWA 25 ppm (125 mg/m^3)	None established	N.D.	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat, respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, fatigue, dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis (aspiration liquid)	Eyes, skin, respiratory system, central nervous system, blood	Clear, colorless liquid with a distinctive, aromatic odor. BP: 337°F Fl.P: 112°F UEL: 6.4% LEL: 0.9% Class II Flammable Liquid
1,2-Dichlorobenzene	95-50-1	TWA 25 ppm STEL 50 ppm	C 50 ppm (300 mg/m^3)	C 50 ppm (300 mg/m^3)	200 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, nose; liver, kidney damage; skin blisters	Eyes, skin, respiratory system, liver, kidneys	Colorless to pale-yellow liquid with a pleasant, aromatic odor. [herbicide] BP: 357°F Fl.P: 151°F UEL: 9.2% LEL: 2.2% Class IIIA Combustible Liquid
1,2-Dichloroethane	107-06-2	TWA 10 ppm	Ca TWA 1 ppm (4 mg/m^3) STEL 2 ppm (8 mg/m^3)	TWA 50 ppm C 100 ppm 200 ppm [5-minute maximum peak in any 3 hours]	Ca [50 ppm]	inhalation, ingestion, skin absorption, skin and/or eye contact	Irritation eyes, corneal opacity; central nervous system depression; nausea, vomiting; dermatitis; liver, kidney, cardiovascular system damage; [potential occupational carcinogen]	Eyes, skin, kidneys, liver, central nervous system, cardiovascular system	Colorless liquid with a pleasant, chloroform-like odor. [Note: Decomposes slowly, becomes acidic & darkens in color.] BP: 182°F Fl.P: 56°F UEL: 16% LEL: 6.2% Class IB Flammable Liquid

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 5530 Broadway, Bronx, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
1,2-Dichloroethene (total)	540-59-0	TWA 200 ppm (790 n	TWA 200 ppm (790 mg/m^3)	TWA 200 ppm (790 mg/m^3)	1000 ppm	inhalation, ingestion, skin and/or eye contact	Irritation eyes, respiratory system; central nervous system depression	Eyes, respiratory system, central nervous system	Colorless liquid (usually a mixture of the cis & trans isomers) with a slightly acrid, chloroform-like odor BP: 118-140°F Fl.P: 36-39°F UEL: 12.8% LEL: 5.6% Class IB Flammable Liquid
1,3,5-Trimethylbenzene	108-67-8	None established	TWA 25 ppm (125mg/m^3)	None established	N.D.	Inhalation; ingestion; skin and/or eye contact	Eye, skin, nose, and throat, resp syst irritation; bronchitis; hypochromic anemia; headache, drowsiness, weakness, dizziness, nausea, incoordination, vomit, confusion; chemical pneumonitis	Eyes, skin, resp sys, CNS, blood	Clear, colorless liquid with a distinctive, aromatic odor BP: 329°F FL.P: 122°F Class II Flammable liquid
1,3,5-Trimethylbenzene	108-67-8	TWA 25 ppm (125 mg	TWA 25 ppm (125 mg/m^3)	None established	N.D	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat, respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, lassitude (weakness, exhaustion), dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis (aspiration liquid)	Eyes, skin, respiratory system, central nervous system, blood	Clear, colorless liquid with a distinctive, aromatic odor. BP: 329°F Fl.P: 122°F Class II Flammable Liquid
1,4-Dichlorobenzene	106-46-7	TWA 10 ppm	Ca	TWA 75 ppm (450 mg/m^3)	Ca [150 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Eye irritation, swelling periorbital (situated around the eye); profuse rhinitis; headache, anorexia, nausea, vomiting; weight loss, jaundice, cirrhosis; in animals: liver, kidney injury; [potential occupational carcinogen]	Liver, respiratory system, eyes, kidneys, skin	Colorless or white crystalline solid with a mothball-like odor. [insecticide] BP: 345°F Fl.P: 150°F LEL: 2.5% Combustible Solid
2,4-Dimethylphenol	105-67-9	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, respiratory system, mouth, throat, stomach; dizziness, weakness, fatigue, nausea, headache; systemic damage; moderate to severe eye injury.	Skin, CVS, eyes, CNS	Clear, colorless liquid with a faint ether or chloroform-like odor BP: 178°F
2-Butanone (MEK)	78-93-3	TWA 200 ppm (590 mg/m^3) STEL 300 ppm (885 mg/m^3)	TWA 200 ppm (590 mg/m^3) STEL 300 ppm (885 mg/m^3)	TWA 200 ppm (590 mg/m^3)	3000 ppm	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose; headache; dizziness; vomiting; dermatitis	Eyes, skin, respiratory system, central nervous system	Colorless liquid with a moderately sharp, fragrant, mint- or acetone-like odor. BP: 175°F Fl.P: 16°F UEL(200°F): 11.4% LEL(200°F): 1.4% Class IB Flammable Liquid
Acenaphthene	83-32-9	None established	None established	None established	None established	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, respiratory system	Eyes, skin, respiratory system	Brown solid

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 5530 Broadway, Bronx, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Acetone	67-64-1	TWA 200 ppm STEL 500 ppm	TWA 250 ppm (590 mg/m^3)	TWA 1000 ppm (2400 mg/m^3)	2500 ppm [10%LEL]	inhalation, ingestion, skin and/or eye contact	Irritation eyes, nose, throat; headache, dizziness, central nervous system depression; dermatitis	Eyes, skin, respiratory system, central nervous system	Colorless liquid with a fragrant, mint-like odor BP: 133°F Fl.P: 0°F UEL: 12.8% LEL: 2.5% Class IB Flammable Liquid
Anthracene	65996-93-2	TWA 0.2 mg/m^3	Ca TWA 0.1 mg/m^3 (cyclohexane-extractable fraction)	TWA 0.2 mg/m^3 (benzene-soluble fraction)	Ca [80 mg/m^3]	inhalation, skin and/or eye contact	Dermatitis, bronchitis, [potential occupational carcinogen]	respiratory system, skin, bladder, kidneys	Black or dark-brown amorphous residue. Combustible Solids
Antimony	7440-36-0	TWA 0.5 mg/m^3	TWA 0.5 mg/m^3	TWA 0.5 mg/m^3	50 mg/m^3 (as Sb	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat, mouth; cough; dizziness; headache; nausea, vomiting, diarrhea; stomach cramps; insomnia; anorexia; unable to smell properly	Eyes, skin, respiratory system, cardiovascular system	Silver-white, lustrous, hard, brittle solid; scale-like crystals; or a dark-gray, lustrous powder. BP: 2975°F
Arsenic (inorganic)	7440-38-2 (metal)	TWA 0.01 mg/m3	Ca C 0.002 mg/m3 [15-min]	TWA 0.010 mg/m3	Ca [5 mg/m3 (as As)]	Inhalation; ingestion; skin absorption; skin and/or eye contact	Ulceration of nasal septum, dermatitis, GI disturbances, peripheral neuropathy, resp irritation, hyperpigmentation of skin, [potential occupational carcinogen]	Liver, kidneys, skin, lungs, lymphatic sys	Metal: sliver-gray or tin-white, brittle, odorless solid BP: sublimes
Asbestos	1332-21-4	TWA 0.1 f/cc	Ca 100,000 fibers/m3	TWA 0.1 fiber/cm3	Ca [IDLH value has not been determined]	Inhalation; ingestion; skin and/or eye contact	Asbestosis (chronic exposure), dyspnea, interstitial fibrosis, restricted pulmonary function, finger clubbing, irritation eyes, [potential occupational carcinogen]	Respiratory system, eyes,	White or greenish (chrysotile), blue (crocidolite), or gray-green (amosite), fibrous, odorless solids. BP: decomposes
Asphalt fumes	8052-42-4	TWA 0.5 mg/m^3(fumes)	Ca C 5 mg/m3 [15 min]	None established	Ca [IDLH value has not been determined]	Skin absorption; inhalation; skin and/or eye contact	Irritation eyes, resp sys	Eyes, respiratory system	Black or dark brown cement-like substance Combustible solid
Barium	7440-39-3	TWA 0.5 mg/m3	None established	TWA 0.5 mg/m3	None established	Inhalation, ingestion, skin contact	Irritation skin, respiratory system,	Skin, eyes, respiratory system	Yellow white powder BP: 1640 C
Benzene	71-43-2	TWA 0.5 ppm STEL 2.5 ppm	Ca TWA 0.1 ppm STEL 1 ppm	TWA 1 ppm STEL 5 ppm	Ca [500 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude (weakness, exhaustion); dermatitis; bone marrow depression; [potential occupational carcinogen]	Eyes, skin, respiratory system, blood, central nervous system, bone marrow	Colorless to light yellow liquid with an aromatic odor [Note: Solid below 42 °F] BP: 176°F Fl.Pt = 12°F LEL: 1.2% UEL: 7.8% Class B Flammable liquid
Benzo[a]anthracene	56-55-3	None established	None established	None established	None established	Inhalation; ingestion; skin absorption; skin and/or eye contact	Irritation eyes, skin, respiratory system, CNS	Skin	Pale Yellow crystal, solid BP: 438 C

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 5530 Broadway, Bronx, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Benzo[a]pyrene	50-32-8	None established	TWA 0.1 mg/m3	TWA 0.2 mg/m3	None established	Inhalation; ingestion; skin absorption; skin and/or eye contact	POISON. This material is an experimental carcinogen, mutagen, tumorigen, neoplastigen and teratogen. It is a probable carcinogen in humans and a known human mutagen. IARC Group 2A carcinogen. It is believed to cause bladder, skin and lung cancer. Exposure to it may damage the developing foetus. May cause reproductive damage. Skin, respiratory and eye irritant or burns.	Skin, eye, bladder, lung, reproductive	Yellow crystals or powder [found in cigarette smoke, coal tar, fuel exhaust gas and in many other sources] BP: 495 C
Benzo[b]fluoranthene	205-99-2	None established	TWA 0.1 mg/m3	TWA 0.2 mg/m3	None established	Inhalation; ingestion; skin and/or eye contact	No data were identified on the toxicity of benzo[b]fluoranthene to humans. Based on results of studies in animals, IARC concluded that benzo[b]fluoranthene is possibly carcinogenic to humans	Respiratory system, skin, bladder, kidneys	Off-white to tan powder
Benzo[k]fluoranthene	207-08-9	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, respiratory tract, gastrointestinal; fatal if swallowed, inhaled, absorbed through the skin; vomiting, nausea, diarrhea	Lungs, respiratory system	Yellow crystals BP: 480 C
Beryllium	7440-41-7 (metal)	TWA 0.002 mg/m^3	Ca C 0.0005 mg/m^3	TWA 0.002 mg/m^3 C 0.005 mg/m^3 (30 minutes) with a maximum peak of 0.025 mg/m^3	Ca [4 mg/m^3 (as Be)]	inhalation, skin and/or eye contact	Berylliosis (chronic exposure): anorexia, weight loss, lassitude (weakness, exhaustion), chest pain, cough, clubbing of fingers, cyanosis, pulmonary insufficiency; irritation eyes; dermatitis; [potential occupational carcinogen]	Eyes, skin, respiratory system	Metal: A hard, brittle, gray-white solid. BP: 4532°F
Bis(2-ethylhexyl) phthalate	117-81-7	TWA 5 mg/m^3	TWA 5 mg/m^3 STEL 10 mg/m^3 (do not exceed during andy 15-minute work period)	TWA 5 mg/m^3	None established	inhalation, skin and/or eye contact	Irritation eyes, skin, nose, throat; affect the nervous system and liver; damage to male reproductive glands	Eyes, skin, nose, respiratory system, nervous system, reproductive system, liver	Colorless to light colored, thick liquid with slight odor
Butane	106-97-8	TWA 1000 ppm	TWA 800 ppm (1900 mg/m^3)	None established	None established	inhalation, skin and/or eye contact (liquid)	Drowsiness, narcosis, asphyxia; liquid: frostbite	central nervous system	Colorless gas with a gasoline-like or natural gas odor. BP: 31°F UEL: 8.4% LEL: 1.6% Flammable Gas
Cadmium	7440-43-9 (metal)	TWA 0.01 mg/m^3	Ca	TWA 0.005 mg/m^3	Ca [9 mg/m^3 (as Cd)]	inhalation, ingestion	Pulmonary edema, dyspnea (breathing difficulty), cough, chest tightness, substernal (occurring beneath the sternum) pain; headache; chills, muscle aches; nausea, vomiting, diarrhea; anosmia (loss of the sense of smell), emphysema, proteinuria, mild anemia; [potential occupational carcinogen]	respiratory system, kidneys, prostate, blood	Metal: Silver-white, blue-tinged lustrous, odorless solid. BP: 1409°F

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 5530 Broadway, Bronx, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Carbon Disulfide	75-15-0	TWA 1 ppm	TWA 1 ppm (3 mg/m^3) STEL 10 ppm (30 mg/m^3) [skin]	TWA 20 ppm C 30 ppm 100 ppm (30-minute maximum peak)	500 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	Dizziness, headache, poor sleep, lassitude (weakness, exhaustion), anxiety, anorexia, weight loss; psychosis; polyneuropathy; Parkinson-like syndrome; ocular changes; coronary heart disease; gastritis; kidney, liver injury; eye, skin burns; dermatitis; reproductive effects	central nervous system, peripheral nervous system, cardiovascular system, eyes, kidneys, liver, skin, reproductive system	Colorless to faint-yellow liquid with a sweet ether-like odor. BP: 116°F Fl.P: -22°F UEL: 50.0% LEL: 1.3% Class IB Flammable Liquid
Chlorobenzene	108-90-7	TWA 10 ppm	None established	TWA 75 ppm (350 mg/m^3)	1000 ppm	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose; drowsiness, incoordination; central nervous system depression; in animals: liver, lung, kidney injury	Eyes, skin, respiratory system, central nervous system, liver	Colorless liquid with an almond-like odor BP: 270°F Fl.P: 82°F UEL: 9.6% LEL: 1.3%
Chloroethane	75-00-3	TWA 100ppm	Handle with caution in the workplace	TWA 1000 ppm (2600 mg/m^3)	3800 ppm [10%LEL]	inhalation, skin absorption (liquid), ingestion (liquid), skin and/or eye contact	Incoordination, inebriation; abdominal cramps; cardiac arrhythmias, cardiac arrest; liver, kidney damage	Liver, kidneys, respiratory system, cardiovascular system, central nervous system	Colorless gas or liquid (below 54°F) with a pungent, ether-like odor. BP: 54°F Fl.P: NA (Gas) -58°F (Liquid) UEL: 15.4% LEL: 3.8%
Chloroform	67-66-3	TWA 10 ppm	Ca STEL 2 ppm (9.78 mg/m^3) [60-minute]	C 50 ppm (240 mg/m^3)	Ca [500 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; dizziness, mental dullness, nausea, confusion; headache, lassitude (weakness, exhaustion); anesthesia; enlarged liver; [potential occupational carcinogen]	Liver, kidneys, heart, eyes, skin, central nervous system	Colorless liquid with a pleasant odor BP: 143°F
Chromium	7440-47-3	TWA 0.5 mg/m^3 (metal and Cr III compounds) TWA 0.05 mg/m^3 (water-soluble Cr IV compounds) TWA 0.01 mg/m^3 (insoluble Cr IV compounds)	TWA 0.5 mg/m^3	TWA 1 mg/m^3	250 mg/m^3 (as Cr)	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin; lung fibrosis (histologic)	Eyes, skin, respiratory system	Blue-white to steel-gray, lustrous, brittle, hard, odorless solid. BP: 4788°F
Chrysene; Phenanthrene; Pyrene; Coal tar pitch volatiles	65996-93-2	TWA 0.2 mg/m3	Ca TWA 0.1 mg/m^3 (cyclohexane-extractable fraction)	TWA 0.2 mg/m^3 (benzene-soluble fraction)	Ca [80 mg/m^3]	Inhalation, skin and/or eye contact	Dermatitis, bronchitis, [potential occupational carcinogen]	Respiratory system, skin, bladder, kidneys	Black or dark-brown amorphous residue. Combustible Solids
cis-1,2-Dichloroethene	158-59-2	TWA 200 ppm	TWA 200 ppm	TWA 200 ppm	None established	inhalation, skin absorption, ingestion	Harmful if swallowed, inhaled, or absorbed through skin. Irritant. Narcotic. Suspected carcinogen	Skin	Colorless liquid BP: 60 C Fl.P: 4 C UEL: 12.8% LEL: 9.7 %
Copper	7440-50-8	TWA 0.2mg/m^3 (fume) 1 mg/m^3 (dusts and mists)	TWA 1 mg/m^3	TWA 1 mg/m^3	100 mg/m^3 (as Cu)	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, respiratory system; cough, dyspnea (breathing difficulty), wheezing	Eyes, skin, respiratory system, liver, kidneys (increase(d) risk with Wilson's disease)	Noncombustible Solid in bulk form, but powdered form may ignite. BP: 4703°F
Dibenzo[a,h]anthracene	53-70-3	None established	None established	None established	None established	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin	Eyes, skin; skin photosensitization.	Colorless crystalline powder BP: 524°C

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 5530 Broadway, Bronx, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Diesel Fuel #2	68476-34-6	None established	None established	Designated as an OSHA Select Carcinogen	None established	ingestion, skin and/or eye contact	Kidney damage; potential lung damage; suspected carcinogen; irritation of eyes, skin, respiratory tract; dizziness, headache, nausea; chemical pneumonitis (from aspiration of liquid); dry, red skin; irritant contact dermatitis; eye redness, pain.	Eyes, skin, kidneys	Clear yellow brown combustible liquid; floats on water; distinct diesel petroleum hydrocarbon odor. BP: 356-716°F Fl.P: 154.4-165.2°F LEL: 0.6% UEL: 7.0%
Ethylbenzene	100-41-4	TWA 100 ppm STEL 125 ppm	TWA 100 ppm (435 mg/m^3) STEL 125 ppm (545 mg/m^3)	TWA 100 ppm (435 mg/m^3)	800 ppm [10%LEL]	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, mucous membrane; headache; dermatitis; narcosis, coma	Eyes, skin, respiratory system, central nervous system	Colorless liquid with an aromatic odor. BP: 277°F Fl.P: 55°F UEL: 6.7% LEL: 0.8% Class IB Flammable Liquid
Fluoranthene	206-44-0	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; possible burns; heart and liver injury, pulmonary edema, respiratory arrest, gastrointestinal disturbances.	Heart, liver, lungs.	Yellow needles.
Fluorene	86-73-7	None established	None established	None established	None established	inhalation, ingestion, skin and/or eye contact	Irritation skin, digestive tract	Skin	White crystals BP: 563°F
Fuel Oil #2	68476-30-2	TWA 100mg/m^3 (aerosol and vapor, as total hydrocarbons)	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; CNS effects; nausea, vomiting, headache, cramping, dizziness, weakness, loss of coordination,, drowsiness; kidney, liver damage	Eyes, skin, CNS	Clear or yellow to red oily liquid, kerosene-like odor BP: 347 - 689 °F UEL:5-6% LEL: 0.7-1.0%
Gasoline	8006-61-9	TWA 300 ppm STEL 500 ppm	Carcinogen	None established	Ca [IDLH value has not been determined]	Skin absorption; inhalation; ingestion; skin and/or eye contact	Eyes and skin irritation, mucous membrane; dermatitis; headache; listlessness, blurred vision, dizziness, slurred speech, confusion, convulsions; chemical pneumonitis; possible liver, kidney damage [Potential occupational carcinogen]	Eyes, skin, respiratory system, CNS, Liver, Kidneys	Clear liquid with a characteristic odor, aromatic Fl.Pt = -45°F LEL = 1.4% UEL = 7.6% Classs 1B Flammable Liquid
Hexachlorobutadiene	87-68-3	TWA 0.02 ppm	Ca TWA 0.02 ppm (0.24 mg/m^3) [skin]	None established	Ca [N.D.]	inhalation, skin absorption, ingestion, skin and/or eye contact	In animals: irritation eyes, skin, respiratory system; kidney damage; [potential occupational carcinogen]	Eyes, skin, respiratory system, kidneys	Clear, colorless liquid with a mild, turpentine-like odor. BP: 419°F

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 5530 Broadway, Bronx, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Hydrogen Sulfide	7783-06-4	TWA (10 ppm) STEL (15 ppm) (adopted values for which changes are proposed in the NIC)	C 10 ppm (15 mg/m^3) [10-minute]	C 20 ppm 50 ppm [10-minute maximum peak]	100 ppm	inhalation, skin and/or eye contact	Irritation eyes, respiratory system; apnea, coma, convulsions; conjunctivitis, eye pain, lacrimation (discharge of tears), photophobia (abnormal visual intolerance to light), corneal vesiculation; dizziness, headache, lassitude (weakness, exhaustion), irritability, insomnia; gastrointestinal disturbance; liquid: frostbite	Eyes, respiratory system, central nervous system	Colorless gas with a strong odor of rotten eggs. BP: -77°F UEL: 44.0% LEL: 4.0% Flammable Gas
Indeno[1,2,3-cd]pyrene	193-39-5	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; possible human carcinogen (skin); weakness; affect liver, lung tissue, renal tissue; impariment of blood forming tissue	Skin	Fluorescent green-yellow crystalline solid BP: 536 C
Indeno[1,2,3-cd]pyrene	193-39-5	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; possible human carcinogen (skin); weakness; affect liver, lung tissue, renal tissue; impariment of blood forming tissue	Skin	Yellowish crystal solid BP: 536 C
Isopropylbenzene	98-82-8	TWA 50 ppm	TWA 50 ppm (245 mg/m^3) [skin]	TWA 50 ppm (245 mg/m^3) [skin]	900 ppm [10%LEL]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, mucous membrane; dermatitis; headache, narcosis, coma	Eyes, skin, respiratory system, central nervous system	Colorless liquid with a sharp, penetrating, aromatic odor. BP: 306°F Fl.P: 96°F UEL: 6.5% LEL: 0.9%
Kerosene	8008-20-6	TWA 200 mg/m^3	TWA 100 mg/m^3	None established	IDLH value has not been determined	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat; burning sensation in chest; headache, nausea, lassitude (weakness, exhaustion), restlessness, incoordination, confusion, drowsiness; vomiting, diarrhea; dermatitis; chemical pneumonitis (aspiration liquid)	Eyes, skin, respiratory system, central nervous system	Colorless to yellowish, oily liquid with a strong, characteristic odor. BP: 347-617°F Fl.P: 100-162°F UEL: 5% LEL: 0.7% Class II Combustible Liquid
Lead	7439-92-1	TWA 0.05 mg/m^3	TWA (8-hour) 0.050 mg/m^3	TWA 0.050 mg/m^3	100 mg/m^3 (as Pb)	inhalation, ingestion, skin and/or eye contact	Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypertension	Eyes, gastrointestinal tract, central nervous system, kidneys, blood, gingival tissue	A heavy, ductile, soft, gray solid. BP: 3164°F Noncombustible Solid in bulk form

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 5530 Broadway, Bronx, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Manganese	7439-96-5 (metal)	TWA 0.2 mg/m^3	TWA 1 mg/m^3 STEL 3 mg/m^3	C 5 mg/m^3	500 mg/m^3 (as Mn)	inhalation, ingestion	Manganism; asthenia, insomnia, mental confusion; metal fume fever: dry throat, cough, chest tightness, dyspnea (breathing difficulty), rales, flu-like fever; low-back pain; vomiting; malaise (vague feeling of discomfort); lassitude (weakness, exhaustion); kidney damage	respiratory system, central nervous system, blood, kidneys	A lustrous, brittle, silvery solid. BP: 3564°F
Mercury (organo) alkyl compounds (as Hg)	7439-97-6	TWA 0.01 mg/m^3 STEL 0.03 mg/m^3 [skin]	TWA 0.01 mg/m^3 STEL 0.03 mg/m^3 [skin]	TWA 0.01 mg/m^3 C 0.04 mg/m^3	2 mg/m^3 (as Hg)	inhalation, skin absorption, ingestion, skin and/or eye contact	Paresthesia; ataxia, dysarthria; vision, hearing disturbance; spasticity, jerking limbs; dizziness; salivation; lacrimation (discharge of tears); nausea, vomiting, diarrhea, constipation; skin burns; emotional disturbance; kidney injury; possible teratogenic effects	Eyes, skin, central nervous system, peripheral nervous system, kidneys	Appearance and odor vary depending upon the specific (organo) alkyl mercury compound
Mercury compounds [except (organo) alkyls] (as Hg) Mercury	7439-97-6	TWA 0.025 mg/m^3 (elemental and inorganic forms)	Hg Vapor: TWA 0.05 mg/m^3 [skin] Other: C 0.1 mg/m3 [skin]	TWA 0.1 mg/m^3	10 mg/m^3 (as Hg)	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria	Eyes, skin, respiratory system, central nervous system, kidneys	Metal: Silver-white, heavy, odorless liquid. [Note: "Other" Hg compounds include all inorganic & aryl Hg compounds except (organo) alkyls.] BP: 674°F
Methyl tert-butyl ether (MTBE)	1634-04-4	TWA 50 ppm	No established REL	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, mucous membrane, respiratory; dizziness, nausea, headache, intoxication	Eyes, skin, mucous membrane, respiratory system, central nervous system	Colorless liquid BP: 55.2 C
Methylene Chloride	75-09-2	TWA 50 ppm, A3 - suspected human carcinogen	Ca	TWA 25 ppm STEL 125 ppm	Ca [2300 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; lassitude (weakness, exhaustion), drowsiness, dizziness; numbness, tingle limbs; nausea; [potential occupational carcinogen]	Eyes, skin, cardiovascular system, central nervous system	Colorless liquid with a chloroform-like odor BP: 104°F UEL: 23% LEL: 13%
Metals Remediation Compound (MRC): Glycerol Tripolylactate Sorbitol Cysteinate Lactic Acid Glycerol	 201167-72-8 444618-64-8 50-21-5 56-81-5	None established	None established	None established	None established	inhalation, ingestion, skin absorption, skin and/or eye contact	Irritation eyes, skin, respiratory tract	Behavioral (headache), gastrointestinal tract, reproductive system	Viscous amber gel/liquid; strong amine/sulfur odor
Naphtha (coal tar)	8030-30-6	None established	TWA 100 ppm (400 mg/m^3)	TWA 100 ppm (400 mg/m^3)	1000 ppm [10%LEL]	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose; dizziness, drowsiness; dermatitis; in animals: liver, kidney damage	Eyes, skin, respiratory system, central nervous system, liver, kidneys	Reddish-brown, mobile liquid with an aromatic odor BP: 320-428°F Fl.P: 100-109°F Class II Combustible Liquid

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 5530 Broadway, Bronx, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Naphthalene	91-20-3	TWA 2 ppm STEL 15 ppm	TWA 10 ppm (50 mg/m^3) STEL 15 ppm (75 mg/m^3)	TWA 10 ppm (50 mg/m^3)	250 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes; headache, confusion, excitement, malaise (vague feeling of discomfort); nausea, vomiting, abdominal pain; irritation bladder; profuse sweating; jaundice; hematuria (blood in the urine), renal shutdown; dermatitis, optical neuritis, corneal damage	Eyes, skin, blood, liver, kidneys, central nervous system	Colorless to brown solid with an odor of mothballs. BP: 424°F Fl.P: 174°F UEL: 5.9% LEL: 0.9%
n-Butylbenzene	104-51-8	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; CNS depression, lung damage; nausea, vomiting, headache, dizziness, weakness, loss of coordination, blured vision, drowsiness, confusion, disorientation	Eyes, skin,repiratory system, central nervous system	Colorless liquid with a sweet odor BP: 183 C Fl.P: 59 C UEL: 5.8% LEL: 0.8%
Nickel	7440-02-0 (Metal)	TWA 1.5 mg/m^3 (elemental) TWA 0.1 mg/m^3 (soluble inorganic compounds) TWA 0.2 mg/m^3 (insoluble inorganic compounds) TWA 0.1 mg/m^3 (Nickle subsulfide)	Ca TWA 0.015 mg/m^3	TWA 1 mg/m^3	Ca [10 mg/m^3 (as Ni)]	inhalation, ingestion, skin and/or eye contact	Sensitization dermatitis, allergic asthma, pneumonitis; [potential occupational carcinogen]	Nasal cavities, lungs, skin	Metal: Lustrous, silvery, odorless solid. BP: 5139°F
Nitrobenzene	98-95-3	TWA 1 ppm	TWA 1 ppm (5 mg/m^3) [skin]	TWA 1 ppm (5 mg/m^3) [skin]	200 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; anoxia; dermatitis; anemia; methemoglobinemia; in animals: liver, kidney damage; testicular effects	Eyes, skin, blood, liver, kidneys, cardiovascular system, reproductive system	Yellow, oily liquid with a pungent odor like paste shoe polish. BP: 411°F Fl.P: 190°F LEL(200°F): 1.8%
n-Propylbenzene	103-65-1	None established	None established	None established	None established	inhalation, ingestion, skin and/or eye contact	Harmful if swallowed, Irritation eyes, skin, digestive tract, respiratory tract, central nervous system	Eyes, skin, central nervous system, respiratory system	colorless or light yellow liquid BP: 159 C Fl.P: 47 C UEL: 6% LEL: 0.8%
Petroleum hydrocarbons(Petroleum distillates)	8002-05-9	None established	TWA 350 mg/m^3 C 1800 mg/m^3 [15 min]	TWA 500 ppm (2000 mg/m^3)	1,100 [10% LEL]	Inhalation; ingestion; skin and/or eye contact	Irritation eyes, skin, nose, throat; dizziness, drowsiness, headache, nausea; dried/cracked skin; chemical pneumonitis	CNS, eyes, respiratory system, skin	Colorless liquid with a gasoline or kerosene-like odor BP: 86-460°F Fl. Pt = -40 to -86°F UEL: 5.9% LEL: 1.1% Flammable liquid
Phenol	108-95-2	TWA 5 ppm	TWA 5 ppm (19 mg/m^3) C 15.6 ppm (60 mg/m^3) [15-minute] [skin]	TWA 5 ppm (19 mg/m^3) [skin]	250 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, nose, throat; anorexia, weight loss; lassitude (weakness, exhaustion), muscle ache, pain; dark urine; cyanosis; liver, kidney damage; skin burns; dermatitis; ochronosis; tremor, convulsions, twitching	Eyes, skin, respiratory system, liver, kidneys	Colorless to light-pink, crystalline solid with a sweet, acrid odor. BP: 359°F UEL: 8.6% LEL: 1.8%

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 5530 Broadway, Bronx, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
p-Isopropyltoluene	99-87-6	None established	None established	None established	None established	inhalation, skin absorption, eye contact	Irritation skin	CNS, skin	Colorless, clear liquid, sweetish aromatic odor BP: 350.8°F Class III Flammable liquid
Regenox Part A: Sodium Percarbonate Sodium Carbonate Monohydrate Silicic Acid Silica Gel	 15630-89-4 5968-11-6 7699-11-6 63231-67-4	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation respiratory tract, mucous membranes, nose, throat, eyes, skin; gastrointestinal disturbance	Respiratory system, eyes, skin	Odorless, white, powder [Note: Self-accelerating decomposition with oxygen release starts at 50° C]
Regenox Part B: Silicic Acid, Sodium Salt, Sodium Silicate; Silica Gel; Ferrous Sulfate; Water	 1344-09-8 63231-67-4 7720-78-7 7732-18-5	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation respiratory tract, mucous membranes, nose, throat, eyes, skin, mouth, esophagus and stomach	Respiratory system, eyes, skin, gastrointestinal tract	Odorless, Blue/Green, liquid [Note: Oxides of carbon and silicon may be formed when heated to decomposition]
sec-Butylbenzene	135-98-8	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, upper airway; central nervous system, headache, dizziness; gastrointestinal disturbance	Respiratory system, central nervous system, eyes, skin;	Colorless liquid BP: 344°F Fl.P: 126 °F UEL: 6.9% LEL: 0.8% Combustible liquid
Selenium	7782-49-2	TWA 0.2 mg/m^3	TWA 0.2 mg/m^3	TWA 0.2 mg/m^3	1 mg/m^3 (as Se)	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat; visual disturbance; headache; chills, fever; dyspnea (breathing difficulty), bronchitis; metallic taste, garlic breath, gastrointestinal disturbance; dermatitis; eye, skin burns; in animals: anemia; liver necrosis, cirrhosis; kidney, spleen damage	Eyes, skin, respiratory system, liver, kidneys, blood, spleen	Amorphous or crystalline, red to gray solid. [Note: Occurs as an impurity in most sulfide ores.] BP: 1265°F
Silver	7440-22-4 (metal)	TWA 0.1 mg/m^3 (metal, dust, fumes) TWA 0.01 mg/m^3 (Soluble compounds, as Ag)	TWA 0.01 mg/m^3	TWA 0.01 mg/m^3	10 mg/m^3 (as Ag)	inhalation, ingestion, skin and/or eye contact	Blue-gray eyes, nasal septum, throat, skin; irritation, ulceration skin; gastrointestinal disturbance	Nasal septum, skin, eyes	Metal: White, lustrous solid BP: 3632°F
Slop Oil	69029-75-0	None established	None established	None established	None established	Inhalation; ingestion	Irritation eyes, skin, gastrointestinal tract	Eyes, skin, gastrointestinal tract	Clear light to dark amber liquid, with mild hydrocarbon odor. BP: >500°F Fl.P : 250°F
Sulfuric Acid	7664-93-9	TWA 0.2 mg/m^3	TWA 1 mg/m^3	TWA 1 mg/m^3	15 mg/m^3	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat; pulmonary edema, bronchitis; emphysema; conjunctivitis; stomatis; dental erosion; eye, skin burns; dermatitis	Eyes, skin, respiratory system, teeth	Colorless to dark-brown, oily, odorless liquid. BP: 554°F Noncombustible Liquid
tert-Butylbenzene	98-06-6	None established	None established	None established	None established	inhalation, skin absorption, ingestion,	Eye and respiratory irritant; CNS depression; liver or kidney damage	Respiratory system, central nervous system, eyes, liver, kidney	Colorless liquid with an aromatic odor BP: 168 - 169 C Fl.P: 34 C UEL:5.6 % LEL: 0.8 %

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 5530 Broadway, Bronx, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Tetrachloroethene	127-18-4	TWA 25 ppm STEL 100 ppm (STEL) listed as A3, animal carcinogen	Ca Minimize workplace exposure concentrations	TWA 100 ppm C 200 ppm (for 5 minutes in any 3-hour period), with a maximum peak of 300 ppm	Ca [150 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination; headache, drowsiness; skin erythema (skin redness); liver damage; [potential occupational carcinogen]	Eyes, skin, respiratory system, liver, kidneys, central nervous system	Colorless liquid with a mild, chloroform-like odor. BP: 250°F Noncombustible Liquid
Toluene	108-88-3	TWA 20 ppm	TWA 100 ppm (375 mg/m^3) STEL 150 ppm (560 mg/m^3)	TWA 200 ppm C 300 ppm 500 ppm (10-minute maximum peak)	500 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, nose; lassitude (weakness, exhaustion), confusion, euphoria, dizziness, headache; dilated pupils, lacrimation (discharge of tears); anxiety, muscle fatigue, insomnia; paresthesia; dermatitis; liver, kidney damage	Eyes, skin, respiratory system, central nervous system, liver, kidneys	Colorless liquid with a sweet, pungent, benzene-like odor. BP: 232°F Fl.P: 40°F UEL: 7.1% LEL: 1.1% Class IB Flammable Liquid
trans-1,2-Dichloroethene	156-60-5	TWA 200 ppm	None established	TWA 200 ppm STEL 250 ppm (skin)	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Narcotic. Irritation eyes, skin, respiratory tract, mucous membrane; CNS depression.	Respiratory tract, mucous membrane, eyes, skin, CNS	Colorless liquid with a fruity pleasant odor BP: 48°C Fl.P 6C UEL: 12.8% LEL: 9.7%
Trichloroethene	79-01-6	TWA 10 ppm STEL 25 ppm	Ca	TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 2 hours)	Ca [1000 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen]	Eyes, skin, respiratory system, heart, liver, kidneys, central nervous system	Colorless liquid (unless dyed blue) with a chloroform-like odor. BP: 189°F UEL(77°F): 10.5% LEL(77°F): 8%
Vinyl Chloride	75-01-4	TWA 1 ppm	Carcinogen	TWA 1 ppm C 5 ppm [15-minute]	Ca [IDLH value has not been determined]	inhalation, skin, and/or eye contact (liquid)	Lassitude (weakness, exhaustion); abdominal pain, gastrointestinal bleeding; enlarged liver; pallor or cyanosis of extremities; liquid: frostbite; [potential occupational carcinogen]	Liver, central nervous system, blood, respiratory system, lymphatic system	Colorless gas or liquid (below 7°F) with a pleasant odor at high concentrations. BP: 7°F UEL: 33.0% LEL: 3.6% Flammable Gas
Xylene (m, o & p isomers)	108-38-3, 95-47-6, 106-42-3	TWA 100 ppm (435 mg/m^3) STEL 150 ppm	TWA 100 ppm (435 mg/m^3)	TWA 100 ppm (435 mg/m^3)	900 ppm	Skin absorption, inhalation, ingestion, skin, and/or eye contact	Irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis	Eyes, skin, respiratory system, central nervous system, gastrointestinal tract, blood, liver, kidneys	Colorless liquid with an aromatic odor BP: 282°F, 292°F, 281°F Fl. Pt. 82°F, 90°F, 81°F LEL: 1.1%, 0.9%, 1.1% UEL: 7.0%, 6.7%, 7.0% Classs C Flammable Liquid
Zinc	7440-66-6	TWA 10 mg/m3 (Inhalable fraction)	None established	TWA 10 mg/m3 (for zinc oxide fume)	None established	skin and/or eye contact, inhalation, ingestion	Irritation eyes, skin, respiratory tract; gastrointestinal disturbances	Eyes, skin, respiratory system	Bluish gray solid BP: 1664.6°F Flammable

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 5530 Broadway, Bronx, New York

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Abbreviations:

ACGIH – American Conference of Governmental Industrial Hygienists.
BP – boiling point at 1 atmosphere, °F
C – Ceiling, is a concentration that should not be exceeded during and part of the working exposure.
Ca - considered by NIOSH to be a potential occupational carcinogen
CAS# Chemical Abstracts Service registry number which is unique for each chemical.
Fl. Pt. – Flash point
IDLH - Immediately Dangerous to Life and Health concentrations represent the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing or irreversible health effects.
LEL – Lower explosive (flammable) limit in air, % by volume (at room temperature)
mg/m^3 – Milligrams of substance per cubic meter of air
NIOSH -National Institute for Occupational Safety and Health.
OSHA – Occupational Safety and Health Administration
PEL - OSHA Permissible Exposure Limit (usually) a time weighted average concentration that must not be exceeded during any 8 hour work shift of a 40 hr work week.
ppm – parts per million
REL – NIOSH Recommended Limit indicated a time weighted average concentration that must not be exceeded during any 10 hour work shift of a 40 hr work week
STEL – Short-term exposure limit
TLV -ACGIH Threshold Limit Values (usually 8 hour time weighted average concentrations).
TWA – 8-hour, time-weighted average
UEL – Upper explosive (flammable) limit in air, % by volume (at room temperature)

TABLE 2

ACTION LEVELS FOR WORKER BREATHING ZONE

Instrument	Action Level *	Level of Respiratory Protection/Action
PID	0 to <5 ppm (one minute sustained)	Level D *
PID	>5 to <50 ppm (one minute sustained)	Utilize APR (Level C)
PID	>50 to <100 ppm (one minute sustained)	Level B
PID	>100ppm	Stop work** (ventilate, apply foam)
CGI/H_2S Meter	<5%	Level D
CGI/H_2S Meter	>5% to <25%	Level B
CGI/H_2S Meter	>25%	Stop work**
CGI/CO Meter	>25%	Level B
CGI/CO Meter	>50%	Stop work** (ventilate area)
CGI/O_2 Meter	<10% LEL, in excavation	Level D
	19.5% oxygen – 23.5%	Level D
CGI/O_2 Meter	>10% LEL, in excavation	Allow to vent, apply foam**
	>23.5% oxygen	Stop work, Oxygen Enriched ATM**
Dust Monitor	0 – 1.0 mg/m^3, 5-minutes average	Level D
Dust Monitor	>1.0 to 5.0 mg/m^3, 5-minutes average	Level D – Institute dust suppression measures
Dust Monitor	5.0 to >50 mg/m^3, 5-minute average	Level C – Institute dust suppression measures

Note: Action levels are based on above background levels.

* Instrument readings will be taken in the breathing zone (BZ) of the workers, unless otherwise indicated.

** Suspend work in immediate area. Conduct air monitoring periodically to determine when work can continue. Implement mitigative measures.

APPENDIX A

Activity Hazard Analysis and Material Safety Data Sheets

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JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
GENERIC	**Site Recon**	**Site Walk and Inspection**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
Chelsea Willett	Staff Assistant Geologist	Curtis Taylor	SHSM
		Mike Ritorto	Project Hydrogeologist

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☐ FACE SHIELD ☒ HEARING PROTECTION: ear plugs as necessary ☒ SAFETY SHOES: Steel or composite toed	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: High-visibility vest, long sleeves	☒ GLOVES: Leather/cut-resistant/chemical resistant ☒ OTHER: tyvek and rubber boots as necessary, dust mask as necessary

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Required Equipment: Site map and/or guide familiar with Site, operating cell phone or walkie-talkie if Site allows.

Commitment to LPS – All personnel onsite will actively participate in SPSA performance by verbalizing SPSAs throughout the day.

EXCLUSION ZONE (EZ): A minimum 10' exclusion zone will be maintained around equipment.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Check in with Site manager.	**1a. CONTACT/EXPOSURE/FALL:** Lack of communication could result in H&S incident.	1a. Inform Site personnel of work scope, timeline and location(s). 1a. Inquire about other activities taking place at the Site.
2. Traversing the Site and setting up at work locations.	**2a. CONTACT:** Property damage and personal injury caused by obstructions/vehicles.	2a. Maintain speed limit of 5 mph on-site. 2a. All equipment must be stowed and secured prior to moving. Use wheel chocks on all construction vehicles when not in motion. 2a. Drive on established roadways. 2a. Yield to all pedestrians. 2a. Do not back up vehicle without spotter where visibility is limited; use pull-through spots or back into parking spots; use an audible signal (horn/back-up alarm) when backing up vehicles. 2a. Wear high visibility clothing/safety vest.
	2b. FALL: Uneven terrain and weather conditions. Overgrown shrubs and vines. Equipment in the workzone.	2b. Inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment. 2b. Use established pathways and walk on stable, secure ground.
	2c. OVEREXERTION: Muscle strain while carrying equipment.	2c. When carrying equipment to/from work area, use proper lifting techniques; keep back straight, lift with legs, keep load close to body, never reach with a load. Ensure that loads are balanced to reduce the potential for muscle strain. Use mechanical assistance or make multiple trips to carry equipment. 2c. Two people or a mechanical lifting device are required when lifting objects over 50 lbs or when the shape makes the object difficult to lift.
	2d. EXPOSURE: Biological hazards - ticks, bees/wasps, poison ivy, insects, etc. (Ticks are most active any time the temperature is above freezing, typically from March to November)	2d. Inspect area to avoid contact with biological hazards. 2d. Ticks: • Treat outer clothing including pants, shirts, socks, boots and hats the evening before use with Permethrin (allowing at least two hours before use). • Apply DEET to exposed skin before travelling to the Site and reapply after two hours. • Check for ticks during and after work. 2d. Bees: Use bee spray to remove nests. Protect exposed skin with insect repellent. 2d. Poison Ivy: • Identify areas of poison ivy and spray with weed killer. Don Tyvek and rubber boots while traversing poison ivy areas. • If skin comes in contact with poison ivy, wash skin thoroughly with soap and water.
	2e. EXPOSURE: Sun, possibly causing sunburn.	2e. Wear sunscreen with SPF 15 or greater on exposed skin whenever 30 minutes or more of sun exposure is expected.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.

[2] A hazard is a potential danger. Break hazards into five types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards; Energy Source – electricity, pressure, compression/tension.

[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift." Avoid general statements such as, "be careful."

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
3. Define and secure the work area.	**3a. CONTACT:** Personal injury or property damage from other vehicles on-site.	3a. Face traffic, maintain eye contact with oncoming vehicles, and establish a safe exit route. 3a. Look both ways in high traffic areas. 3a. Position vehicle to protect against oncoming traffic. 3a. Use 42" traffic cone and caution tapesto delineate work area. Use a spotter in high traffic areas. 3a. Wear high visibility clothing/safety vest.
4. Walking near heavy equipment and machinery.	**4a. CONTACT:** Personal injury from Site and roadway traffic. Personal injury from flying debris.	4a. See 3a. 4a. Place traffic cones to re-direct traffic flow around work area and to alert others as to activity taking place. 4a. Maintain a minimum exclusion zone of 10 feet from all equipment. Task specific JSAs should be referenced to determine the actual exclusion zone for that piece of equipment being used. 4a. Keep body parts from being present within the line of fire of pinch points. 4a. Routinely inspect work area and be aware of location of all Site personnel. Make eye contact with operator prior to entering the work area. 4a. Wear safety glasses.
	4b. OVEREXERTION: Personal injury from lifting/moving/rotating equipment.	4b. See 2c.
	4c. EXPOSURE: Hearing damage from excavation activities. Inhalation/exposure to hazardous vapors and or dust.	4c. Monitoring air quality with multi-gas meter and dust meter, if necessary. Utilize water to suppress dust, if necessary. Wear dust mask, if necessary. 4c. Wear hearing protection if >85 dB. 4c. Always wear leather gloves when handling any tools or equipment. Wear cut-resistant gloves (Kevlar or similar) when handling sharp objects or cutting tools.
	4d. EXPOSURE: Working in a remote area.	4d. Use the "buddy system" whenever possible. If working alone, contact PM upon arrival/departure, as well as during work activities to be established by the PM prior to commencing work. 4d. Always carry a communication (i.e., cell phone, walkie-talkie) or directional (i.e., map, compass, etc.) device when traversing remote areas.
5. Working in adverse weather conditions.	**5a. EXPOSURE:** Heat Stress & Cold Stress. Personal injury from working in inclement weather conditions.	5a. Watch for heat stress symptoms (muscle cramping, exhaustion, dizziness, rapid and shallow breathing). Take breaks as needed. 5a. Watch for cold stress symptoms (severe shivering, slowing of body movement, weakness, stumbling or inability to walk, collapse). Take breaks as needed. 5a. Wear appropriate rain gear. 5a. Take frequent breaks if tired, wet, or cold/hot. Drink water. 5a. If lightning is observed, wait 30 minutes after last thunder boom/lightning bolt in a sheltered location (car acceptable) before starting work again.
6. Departing Site.	**6a. EXPOSURE:** Exposure to hazards should personnel believe Roux is on-Site during an emergency.	6a. Sign out or notify Site personnel of your departure.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.

[2] A hazard is a potential danger. Break hazards into five types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards; Energy Source – electricity, pressure, compression/tension.

[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

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JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
GENERIC	**Site Recon**	**Mobilization/Demobilization**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
Jared Lefkowitz	Staff Assistant Scientist	Curtis Taylor	SHSM
		Mike Ritorto	Project Hydrogeologist

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☐ FACE SHIELD ☒ HEARING PROTECTION (as needed) ☒ SAFETY SHOES: Steel Toe or composite toe	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Fluorescent reflective vest of high-visibility clothing; long sleeve shirt; long pants	☐ GLOVES: Leather, nitrile, and cut resistant (as needed) ☐ OTHER

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Required Equipment:

Commitment to LPS – All personnel onsite will actively participate in SPSA performance by verbalizing SPSAs throughout the day.

EXCLUSION ZONE: A minimumexclusion zone of 10' will be maintained around moving equipment (if necessary)

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Mobilize/demobilize and establish work area	**1a. FALL:** Slip/trips/falls from obstructions, uneven terrain, weather conditions, heavy loads, and/or poor housekeeping.	1a. Use 3 points-of-contact/ensure secure footing when entering and exiting vehicle. 1a. Inspect walking path for uneven terrain, steep hills, obstructions, and/or weather-related hazards (i.e., ice, snow, and puddles) prior to mobilizing equipment. Use established pathways.Walk on stable/secure ground. 1a. Do not climb over stored materials/equipment; walk around. Practice good housekeeping. 1a. Wear boots with adequate treads. 1a. Delineate unsafe areas with 42" cones, caution tape and/or flagging.
	1b. CONTACT: Personal injury and/or property damage caused by being struck by Site traffic or equipment used in Site activities.	1b. Observe and maintain the posted speed limits. 1b. When first arriving onsite, park vehicles in designated parking space and/or out of the way locations. Use parking brake on all vehicles and tire chocks on work trucks and trailers. 1b. Check in with Site Manager/Supervisor to ensure coordination with other Site activities. 1b. Identify potential traffic sources. 1b. Wear PPE including high visibility clothing or reflective vest. 1b. Use a spotter while moving work vehicles; plan ahead to avoid backing when unnecessary. 1b. Maintain a minimum 10' exclusion zone when vehicles are in motion. When backing up truck rig with an attached trailer use a second spotter if there is tight clearance simultaneously on multiple sides of the equipment or if turning angles limit driver visibility. 1b. Delineate work area with 42" cones, flags, caution tape, and/or other barriers. 1b. Position "Work Area" signs at Site entrances, if possible, or at either side of work area. 1b. Position largest vehicle to protect against oncoming traffic. 1b. Face traffic, maintain eye contact with oncoming vehicles, use a spotter, and establish a safe exit route.
	1c. CAUGHT: Personal injury from pinch points and being in line-of-fire of vehicle and/or equipment.	1c. Make sure driver has engaged parking brake and placed wheel chocks in a position to prevent movement. Be sure that vehicle is parked in front/down gradient of work area. 1c. Wear leather gloves when handling any tools or equipment. Avoid wearing loose clothing. Wear cut-resistant gloves (Kevlar or similar) when handling sharp objects/cutting tools. 1c. Keep body parts away from line-of-fire of equipment. 1c. Always carry tools by the handles and/or designated carrier. Ensure sharp-edged tools are sheathed/secure. 1c. Remove any loose jewelry. Ensure loose clothing is secure.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.

[2] A hazard is a potential danger. Break hazards into five types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards; Energy Source – electricity, pressure, compression/tension.

[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift." Avoid general statements such as, "be careful."

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
	1d. OVEREXERTION: Muscle strains while lifting/carrying equipment.	1d. Use body positioning and lifting techniques that avoid muscle strain; keep back straight, lift with legs, keep load close to body, and never reach with a load. 1d. Ensure that loads are balanced. Use assistance (mechanical or additional person) to carry equipment that is either awkward to carry or over 50 lbs.
	1e. EXPOSURE: Personal injury from exposure to biological and environmental hazards.	1e. Inspect area to avoid contact with biological hazards (i.e. poisonous plants, stinging insects, ticks, etc.). 1e. Wear long sleeved clothes, apply insect repellant containing DEET, and inspect clothes and skin for ticks during and after work. 1e. Apply sunscreen (SPF 15+) if exposure to sun for 30 minutes or more is expected.
	1f. EXPOSURE: Heat and cold related injuries.	1f. Watch for heat stress symptoms (muscle cramping, exhaustion, dizziness, rapid and shallow breathing). Take breaks as needed. 1f. Watch for cold stress symptoms (severe shivering, slowing of body movement, weakness, stumbling or inability to walk, collapse). Take breaks as needed. 1f. Wear clothing appropriate for weather and temperature conditions (e.g., rain jackets, snow pants, multiple layers). 1f. If lightning is observed, wait 30 minutes in a sheltered location (car is acceptable) before resuming work.
	1g. EXPOSURE: Personal injury from noise hazards.	1g. Wear hearing protection if sound levels exceed 85 dBA.

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JOB SAFETY ANALYSIS Ctrl. No. GEN-005	DATE 12/10/2012	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY	WORK TYPE:	WORK ACTIVITY (Description):	
Generic	**Gauging and Sampling**	**Gauging and Sampling**	
DEVELOPMENT TEAM	**POSITION / TITLE**	**REVIEWED BY:**	**POSITION / TITLE**
Gina Masciello	Project Scientist	Curtis Taylor	SHSM
		Michael Ritorto	Project Hydrogeologist

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☐ AIR PURIFYING RESPIRATOR	☒ GLOVES: Leather, Nitrile and cut resistant
☒ HARD HAT	☐ FACE SHIELD	☐ SUPPLIED RESPIRATOR	☒ OTHER: Knee pads, Insect Repellant, sunscreen (as needed)
☐ LIFELINE / BODY HARNESS	☐ HEARING PROTECTION	☒ PPE CLOTHING: Fluorescent reflective vest or high visibility clothing	
☒ SAFETY GLASSES	☒ SAFETY SHOES: Composite-toe or steel toe boots		

REQUIRED AND / OR RECOMMENDED EQUIPMENT

42 inch Safety Cones, Caution Tape, Interface Probe and/or Water Level Meter, 20 lb. Fire Extinguisher, Buckets. Tools as needed: Socket Wrench, Screw Driver, Crow Bar, Mallet, and Wire Brush.

Commitment to LPS – All personnel onsite will actively participate in SPSA performance by verbalizing SPSAs throughout the day.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Mobilization to monitoring well(s).	1a. **FALL:** Personal injury from slip/trip/fall due to uneven terrain and/or obstructions.	1a. Inspect pathway and plan for most suitable designated pathway prior to mobilization. 1a. Use established pathways, walk and/or drive on stable, secure, ground and avoid steep hills or uneven terrain.
	1b. **CONTACT:** With traffic/third parties.	1b. Identify potential traffic sources and delineate work area with 42 inch traffic safety cones. Position vehicle to protect against oncoming traffic. Use caution tape to provide a more visible delineation of the work area if necessary. 1b. Wear appropriate PPE including high visibility clothing or reflective vest. 1b. Face traffic, maintain eye contact with oncoming vehicles, and establish a safe exit route.
	1c. **EXPOSURE:** To biological hazards.	1c. Inspect work area for bees and insects. 1c. Use insect/tick repellent as necessary.
2. Open/close well.	2a. **OVEREXERTION:** Muscle strain.	2a. Use proper lifting techniques; keep back straight, lift with legs and bend knees when reaching to open/close well.
	2b. **CAUGHT:** Pinch points associated with removing/replacing manholes and working with hand tools.	2b. Wear leather gloves or cut resistant gloves when working with well cover and hand tools. 2b. Use proper tools (ratchet and pry bar for well cover) and inspect before use. 2b. Do not put fingers under well cover.
	2c. **EXPOSURE:** To potential hazardous vapors.	2c. No open flames/heat sources. 2c. To minimize exposure to vapors allow well to vent after opening it and before sampling activities begin. 2c. Stand up-wind, if possible, to avoid vapors.
3. Gauge well.	3a. **CONTACT:** With contamination (e.g. contaminated groundwater).	3a. Wear chemical-resistant disposable gloves and safety glasses when gauging well. 3a. Insert and remove probe slowly to avoid splashing. 3a. Use an absorbent pad to clean probe.
	3b. **CONTACT:** With traffic.	3b. See 1b.
4. Purge and sample well.	4a. **EXPOSURE/CONTACT:** To contamination (e.g., SPH, contaminated groundwater, vapors) and/or sample preservatives.	4a. Open and fill sample jars slowly to avoid splashing and contact with preservatives. 4a. Wear cut-resistant gloves and chemical-resistant disposable gloves when sampling. 4a. Fill sample containers over purge container to avoid spilling water onto the ground. 4a. Use an absorbent pad to clean spills.

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
4. Purge and sample well (Continued).	4b. **CONTACT:** Personal injury from cuts, abrasions, or punctures by glassware or sharp objects. 4c. **EXERTION:** Muscle strain while carrying equipment. 4d. **CONTACT:** With traffic.	4b. To avoid spills or breakage, place sample ware on even surface. 4b. Do not over tighten caps on glass sample ware. 4b. Wear cut-resistant (i.e., Kevlar) gloves and chemical-resistant disposable gloves when sampling and handling glassware (i.e., VOA vials) or when using cutting tools. 4c. Use proper lifting techniques when handling/moving equipment; bend knees and keep back straight. 4c. Use mechanical assistance or team lifting techniques when equipment is 50lbs or heavier. 4c. Make multiple trips to carry equipment. 4d. See 1b.
5. Management of purge water.	5a. **EXPOSURE/CONTACT:** To contamination (e.g., SPH, contaminated groundwater, vapors). 5b. **EXERTION:** Muscle strain from lifting/carrying and moving containers.	5a. Do not overfill container and pour liquids in such a manner that they do not splash. 5a. Properly dispose of used materials/PPE in appropriate container in designated storage area. 5b. Use proper lifting techniques when lifting / carrying or moving container(s) (see 4c.). 5b. Do not overfill container(s).
6. Decontaminate equipment.	6a. **EXPOSURE/CONTACT:** To contamination (e.g., SPH, contaminated groundwater, vapors).	6a. Work on the upwind side, where possible, of decon area. 6a. Wear chemical-resistant disposable gloves and safety glasses. 6a. Use an absorbent pad to clean spills.

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JOB SAFETY ANALYSIS	Cntrl. No. GEN-009	DATE: 12//31/2012	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
GENERIC	**Hand Tools**	**Pre-Clearing activities, including Air Knifing and Soil Vacuuming**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
Alyssa Lau	Staff Engineer	Curtis Taylor	SHSM
		Mike Ritorto	Project Hydrogeologist

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☐ AIR PURIFYING RESPIRATOR	☒ GLOVES: Nitrile and cut resistant
☒ HARD HAT	☒ FACE SHIELD (while air knifing)	☐ SUPPLIED RESPIRATOR	
☐ LIFELINE / BODY HARNESS	☒ HEARING PROTECTION (as needed)	☒ PPE CLOTHING: Fluorescent reflective vest or high visibility clothing	☒ OTHER: Dust mask (as needed)
☒ SAFETY GLASSES	☒ SAFETY SHOES: Steel or composite toed		

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Required Equipment: Air Knife, Vactor Truck (Vac Truck), Compressor, Hand Tools, Photoionization Detector, Multi-Gas Meter, Traffic Cones, 20 lb. Fire Extinguisher, "Work Area" and/or "Exclusion Zone" Signs

Commitment to LPS – All personnel onsite will actively participate in SPSA performance by verbalizing SPSAs throughout the day.

EXCLUSION ZONE: A 10 foot exclusion zone will be maintained around air knife and/or soil vacuum operations.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Verify pre-clearance protocol.	1a. **CONTACT**: Underground utility damage; property damage; personal injury. See Site Walk Inspection JSA for potential hazards.	1a. Confirm that local utility companies were contacted prior to drilling. 1a. Walk the Site to evaluate utility markings and review maps (**See Site Walk Inspection JSA for critical actions**). 1a. Review pre-clearing checklist form and sub-surface clearance form. Pre-clearing protocol indicates that clearance must be conducted to a minimum of 5 vertical feet below ground surface or 8 vertical feet below ground surface in the critical zone using hand tools.
2. Mobilize/demobilize and establish work area.	2a. **See Mobilization / Demobilization JSA for potential hazards.**	2a. **See Mobilization / Demobilization JSA for critical actions.**
3. Pre-clear with air knife and soil vacuum, and/or clearance with hand tools	3a. **CONTACT**: Flying debris. 3b. **EXPOSURE/ENERGY SOURCE**: Inhalation/exposure to hazardous vapors; inhalation/exposure to dust; electrocution. 3c. **CONTACT:** Damage to unknown/known utility with air knife. 3d.**OVEREXERTION**: Poor body positioning when handling equipment and materials.	3a. **Maintain 10 foot exclusion zone.** Only (air knife/vac truck) operator and designated helper shall remain within exclusion zone while air knife/vac truck is active. Use the required PPE, including (at a minimum), cut resistant gloves, safety glasses with side shields, and long sleeved shirt. 3a. Wear a face shield to protect face from flying debris when using air knife. 3a. Aim air knife tip away from self and others, so to avoid line-of-fire hazards. 3a. Use anti-whip devices on compressor hoses. 3b. Monitor breathing zone with a calibrated PID and multi-gas meter. If vapors sustain levels > 5 ppm, the Roux field personnel must temporarily cease work, instruct all Site personnel to step away from the area of elevated readings and inform the Roux Project Manager of the condition. The Roux Project Manager will then recommend additional precautions. 3b. Wear dust masks as needed. 3b. Ensure no open flames/heat sources are present within the work area. 3b. Ensure vac truck is properly grounded prior to use. 3b. Do not use metal dig bar; use fiberglass or equivalent. 3c. Avoid contacting utilities directly with the high pressure air stream and using the air knife tip as a physical digging tool. 3c. Keep the air knife tip constantly moving to reduce direct pressure on a potential utility. 3c. Increase the distance between air knife tip and soil/utility. 3c. Continually remove soil slurry from hole with vacuum, which may have an abrasive effect on utility casings. 3d. Use proper body positioning and lifting techniques that minimizes muscle strain; keep back straight, lift with legs, keep

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		load close to body, and never reach with a load.
3. Pre-clearing with air knife and soil vacuum, and/or clearance with hand tools (continued)	3d. **OVEREXERTION**: (continued) Poor body positioning when handling equipment and materials.	3d. Ensure that loads are balanced to reduce the potential for muscle strain. 3d. Two people or a mechanical lifting aid are required when lifting objects over 50 lb. or when the shape makes the object difficult to lift.
	3e. **FALL**: Tripping/falling due to uneven terrain, weather conditions, and materials/equipment stored at the Site.	3e. Inspect walking path for uneven terrain, weather-related hazards (e.g., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment. 3e. Walk around any stored materials/equipment; do not climb over. Practice good housekeeping. 3e. Use established pathways and walk on stable, secure ground. 3e. Equipment and tools will be stored at the lowest point of potential energy and out of the walkway and immediate work area (i.e., tools should not be propped against walls or nearby equipment or vehicles). 3e. Equipment and tools that are not anticipated to be used will be returned to a storage area that is out of the immediate work area. 3e. Ensure power cords/hoses are grouped when used within the work area. Mark out cords/hoses that cross pathways with traffic cones. 3e. Ensure all Site personnel and equipment stay a minimum of 2 feet from an open hole. Mark out open holes with traffic cones/caution tape, etc. 3e. Pre-cleared location will be finished flush to grade as to prevent a slip/trip hazard.
	3f. **CAUGHT**: Pinch points associated with the equipment and vacuum hose.	3f. Always wear cut-resistant gloves when making connections and using hand tools. 3f. Inspect the equipment prior to use for potential pinch points. 3f. Test all emergency shutdown devices prior to using equipment. 3f. Ensure all jewelry is removed, loose clothing is secured, and PPE is secured close to the body. 3f. **All non-essential personnel shall maintain a 10 foot exclusion zone**; position body out of the line-of-fire of equipment. 3f. **Drillers and helpers will understand and use the "Show Me Your Hands Policy".**
	3g. **EXPOSURE**: Noise from vac truck and/or air compressor.	3g. Wear hearing protection when vac truck and air compressor are in operation. Otherwise, if sound levels exceed 85 dB, don hearing protection.
4. Move drum to staging area using drum cart.	4a. **EXPOSURE/CONTACT**: Contamination (e.g., Separate Phase Hydrocarbons (SPH), contaminated groundwater, soil).	4a. Wear chemically resistant gloves (i.e., Nitrile; worn in addition to cut resistant gloves). 4a. Do not overfill drums. Ensure that the drum lids are attached securely. 4a. Stage all drums in the designated storage area (per Roux Project Manager) and ensure they are labeled.
	4b. **EXERTION**: Muscle strain while maneuvering drums with drum cart/lift gate.	4b. See 3d. Do not overfill drums. Use lift gate on back of truck to load and unload drums or drum cart to transport drums.
	4c. **CAUGHT**: Pinch points associated with handling drum lid.	4c. Ensure that fingers are not placed under the lid of the drum. Wear cut-resistant gloves. Use 15/16" ratchet while sealing drum lid.
5. Decontaminate equipment and tools.	5a. **EXPOSURE/CONTACT**: To contamination (e.g., Separate Phase Hydrocarbons (SPH), contaminated groundwater, vapors).	5a. See 4a. 5a. Contain decontamination water (closed lid) so that it does not spill. 5a. Use an absorbent pad to clean spills, if necessary. 5a. Store all impacted materials/PPE in a designated storage container (per Roux Project Manager) and ensure the container is labeled.
	5b. **EXPOSURE**: To chemicals in cleaning solution.	5b. See 4a.

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JOB SAFETY ANALYSIS Ctrl. No. GEN-004	DATE 12/6/2012	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY: **Generic**	WORK TYPE: **Drilling**	WORK ACTIVITY (Description): **Direct Push Soil Borings / Well Installation**	
DEVELOPMENT TEAM	**POSITION / TITLE**	**REVIEWED BY:**	**POSITION / TITLE**
Jeffrey Wills	Project Hydrogeologist	Curtis Taylor	Health and Safety Officer
		Michael Ritorto	Project Hydrogeologist

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☐ FACE SHIELD ☒ HEARING PROTECTION: (as needed) ☒ SAFETY SHOES: Composite-toe or steel toe boots	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Fluorescent reflective vest or high visibility clothing, Long Sleeve Shirt	☒ GLOVES: Leather, Nitrile and cut resistant ☒ OTHER: Insect Repellant, sunscreen (as needed)

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Geoprobe or Truck-Mounted Direct Push Drill Rig, Hand Tools, Photoionization Detector, Multi-Gas Meter (or equivalent), Macrocore liners, Liner Opening Tool, 20 lb. Fire Extinguisher, 42" Cones & Flags, "Work Area" Signs, Water

COMMITMENT TO LPS - All personnel onsite will actively participate in SPSA performance by verbalizing SPSAs throughout the day.

Exclusion Zone Policy – All non-essential personnel will maintain a distance of 10' feet from drilling equipment while moving/engaged.

"SHOW ME YOUR HANDS"
Driller and helper should show that hands are clear from controls and moving parts

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Mobilization of drilling rig (ensure the Subsurface Clearance Protocol and Drill Rig Checklist are completed)	1a. **CONTACT**: Equipment/property damage.	1a. The drill rig's tower/derrick will be lowered and secured prior to mobilization. 1a. A spotter should be utilized while moving the drill rig. If personnel move into the path of the drill rig, the drill rig will be stopped until the path is again clear. Use a spotter for all required backing operations. 1a. Set-up the work area and position equipment in a manner that eliminates or reduces the need for backing of support trucks and trailers. 1a. When backing up truck rig with an attached trailer use a second spotter if there is tight clearance simultaneously on multiple sides of the equipment or if turning angles limit driver visibility. 1a. Inspect the driving path for uneven terrain. Level or avoid if needed. 1a. Drill rig should have a minimum **exclusion zone of 10 feet** for non-essential personnel (i.e., driller helper, geologist) when the rig is moving/ in operation.
	1b. **FALL**: Slip/trip/fall hazards.	1b Inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment. 1b. Do not climb over stored materials/equipment; walk around. Practice good housekeeping. 1b. Use established pathways and walk on stable, secure ground.
2. Raising tower/derrick of drill rig	2a. **CONTACT**: Overhead hazards.	2a. Prior to raising the tower/derrick, the area above the drilling rig will be inspected for wires, tree limbs, piping, or other structures, that could come in contact with the rig's tower and/or drilling rods or tools. 2a. Maintain a safe distance from overhead structures.
	2b. **CONTACT**: Pinch Points when raising the rig and instability of rig	2b. Inspect the equipment prior to use and avoid pinch points. 2b. Lower out riggers on rig to ensure stability prior to raising rig tower/derrick. 2b. If the rig needs to be mounted, be sure to use three points of contact.
3. Advancement of drilling equipment and well installation	3a. **CONTACT**: Flying debris	3a. Be aware of and avoid potential lines of fire and wear required PPE such as eye, ear, and hand protection.

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3. Advancement of drilling equipment and well installation (Continued)	3b. **EXPOSURE**: Noise and dust.	3b. Wet borehole area with sprayer to minimize dust. 3b. Stand upwind and keep body away from rig. 3b. Dust mask should be worn if conditions warrant. 3b. Wear hearing protection when the drill rig is in operation.
	3c. **CAUGHT**: Limb/extremity pinching; abrasion/crushing.	3c. Always wear leather gloves when making connections and using hand tools; wear cut-resistant (i.e., Kevlar) gloves when handling cutting tools. 3c. Inspect the equipment prior to use for potential pinch points. Keep hands away from being between pinch points and use of tools is preferable compared to fingers and hands. 3c. Inspect drill head for worn surface or missing teeth; replace if damaged or blunt. 3c. Ensure all jewelry is removed, loose clothing is secured, and PPE is secured close to the body. 3c. All non-essential personnel should stay away from the immediate work area; position body out of the line-of-fire of equipment. 3c. Drillers and helpers will understand and use the "Show Me Your Hands" Policy. 3c. Spinning rods/casing have an **exclusion zone of 10 feet** while in operation.
	3d. **CONTACT**: Equipment imbalance during advancement of drill equipment.	3d. Drillers will advance the borehole with caution to avoid causing the rig to become imbalanced and/or tip. 3d. The blocking and leveling devices used to secure the rig will be inspected by drillers and Roux personnel regularly to see if shifting has occurred. 3d. In addition, personnel and equipment that are non-essential to the advancement of the borehole will be positioned away from the rig at a distance that is at least as far as the boom is high (**minimum exclusion zone of 10 feet**).
	3e. **EXPOSURE**: Inhalation of contamination/vapors.	3e. Air monitoring using a calibrated photoionization detector (PID) will be used to periodically to monitor the breathing zone of the work area. 3e. If a reading of >5ppm is recorded, the Roux field personnel must temporarily cease work, instruct all Site personnel to step away from the area of elevated readings and inform the Roux PM of the condition. The Roux PM will then recommend additional precautions in accordance with the site specific health and safety plan.
	3f. **FALL**: Slip/trip/fall hazards.	3f. Contain drill cuttings and drilling water to prevent fall hazards from developing in work area. 3f. See 1b.
	3g. **EXERTION**: Potential for muscle strain/injury while lifting and installing well casings, lifting sand bags, and/or lifting rods.	3g. Keep back straight and bend at the knees. 3g. Utilize team lifting for objects over 50lbs. 3g. Use mechanical lifting device for odd shaped objects.
4. Decontaminate equipment.	4a. **EXPOSURE/CONTACT**: To contamination (e.g., Separate Phase Hydrocarbons (SPH), contaminated groundwater, vapors).	4a. Wear chemical-resistant disposable gloves and safety glasses. 4a. Contain decontamination water so that it does not spill. 4a. Use an absorbent pad to clean spills, if necessary. 4a. See 3b.
	4b. **EXPOSURE:** To chemicals in cleaning solution including ammonia.	4b. See 4a. Review MSDS to ensure appropriate precautions are taken and understood.

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JOB SAFETY ANALYSIS	Cntrl. No. GEN-012	DATE: 12/31/2012	☐NEW ☒REVISED	PAGE 1 of 2

JSA TYPE CATEGORY:	WORK TYPE:	WORK ACTIVITY (Description):	
GENERIC	**Gauging & Sampling**	**Soil Sampling**	
DEVELOPMENT TEAM	**POSITION / TITLE**	**REVIEWED BY:**	**POSITION / TITLE**
Michael Hodess	Staff Environmental Scientist	Curtis Taylor	SHSM
		Mike Ritorto	Project Hydrogeologist

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES ☒ FLAME RESISTANT CLOTHING (as needed)	☐ GOGGLES ☐ FACE SHIELD: ☒ HEARING PROTECTION: (as needed) ☒ SAFETY SHOES: Composite-toe or steel toe boots	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Fluorescent reflective vest or high visibility clothing	☒ GLOVES: Leather, Nitrile and cut resistant ☒ OTHER: Insect Repellant, sunscreen (as needed)

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Recommended Equipment; 42" traffic cones, caution tape, trowel

COMMITMENT TO LPS - All personnel onsite will actively participate in SPSA performance by verbalizing SPSAs throughout the day.

EXCLUSION ZONE: A minimum 10' exclusion zone will be maintained around moving equipment, if present.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Secure location	1a. **CONTACT:** Personnel and vehicular traffic may enter the work area.	1a. If in an area with foot or vehicle traffic, delineate the work area with 42" traffic cones and/or caution tape to prevent exposure to traffic and inform others of work activity. 1a. Wear reflective vest and/or fluorescent clothing. 1a. Face the direction of any vehicular traffic. Position vehicle to protect worker from traffic. 1a. Communicate work activity with adjacent work areas.
	1b. **FALL:** Tripping/falling due to uneven terrain or entry/exit from excavations.	1b. Inspect pathways and work area for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions. 1b. Use established pathways and walk on stable, secure ground. 1b. Stage equipment and tools will in a convenient, stable, and orderly manner. Store equipment at lowest potential energy. 1b. Roux employees should stay 5 feet from in-progress excavations and trenches. Should entry to an excavation be appropriate (when stabilization is complete), ladders must be employed for steep embankments, excavations, pits, and trenches.
	1c. **EXPOSURE:** Exposure to sun and excessive heat, possibly causing sunburn, heat exhaustion or heat stroke, Exposure to cold temperatures possibly causing cold stress. Skin burn as a result of fire if occurred. Exposure to explosive vapors due to tank farm operations, Biological hazards - ticks, bees/wasps, poison ivy, thorns, insects, etc.	1c. Wear sunscreen with an SPF 15 or greater whenever 30 minutes or more of exposure is expected. 1c. Use a tent to shade the work area from direct sunlight particularly when warm temperatures are also expected. 1c. Be aware of the location of all Site personnel. 1c. Watch for heat stress symptoms (muscle cramping, exhaustion, dizziness, rapid and shallow breathing). 1c. Watch for cold stress symptoms (severe shivering, slowing of body movement, weakness, stumbling or inability to walk, collapse). 1c. Take breaks for rest and water as necessary. Move to an area that is well shaded or an area with air conditioning (i.e., car, site trailer, etc.). Move to an area that is warm. 1c. No open flames/heat sources. 1c. Flame resistant clothing must be worn when specified by Site policy. 1c. Cell phones should be disabled when specified by Site policy. 1c. Pre-treat field clothing with Permethrin prior to site visit to kill/repel ticks and insects. 1c. Wear long sleeved shirts and tuck in (or tape) pant legs into socks or boots to prevent ticks from reaching skin. 1c. Spray insect repellant containing DEET on exposed skin when working in overgrown areas of the Site. 1c. Inspect area to avoid contact with biological hazards. 1c. Wear cut-resistant gloves when handling branches, shrubs, etc. that may lie within the walking path. 1c. Personnel shall examine themselves and co-worker's outer clothing for ticks periodically when onsite. 1c. If skin comes in contact with poison ivy, wash skin thoroughly with soap and water.

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[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
2. Collect Soil Sample	2a. **CONTACT:** Personal injury from pinch points, cuts, and abrasions from sampling equipment tools, and material within soil sample. Personal injury from contact with moving equipment while sampling.	2a. Wear cut-resistant (i.e., Kevlar) gloves under chemical-resistant disposable gloves when handling soil samples and sampling jars. 2a. Where possible, use trowel or equivalent tool to avoid contact with soil. 2a. If sampling from bucket of heavy equipment, ensure all equipment is off and operator utilizes the "show me your hands" policy. 2a. See 1a.
	2b. EXPOSURE: Exposure to contamination (impacted soil) and/or lab preservatives.	2b. Wear chemical-resistant disposable gloves over cut resistant gloves to protect hands when handling samples; use containment material or plastic sheeting to protect surrounding areas. 2b. When collecting soil sample from hand auger, put large zip lock bag over entire auger to prevent spillage of soil on to the ground. 2b. Open sample jars slowly and fill carefully to avoid contact with preservatives.
3. Decontaminate equipment	3a. **EXPOSURE/CONTACT:** Contamination (e.g., Separate Phase Hydrocarbons (SPH), contaminated vapors and/or soil).	3a. Wear chemical-resistant disposable gloves and safety glasses. 3a. Use an absorbent pad to clean spills. 3a. Properly dispose of used materials/PPE in provided drums in designated drum storage area.
	3b. **EXPOSURE:** Chemicals in cleaning solution including ammonia.	3b. Wear chemical-resistant disposable gloves and safety glasses. 3b. Work on the upwind side of decon area. 3b. Use an absorbent pad to clean spills. 3b. Properly dispose of used materials/PPE in provided drums in designated drum storage area.

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JOB SAFETY ANALYSIS	Ctrl. No. GEN-013	DATE: 12/31/2012	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY:	WORK TYPE	WORK ACTIVITY (Description)
GENERIC	**Gauging and Sampling**	**Soil Vapor Sampling (Permanent Monitoring Points)**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
Jeff Wills	Project Hydrogeologist	Curtis Taylor	SHSM
		Mike Ritorto	Project Hydrogeologist

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☐ AIR PURIFYING RESPIRATOR	☒ GLOVES: Cut-resistant & Nitriles
☒ HARD HAT	☐ FACE SHIELD	☐ SUPPLIED RESPIRATOR	☒ OTHER: Bug Spray, Sun Screen, Knee Pads or kneeling pad
☐ LIFELINE / BODY HARNESS	☐ HEARING PROTECTION	☒ PPE CLOTHING: Fluorescent reflective vest or high visibility clothing	
☒ SAFETY GLASSES	☒ SAFETY SHOES: Steel-toe boots		

REQUIRED AND / OR RECOMMENDED EQUIPMENT

9/16" Socket and Wrench, Non-Toxic Clay, Teflon-Lined Tubing, Masterflex Tubing, 3-Way Stopcock, Air Pump with Low Flow, Dry Cal, Enclosure (Bucket), Helium Gas Canister, Summa Canisters and Flow Controllers, MultiRae Gas Meters, CO2/O2 Meters, Helium Detector, Tubing Cutter, 42-inch Safety Cones, Caution Tape or Retractable Cone Bars

COMMITMENT TO LPS - All personnel onsite will actively participate in SPSA performance by verbalizing SPSAs throughout the day.

Exclusion Zone: Maintain a 5-Foot Exclusion Zone for Non-Essential Personnel

ACCESS [1]JOB STEPS	ANALYZE [2]POTENTIAL HAZARDS	ACT [3]CRITICAL ACTIONS
1. Define and secure work area.	1a. **FALL:** Potential tripping hazards.	1a. Ensure work area is secure and inform others (third party) of work activity. 1a. Remove tripping hazards and inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment.
	1b. **CONTACT:** Potential contact with moving vehicles or pedestrians.	1b. If working alongside roads, look both ways before entering roadways, face traffic, and utilize work vehicle to protect employees. 1b. Delineate work area (including vehicles) with traffic safety cones and caution tape or retractable cone bars. 1b. Maintain a 5 foot exclusion zone. 1b. Wear high visibility clothing or reflective safety vest.
	1c. **OVEREXERTION:** Muscle strain while lifting and carrying equipment.	1c. When carrying equipment to/from work area, keep back straight, lift with legs, keep load close to body, never reach with a load. Ensure that loads are balanced. Use mechanical assistance/make multiple trips to carry equipment.
2. Remove well cover / close well cover.	2a. **CONTACT/CAUGHT:** Pinch points and scrapes associated with hand tools and well covers.	2a. Keep hands away from pinch points. 2a. Use hand tools to remove and replace well covers. 2a. Wear cut-resistant gloves. 2a. Use knee pads or kneeling mat when repetitive kneeling on rough ground is anticipated.
	2b. **FALL:** Potential tripping hazards associated with installing bolts.	2b. Place security bolts in secure location so not to create tripping hazards. Replace security bolts so that they fit flush with monitoring well covers.
	2c. **OVEREXERTION:** Physical exertion to remove bolts that were over torque or stripped.	2c. Replace any security bolts that show signs of stripping. Do not over tighten. 2c. Use body positioning and bending techniques that minimize muscle strain; keep back straight, bend at the knees. 2c. See 2a.
3. Remove / replace brass caps at the end of the sample tubing.	3a. **CONTACT:** Pinch points associated with hand tools and brass caps.	3a. Use wrench to remove and replace brass caps. 3a. Wear cut-resistant gloves to protect against pinch points and scrapes.
	3b. **EXPOSURE:** Potential pathway for vapors to migrate to land surface.	3b. Replace brass caps immediately upon completion to avoid soil vapors migrating to the surface through sample tubing. 3b. Stand up wind of sample point location.

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ACCESS [1]JOB STEPS	ANALYZE [2]POTENTIAL HAZARDS	ACT [3]CRITICAL ACTIONS
4. Set up soil vapor sampling equipment and calibration of meters.	4a. **FALL:** Potential tripping hazards associated with equipment and tubing. 4b. **CONTACT:** Pinch points associated with handling equipment. 4c. **EXPOSURE:** Inhalation of calibration gas and helium.	4a. Place equipment in one area close to the sampling location. 4a. Keep tubing slack to a minimum and locate the summa canister as close to the sampling location as possible. 4a. Avoid stepping over equipment and tubing. 4b. Do not place fingers/hands under sampling equipment. 4b. Make multiple trips when unloading equipment in work area. 4b. Wear cut-resistant gloves to protect against pinch points while handling sampling equipment. 4c. Review MSDS for each type of calibration gas used before calibrating. 4c. Calibrate meters in a well vented area and keep air flow regulator away from face. 4c. Close valve on canisters after use to avoid inhalation of excess helium or calibration gas. 4c. Stand up wind of bucket during helium tracer gas test.
5. Screen sample tubing with multiple gas and CO_2/O_2 meters.	5a. **FALL:** Potential tripping hazards associated with equipment. 5b. **EXPOSURE:** Inhalation of soil vapor	5a. See 4a 5a. Identify area where equipment is to be stored within the work area (away from main walking path). 5a. Don't leave equipment on the ground. Return equipment to storage area between uses. 5b. See 3b. 5b. Use master flex to connect tubing to meter. 5b. Stand on opposite side of meter vent and upwind soil vapor point during screening activities.
6. Cleaning Work Area.	6a. **FALL:** Potential tripping hazards associated with equipment and tubing. 6b. **CONTACT:** Storing and transport of equipment in car.	6a. See 4a. 6a. See 5a. 6b. Ensure that equipment is placed securely in the vehicle. Do not stack equipment on top of each other. Secure equipment so that it will not slide while being transported. 6b. Wear cut-resistant gloves while handling/loading equipment.

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JOB SAFETY ANALYSIS	Cntrl#: GEN-015	DATE 7/3/13	☐NEW ☒REVISED	PAGE 1 of 2

JSA TYPE CATEGORY:	WORK TYPE:	WORK ACTIVITY (Description):	
GENERIC	**Drilling**	**Well Development**	
DEVELOPMENT TEAM	**POSITION / TITLE**	**REVIEWED BY:**	**POSITION / TITLE**
Amy Hoffman	Staff Geologist	Mike Ritorto	Project Hydrogeologist
		Curtis Taylor	SHSM

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☐ FACE SHIELD ☒ HEARING PROTECTION (as needed) ☒ SAFETY SHOES: Composite-toe or steel toe boots	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Fluorescent reflective vest or high visibility clothing	☒ GLOVES: Leather, Nitrile and cut resistant ☒ OTHER: Insect repellant, sunscreen (as needed)

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Required Equipment as needed: Truck Rig or support truck, Trailer, 42 inch Safety cones and flags, Caution Tape, Interface Probe, Power Source, Submercible Pump, Surge Block/Plunger, 20 lb. Fire Extinguisher, Holding Tanks and/or Buckets, Tools as needed: Socket and Pipe Wrench, Screw Driver, Pry Bar, Ratchet, Vault Key.

COMMITMENT TO LPS - All personnel onsite will actively participate in SPSA performance by verbalizing SPSAs throughout the day.

Maintain a 20 Foot Exclusion Zone During Development Activities

"SHOW ME YOUR HANDS"
Driller and helper should show that hands are clear from controls and moving parts

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Mobilization / Demobilization (**Review Mobilization and Demobilization JSA**)	1a. **CONTACT:** Equipment/property damage.	1a. The truck rig's tower/derrick will be lowered and secured prior to mobilization. 1a. Set-up the work area / position equipment in a manner that eliminates or reduces the need for backing of trucks and trailers. 1a. All non-essential personnel should **maintain an exclusion zone of 20 feet**. 1a. Beep horn twice before backing up. 1a. When backing up with an attached trailer use a spotter if there is tight clearance simultaneously on multiple sides of the equipment or if turning angles limit driver visibility. Stay away from the line-of-fire. 1a. Inspect the driving path for uneven terrain. Level or avoid if needed.
	1b. **FALL:** Slip/trip/fall hazards.	1b Inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment. 1b. Do not climb over stored materials/equipment; walk around. Store equipment at lowest potential energy.
2. Open/close well.	2a. **OVEREXERTION:** Muscle strain (some wells have large vault covers).	2a. Keep back straight, lift with legs, keep load close to body, and never reach with a load. Ensure that loads are balanced to reduce the potential for muscle strain. Two people are required when lifting objects over 50 lbs or when the shape makes the object difficult to lift.
	2b. **CAUGHT:** Pinch points associated with removing/replacing manholes and working with hand tools.	2b. Wear leather gloves when working with well vault/cover and hand tools. Do not put fingers under well vault/cover. 2b. Use ratchet and pry bar for well cover and inspect before use.
	2c. **EXPOSURE:** Potentially hazardous vapors.	2c. No open flames/heat sources. 2c. Allow well to vent after opening it and before starting development activities to minimize exposure to vapors. Air monitoring must be performed prior to set up and during the well development activities. Work on upwind side of well.
	2d. **CONTACT:** Traffic.	2d. Wear required PPE including high visibility clothing or reflective vest. 2d. Delineate work area with 42" safety cones and/or other barriers. Position vehicle to protect against oncoming traffic. 2d. Face traffic, maintain eye contact with oncoming vehicles, and establish a safe exit route.

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
3. Develop well (mechanical surging).	3a. **CAUGHT:** Cut hazards and finger pinch points. 3b. **CONTACT/EXPOSURE:** Contamination (e.g., SPH, contaminated groundwater, vapors). 3c. **OVEREXERTION:** Muscle strain from lifting equipment. 3d. **CONTACT:** Injury while handling wench line/cable, or with active surging equipment	3a See 2b. 3a. Use required PPE including leather/cut-resistant gloves when handling development equipment. Identify finger/hand pinch points. Keep hands away from active surge equipment. 3a. All non-essential personnel should **maintain an exclusion zone of 20 feet**. 3b. See 2c. 3b. Wear Nitrile gloves and safety glasses. Insert and remove surge block/plunger and line/cable slowly to avoid splashing at the surface. 3b. Use an absorbent pad to clean any spills. 3c. See 2a. 3c. Use mechanical device to insert and remove surge block/plunger if greater than 50lb. 3d. If using a drill rig, inspect all wench lines/cables for any kinks or if frayed prior to use. Replace any damaged lines/cables. Review **Drill Rig checklist prior to development activities**. . 3d. See 3a.
4. Purging well (pumping water to holding tanks/drums/buckets).	4a. **CAUGHT:** Pinch points associated with connecting hose to tank. Pinch points associated with handling pump and hoses. 4b. **FALL:** Using side mounted ladder when attaching hose to tank. Slip, trip, fall from lines/hoses 4c. **CONTACT:** Contamination (e.g., SPH, contaminated groundwater). 4d. **EXERTION:** Muscle strain from lifting/carrying equipment. 4e.**FALL:** Spilled purge water.	4a. See 3a. 4a. Ensure that fingers are not placed near coupling when attaching and securing hose(s). Do not place fingers under pump/hoses. Wear leather or cut-resistant gloves when handling pump/hose(s). 4a. Keep hands clear from any line of fire. 4b. Inspect ladder steps make sure steps are not bent/damaged and free of debris/fluid. 4b. Use three points of contact at all times when using ladder. 4b. Utilize anti-whip cords on all compressed hoses. Keep hoses and lines coiled and organized out of designated walking paths around the work zone. 4c. Secure water hose. 4c. Do not overfill tanks, and purge/transfer liquids in such a manner that they do not splash. (See 3b). 4c. Dispose of used materials/PPE in the designated impacted PPE container. 4d. Use lifting techniques to minimize muscle strain when carrying equipment. When possible, use mechanic means to lift equipment. 4d. Use two people to lift any equipment or material that is over 50 lbs. 4e. Clean up any spills using absorbent pads or spill kits.
5. Decontaminate equipment	5a. **CONTACT/EXPOSURE:** Contamination (e.g., SPH, contaminated groundwater, vapors). 5b. **EXPOSURE/CONTACT:** Chemicals in cleaning solution	5a. See 3b. 5b. Decontaminate equipment in well-ventilated area. Wear nitrile gloves to avoid skin contact with cleaning solutions.

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JOB SAFETY ANALYSIS	Ctrl. No. GEN-001	DATE: 12/5/12	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
Generic	**Construction - Excavation**	**Excavation / Trenching**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
Ian Holst	Staff Engineer	Curtis Taylor	Health and Safety Officer
		Michael Ritorto	Project Hydrogeologist

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☐ AIR PURIFYING RESPIRATOR	☒ GLOVES: Leather or cut resistant
☒ HARD HAT	☐ FACE SHIELD	☐ SUPPLIED RESPIRATOR	☐ OTHER
☒ LONG SLEEVED SHIRT	☒ HEARING PROTECTION	☒ PPE CLOTHING: Fluorescent reflective vest or high visibility long sleeved clothing	
☐ LIFELINE / BODY HARNESS	☒ SAFETY SHOES: Steel-toe boots		
☒ SAFETY GLASSES			

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Jackhammer, Excavator, Hand Tools, Photoionization Detector, barrels, cones, caution tape, ladders, shovels, digging bars , power tools (cut off saw)

Commitment to LPS – All personnel onsite will actively participate in SPSA performance by verbalizing SPSAs throughout the day.

EXCLUSION ZONE: Maintain 10' or greater exclusion zone around excavator while it is in motion.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Pre-Clearance Protocol.	1a. **CONTACT:** Damage to underground utility.	1a. Confirm that (if applicable) "Call Before You Dig" and local utility companies were contacted prior to trenching in order to confirm utility mark outs. Must have a case # before digging.
	1b. **ENERGY SOURCE/CONTACT:** Property damage; Pressurized water mains. Pressurized gas mains. Sewer lines. Underground electric.	1b. Pre-clearing of the trenching location must be conducted to a minimum of 4 vertical feet below the ground surface (8 feet minimum for Critical Zone) using hand tools (shovel and non-metallic dig bar) prior to trenching. Supervisor should be contacted to discuss appropriate pre-clearing depth. Complete subsurface clearance checklist.
	1c. **FALL:** Slip ,Trip or Fall.	1c. Be aware of the conditions when walking, or loading equipment and working. Walk within established pathway avoiding uneven surfaces. Remove potential slip/trip/fall hazards.
2. Set up work zone.	2a. **CONTACT/CAUGHT:** Injury from equipment.	2a. Isolate work area from hazards with cones, barricades, and caution tape. Utilize a flag person when necessary (i.e., third party traffic in area). Install traffic signs in roadways and for detours. Spotters will maintain and enforce exclusion zone.
	2b. **FALL:** Slip ,Trip or Fall.	2b. See 1c.

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[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
3. Trenching Activity.	3a. **CONTACT:** Injury due to contact with machine. 3b. **FALL:** Slip ,Trip or Fall. 3c. **EXPOSURE:** Noise, Dust, Concrete- Asphalt, petroleum hydrocarbon vapors.	3a. Spotter(s) required for all heavy equipment operation. No worker shall be allowed inside the exclusion zone or along the trench/excavation area while any equipment is digging. A minimum exclusion zone greater than the length of the equipment boom must be established. Workers only allowed in exclusion zone if the operator is in "Hands Off "mode. Operator will not operate equipment until worker is out of exclusion zone. 3b. Any trench/excavation deeper than 4' must have a ladder within 25' of any worker in the excavation. At least 3' (rungs) shall be above the top of the excavation. All spoil piles shall be maintained 2' minimum from edge of excavation. 3c. Air monitoring using a calibrated photoionization detector (PID) will be used to monitor the breathing zone of the work area. If a reading of >5ppm is recorded, the oversight personnel must temporarily cease work, instruct all Site personnel to step away from the area of elevated readings.
4. Setting Trench protections if necessary.	4a. **CAUGHT:** Injury due to contact with failed trench. 4b. **CONTACT/CAUGHT:** Injury due rigging activities and entering exclusion zone during lifting and/or transport of shoring box/material. 4c. **FALL:** Possible injury due to fall into excavation.	4a. To prevent cave-ins and avoid caught by/between, excavations over 5' in depth shall have engineer approved shoring, sheeting or digging box. Top of protection shall be at least 2' above top of excavation. 4b. Use only inspected rigging with 2, 3 or 4 lift points; wear cut-resistant gloves. Rigging to be hooked up to factory installed hook up points on equipment. Control load with non-conductive tag lines with workers out of exclusion zone. Don't stand underneath suspended load; wear steel toed boots and hard hat. 4c. Shoring to be set and sides will be backfilled to avoid fall hazards before workers allowed to enter area. Operator will be in "HANDS OFF" mode before workers enter work area to unhook rigging. An inspected ladder set 3' above top of shoring will be used to enter and exit shoring. Workers will use three points of contact when using ladder.
5. Secure/Leave Site. **If backfilling, see excavation backfilling and compaction JSA for potential hazards and critical actions.**	5a. **FALL:** Potential Slip ,Trip or Fall hazards.	5a. See 1c. All open excavations must be backfilled or secured prior to departure with steel plates, orange construction fence or temporary chain link fencing.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.

[2] A hazard is a potential danger. Break hazards into five types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards; Energy source – electricity, pressure, compression/tension.

[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

JOB SAFETY ANALYSIS	Ctrl. No. GEN-002	DATE 12/5/2012	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
GENERIC	**Construction - Excavation**	**Backfilling Excavation & Compaction**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
David Kaiser		Curtis Taylor	Health and Safety Officer - Roux
		Michael Ritorto	Project Hydrogeologist - Roux

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☒ AIR PURIFYING RESPIRATOR	☒ GLOVES: Leather/ cut-resistant
☒ HARD HAT	☐ FACE SHIELD	☐ SUPPLIED RESPIRATOR	☐ OTHER ____
☐ LIFELINE / BODY HARNESS	☒ HEARING PROTECTION	☒ PPE CLOTHING: Long Sleeved shirt and reflective safety	
☒ SAFETY GLASSES	☒ SAFETY SHOES Steel-toe boots		

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Payloader, Backhoe, Dump Trucks, Mechanical gas powered tampers, Excavator with hydraulic tamper. APR when tamping if dust present.

COMMITMENT TO LPS - All personnel onsite will actively participate in SPSA performance by verbalizing SPSAs throughout the day.

EXCLUSION ZONE: A 10' minimum exclusion zone will be maintained around excavator, backhoe, tampers, and dump trucks.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Secure work area.	1a. **CONTACT:** Potential for personnel to enter the work area.	1a. Ensure work area is secure and inform others of work activity. Establish a work zone using 42" traffic cones, barrels & caution tape. Use of flag persons to minimize motorist confusion during set-up of new traffic pattern.
	Potential for equipment to contact personnel.	1a. Dump Truck/Excavator/Payloader/Backhoe equipment to be set-up by personnel who are familiar with machinery. Spotters shall be in place for all equipment. Truck wheels are chocked when driver is not in truck and engine shut off. Personnel shall stay out of the exclusion zone (10' minimum or greater than the equipment boom) while equipment is maneuvering.
	1b. **EXERTION:** Potential for muscle strain while installing traffic cones and barrels	1b. Keep back straight, keep load close to the body and bend knees while lifting and working. If over 50 lbs., use 2 or more laborers for lifting or use of equipment.
2. Backfilling excavation, and & compaction	2a. CONTACT: Traffic and live equipment.	2a. Equipment and trucks shall be isolated from other workers, subcontractors and third party traffic with cones, barricades, caution tape, and/or Jersey barriers. Spotters shall direct dump truck for placement of fill near excavation. Payloader, as directed by spotter, shall move fill into trench where it shall be placed in layers and compacted by mechanical means. 2a. Spotters will wear florescent vests at all times. 2a. Spotters will remain out of the line of fire from equipment and third party vehicles.
	2b. EXPOSURE: Fumes from gas powered tamper.	2b. Fueling will be done outside of work area in a well vented area. Refueling will be done only after a 2 minute cool down.
	2c. FALL: Slips, trips, fall hazards.	2c. Work area will be clean and free of any debris to remove slip, trip and fall hazards. All tools will be kept in designated areas. Insure work area is well illuminated. 2c. Workers should only be working in areas that have been leveled with a machine.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.

[2] A hazard is a potential danger. Break hazards into five types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards; Energy Source – electricity, pressure, compression/tension.

[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
2. Backfilling, excavation, and compaction (Continued).	2d. **OVEREXERTION:** Muscle strain. 2e. **EXPOSURE:** Noise from tamper.	2d. Keep knees bent and back straight while maneuvering tamper. Utilize a co-worker to avoid staining muscles. 2e. Workers will wear hearing protection during compaction tamper activities.
3. Secure/leave site.	3a. **FALL:** Slip, trip, fall	3a. Clear work area of all debris and store all equipment in designated areas/containers before opening up to traffic.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.

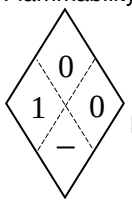
[2] A hazard is a potential danger. Break hazards into five types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards; Energy Source – electricity, pressure, compression/tension.

[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

Approved: April 4, 2012

NFPA

Flammability



Health Reactivity

0 = Minimal Hazard
4 = Severe Hazard

MATERIAL SAFETY DATA SHEET* (MSDS)
International Products Corporation

MICRO-90®

CONCENTRATED CLEANING SOLUTION

HMIS

Health – 1
Flammability – 0
Physical Hazards – 0
Personal Protection – B

0 = Minimal Hazard
4 = Severe Hazard
B = Safety Glasses & Gloves

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME.....MICRO-90®
CHEMICAL FAMILY.....Mixture
CHEMICAL USE.....Concentrated Cleaning Solution
ISSUE DATE OF MSDS.....April 4, 2012

MANUFACTURER:

International Products Corporation
201 Connecticut Drive
Burlington, NJ 08016, USA
Tel: (609) 386-8770
Fax: (609) 386-8438
mkt@ipcol.com

UK BRANCH:
Unit 5, Green Lane Bus. Park
238 Green Lane
London, SE9 3TL, United Kingdom
Tel: 020 – 8857-5678
Fax: 020 – 8857-1313
saleseurope@ipcol.com

EMERGENCY TELEPHONES:

Transportation:
CHEMTREC
(800) 424-9300
(Calls within USA & Canada)

(703) 527-3887
(Calls from outside the USA)

Non-transportation:
Tel: (609) 386-8770
Fax: (609) 386-8438

2. COMPOSITION / INFORMATION ON INGREDIENTS

Contains water, builders, and surfactants.

This MSDS contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and available for employees and other users of the product.

3. HAZARDS IDENTIFICATION

* *

EMERGENCY OVERVIEW

Pale yellow aqueous solution with a slight ammonia odor. Nonflammable aqueous solution. NFPA rating of zero. No immediate hazards associated with the product.

* *

POTENTIAL HEALTH EFFECTS

EYE CONTACT..... Prolonged or repeated contact may cause irritation.

SKIN CONTACT ..... Prolonged or repeated contact may cause irritation.

INHALATION ..... Prolonged or repeated contact may cause irritation.

INGESTION..... No hazard in normal industrial use.

CARCINOGENICITY:

NTP ..... No ingredients are listed.
IARC ..... No ingredients are listed.
OSHA..... No ingredients are listed.

CHRONIC EFFECTS . Not determined.

TARGET ORGANS.... Not determined.

SIGNS AND SYMPTOMS..... Eye and skin irritation (redness or swelling)

* *

POTENTIAL ENVIRONMENTAL EFFECTS

None known.

4. FIRST AID MEASURES

EYE CONTACT ..... Immediately flush eyes with plenty of water. Get medical attention if irritation develops or persists.

SKIN CONTACT..... Remove contaminated clothing. Wash skin with soap and water. Get medical attention if irritation develops or persists.

INHALATION..... If exposed to excessive levels of fumes, remove to fresh air and get medical attention if cough or other symptoms develop.

INGESTION ..... No specific treatment is necessary since this material is unlikely to be hazardous by ingestion. Call physician if pain or discomfort develops.

5. FIRE FIGHTING MEASURES

Nonflammable aqueous cleaner.

FLASH POINT..... None.

LFL ..... Not applicable.

UFL..... Not applicable.

EXTINGUISHING MEDIA..... Use alcohol foam, carbon dioxide, or water spray to extinguish flames.

FIRE FIGHTING INSTRUCTION..... As in any fire, wear self-contained breathing apparatus, pressure-demand MSHA/NIOSH (approved or equivalent) and full protective gear. Water runoff may cause environmental damage. Dike and collect water used to fight fire.

6. ACCIDENTAL RELEASE MEASURES

Clean up spills immediately, observing precautions in Section 8 Personal Protection. Absorb spill with inert material (e.g., dry sand or earth), then place in a chemical waste container.

7. HANDLING AND STORAGE

HANDLING..... Avoid contact with eyes, skin and clothing. Use in a well-ventilated area.

STORAGE..... Store in a cool place in original container and protect from sunlight. Keep container closed when not in use. Use only stainless steel, polyethylene or plastic-lined containers for handling. Do not store in contact with aluminum, zinc, copper or their alloys.

SHELF LIFE ..... Five years from date of manufacture when stored in original sealed container at recommended storage temperature range.

STORAGE TEMPERATURE..... 5–43°C (41–110°F)

*ANSI Z400.1-1998 format

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

ENGINEERING CONTROLS.....Good general ventilation should be sufficient to control airborne levels.

RESPIRATORY PROTECTION .....For most situations, no respiratory protection should be needed.

SKIN PROTECTION .....Wear nitrile or neoprene gloves.

EYE PROTECTION .....Wear safety glasses with side shields (or goggles). Contact lenses should not be worn.

GENERAL HYGIENE CONSIDERATIONS .....There are no known health hazards associated with this material when used as recommended. The following general hygiene considerations are recognized as common, good industrial hygiene practices:

- Wash hands after use and before eating.
- Avoid breathing vapors.
- Wear safety glasses and gloves.

* *

EXPOSURE LIMITS .....Not established for product as whole.

Ingredients	CAS #	ACGIH

None established for individual components.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE .....Clear, colorless to pale yellow solution.

ODOR.....Ammonia odor.

pH (neat).....ca. 9.5

BOILING POINT .....ca. 100°C (212°F)

FREEZING POINT .....ca. -8°C (18°F)

SOLUBILITY IN WATER .....Complete

SPECIFIC GRAVITY (water = 1).....1.135@25°C

10. STABILITY AND REACTIVITY

STABILITY .....Stable liquid.

HAZARDOUS POLYMERIZATION.....Will not occur.

INCOMPATIBILITIES.....May etch aluminum, zinc, copper, and its alloys. May craze acrylic and polycarbonate if not wiped or rinsed off. Do not mix with other cleaners. Mixing with chlorine-based cleaners may produce toxic gases.

DECOMPOSITION PRODUCTS .....Not determined.

11. TOXICOLOGICAL INFORMATION

Eye: Irritant per USA-FHSA criteria.
Not an Irritant per OECD Guideline No. 405.

Skin: Not an irritant per USA-FHSA criteria.
Not an irritant per OECD Guideline No. 404.

Oral: LD_{50} is greater than 5g/kg (rats).

12. ECOLOGICAL INFORMATION

Contains no CFCs, ODCs, phosphates, silicates, borates, halogens, or phenols.

13. DISPOSAL CONSIDERATIONS

MICRO-90® Concentrated Cleaning Solution is not considered a hazardous waste under Federal Hazardous Waste Regulations 40 CFR 261. Please be advised, however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

(Note: Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate.)

14. TRANSPORTATION INFORMATION

A. USA

D.O.T. SHIPPING .....Not regulated.

TECHNICAL SHIPPING NAME .....Liquid Detergent

D.O.T. LABEL .....None.

D.O.T. PLACARD (non-bulk) .....None.

FREIGHT CLASS PACKAGE .....Class 55 — Liquid detergent

PRODUCT LABEL .....Concentrated Cleaning Solution

B. CANADA: TDG .....Not regulated.

C. ENGLAND: APPROVED CARRIAGE LIST .....Not regulated.

15. REGULATORY INFORMATION

A. USA

TSCA STATUS ..... All ingredients are listed on the TSCA inventory.

SARA TITLE III, 302/303 EHS..... None.

SARA TITLE III, 304, HS ..... None.

SARA TITLE III, 313 ..... None.

B. CANADA

DSL ..... All ingredients are listed on the Domestic Substance List.

WHMIS Classification..... Not controlled.

C. EC

EINECS ..... All ingredients are listed.

RoHS Directive ..... MICRO-90® does not contain any ingredients listed in 2002/95/EC.

REACH Directive..... All ingredients comply with EC 1907/2006.

D. CHIPS ..... Not a significant eye irritant. Not a skin irritant.

All ingredients are also listed on the following inventories: Australia (AICS), Korea (ECL), Japan (ENCS), China (EICS), and Philippines (PICCS).

16. STATE REGULATORY INFORMATION

For details on specific requirements, you should contact the appropriate agency in your state.

17. OTHER INFORMATION

PREPARED BY.....K. Wyrofsky, President

APPROVED BY.....T. McGuckin, V.P. of Research, Quality & Safety

APPROVAL DATE .....April 4, 2012

NOTE: All data presented here are for the full-strength product, unless otherwise noted. However, recommended usage is as a 1-2% w/w solution in water.

While International Products Corporation believes the information contained herein to be true and accurate, it has relied on information provided by others. International Products Corporation makes no warranties, express or implied, as to the accuracy or adequacy of the information contained herein or with respect to the results to be obtained from the use of the product. International Products Corporation disclaims all liability with respect to the use of this product, including without limitation, liability for injury to the user or third-party persons.

MATERIAL SAFETY DATA SHEET

ALCONOX®

Prepared to U.S. OSHA, CMA, ANSI, Canadian WHMIS, Australian WorkSafe, Japanese Industrial Standard JIS Z 7250:2000, and European Union REACH Regulations

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:	**ALCONOX®**
CHEMICAL FAMILY NAME:	Detergent.
PRODUCT USE:	Critical-cleaning detergent for laboratory, healthcare and industrial applications
U.N. NUMBER:	Not Applicable
U.N. DANGEROUS GOODS CLASS:	Non-Regulated Material
SUPPLIER/MANUFACTURER'S NAME:	Alconox, Inc.
ADDRESS:	30 Glenn St., Suite 309, White Plains, NY 10603. USA
EMERGENCY PHONE:	**TOLL-FREE in USA/Canada** 800-255-3924
	International calls 813-248-0585
BUSINESS PHONE:	914-948-4040
DATE OF PREPARATION:	May 2011
DATE OF LAST REVISION:	February 2008

SECTION 2 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: This product is a white granular powder with little or no odor. Exposure can be irritating to eyes, respiratory system and skin. It is a non-flammable solid. The Environmental effects of this product have not been investigated.

US DOT SYMBOLS

Non-Regulated

CANADA (WHMIS) SYMBOLS

EUROPEAN and (GHS) Hazard Symbols

Signal Word: **Warning!**

EU LABELING AND CLASSIFICATION:

Classification of the substance or mixture according to Regulation (EC) No1272/2008 Annex 1
EC# 205-633-8 This substance is not classified in the Annex I of Directive 67/548/EEC
EC# 268-356-1 This substance is not classified in the Annex I of Directive 67/548/EEC
EC# 231-838-7 This substance is not classified in the Annex I of Directive 67/548/EEC
EC# 231-767-1 This substance is not classified in the Annex I of Directive 67/548/EEC
EC# 207-638-8 Index# 011-005-00-2
EC# 205-788-1 This substance is not classified in the Annex I of Directive 67/548/EEC

GHS Hazard Classification(s):

Eye Irritant Category 2A

Hazard Statement(s):

H319: Causes serious eye irritation

Precautionary Statement(s):

P260: Do not breath dust/fume/gas/mist/vapors/spray
P264: Wash hands thoroughly after handling
P271: Use only in well ventilated area.
P280: Wear protective gloves/protective clothing/eye protection/face protection/

Hazard Symbol(s):

[Xi] Irritant

Risk Phrases:
R20: Harmful by inhalation
R36/37/38: Irritating to eyes, respiratory system and skin

Safety Phrases:
S8: Keep container dry
S22: Do not breath dust
S24/25: Avoid contact with skin and eyes

HEALTH HAZARDS OR RISKS FROM EXPOSURE:

ACUTE: Exposure to this product may cause irritation of the eyes, respiratory system and skin. Ingestion may cause gastrointestinal irritation including pain, vomiting or diarrhea.

CHRONIC: This product contains an ingredient which may be corrosive.

TARGET ORGANS: ACUTE: Eye, respiratory System, Skin CHRONIC: None Known

SECTION 3 - COMPOSITION and INFORMATION ON INGREDIENTS

HAZARDOUS INGREDIENTS:	CAS #	EINECS #	ICSC #	WT %	HAZARD CLASSIFICATION; RISK PHRASES
Sodium Bicarbonate	144-55-8	205-633-8	1044	33 - 43%	HAZARD CLASSIFICATION: None RISK PHRASES: None
Sodium (C10 – C16) Alkylbenzene Sulfonate	68081-81-2	268-356-1	Not Listed	10 – 20%	HAZARD CLASSIFICATION: None RISK PHRASES: None
Sodium Tripolyphosphate	7758-29-4	231-838-7	1469	5 - 15%	HAZARD CLASSIFICATION: None RISK PHRASES: None
Tetrasodium Pyrophosphate	7722-88-5	231-767-1	1140	5 - 15%	HAZARD CLASSIFICATION: None RISK PHRASES: None
Sodium Carbonate	497-19-8	207-638-8	1135	1 - 10%	HAZARD CLASSIFICATION: [Xi] Irritant RISK PHRASES: R36
Sodium Alcohol Sulfate	151-21-3	205-788-1	0502	1 – 5%	HAZARD CLASSIFICATION: None RISK PHRASES: None
Balance of other ingredients are non-hazardous or less than 1% in concentration (or 0.1% for carcinogens, reproductive toxins, or respiratory sensitizers).					

NOTE: ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-2004 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR, EU Directives and the Japanese Industrial Standard *JIS Z 7250: 2000*.

SECTION 4 - FIRST-AID MEASURES

Contaminated individuals of chemical exposure must be taken for medical attention if any adverse effect occurs. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to health professional with contaminated individual.

EYE CONTACT: If product enters the eyes, open eyes while under gentle running water for at least 15 minutes. Seek medical attention if irritation persists.

SKIN CONTACT: Wash skin thoroughly after handling. Seek medical attention if irritation develops and persists. Remove contaminated clothing. Launder before re-use.

INHALATION: If breathing becomes difficult, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Seek medical attention if breathing dificulty continues.

INGESTION: If product is swallowed, call physician or poison control center for most current information. If professional advice is not available, do not induce vomiting. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or who cannot swallow. Seek medical advice. Take a copy of the label and/or MSDS with the victim to the health professional.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing skin, or eye problems may be aggravated by prolonged contact.

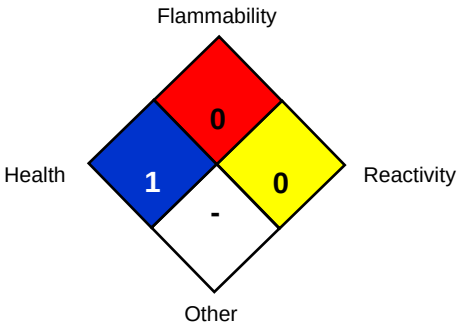
RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and reduce over-exposure.

SECTION 5 - FIRE-FIGHTING MEASURES

FLASH POINT: Not Flammable
AUTOIGNITION TEMPERATURE: Not Applicable
FLAMMABLE LIMITS (in air by volume, %): Lower (LEL): NA Upper (UEL): NA
FIRE EXTINGUISHING MATERIALS: As appropriate for surrounding fire. Carbon dioxide, foam, dry chemical, halon, or water spray.

UNUSUAL FIRE AND EXPLOSION HAZARDS: This product is non-flammable and has no known explosion hazards.
Explosion Sensitivity to Mechanical Impact: Not Sensitive.
Explosion Sensitivity to Static Discharge: Not Sensitive
SPECIAL FIRE-FIGHTING PROCEDURES: Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Isolate materials not yet involved in the fire and protect personnel. Move containers from fire area if this can be done without risk; otherwise, cool with carefully applied water spray. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.

NFPA RATING SYSTEM



HMIS RATING SYSTEM

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

HEALTH HAZARD (BLUE)	1
FLAMMABILITY HAZARD (RED)	0
PHYSICAL HAZARD (YELLOW)	0

PROTECTIVE EQUIPMENT			
EYES	RESPIRATORY	HANDS	BODY
	See Sect 8		See Sect 8

For Routine Industrial Use and Handling Applications

Hazard Scale: **0** = Minimal **1** = Slight **2** = Moderate **3** = Serious **4** = Severe * = Chronic hazard

SECTION 6 - ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Personnel should be trained for spill response operations.
SPILLS: Contain spill if safe to do so. Prevent entry into drains, sewers, and other waterways. Sweep, shovel or vacuum spilled material and place in an appropriate container for re-use or disposal. Avoid dust generation if possible. Dispose of in accordance with applicable Federal, State, and local procedures (see Section 13, Disposal Considerations).

SECTION 7 - HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat, drink, smoke, or apply cosmetics while handling this product. Avoid breathing dusts generated by this product. Use in a well-ventilated location. Remove contaminated clothing immediately.

STORAGE AND HANDLING PRACTICES: Containers of this product must be properly labeled. Store containers in a cool, dry location. Keep container tightly closed when not in use. Store away from strong acids or oxidizers.

SECTION 8 - EXPOSURE CONTROLS - PERSONAL PROTECTION

EXPOSURE LIMITS/GUIDELINES:

Chemical Name	CAS#	ACGIH TWA	OSHA TWA	SWA
Sodium Bicarbonate	144-55-8	10 mg/m³ Total Dust	15 mg/m³ Total Dust	10 mg/m³ Total Dust
Sodium (C10 – C16) Alkylbenzene Sulfonate	68081-81-2	10 mg/m³ Total Dust	15 mg/m³ Total Dust	10 mg/m³ Total Dust
Sodium Tripolyphosphate	7758-29-4	10 mg/m³ Total Dust	15 mg/m³ Total Dust	10 mg/m³ Total Dust
Tetrasodium Pyrophosphate	7722-88-5	5 mg/m³	5 mg/m³	5 mg/m³
Sodium Carbonate	497-19-8	10 mg/m³ Total Dust	15 mg/m³ Total Dust	10 mg/m³ Total Dust
Sodium Alcohol Sulfate	151-21-3	10 mg/m³ Total Dust	15 mg/m³ Total Dust	10 mg/m³ Total Dust

Currently, International exposure limits are not established for the components of this product. Please check with competent authority in each country for the most recent limits in place.

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to ensure exposure levels are maintained below the limits provided below. Use local exhaust ventilation to control airborne dust. Ensure eyewash/safety shower stations are available near areas where this product is used.

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132) or equivalent standard of Canada, or standards of EU member states (including EN 149 for respiratory PPE, and EN 166 for face/eye protection), and those of Japan. Please reference applicable regulations and standards for relevant details.

RESPIRATORY PROTECTION: Based on test data, exposure limits should not be exceeded under normal use conditions when using Alconox Detergent. Maintain airborne contaminant concentrations below guidelines listed above, if applicable. If necessary, use only respiratory protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), equivalent U.S. State standards, Canadian CSA Standard Z94.4-93, the European Standard EN149, or EU member states.

EYE PROTECTION: Safety glasses. If necessary, refer to U.S. OSHA 29 CFR 1910.133 or appropriate Canadian Standards.

HAND PROTECTION: Use chemical resistant gloves to prevent skin contact.. If necessary, refer to U.S. OSHA 29 CFR 1910.138 or appropriate Standards of Canada.

BODY PROTECTION: Use body protection appropriate to prevent contact (e.g. lab coat, overalls). If necessary, refer to appropriate Standards of Canada, or appropriate Standards of the EU, Australian Standards, or relevant Japanese Standards.

SECTION 9 - PHYSICAL and CHEMICAL PROPERTIES

PHYSICAL STATE:	Solid
APPEARANCE & ODOR:	White granular powder with little or no odor.
ODOR THRESHOLD (PPM):	Not Available
VAPOR PRESSURE (mmHg):	Not Applicable
VAPOR DENSITY (AIR=1):	Not Applicable.
BY WEIGHT:	Not Available
EVAPORATION RATE (nBuAc = 1):	Not Applicable.
BOILING POINT (C°):	Not Applicable.
FREEZING POINT (C°):	Not Applicable.
pH:	9.5 (1% aqueous solution)
SPECIFIC GRAVITY 20°C: (WATER =1)	0.85 – 1.1
SOLUBILITY IN WATER (%)	>10% w/w
COEFFICIENT OF WATER/OIL DIST.:	Not Available
VOC:	None
CHEMICAL FAMILY:	Detergent

SECTION 10 - STABILITY and REACTIVITY

STABILITY: Product is stable
DECOMPOSITION PRODUCTS: When heated to decomposition this product produces Oxides of carbon (COx)
MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Strong acids and strong oxidizing agents.
HAZARDOUS POLYMERIZATION: Will not occur.
CONDITIONS TO AVOID: Contact with incompatible materials and dust generation.

SECTION 11 - TOXICOLOGICAL INFORMATION

TOXICITY DATA: Toxicity data is available for mixture:

CAS# 497-19-8 LD50 Oral (Rat)	4090 mg/kg
CAS# 497-19-8 LD50 Oral (Mouse)	6600 mg/kg
CAS# 497-19-8 LC50 Inhalation (Rat)	2300 mg/m³ 2H
CAS# 497-19-8 LC50 Inhalation (Mouse)	1200 mg/m³ 2H
CAS# 7758-29-4 LD50 Oral (Rat)	3120 mg/kg
CAS# 7758-29-4 LD50 Oral (Mouse)	3100 mg/kg
CAS# 7722-88-5 LD50 Oral (Rat)	4000 mg/kg

SUSPECTED CANCER AGENT: None of the ingredients are found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, IARC and therefore is not considered to be, nor suspected to be a cancer-causing agent by these agencies.
IRRITANCY OF PRODUCT: Contact with this product can be irritating to exposed skin, eyes and respiratory system.
SENSITIZATION OF PRODUCT: This product is not considered a sensitizer.
REPRODUCTIVE TOXICITY INFORMATION: No information concerning the effects of this product and its components on the human reproductive system.

SECTION 12 - ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.
ENVIRONMENTAL STABILITY: No Data available at this time.
EFFECT OF MATERIAL ON PLANTS or ANIMALS: No evidence is currently available on this product's effects on plants or animals.

EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence is currently available on this product's effects on aquatic life.

SECTION 13 - DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations, those of Canada, Australia, EU Member States and Japan.

SECTION 14 - TRANSPORTATION INFORMATION

US DOT; IATA; IMO; ADR:

THIS PRODUCT IS NOT HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.
PROPER SHIPPING NAME: Non-Regulated Material
HAZARD CLASS NUMBER and DESCRIPTION: Not Applicable
UN IDENTIFICATION NUMBER: Not Applicable
PACKING GROUP: Not Applicable.
DOT LABEL(S) REQUIRED: Not Applicable
NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2004): Not Applicable
MARINE POLLUTANT: None of the ingredients are classified by the DOT as a Marine Pollutant (as defined by 49 CFR 172.101, Appendix B)

U.S. DEPARTMENT OF TRANSPORTATION (DOT) SHIPPING REGULATIONS:
This product is not classified as dangerous goods, per U.S. DOT regulations, under 49 CFR 172.101.

TRANSPORT CANADA, TRANSPORTATION OF DANGEROUS GOODS REGULATIONS:
This product is not classified as Dangerous Goods, per regulations of Transport Canada.

INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA):
This product is not classified as Dangerous Goods, by rules of IATA:

INTERNATIONAL MARITIME ORGANIZATION (IMO) DESIGNATION:
This product is not classified as Dangerous Goods by the International Maritime Organization.

EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR):

This product is not classified by the United Nations Economic Commission for Europe to be dangerous goods.

SECTION 15 - REGULATORY INFORMATION

UNITED STATES REGULATIONS

SARA REPORTING REQUIREMENTS: This product is not subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act., as follows: None

TSCA: All components in this product are listed on the US Toxic Substances Control Act (TSCA) inventory of chemicals.

SARA 311/312:

Acute Health: Yes Chronic Health: No Fire: No Reactivity: No

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for this product. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lb (4,540 kg) may apply, per 40 CFR 370.20.

U.S. CERCLA REPORTABLE QUANTITY (RQ): None

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): None of the ingredients are on the California Proposition 65 lists.

CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: All of the components of this product are on the DSL Inventory

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: No component of this product is on the CEPA First Priorities Substance Lists.

CANADIAN WHMIS CLASSIFICATION and SYMBOLS: This product is categorized as a Controlled Product, Hazard Class D2B as per the Controlled Product Regulations

EUROPEAN ECONOMIC COMMUNITY INFORMATION:

EU LABELING AND CLASSIFICATION:

Classification of the mixture according to Regulation (EC) No1272/2008. See section 2 for details.

AUSTRALIAN INFORMATION FOR PRODUCT:

AUSTRALIAN INVENTORY OF CHEMICAL SUBSTANCES (AICS) STATUS: All components of this product are listed on the AICS.

STANDARD FOR THE UNIFORM SCHEDULING OF DRUGS AND POISONS: Not applicable.

JAPANESE INFORMATION FOR PRODUCT:

JAPANESE MINISTER OF INTERNATIONAL TRADE AND INDUSTRY (MITI) STATUS: The components of this product are not listed as Class I Specified Chemical Substances, Class II Specified Chemical Substances, or Designated Chemical Substances by the Japanese MITI.

INTERNATIONAL CHEMICAL INVENTORIES:

Listing of the components on individual country Chemical Inventories is as follows:

Asia-Pac:	Listed
Australian Inventory of Chemical Substances (AICS):	Listed
Korean Existing Chemicals List (ECL):	Listed
Japanese Existing National Inventory of Chemical Substances (ENCS):	Listed
Philippines Inventory if Chemicals and Chemical Substances (PICCS):	Listed
Swiss Giftliste List of Toxic Substances:	Listed
U.S. TSCA:	Listed

SECTION 16 - OTHER INFORMATION

PREPARED BY: Paul Eigbrett Global Safety Management, 10006 Cross Creek Blvd. Suite 440, Tampa, FL 33647

Disclaimer: To the best of Alconox, Inc. knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness is not guaranteed and no warranties of any type either express or implied are provided. The information contained herein relates only to this specific product.

ANNEX:

IDENTIFIED USES OF ALCONOX® AND DIRECTIONS FOR USE

Used to clean: Healthcare instruments, laboratory ware, vacuum equipment, tissue culture ware, personal protective equipment, sampling apparatus, catheters, tubing, pipes, radioactive contaminated articles, optical parts, electronic components, pharmaceutical apparatus, cosmetics manufacturing equipment, metal castings, forgings and stampings, industrial parts, tanks and reactors. Authorized by USDA for use in federally inspected meat and poultry plants. Passes inhibitory residue test for water analysis. FDA certified.

Used to remove: Soil, grit, grime, buffing compound, slime, grease, oils, blood, tissue, salts, deposits, particulates, solvents, chemicals, radioisotopes, radioactive contaminations, silicon oils, mold release agents.

Surfaces cleaned: Corrosion inhibited formulation recommended for glass, metal, stainless steel, porcelain, ceramic, plastic, rubber and fiberglass. Can be used on soft metals such as copper, aluminum, zinc and magnesium if rinsed promptly. Corrosion testing may be advisable.

Cleaning method: Soak, brush, sponge, cloth, ultrasonic, flow through clean-inplace. Will foam—not for spray or machine use.

Directions: Make a fresh 1% solution (2 1/2 Tbsp. per gal., 1 1/4 oz. per gal. or 10 grams per liter) in cold, warm, or hot water. If available use warm water. Use cold water for blood stains. For difficult soils, raise water temperature and use more detergent. Clean by soak, circulate, wipe, or ultrasonic method. Not for spray machines, will foam. For nonabrasive scouring, make paste. Use 2% solution to soak frozen stopcocks. To remove silver tarnish, soak in 1% solution in aluminum container. RINSE THOROUGHLY—preferably with running water. For critical cleaning, do final or all rinsing in distilled, deionized, or purified water. For food contact surfaces, rinse with potable water. Used on a wide range of glass, ceramic, plastic, and metal surfaces. Corrosion testing may be advisable.

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1 Identification of the substance/mixture and of the company/undertaking

· **1.1 Product identifier**

· **Trade name: LIQUINOX**
· **Application of the substance / the preparation** Hand detergent

· **1.3 Details of the supplier of the Safety Data Sheet**
· **Manufacturer/Supplier:**
Alconox, Inc.
30 Glenn St., Suite 309
White Plains, NY 10603
Phone: 914-948-4040

· **Further information obtainable from:** Product Safety Department
· **1.4 Emergency telephone number:**
ChemTel Inc.
(800)255-3924, +1 (813)248-0585

2 Hazards identification

· **2.1 Classification of the substance or mixture**
· **Classification according to Regulation (EC) No 1272/2008**


GHS07

Skin Irrit. 2 H315 Causes skin irritation.
Eye Irrit. 2 H319 Causes serious eye irritation.

· **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**

Xi; Irritant

R36/38: Irritating to eyes and skin.
· **Information concerning particular hazards for human and environment:**
The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
· **Classification system:**
The classification is according to the latest editions of the EU-lists, and extended by company and literature data.

· **2.2 Label elements**
· **Labelling according to Regulation (EC) No 1272/2008**
The product is classified and labelled according to the CLP regulation.
· **Hazard pictograms**


GHS07

· **Signal word** Warning

· **Hazard-determining components of labelling:**
Benzenesulfonic Acid, Sodium Salts
· **Hazard statements**
H315 Causes skin irritation.
H319 Causes serious eye irritation.
· **Precautionary statements**
P280 Wear protective gloves/protective clothing/eye protection/face protection.

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P264 Wash thoroughly after handling.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P321 Specific treatment (see on this label).
P362 Take off contaminated clothing and wash before reuse.
P332+P313 If skin irritation occurs: Get medical advice/attention.
P337+P313 If eye irritation persists: Get medical advice/attention.
P302+P352 IF ON SKIN: Wash with plenty of soap and water.

· **Hazard description:**
· **WHMIS-symbols:**
D2B - Toxic material causing other toxic effects

· **NFPA ratings (scale 0 - 4)**

Health = 1
Fire = 0
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**

Health = 1
Fire = 0
Reactivity = 0

· **2.3 Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **3.2 Mixtures**
· **Description:** Mixture of substances listed below with nonhazardous additions.

· **Dangerous components:**

CAS: 68081-81-2	Benzenesulfonic Acid, Sodium Salts Xi R38-41 Eye Dam. 1, H318 Skin Irrit. 2, H315	10-25%
CAS: 1300-72-7 EINECS: 215-090-9	sodium xylenesulphonate Xi R36/37/38 Skin Irrit. 2, H315; Eye Irrit. 2, H319; STOT SE 3, H335	2,5-10%
CAS: 84133-50-6	Alcohol Ethoxylate Xi R36/38 Skin Irrit. 2, H315	2,5-10%
CAS: 68603-42-9 EINECS: 271-657-0	Coconut diethanolamide Xi R36/38	2,5-10%
CAS: 17572-97-3 EINECS: 241-543-5	Ethylenediaminetetraacetic acid, tripotassium salt Xi R36/37/38	2,5-10%

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· **Additional information:** For the wording of the listed risk phrases refer to section 16.

4 First aid measures

· **4.1 Description of first aid measures**
· **General information:** Take affected persons out into the fresh air.
· **After inhalation:** Supply fresh air; consult doctor in case of complaints.
· **After skin contact:**
Immediately wash with water and soap and rinse thoroughly.
If skin irritation continues, consult a doctor.
· **After eye contact:**
Remove contact lenses if worn.
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:**
Do not induce vomiting; call for medical help immediately.
Rinse out mouth and then drink plenty of water.
A person vomiting while laying on their back should be turned onto their side.
· **4.2 Most important symptoms and effects, both acute and delayed**
No further relevant information available.
· **4.3 Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Firefighting measures

· **5.1 Extinguishing media**
· **Suitable extinguishing agents:**
CO2, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
· **5.2 Special hazards arising from the substance or mixture**
No further relevant information available.
· **5.3 Advice for firefighters**
· **Protective equipment:**
Wear self-contained respiratory protective device.
Wear fully protective suit.

6 Accidental release measures

· **6.1 Personal precautions, protective equipment and emergency procedures**
Ensure adequate ventilation
Particular danger of slipping on leaked/spilled product.
· **6.2 Environmental precautions:**
Dilute with plenty of water.
Do not allow to enter sewers/ surface or ground water.
· **6.3 Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Clean the affected area carefully; suitable cleaners are:
Warm water
· **6.4 Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.

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See Section 13 for disposal information.

7 Handling and storage

· **7.1 Precautions for safe handling** No special measures required.
· **Information about fire - and explosion protection:** No special measures required.

· **7.2 Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** No special requirements.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:** None.
· **7.3 Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical facilities:** No further data; see item 7.

· **8.1 Control parameters**
· **Ingredients with limit values that require monitoring at the workplace:**
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
· **Additional information:** The lists valid during the making were used as basis.

· **8.2 Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
· **Respiratory protection:** Not required.
· **Protection of hands:**


Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
· **Material of gloves**
Natural rubber, NR
Nitrile rubber, NBR
Neoprene gloves
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

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· **Penetration time of glove material**
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **Eye protection:**

Safety glasses

Goggles recommended during refilling

9 Physical and chemical properties

· **9.1 Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Liquid
Colour:	Light yellow
· **Odour:**	Odourless
· **Odour threshold:**	Not determined.
· **pH-value at 20°C:**	8,5
· **Change in condition**	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	100°C
· **Flash point:**	Not applicable.
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	
Decomposition temperature:	Not determined.
· **Self-igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapour pressure at 20°C:**	23 hPa
· **Density at 20°C:**	1,08 g/cm³
· **Relative density**	Not determined.
· **Vapour density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with water:**	Fully miscible.
· **Segregation coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.

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· **9.2 Other information** No further relevant information available.

10 Stability and reactivity

· **10.1 Reactivity**
· **10.2 Chemical stability**
· **Thermal decomposition / conditions to be avoided:**
No decomposition if used according to specifications.
· **10.3 Possibility of hazardous reactions**
Reacts with strong oxidizing agents.
Reacts with strong acids.
· **10.4 Conditions to avoid** No further relevant information available.
· **10.5 Incompatible materials:** No further relevant information available.
· **10.6 Hazardous decomposition products:**
Carbon monoxide and carbon dioxide
Sulphur oxides (SOx)
Nitrogen oxides

11 Toxicological information

· **11.1 Information on toxicological effects**
· **Acute toxicity:**
· **Primary irritant effect:**
· **on the skin:** Irritant to skin and mucous membranes.
· **on the eye:** Strong irritant with the danger of severe eye injury.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**
The product shows the following dangers according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version:
Irritant

12 Ecological information

· **12.1 Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **12.2 Persistence and degradability** No further relevant information available.
· **12.3 Bioaccumulative potential** No further relevant information available.
· **12.4 Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Water hazard class 1 (German Regulation) (Self-assessment): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
· **12.5 Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

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· **12.6 Other adverse effects** No further relevant information available.

13 Disposal considerations

· **13.1 Waste treatment methods**
· **Recommendation**
Smaller quantities can be disposed of with household waste.
Small amounts may be diluted with plenty of water and washed away. Dispose of bigger amounts in accordance with Local Authority requirements.
The surfactant used in this product complies with the biodegradability criteria as laid down in Regulation (EC) No. 648/2004 on detergents. Data to support this assertion are held at the disposal of the competent authorities of the Member States and will be made available to them, at their direct request or at the request of a detergent manufacturer.

· **Uncleaned packaging:**
· **Recommendation:** Disposal must be made according to official regulations.
· **Recommended cleansing agents:** Water, if necessary together with cleansing agents.

14 Transport information

· **14.1 UN-Number** · **DOT, ADR, ADN, IMDG, IATA**	N/A
· **14.2 UN proper shipping name** · **DOT, ADR, ADN, IMDG, IATA**	N/A
· **14.3 Transport hazard class(es)** · **DOT, ADR, ADN, IMDG, IATA** · **Class**	N/A
· **14.4 Packing group** · **DOT, ADR, IMDG, IATA**	N/A
· **14.5 Environmental hazards:** · **Marine pollutant:**	No
· **14.6 Special precautions for user**	Not applicable.
· **14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **UN "Model Regulation":**	-

15 Regulatory information

· **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **United States (USA)**
· **SARA**

· **Section 355 (extremely hazardous substances):**
None of the ingredients is listed.

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· **Section 313 (Specific toxic chemical listings):**
None of the ingredients is listed.

· **TSCA (Toxic Substances Control Act):**
All ingredients are listed.

· **Proposition 65 (California):**

· **Chemicals known to cause cancer:**
None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for females:**
None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for males:**
None of the ingredients is listed.

· **Chemicals known to cause developmental toxicity:**
None of the ingredients is listed.

· **Carcinogenic Categories**

· **EPA (Environmental Protection Agency)**
None of the ingredients is listed.

· **TLV (Threshold Limit Value established by ACGIH)**
None of the ingredients is listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
None of the ingredients is listed.

· **OSHA-Ca (Occupational Safety & Health Administration)**
None of the ingredients is listed.

· **Canada**

· **Canadian Domestic Substances List (DSL)**
All ingredients are listed.

· **Canadian Ingredient Disclosure list (limit 0.1%)**
None of the ingredients is listed.

· **Canadian Ingredient Disclosure list (limit 1%)**
None of the ingredients is listed.

· **15.2 Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Relevant phrases**
H315 Causes skin irritation.
H318 Causes serious eye damage.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.

R36/37/38 Irritating to eyes, respiratory system and skin.
R36/38 Irritating to eyes and skin.
R38 Irritating to skin.
R41 Risk of serious damage to eyes.

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· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
ACGIH: American Conference of Governmental Industrial Hygienists
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)

APPENDIX B

Heat and Cold Stress Guidelines

Heat Stress

Heat stress is a significant potential hazard and can be associated with heavy physical activity and/or the use of personal protective equipment (PPE) in hot weather environments.

Heat cramps are brought on by prolonged exposure to heat. As an individual sweats, water and salts are lost by the body resulting in painful muscle cramps. The signs and symptoms of heat cramps are as follows:

- severe muscle cramps, usually in the legs and abdomen;
- exhaustion, often to the point of collapse; and
- dizziness or periods of faintness.

First aid treatment includes moving to a shaded area, rest, and fluid intake. Normally, the individual should recover within one-half hour. If the individual has not recovered within 30 minutes and the temperature has not decreased, the individual should be transported to a hospital for medical attention.

Heat exhaustion may occur in a healthy individual who has been exposed to excessive heat. The circulatory system of the individual fails as blood collects near the skin in an effort to rid the body of excess heat. The signs and symptoms of heat exhaustion are as follows:

- rapid and shallow breathing;
- weak pulse;
- cold and clammy skin with heavy perspiration;
- skin appears pale;
- fatigue and weakness;
- dizziness; and
- elevated body temperature.

First aid treatment includes cooling the victim, elevating the feet, and replacing fluids and electrolytes. If the individual has not recovered within 30 minutes and the temperature has not decreased, the individual should be transported to the hospital for medical attention.

Heat stroke occurs when an individual is exposed to excessive heat and stops sweating. This condition is classified as a **MEDICAL EMERGENCY**, requiring immediate cooling of the victim and transport to a medical facility. The signs and symptoms of heat stroke are as follows:

- dry, hot, red skin;
- body temperature approaching or above 105°F;
- large (dilated) pupils; and
- loss of consciousness – the individual may go into a coma.

First aid treatment requires immediate cooling and transportation to a medical facility.

Heat stress (heat cramps, heat exhaustion, and heat stroke) is a significant hazard if any type of protective equipment (semi-permeable or impermeable) which prevents evaporative cooling is worn in hot weather environments. Local weather conditions may require restricted work schedules in order to adequately protect personnel. The use of work/rest cycles (including working in the cooler periods of the day or evening) and training on the signs and symptoms of heat stress should help prevent heat-related illnesses from occurring. Work/rest cycles will depend on the work load required to perform each task, type of protective equipment, temperature, and humidity. In general, when the temperature exceeds 88°F, a 15 minute rest cycle will be initiated once every two hours. In addition, potable water and fluids containing electrolytes (e.g., Gatorade) will be available to replace lost body fluids.

Cold Stress

Cold stress is a danger at low temperatures and when the wind-chill factor is low. Prevention of cold-related illnesses is a function of whole-body protection. Adequate insulating clothing must be used when the air temperature is below 40°F. In addition, reduced work periods followed by rest in a warm area may be necessary in extreme conditions. Training on the signs and symptoms of cold stress should prevent cold-related illnesses from occurring. The signs and symptoms of cold stress include the following:

- severe shivering;
- abnormal behavior;

- slowing of body movement;
- confusion;
- weakness;
- stumbling or repeated falling;
- inability to walk;
- collapse; and/or
- unconsciousness.

First aid requires removing the victim from the cold environment and seeking medical attention immediately. Also, prevent further body heat loss by covering the victim lightly with blankets. Do not cover the victim's face. If the victim is still conscious, administer hot drinks, and encourage activity, such as walking wrapped in a blanket.

APPENDIX C

Medical Data Form

MEDICAL DATA SHEET

This form must be completed by all onsite personnel prior to the commencement of activities, and shall be kept by the Site Health and Safety Officer during site activities. This form must be delivered to any attending physician when medical assistance is needed.

(This form should be typed or printed legibly.)

Site: _____

Name: _____ Home Telephone: _____
(Area Code/Telephone Number)

Address: _____

Date of Birth: _____ Height: _____ Weight: _____

Emergency Contact: _____ Telephone: _____
(Area Code/Telephone Number)

Drug Allergies or Other Allergies: _____

_____

Previous Illnesses or Exposures to Hazardous Substances: _____

_____

_____

Current Medication (Prescription and Non-Prescription): _____

_____

_____

Medical Restrictions: _____

_____

Name, Address and Telephone Number of Person Physician: _____

_____

APPENDIX D

Community Air Monitoring Plan

Community Air Monitoring Plan

5530 Broadway, Bronx, New York

Real-time air monitoring for volatile organic compounds (VOCs) and particulate levels at the perimeter of the exclusion zone or work area will be performed. Continuous monitoring will be performed for all ground intrusive activities and during the handling of contaminated or potentially contaminated media. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pit excavation or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be performed during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. Periodic monitoring during sample collection, for instance, will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. Depending upon the proximity of potentially exposed individuals, continuous monitoring may be performed during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence. Exceedances of action levels observed during performance of the Community Air Monitoring Plan (CAMP) will be reported to the Project Manager and included in the Daily Report.

VOC Monitoring, Response Levels, and Actions

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

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring 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, activities will be shutdown.

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

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

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

All readings will be recorded and be available for project management personnel to review.

APPENDIX E

Health and Safety Briefing/Tailgate Meeting Form

HEALTH & SAFETY BRIEFING / TAILGATE MEETING FORM

Site Name / Location _____

Date: _____ Weather Forecast: _____

Names of Personnel Attending Briefing

_____ _____ _____

_____ _____ _____

_____ _____ _____

Planned Work

_____

_____

_____

Instrument Calibration: Instrument/Time/Cal. Gas/Cal. Concentration/Actual Concentration

_____

_____

_____

Items Discussed

_____

_____

_____

_____

_____

Work Permit Type and Applicable Restrictions

_____

_____

_____

Signatures of Attending Personnel

_____ _____ _____

_____ _____ _____

_____ _____ _____

APPENDIX F

Accident Report and Investigation Form

☐ **Roux Associates, Inc.** ☐ **Remedial Engineering, P.C.**
(Check applicable company name)

ACCIDENT REPORT

Joe Gentile, Corporate Health and Safety Manager
Cell: (610) 844-6911; Office: (856) 423-8800; Office FAX: (856) 423-3220; Home: (484) 373-0953

PART 1: ADMINISTRATIVE INFORMATION

Project #: _____
Project Name: _____
Project Location (street address/city/state)**:**
_____
_____
Client Corporate Name / Contact / Address / Phone #:
_____
_____
_____
_____
_____

Immediate Verbal Notifications Given To:

Corporate Health & Safety	☐Yes	☐No
Office Health & Safety	☐Yes	☐No
Office Manager	☐Yes	☐No
Project Principal	☐Yes	☐No
Project Manager	☐Yes	☐No
Client Contact	☐Yes	☐No

REPORT STATUS (time due):
☐ Initial (24 hr) ☐ Final (5-10 days)
Date: _____ Date: _____

Accident Report Delivered To:

Corporate Health & Safety	☐Yes	☐No
Office Health & Safety	☐Yes	☐No
Office Manager	☐Yes	☐No
Project Principal	☐Yes	☐No
Project Manager	☐Yes	☐No

REPORT TYPE: ☐ Loss ☐ Near Loss Estimated Costs: $ _____

OSHA CASE # Assigned by Corporate Health & Safety if Applicable: _____

Corporate Health & Safety Confirmed Final Accident Report
☐Yes ☐No

DATE OF INCIDENT: _____

TIME INCIDENT OCCURRED: _____ ☐AM ☐PM

INCIDENT LOCATION – City, State, and Country (If outside U.S.A.)
_____

INCIDENT TYPES: (Select most appropriate if Loss occurred.)
From lists below, please select the option that best categories the incident. When selecting an injury or illness, also indicate the severity level.

☐**INJURY** ☐**ILLNESS**

----------Severity Level----------

☐Fatality ☐First Aid ☐Medical
☐Restricted Work ☐Lost Time Treatment

OTHER INCIDENT TYPES

☐Spill / Release
Material involved:_____
Quantity (U.S. Gallons): _____

☐Misdirected Waste ☐Consent Order ☐NOV
☐Property Damage ☐Exceedance
☐Motor Vehicle ☐Fine / Penalty

ACTIVITY TYPE (Check most appropriate one.)

☐Decommissioning	☐Geoprobe	☐Sampling
☐Demolition	☐Motor Vehicle	☐System Start-up
☐Dewatering	☐Operations/	☐Trenching
☐Drilling	Maintenance	☐AST/UST Removal
☐Excavation	☐Pump/Pilot Test	☐Other_____
☐Gauging	☐Rigging/Lifting	

INJURY TYPE (Check all applicable.)

☐Abrasion	☐Occupational Illness
☐Amputation	☐Puncture
☐Burn	☐Rash
☐Cold/Heat Stress	☐Repetitive Motion
☐Inflammation	☐Sprain/Strain
☐Laceration	☐Other_____

BODY PART AFFECTED (Check all applicable.)

☐Respiratory	☐Shoulder	☐Face
☐Neck	☐Arm	☐Leg
☐Chest	☐Wrist	☐Knee
☐Abdomen	☐Hand/Fingers	☐Ankle
☐Groin	☐Eye	☐Foot/Toes
☐Back	☐Head	☐Other_____

I. PERSON(S) DIRECTLY / INDIRECTLY INVOLVED IN INCIDENT (Attach additional information as necessary/applicable.)

Name/Phone # of Each Person Directly/Indirectly Involved in Incident:	Designate: Roux/Remedial Employee Roux/Remedial Subcontractor Client Employee Client Contractor Third Party	As applicable, Current Occupation; Yrs in Current Occupation; Current Position; and Yrs in Current Position:	As applicable, Employer Name; Address; and Phone #:	As applicable, Supervisor Name; and Phone #:
1)				
2)				

II. PERSONS INJURED IN INCIDENT (Attach additional information as necessary/applicable.)

Name/Phone # of Each Person Injured in Incident:	Designate: Roux/Remedial Employee Roux/Remedial Subcontractor Client Employee Client Contractor Third Party	As applicable, Current Occupation; Yrs in Current Occupation; Current Position; and Yrs in Current Position:	As applicable, Employer Name; Address; and Phone #:	As applicable, Supervisor Name; and Phone #:	Description of Injury:
1)					
2)					

III. PROPERTY DAMAGED IN INCIDENT (Attach additional information as necessary/applicable.)

Property Damaged:	Property Location:	Owner Name, Address & Phone #:	Description of Damage:	Estimated Cost:
1)				$

2)				$

IV. WITNESSES TO INCIDENT (Attach additional information as necessary/applicable.)

Witness Name:	Address:	Phone #:
1)		
2)		

PART 2: WHAT HAPPENED AND INCIDENT DETAILS

PROVIDE FACTUAL DESCRIPTION OF INCIDENT (e.g., describe loss/near loss, injury, response / treatment).

I. AUTHORITIES/GOVERNMENTAL AGENCIES NOTIFIED (Attach additional information as necessary/applicable.)

Authority/Agency Notified:	Name/Phone #/Fax # of Person Notified:	Address of Person Notified:	Date & Time of Notification:	Exact Information Reported/Provided:

II. PUBLIC RESPONSES TO INCIDENT (if applicable)

Response/Inquiry By: (check one)	Entity Name:	Name/Phone # of Respondent/ Inquirer:	Address of Entity/Person:	Date & Time of Response/Inquiry:
☐Newspaper ☐Television ☐Community Group ☐Neighbors ☐Other _____				

Describe Response/Inquiry:

Roux/Remedial Response:

(Check all that apply.) (Attach photos, drawings, etc. to help illustrate the incident.)
ATTACHED INFORMATION: ☐Photo ☐Sketches ☐Vehicle Acord Form ☐Police Report ☐Other

Name(s) of person(s) who prepared Initial and Final Report:	**Title(s):**	**Phone number(s):**

PART 3: INVESTIGATION TEAM ANALYSIS

CONCLUSION: WHY IT HAPPENED (LIST CAUSAL FACTORS AND CORRESPONDING ROOT CAUSES)

(Root Causes: Lack of knowledge or skill, Doing the task according to procedures or acceptable practices takes more time or effort, Short-cuts or not following acceptable practices is reinforced or tolerated, Not following procedures or acceptable practices did not result in an accident, Lack of or inadequate procedures, Inadequate communications of expectations regarding procedures or acceptable practices, Inadequate tools or equipment, External Factors)

ROOT CAUSE(S) AND SOLUTION(S): HOW TO PREVENT INCIDENT FROM RECURRING

CAUSAL FACTOR	ROOT CAUSE		SOLUTION(S) [Must Match Root Cause(s)]		PERSON RESPONSIBLE	AGREED DUE DATE	ACTUAL COMPLETION DATE
			#	Solution(s)			
			1				
			2				
			3				

INVESTIGATION TEAM:

PRINT NAME	JOB POSITION	DATE	SIGNATURE

No One Gets Hurt!

APPENDIX G

Acord Form

AUTOMOBILE LOSS NOTICE

DATE (MM/DD/YYYY)

AGENCY	INSURED LOCATION CODE	DATE OF LOSS AND TIME
The Treiber Group AJ Gallagher Risk Mgmt Svcs 377 Oak Street Garden City, NY 11530		☐ AM ☐ PM
CONTACT NAME: Teresa Garzia	CARRIER: Great Divide Insurance Company	NAIC CODE: 25224
PHONE (A/C, No, Ext): 516.622.2418	POLICY NUMBER: BAP1549799-10	
FAX (A/C, No): 516.622.2618	POLICY TYPE: Commercial Automobile	
E-MAIL ADDRESS: teresa_garzia@ajg.com		
CODE: / SUBCODE:		
AGENCY CUSTOMER ID: ROUXASSO		

INSURED

NAME OF INSURED (First, Middle, Last)			INSURED'S MAILING ADDRESS
Roux Associates, Inc.			Susan Sullivan, General Counsel, Roux Associates, Inc. 209 Shafter Street Islandia, NY 11749
DATE OF BIRTH	FEIN (if applicable): 11-2579482	MARITAL STATUS / CIVIL UNION (if applicable)	
PRIMARY PHONE # ☐ HOME ☑ BUS ☐ CELL: 631.232.2600	SECONDARY PHONE # ☐ HOME ☐ BUS ☐ CELL		PRIMARY E-MAIL ADDRESS: LegalDept@rouxinc.com SECONDARY E-MAIL ADDRESS: Fax Notice of Loss to: 631.232.1525

CONTACT

☐ CONTACT INSURED

NAME OF CONTACT (First, Middle, Last)		CONTACT'S MAILING ADDRESS
Susan Sullivan, General Counsel		Susan Sullivan, General Counsel, Roux Associates, Inc. 209 Shafter Street Islandia, NY 11749
PRIMARY PHONE # ☐ HOME ☑ BUS ☐ CELL: 631.232.2600	SECONDARY PHONE # ☐ HOME ☐ BUS ☐ CELL	
WHEN TO CONTACT		PRIMARY E-MAIL ADDRESS: LegalDept@rouxinc.com SECONDARY E-MAIL ADDRESS: Fax Notice of Loss to: 631.232.1525

LOSS

LOCATION OF LOSS STREET:	POLICE OR FIRE DEPARTMENT CONTACTED
CITY, STATE, ZIP:	REPORT NUMBER
COUNTRY:	

DESCRIBE LOCATION OF LOSS IF NOT AT SPECIFIC STREET ADDRESS:

DESCRIPTION OF ACCIDENT (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

INSURED VEHICLE

VEH #	YEAR	MAKE:	BODY TYPE:	PLATE NUMBER	STATE
		MODEL:	V.I.N.:		

OWNER'S NAME AND ADDRESS ☐ (Check if same as insured)	PRIMARY PHONE # ☐ HOME ☐ BUS ☐ CELL	SECONDARY PHONE # ☐ HOME ☐ BUS ☐ CELL
	PRIMARY E-MAIL ADDRESS:	
	SECONDARY E-MAIL ADDRESS:	
DRIVER'S NAME AND ADDRESS ☐ (Check if same as owner)	PRIMARY PHONE # ☐ HOME ☐ BUS ☐ CELL	SECONDARY PHONE # ☐ HOME ☐ BUS ☐ CELL
	PRIMARY E-MAIL ADDRESS:	
	SECONDARY E-MAIL ADDRESS:	

RELATION TO INSURED (Employee, family, etc.)	DATE OF BIRTH	DRIVER'S LICENSE NUMBER	STATE	PURPOSE OF USE	USED WITH PERMISSION? (Y/N) ☐

DESCRIBE DAMAGE

1. WAS A STANDARD CHILD PASSENGER RESTRAINT SYSTEM (CHILD SEAT) INSTALLED IN THE VEHICLE AT THE TIME OF THE ACCIDENT?	☐ Y / N
2. WAS THE CHILD PASSENGER RESTRAINT SYSTEM (CHILD SEAT) IN USE BY A CHILD DURING THE TIME OF THE ACCIDENT?	☐ Y / N
3. DID THE CHILD PASSENGER RESTRAINT SYSTEM (CHILD SEAT) SUSTAIN A LOSS AT THE TIME OF THE ACCIDENT?	☐ Y / N

ESTIMATE AMOUNT:	WHERE CAN VEHICLE BE SEEN?:	WHEN CAN VEHICLE BE SEEN?:
OTHER INSURANCE ON VEHICLE - CARRIER:		POLICY NUMBER:

OTHER VEHICLE / PROPERTY DAMAGED **NON - VEHICLE?** ☐ **AGENCY CUSTOMER ID:** ROUXASSO

VEH #	YEAR	MAKE:	BODY TYPE:	PLATE NUMBER	STATE
		MODEL:	V.I.N.:		

DESCRIBE PROPERTY (Other Than Vehicle) **OTHER VEH/PROP INS? (Y/N)** ☐

CARRIER OR AGENCY NAME	NAIC CODE	POLICY NUMBER

OWNER'S NAME AND ADDRESS

PRIMARY PHONE # ☐ HOME ☐ BUS ☐ CELL **SECONDARY PHONE #** ☐ HOME ☐ BUS ☐ CELL

PRIMARY E-MAIL ADDRESS:

SECONDARY E-MAIL ADDRESS:

DRIVER'S NAME AND ADDRESS ☐ **(Check if same as owner)**

PRIMARY PHONE # ☐ HOME ☐ BUS ☐ CELL **SECONDARY PHONE #** ☐ HOME ☐ BUS ☐ CELL

PRIMARY E-MAIL ADDRESS:

SECONDARY E-MAIL ADDRESS:

DESCRIBE DAMAGE

ESTIMATE AMOUNT	WHERE CAN DAMAGE BE SEEN?	

INJURED

NAME & ADDRESS	PHONE (A/C, No)	PED	INS VEH	OTH VEH	AGE	EXTENT OF INJURY
		☐	☐	☐		
		☐	☐	☐		
		☐	☐	☐		
		☐	☐	☐		

WITNESSES OR PASSENGERS

NAME & ADDRESS	PHONE (A/C, No)	INS VEH	OTH VEH	OTHER (Specify)
		☐	☐	
		☐	☐	
		☐	☐	

REPORTED BY	REPORTED TO

REMARKS (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

APPLICABLE IN ALASKA

A person who knowingly and with intent to injure, defraud, or deceive an insurance company files a claim containing false, incomplete, or misleading information may be prosecuted under state law.

APPLICABLE IN ARIZONA

For your protection, Arizona law requires the following statement to appear on this form. Any person who knowingly presents a false or fraudulent claim for payment of a loss is subject to criminal and civil penalties.

APPLICABLE IN ARKANSAS, DELAWARE, KENTUCKY, LOUISIANA, MAINE, MICHIGAN, NEW JERSEY, NEW MEXICO, NORTH DAKOTA, PENNSYLVANIA, RHODE ISLAND, SOUTH DAKOTA, TENNESSEE, TEXAS, VIRGINIA, AND WEST VIRGINIA

Any person who knowingly and with intent to defraud any insurance company or another person, files a statement of claim containing any materially false information, or conceals for the purpose of misleading, information concerning any fact, material thereto, commits a fraudulent insurance act, which is a crime, subject to criminal prosecution and civil penalties. In LA, ME, TN, and VA, insurance benefits may also be denied.

APPLICABLE IN CALIFORNIA

For your protection, California law requires the following to appear on this form: Any person who knowingly presents a false or fraudulent claim for payment of a loss is guilty of a crime and may be subject to fines and confinement in state prison.

APPLICABLE IN COLORADO

It is unlawful to knowingly provide false, incomplete, or misleading facts or information to an insurance company for the purpose of defrauding or attempting to defraud the company. Penalties may include imprisonment, fines, denial of insurance, and civil damages. Any insurance company or agent of an insurance company who knowingly provides false, incomplete, or misleading facts or information to a policy holder or claimant for the purpose of defrauding or attempting to defraud the policy holder or claimant with regard to a settlement or award payable from insurance proceeds shall be reported to the Colorado Division of Insurance within the Department of Regulatory Agencies.

APPLICABLE IN THE DISTRICT OF COLUMBIA

Warning: It is a crime to provide false or misleading information to an insurer for the purpose of defrauding the insurer or any other person. Penalties include imprisonment and/or fines. In addition, an insurer may deny insurance benefits, if false information materially related to a claim was provided by the applicant.

APPLICABLE IN FLORIDA

Pursuant to S. 817.234, Florida Statutes, any person who, with the intent to injure, defraud, or deceive any insurer or insured, prepares, presents, or causes to be presented a proof of loss or estimate of cost or repair of damaged property in support of a claim under an insurance policy knowing that the proof of loss or estimate of claim or repairs contains any false, incomplete, or misleading information concerning any fact or thing material to the claim commits a felony of the third degree, punishable as provided in S. 775.082, S. 775.083, or S. 775.084, Florida Statutes.

APPLICABLE IN HAWAII

For your protection, Hawaii law requires you to be informed that presenting a fraudulent claim for payment of a loss or benefit is a crime punishable by fines or imprisonment, or both.

APPLICABLE IN IDAHO

Any person who knowingly and with the intent to injure, defraud, or deceive any insurance company files a statement of claim containing any false, incomplete or misleading information is guilty of a felony.

APPLICABLE IN INDIANA

A person who knowingly and with intent to defraud an insurer files a statement of claim containing any false, incomplete, or misleading information commits a felony.

APPLICABLE IN KANSAS

Any person who, knowingly and with intent to defraud, presents, causes to be presented or prepares with knowledge or belief that it will be presented to or by an insurer, purported insurer, broker or any agent thereof, any written statement as part of, or in support of, an application for the issuance of, or the rating of an insurance policy for personal or commercial insurance, or a claim for payment or other benefit pursuant to an insurance policy for commercial or personal insurance which such person knows to contain materially false information concerning any fact material thereto; or conceals, for the purpose of misleading, information concerning any fact material thereto commits a fraudulent insurance act.

APPLICABLE IN MARYLAND

Any person who knowingly and [or]* willfully presents a false or fraudulent claim for payment of a loss or benefit or who knowingly and [or]* willfully presents false information in an application for insurance is guilty of a crime and may be subject to fines and confinement in prison. * [or] effective 01-01-2013

APPLICABLE IN MINNESOTA

A person who files a claim with intent to defraud or helps commit a fraud against an insurer is guilty of a crime.

APPLICABLE IN NEVADA

Pursuant to NRS 686A.291, any person who knowingly and willfully files a statement of claim that contains any false, incomplete or misleading information concerning a material fact is guilty of a felony.

APPLICABLE IN NEW HAMPSHIRE

Any person who, with purpose to injure, defraud or deceive any insurance company, files a statement of claim containing any false, incomplete or misleading information is subject to prosecution and punishment for insurance fraud, as provided in RSA 638:20.

APPLICABLE IN NEW YORK

Any person who knowingly and with intent to defraud any insurance company or other person files an application for commercial insurance or a statement of claim for any commercial or personal insurance benefits containing any materially false information, or conceals for the purpose of misleading, information concerning any fact material thereto, and any person who in connection with such application or claim knowingly makes or knowingly assists, abets, solicits or conspires with another to make a false report of the theft, destruction, damage or conversion of any motor vehicle to a law enforcement agency, the Department of Motor Vehicles or an insurance company, commits a fraudulent insurance act, which is a crime, and shall also be subject to a civil penalty not to exceed five thousand dollars and the value of the subject motor vehicle or stated claim for each violation.

APPLICABLE IN OHIO

Any person who, with intent to defraud or knowing that he/she is facilitating a fraud against an insurer, submits an application or files a claim containing a false or deceptive statement is guilty of insurance fraud.

APPLICABLE IN OKLAHOMA

WARNING: Any person who knowingly and with intent to injure, defraud or deceive any insurer, makes any claim for the proceeds of an insurance policy containing any false, incomplete or misleading information is guilty of a felony.

APPLICABLE IN WASHINGTON

It is a crime to knowingly provide false, incomplete, or misleading information to an insurance company for the purpose of defrauding the company. Penalties include imprisonment, fines and denial of insurance benefits.

APPENDIX H

OSHA 300

OSHA's Form 300 (Rev. 01/2004)

Log of Work-Related Injuries and Illnesses

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

Year _____

U.S. Department of Labor
Occupational Safety and Health Administration

You must record information about every work-related injury or illness that involves loss of consciousness, restricted work activity or job transfer, days away from work, or medical treatment beyond first aid. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR 1904.8 through 1904.12. Feel free to use two lines for a single case if you need to. You must complete an injury and illness incident report (OSHA Form 301) or equivalent form for each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

Form approved OMB no. 1218-0176

Establishment name _____

City _____ State _____

Identify the person			Describe the case			Classify the case											
(A) Case No.	(B) Employee's Name	(C) Job Title (e.g., Welder)	(D) Date of injury or onset of illness (mo./day)	(E) Where the event occurred (e.g. Loading dock north end)	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (e.g. Second degree burns on right forearm from acetylene torch)	**CHECK ONLY ONE** box for each case based on the most serious outcome for that case:				Enter the number of days the injured or ill worker was:		Check the "injury" column or choose one type of illness:					
						Death	Days away from work	Remained at work		Away From Work (days)	On job transfer or restriction (days)	(M) Injury	Skin Disorder	Respiratory Condition	Poisoning	Hearing Loss	All other illnesses
								Job transfer or restriction	Other record-able cases								
						(G)	(H)	(I)	(J)	(K)	(L)	(1)	(2)	(3)	(4)	(5)	(6)
					Page totals	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

Be sure to transfer these totals to the Summary page (Form 300A) before you post it.

Public reporting burden for this collection of information is estimated to average 14 minutes per response, including time to review the instruction, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistics, Room N-3644, 200 Constitution Ave, NW, Washington, DC 20210. Do not send the completed forms to this office.

Injury	Skin Disorder	Respiratory Condition	Poisoning	Hearing Loss	All other illnesses
(1)	(2)	(3)	(4)	(5)	(6)

OSHA's Form 300A (Rev. 01/2004)

Summary of Work-Related Injuries and Illnesses

Year _____

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

All establishments covered by Part 1904 must complete this Summary page, even if no injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the log. If you had no cases write "0."

Employees former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR 1904.35, in OSHA's Recordkeeping rule, for further details on the access provisions for these forms.

Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
0	0	0	0
(G)	(H)	(I)	(J)

Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
0	0
(K)	(L)

Injury and Illness Types

Total number of… (M)			
(1) Injury	0	(4) Poisoning	0
(2) Skin Disorder	0	(5) Hearing Loss	0
(3) Respiratory Condition	0	(6) All Other Illnesses	0

Post this Summary page from February 1 to April 30 of the year following the year covered by the form

Establishment information

Your establishment name _____

Street _____

City _____ State _____ Zip _____

Industry description (e.g., Manufacture of motor truck trailers)

_____

Standard Industrial Classification (SIC), if known (e.g., SIC 3715)

____ ____ ____ ____

OR North American Industrial Classification (NAICS), if known (e.g., 336212)

____ ____ ____ ____ ____ ____

Employment information

Annual average number of employees _____

Total hours worked by all employees last year _____

Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

_____ Company executive

_____ Title

_____ Phone

_____ Date

OSHA's Form 301
Injuries and Illnesses Incident Report

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

This *Injury and Illness Incident Report* is one of the first forms you must fill out when a recordable work-related injury or illness has occurred. Together with the *Log of Work-Related injuries and Illnesses* and the accompanying *Summary*, these forms help the employer and OSHA develop a picture of the extent and severity of work-related incidents.

Within 7 calendar days after you receive information that a recordable work-related injury or illness has occurred, you must fill out this form or an equivalent. Some state workers' compensation, insurance, or other reports may be acceptable substitutes. To be considered an equivalent form, any substitute must contain all the information asked for on this form.

According to Public Law 91-596 and 29 CFR 1904, OSHA's recordkeeping rule, you must keep this form on file for 5 years following the year to which it pertains

If you need additional copies of this form, you may photocopy and use as many as you need.

Completed by _____

Title _____

Phone _____ Date _____

Information about the employee

1) Full Name _____

2) Street _____

City _____ State _____ Zip _____

3) Date of birth _____

4) Date hired _____

5) ☐ Male
☐ Female

Information about the physician or other health care professional

6) Name of physician or other health care professional

_____

_____

7) If treatment was given away from the worksite, where was it given?

Facility _____

Street _____

City _____ State _____ Zip _____

8) Was employee treated in an emergency room?
☐ Yes
☐ No

9) Was employee hospitalized overnight as an in-patient?
☐ Yes
☐ No

Information about the case

10) Case number from the Log _____ *(Transfer the case number from the Log after you record the case.)*

11) Date of injury or illness _____

12) Time employee began work _____ AM/PM

13) Time of event _____ AM/PM ☐ Check if time cannot be determined

14) **What was the employee doing just before the incident occurred?** Describe the activity, as well as the tools, equipment or material the employee was using. Be specific. Examples: "climbing a ladder while carrying roofing materials"; "spraying chlorine from hand sprayer"; "daily computer key-entry."

15) **What happened?** Tell us how the injury occurred. Examples: "When ladder slipped on wet floor, worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time."

16) **What was the injury or illness?** Tell us the part of the body that was affected and how it was affected; be more specific than "hurt", "pain", or "sore." Examples: "strained back"; "chemical burn, hand"; "carpal tunnel syndrome."

17) **What object or substance directly harmed the employee?** Examples: "concrete floor"; "chlorine"; "radial arm saw." If this question does not apply to the incident, leave it blank.

18) **If the employee died, when did death occur?** Date of death

APPENDIX I

Weekly Safety Report

APPENDIX I

WEEKLY SAFETY REPORT

Job Name_____ Job#_____

Week of: **Days Without Lost Time Injury:**

Describe any recordable incidents or accidents:

What actions were taken to prevent such incidents or accidents from occurring again?

Was training conducted addressing the incident? Y N What date?___

What level of PPE is currently in place?

Has PPE been upgraded or downgraded?

Have Perimeter Air Monitoring action limits been exceeded:

What action was taken to mitigate the exceedance?

Have personal air monitoring limits been exceeded:

What actions were taken?

List any problems with air monitoring equipment:

Write a summary of work completed during the week:

Write a summary of proposed work for the coming week:

Summarize any safety issues that are outstanding:

HSO Name: _____ HSO Signature: _____

APPENDIX J

Job Safety and Health Protection Poster

You Have a Right to a Safe and Healthful Workplace.

IT'S THE LAW!

- You have the right to notify your employer or OSHA about workplace hazards. You may ask OSHA to keep your name confidential.
- You have the right to request an OSHA inspection if you believe that there are unsafe and unhealthful conditions in your workplace. You or your representative may participate in the inspection.
- You can file a complaint with OSHA within 30 days of discrimination by your employer for making safety and health complaints or for exercising your rights under the *OSH Act*.
- You have a right to see OSHA citations issued to your employer. Your employer must post the citations at or near the place of the alleged violation.
- Your employer must correct workplace hazards by the date indicated on the citation and must certify that these hazards have been reduced or eliminated.
- You have the right to copies of your medical records or records of your exposure to toxic and harmful substances or conditions.
- Your employer must post this notice in your workplace.

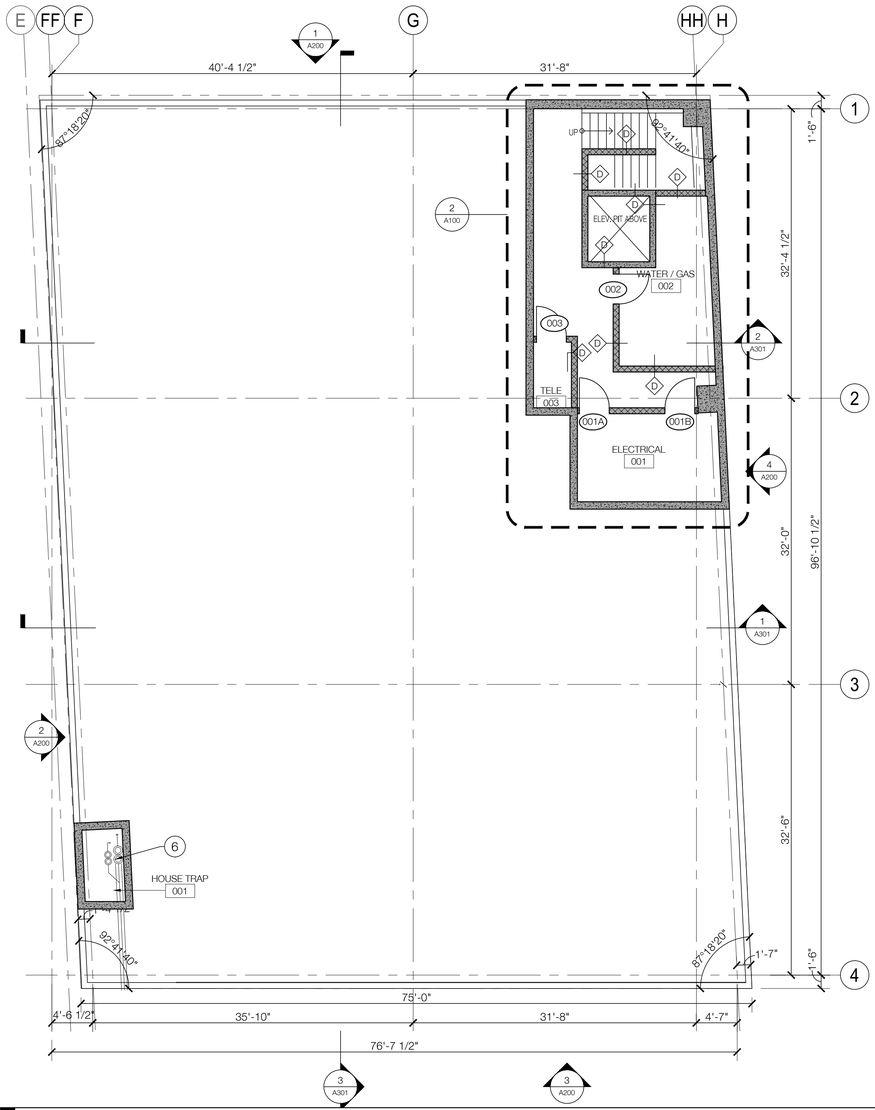
The *Occupational Safety and Health Act of 1970 (OSH Act)*, P.L. 91-596, assures safe and healthful working conditions for working men and women throughout the Nation. The Occupational Safety and Health Administration, in the U.S. Department of Labor, has the primary responsibility for administering the *OSH Act*. The rights listed here may vary depending on the particular circumstances. To file a complaint, report an emergency, or seek OSHA advice, assistance, or products, call 1-800-321-OSHA or your nearest OSHA office: • Atlanta (404) 562-2300 • Boston (617) 565-9860 • Chicago (312) 353-2220 • Dallas (214) 767-4731 • Denver (303) 844-1600 • Kansas City (816) 426-5861 • New York (212) 337-2378 • Philadelphia (215) 861-4900 • San Francisco (415) 975-4310 • Seattle (206) 553-5930. Teletypewriter (TTY) number is 1-877-889-5627. To file a complaint online or obtain more information on OSHA federal and state programs, visit OSHA's website at **www.osha.gov**. If your workplace is in a state operating under an OSHA-approved plan, your employer must post the required state equivalent of this poster.

1-800-321-OSHA

www.osha.gov

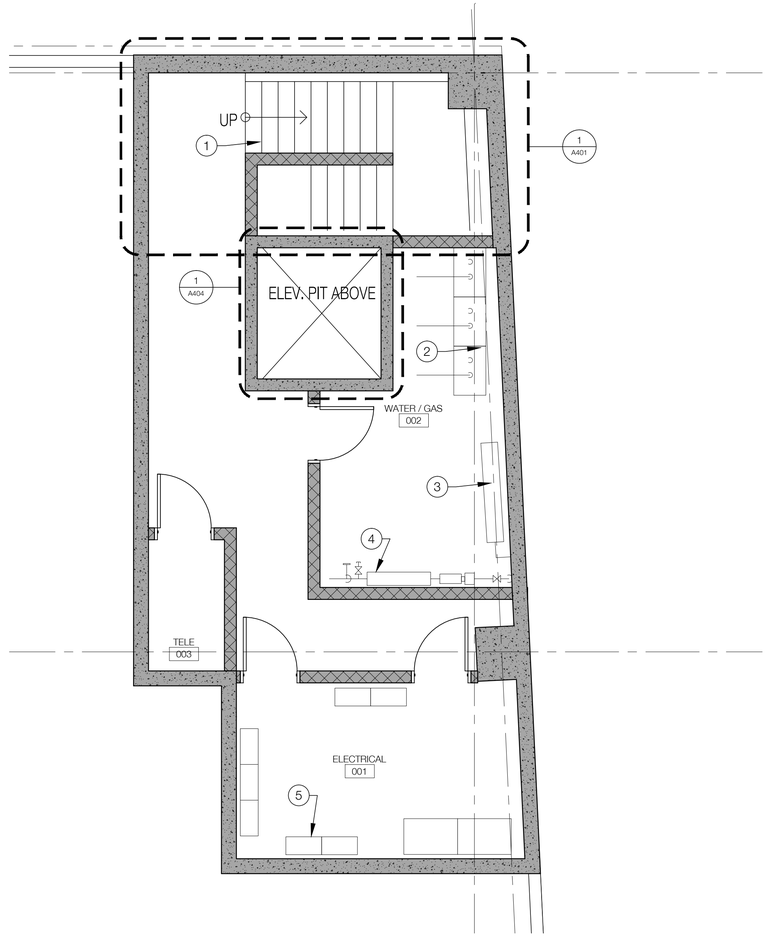
U.S. Department of Labor • **Occupational Safety and Health Administration** • **OSHA 3165**

Proposed Redevelopment Plans



1 CELLAR FLOOR PLAN

SCALE: 1/8" = 1'-0"



2 CELLAR FLOOR DETAIL PLAN

SCALE: 1/4" = 1'-0"

1. METAL PAN STAIR W/ CONCRETE TREADS
2. GAS METERS. SEE MEP.
3. DOMESTIC WATER VALVES. SEE MEP.
4. FIRE WATER VALVES. SEE MEP.
5. ELECTRICAL PANELS. SEE MEP.
6. COMBINED SEWER TRAP. SEE MEP.

3 PLAN KEYNOTES

SCALE: N.T.S.

1. ZONING ANALYSIS, REFER TO DWG. Z-001 & Z-002
2. BUILDING CODE REQUIREMENTS, REFER TO DWG. A-001
3. ADA ACCESSIBILITY DATA, REFER TO DWG. A-002
4. CELLAR LIFE SAFETY PLAN, REFER TO DWG. A-003
5. FIRST FLOOR LIFE SAFETY PLAN, REFER TO DWG. A-004
6. ARCHITECTURAL SITE PLAN, REFER TO DWG. A-010
7. CELLAR FLOOR PLAN, REFER TO DWG. A-100
8. FIRST FLOOR PLAN, REFER TO DWG. A-101
9. SECOND FLOOR PLAN, REFER TO DWG. A-102
10. ROOF PLAN, REFER TO DWG. A-104
11. CELLAR SLAB PLAN, REFER TO DWG. A-110
12. FIRST FLOOR SLAB PLAN, REFER TO DWG. A-111
13. SECOND FLOOR SLAB PLAN, REFER TO DWG. A-112
14. ROOF SLAB PLAN, REFER TO DWG. A-114
15. REFLECTED CEILING PLANS, SEE TO DWGS. A120-A122
16. BUILDING ELEVATIONS, REFER TO DWG. A-200
17. BUILDING SECTIONS, REFER TO DWG. A-300
18. EXTERIOR WALL SECTIONS, REFER TO DWG. A-310, A-311
19. FOUNDATION WATERPROOFING, REFER TO DWG. A-320
20. ENLARGED PLAN DETAILS, REFER TO DWG. A-340, A-341
21. ENLARGED STAIR PLANS, REFER TO A-400, A-401, A-402
22. ENLARGED ELEVATOR PLANS, REFER TO DWG. A-410
23. PARTITION TYPES, REFER TO DWG. A-500
24. DOOR SCHEDULE AND DETAILS, REFER TO DWG. A-600
25. STOREFRONT SCHEDULES, REFER TO DWG. A-601

4 KEYNOTES

SCALE: N.T.S.

5 PLAN NOTES

SCALE: N.T.S.

SYMBOL	DESCRIPTION
	CMU PARTITION
	CONCRETE PARTITION
	GYP. BD. PARTITION
	EXTERIOR PARTITION
	DOOR
1	KEY NOTE
	NOT IN CONTRACT (N.I.C.)
	ELECTRICAL PANEL
FE	FIRE EXTINGUISHER ON BRACKET
#	DOOR TYPE. SEE A-601
#	PARTITION TYPE. SEE A-500
SFXX	STORE FRONT / LOUVER , SEE A-601.00
	ALIGN

PLAN LEGEND

SCALE: N.T.S.

SBLM

Owner
Equity One

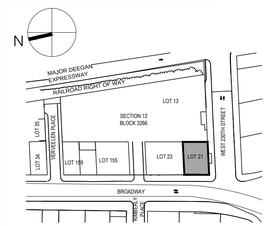
Telephone
Fax

Architect
SBLM Architects
545 West 45th Street, 4th Floor
New York, NY 10036
TeL: 212 995 5600
Fax 212 675 4228
www.sblm.com

Structural Engineering
e2 Engineers
311 State Street
New London, CT 06320
Tel: 860 437 3259
Fax: 860 437 3194

Mechanical, Electrical, Plumbing
DNV Associates
153 West 27th Street #1105
New York, NY 10018
Tel: 212 233 2434
Fax: 212 233 0717

Revisions/Issues



Seal

Project Title
LOT 21

BROADWAY PLAZA
5510 BROADWAY
BRONX, NY 10463

Drawing
CELLAR PLAN

Job Number **013160**

Seal & Signature

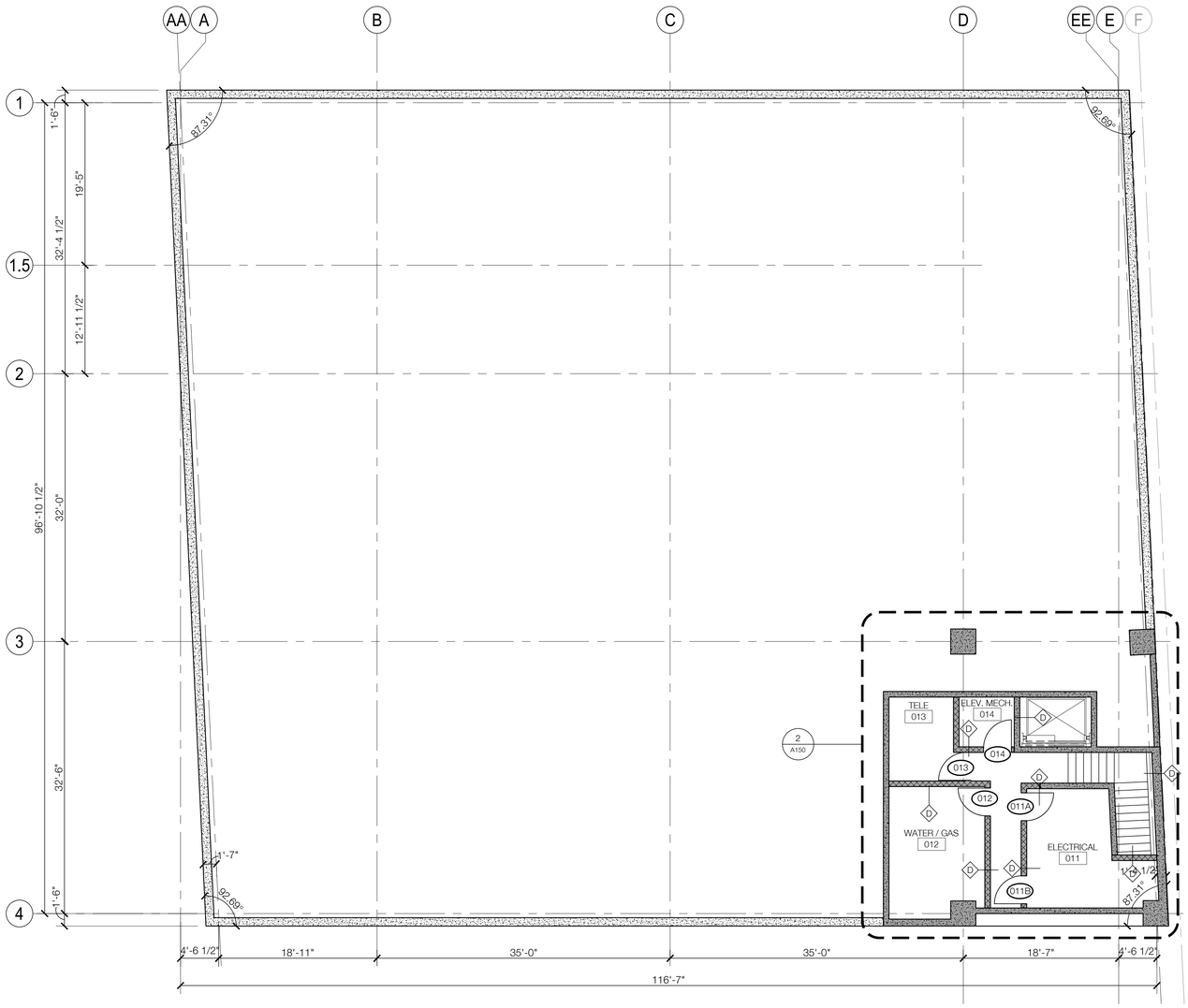
Drawn:	**TC**
Checked:	**FG**
Scale:	**AS NOTED**
Drawing Date:	**12/12/13**

Drawing No.

A100.00

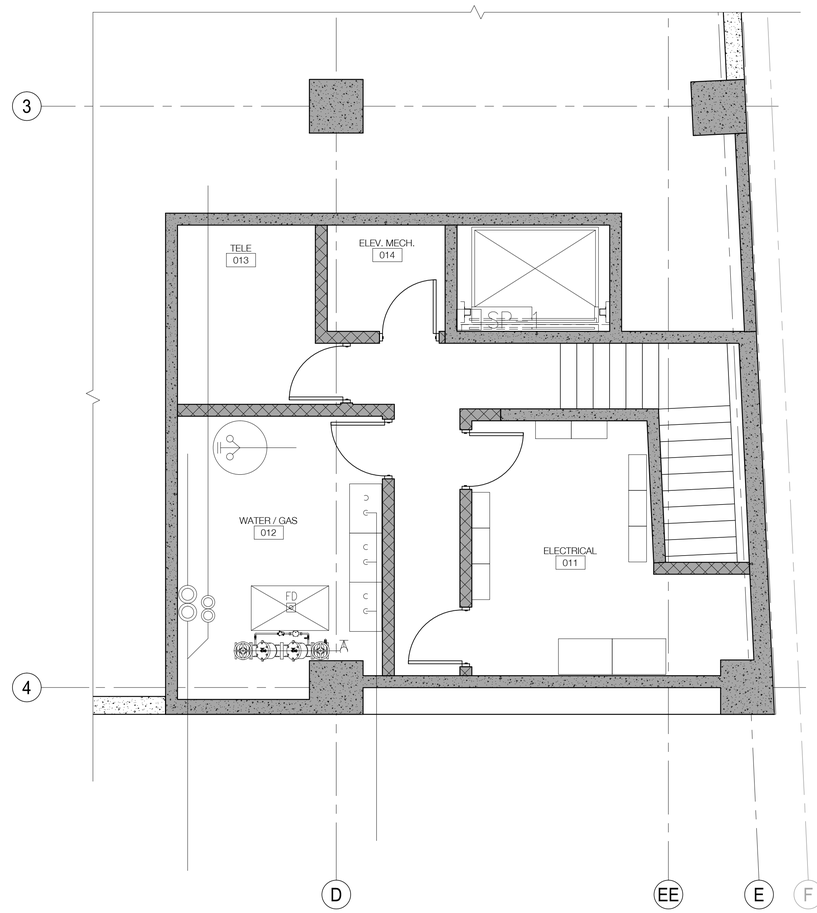
FOR NYC DOB USE

Sheet *Of*



1 CELLAR PLAN

SCALE: 1/8" = 1'-0"



2 CELLAR DETAIL PLAN

SCALE: 1/4" = 1'-0"

3 PLAN KEYNOTES

SCALE: N.T.S.

4 PLAN NOTES

SCALE: N.T.S.

1. ZONING ANALYSIS AND SIGNAGE, REFER TO DWG. Z-001 & Z-002
2. BUILDING CODE REQUIREMENTS, REFER TO DWG. A-001
3. ADA ACCESSIBILITY DATA, REFER TO DWG. A-002
4. CELLAR LIFE SAFETY PLAN, REFER TO DWG. A-003
5. FIRST FLOOR LIFE SAFETY PLAN, REFER TO DWG. A-004
6. ARCHITECTURAL SITE PLAN, REFER TO DWG. A-010
7. CELLAR FLOOR PLAN, REFER TO DWG. A-100
8. FIRST FLOOR PLAN, REFER TO DWG. A-101
9. SECOND FLOOR PLAN, REFER TO DWG. A-102
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11. CELLAR SLAB PLAN, REFER TO DWG. A-110
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13. SECOND FLOOR SLAB PLAN, REFER TO DWG. A-112
14. ROOF SLAB PLAN, REFER TO DWG. A-114
15. REFLECTED CEILING PLANS, REFER TO DWGS. A-120, A-121, A-122
16. BUILDING ELEVATIONS, REFER TO DWG. A-200
17. BUILDING SECTIONS, REFER TO DWG. A-300
18. EXTERIOR WALL SECTIONS, REFER TO DWG. A-310, A-311
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20. ENLARGED PLAN DETAILS, REFER TO DWG. A-340, A-341
21. ENLARGED STAIR PLANS, REFER TO A-400, A-401, A-402
22. ENLARGED ELEVATOR PLANS, REFER TO DWG. A-410
23. PARTITION TYPES, REFER TO DWG. A-500
24. DOOR SCHEDULE AND DETAILS, REFER TO DWG. A-600
25. STOREFRONT SCHEDULES, REFER TO DWG. A-601

5 PLAN LEGEND

SCALE: N.T.S.

SYMBOL	*DESCRIPTION*
	CMU PARTITION
	CONCRETE PARTITION
	GYP. BD. PARTITION
	EXTERIOR PARTITION
	DOOR
1	KEY NOTE
	NOT IN CONTRACT (N.I.C.)
	ELECTRICAL PANEL
FE	FIRE EXTINGUISHER ON BRACKET
#	DOOR TYPE. SEE A-650
#	PARTITION TYPE. SEE A-550
SFXX	STORE FRONT / LOUVER , SEE A-651.00
	ALIGN

SBLM

Owner
Equity One

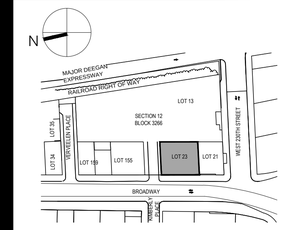
Telephone
Fax

Architect
SBLM Architects
545 West 45th Street, 4th Floor
New York, NY 10036
TeL: 212 995 5600
Fax 212 675 4228
www.sblm.com

Structural Engineering
e2 Engineers
311 State Street
New London, CT 06320
Tel: 860 437 3259
Fax: 860 437 3194

Mechanical, Electrical, Plumbing
DNV Associates
153 West 27th Street #1105
New York, NY 10018
Tel: 212 233 2434
Fax: 212 233 0717

Revisions/Issues



Seal

Project Title
LOT 23

BROADWAY PLAZA
5530 BROADWAY
BRONX, NY 10463

Drawing
CELLAR PLAN

Job Number **013160**

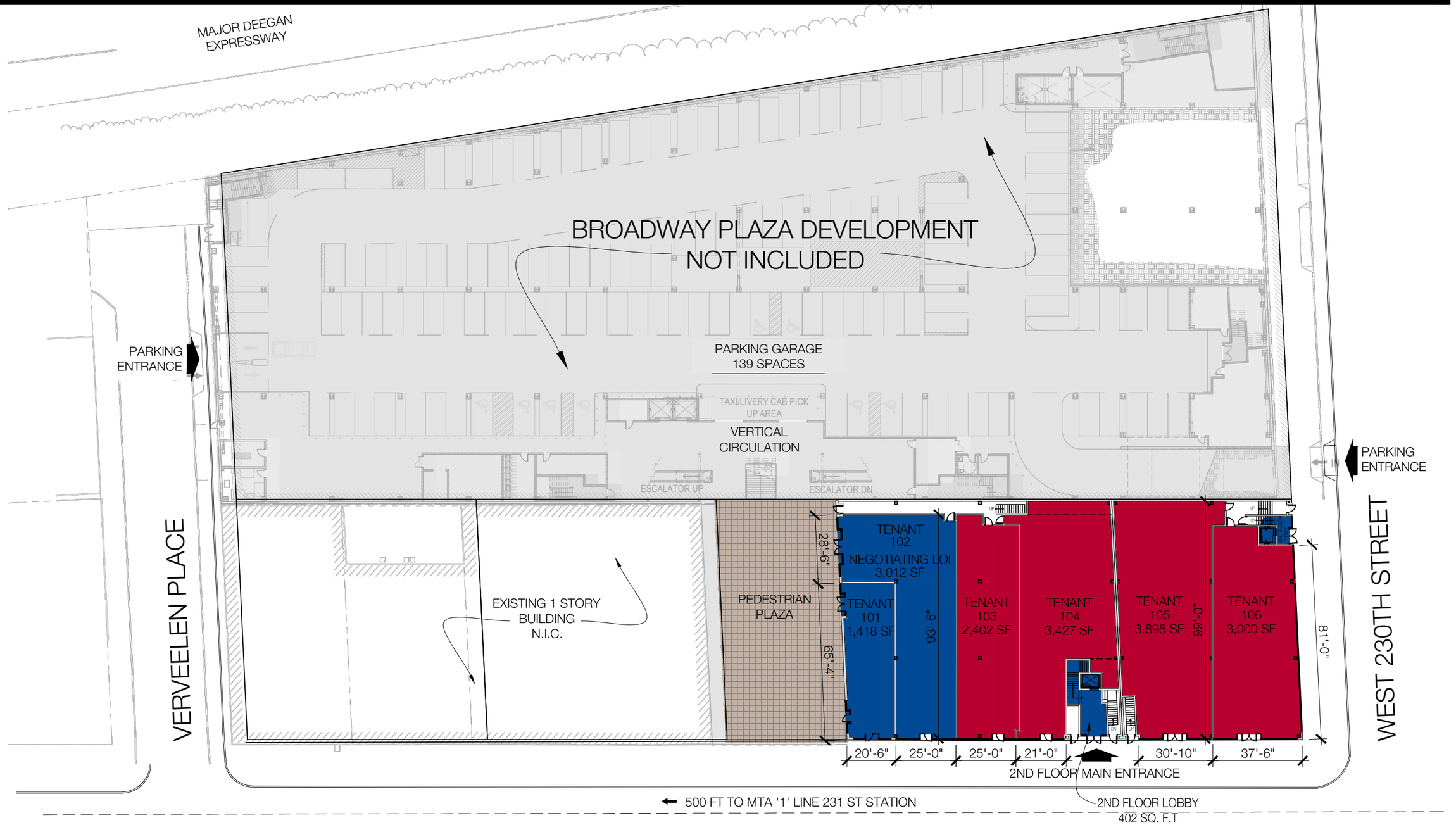
Seal & Signature

Drawn:	**TC**
Checked:	**FG**
Scale:	**AS NOTED**
Drawing Date:	**12/12/13**

Drawing No.
A150.00

FOR NYC DOB USE

Sheet *Of*



SBLM

Owner
EQUITY ONE
410 Park Ave #1220
New York, New York 10022
Telephone 212 796 1760

Architect
SBLM Architects
151 West 26th Street
New York, New York 10001
Telephone 212 995 5600
Fax 212 675 4228

Project Title
5510-5530 Broadway
Bronx, New York

DATE
January 23, 2014

1ST FLOOR

0 20' 40' 80'

SCALE: 1" = 40'-0"

MAJOR DEEGAN EXPRESSWAY

BROADWAY PLAZA DEVELOPMENT
NOT INCLUDED

LOADING DOCK

118'-3 1/2"

67'-10 1/2"

51'-3"

85'-4"

147'-5"

101'-3 1/2"

116'-6"

25'-0"

85'-5 1/2"

122'-8 1/2"

ALDI

18,038 SQ. FT.

VERTICAL CIRCULATION

38'-2 1/2"

23'-6"

UP

UP

DN

DN

IN

2ND FLOOR TOTAL AVAILABLE: 15,832 SF

ROOFTOP MECH. EQUIP.

98'-7"

73'-8"

NEGOTIATING LOI
201A & B

8,363 SF

7,469 SF

78'-7"

98'-4"

PATIO

PEDESTRIAN PLAZA BELOW

EXISTING 1 STORY BUILDING N.I.C.

VERVEELEN PLACE

WEST 230TH STREET

MTA ELEVATED SUBWAY '1' LINE

BROADWAY

SBLM

Owner
EQUITY ONE
410 Park Ave #1220
New York, New York 10022
Telephone 212 796 1760

Architect
SBLM Architects
151 West 26th Street
New York, New York 10001
Telephone 212 995 5600
Fax 212 675 4228

Project Title
5510-5530 Broadway
Bronx, New York

DATE
January 23, 2014

2ND FLOOR

0 20' 40' 80'

SCALE: 1" = 40'-0"

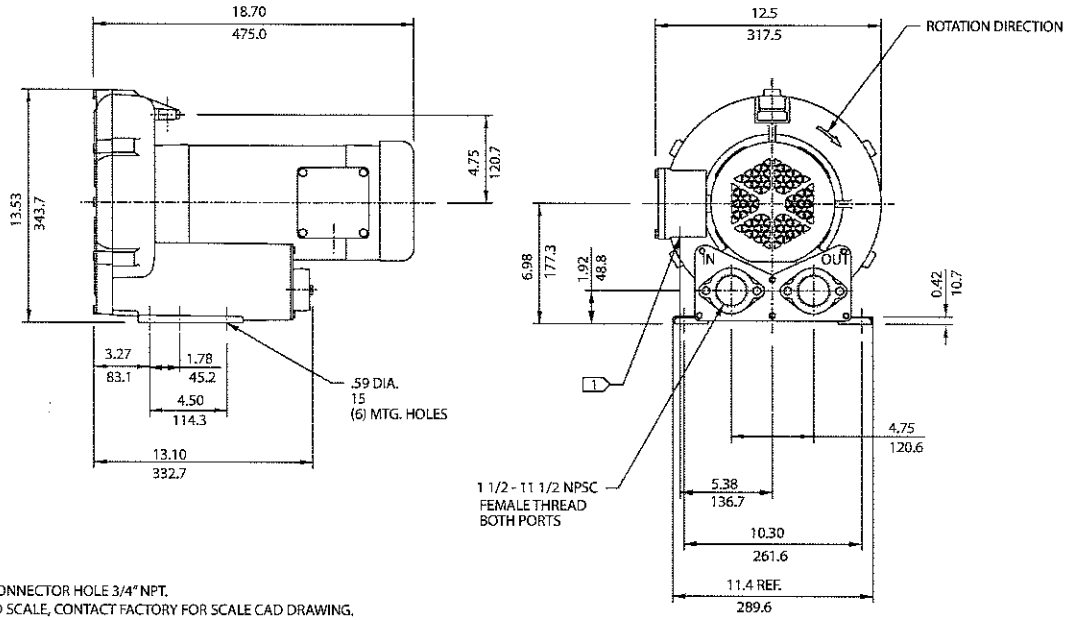
APPENDIX F

Specifications for Sub-Slab Depressurization System Blower

EN 454 & CP 454

ROTRON®

1.5 HP Sealed Regenerative w/Explosion-Proof Motor



IN
MM

NOTES
1. TERMINAL BOX CONNECTOR HOLE 3/4" NPT.
2. DRAWING NOT TO SCALE, CONTACT FACTORY FOR SCALE CAD DRAWING.
3. CONTACT FACTORY FOR BLOWER MODEL LENGTHS NOT SHOWN.

		Part/Model Number			
		EN454W58ML	EN454W72ML	CP454W72MLR	CP454FR72MLR
Specification	Units	080487	080488	080490	080494
Motor Enclosure - Shaft Mtl.	-	1.5	1.5	1.5	1.5
Horsepower	-	Explosion-proof-CS	Explosion-proof-CS	Chem XP-CS	Chem XP-SS
Phase - Frequency	-	Single-60 hz	Three-60 hz	Three-60 hz	Three-60 hz
Voltage	AC	115/208-230	230/460	230/460	230/460
Motor Nameplate Amps	Amps (A)	15/7.9-7.5	4.6/2.3	4.5/2.3	4.6/2.3
Max. Blower Amps	Amps (A)	19/10.9-9.5	5.6/2.8	5.6/2.8	5.6/2.8
Inrush Amps	Amps (A)	96-48	32/16	32/16	32/16
Service Factor	-	1/0	00/00	00/00	00/00
Starter Size	-	1.0	1.0	1.0	1.0
Thermal Protection	-	Class B - Pilot Duty	Class B - Pilot Duty	Class B - Pilot Duty	Class B - Pilot Duty
XP Motor Class - Group	-	I-D, II-F&G	I-D, II-F&G	I-D, II-F&G	I-D, II-F&G
Shipping Weight	Lbs	90	84	84	84
	Kg	40.8	38.1	38.1	38.1

Voltage - ROTRON motors are designed to handle a broad range of world voltages and power supply variations. Our dual voltage 3 phase motors are factory tested and certified to operate on both: **208-230/415-460 VAC-3 ph-60 Hz** and **190-208/380-415 VAC-3 ph-50 Hz.** Our dual voltage 1 phase motors are factory tested and certified to operate on both: **104-115/208-230 VAC-1 ph-60 Hz** and **100-110/200-220 VAC-1 ph-50 Hz.** All voltages above can handle a ±10% voltage fluctuation. Special wound motors can be ordered for voltages outside our certified range.

Operating Temperatures - Maximum operating temperature: Motor winding temperature (winding rise plus ambient) should not exceed 140°C for Class F rated motors or 120°C for Class B rated motors. Blower outlet air temperature should not exceed 140°C (air temperature rise plus inlet temperature). Performance curve maximum pressure and suction points are based on a 40°C inlet and ambient temperature. Consult factory for inlet or ambient temperatures above 40°C.

Maximum Blower Amps - Corresponds to the performance point at which the motor or blower temperature rise with a 40°C inlet and/or ambient temperature reaches the maximum operating temperature.

XP Motor Class - Group - See Explosive Atmosphere Classification Chart in Section I

AMETEK TECHNICAL & INDUSTRIAL PRODUCTS
75 North Street, Saugerties, NY 12477
USA: +1 215-256-6601 - Europe: +44 (0) 845 366 9664 - Asia: +86 21 5763 1258
Customer Service Fax: +1 215.256.1338
www.ametektip.com

Environmental / Chemical Processing Blowers

EN 454 & CP 454

ROTRON®

1.5 HP Sealed Regenerative w/Explosion-Proof Motor

FEATURES

- Manufactured in the USA - ISO 9001 and NAFTA compliant
- Maximum flow: 120 SCFM
- Maximum pressure: 65 IWG
- Maximum vacuum: 59 IWG
- Standard motor: 1.5 HP, explosion-proof
- Cast aluminum blower housing, impeller , cover & manifold; cast iron flanges (threaded); teflon® lip seal
- UL & CSA approved motor with permanently sealed ball bearings for explosive gas atmospheres Class I Group D minimum
- Sealed blower assembly
- Quiet operation within OSHA standards

MOTOR OPTIONS

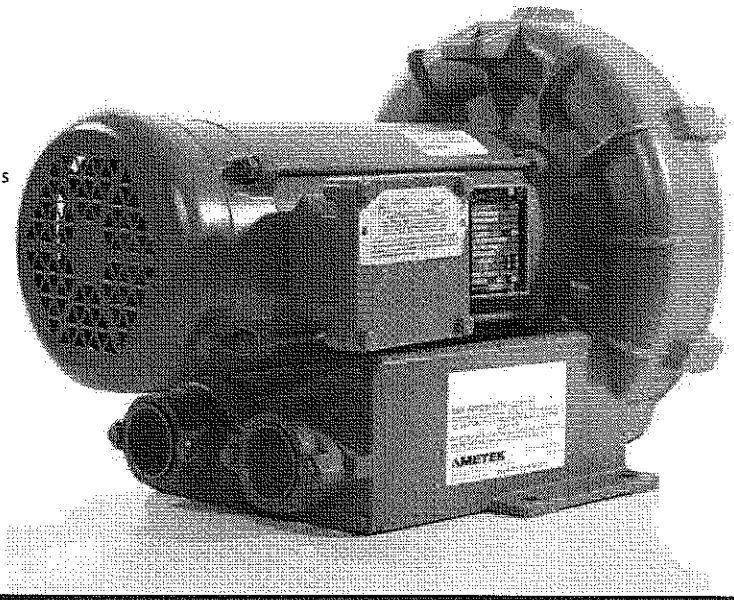
- International voltage & frequency (Hz)
- Chemical duty, high efficiency, inverter duty or industry-specific designs
- Various horsepowers for application-specific needs

BLOWER OPTIONS

- Corrosion resistant surface treatments & sealing options
- Remote drive (motorless) models
- Slip-on or face flanges for application-specific needs

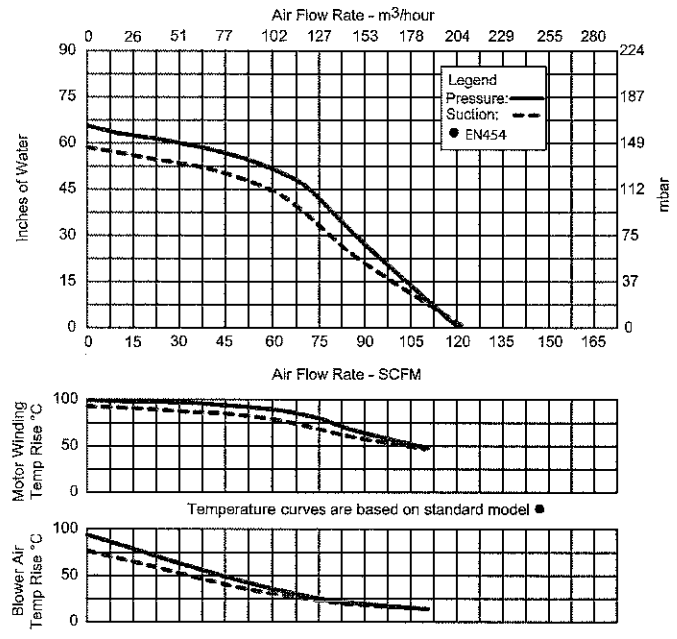
ACCESSORIES

- Flowmeters reading in SCFM
- Filters & moisture separators
- Pressure gauges, vacuum gauges, & relief valves
- Switches - air flow, pressure, vacuum, or temperature
- External mufflers for additional silencing
- Air knives (used on blow-off applications)
- Variable frequency drive package

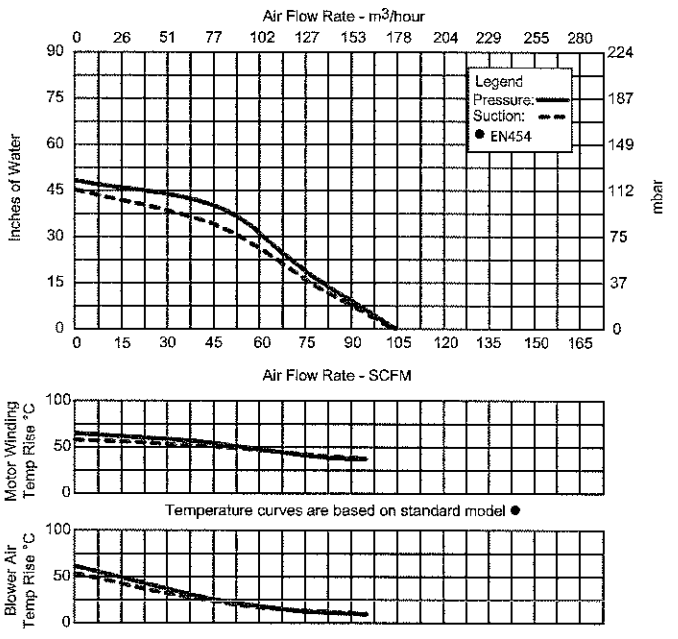


Blower Performance at Standard Conditions

60 Hz



50 Hz

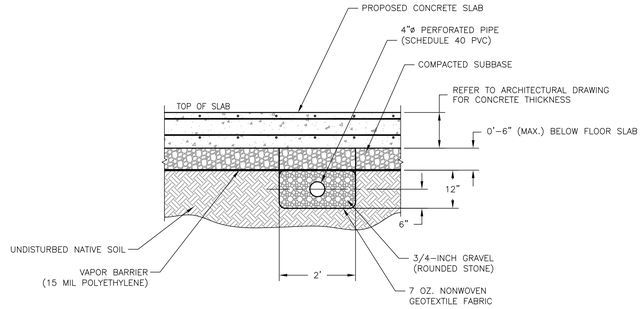


AMETEK TECHNICAL & INDUSTRIAL PRODUCTS
75 North Street, Saugerties, NY 12477
USA: +1 215-256-6601 - Europe: +44 (0) 845 366 9664 - Asia: +86 21 5763 1258
Customer Service Fax: +1 215.256.1338
www.ametektip.com

AMETEK®
TECHNICAL & INDUSTRIAL PRODUCTS

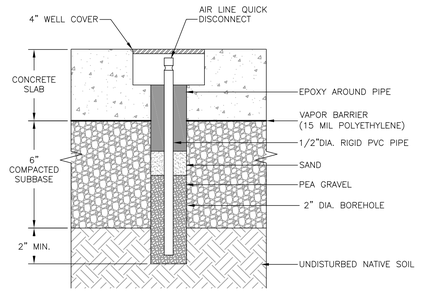
PLATE

Sub-Slab Depressurization Systems



1 PROPOSED SUB-SLAB DEPRESSURIZATION SYSTEM PIPE DETAIL

NOT TO SCALE

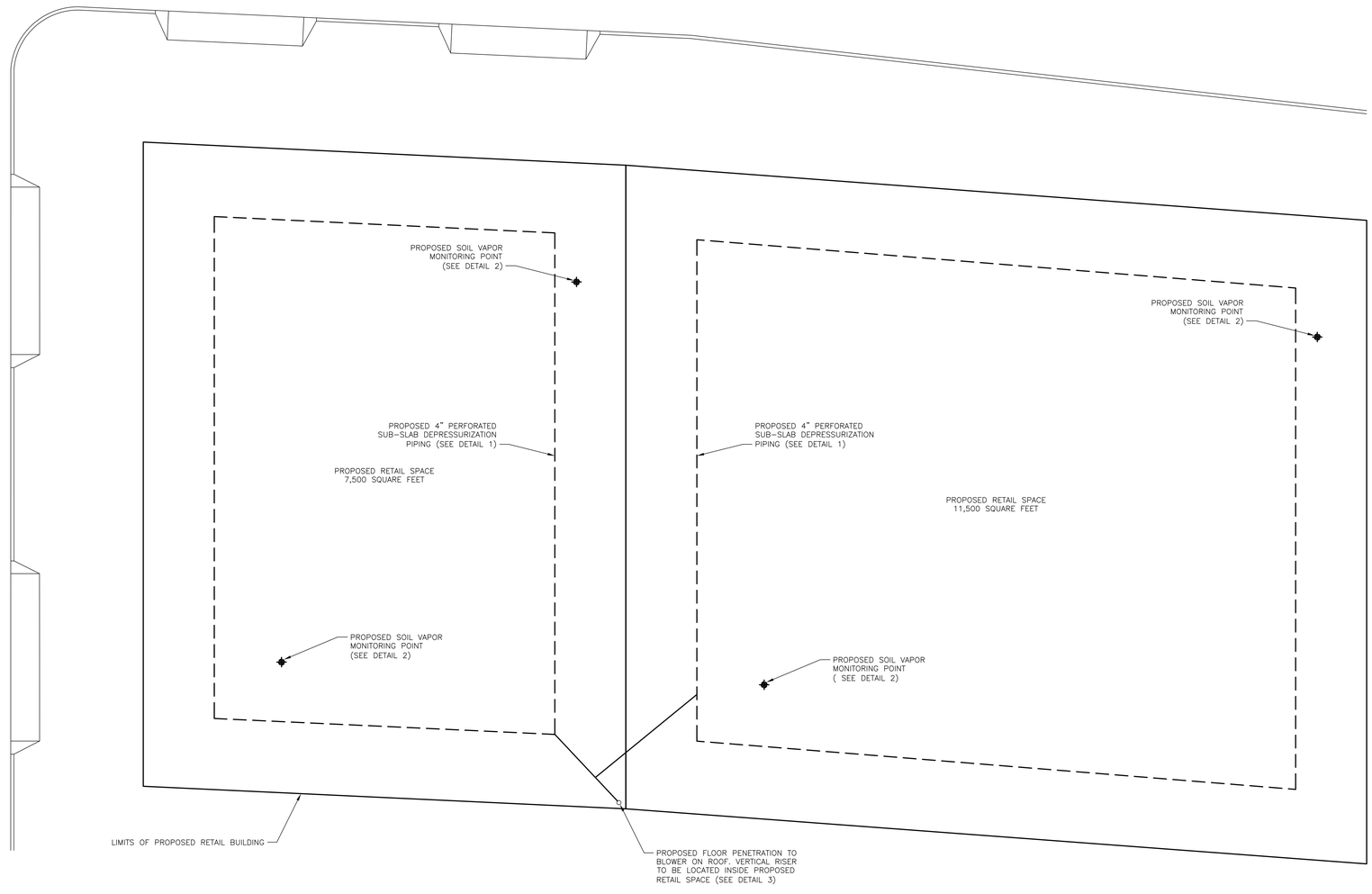


NOTE

DEPICTED LOCATIONS OF SOIL VAPOR MONITORING POINTS ARE APPROXIMATE AND SHALL BE COORDINATED AND CONFIRMED WITH EQUITY ONE AND ROUX ASSOCIATES PRIOR TO CONSTRUCTION.

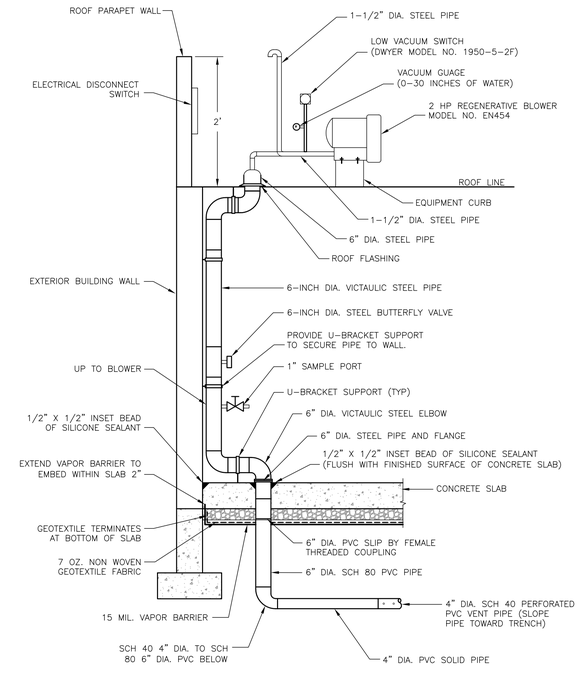
2 SOIL VAPOR MONITORING POINT DETAIL

SCALE: 1" = 4'



PROPOSED SUB-SLAB DEPRESSURIZATION SYSTEM PLAN

SCALE: 1"=10'



3 PROPOSED TYPICAL VERTICAL RISER TO BLOWER DETAIL

NOT TO SCALE

NOTES

1. ONE WARNING LIGHT TO BE LOCATED IN THE INTERIOR SPACE.
2. WARNING LIGHT WILL COME ON WHEN THERE IS NO POWER TO THE BLOWER OR A LOW VACUUM SITUATION OCCURS.

Title:

PROPOSED ACTIVE SUB-SLAB DEPRESSURIZATION SYSTEMS

5530 BROADWAY
BRONX, NEW YORK
REMEDIAL ACTION WORK PLAN

Prepared For:

EQUITY ONE, INC.

Remedial	Compiled by: G.N.	Date: 04FEB14	PLATE
REMEDIAL ENGINEERING, P.C.	Prepared by: J.A.D.	Scale: AS SHOWN	1
ENVIRONMENTAL ENGINEERS	Project Mgr: G.N.	Project: 1924.0005Y00	
	File: 1924.0006Y104.04.DWG		

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