

**538 UNION AVENUE
BROOKLYN, NEW YORK**

REMEDIAL ACTION WORK PLAN

NYC VCP Number: 13CVCP081K

Prepared for:

Withers Owner, LLC
250 Greenpoint Avenue
Brooklyn, NY 11222

Prepared by:

CA RICH Consultants, Inc.
17 Dupont Street
Plainview, NY 11803-1614
(516) 576-8844

AUGUST 2012

REMEDIAL ACTION WORK PLAN

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LIST OF ACRONYMS

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
VCA	Voluntary Cleanup Agreement
MNA	Monitored Natural Attenuation
NOC	Notice of Completion
NYC VCP	New York City Voluntary 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

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, Stephen J. Osmundsen, am a Professional Engineer licensed in the State of New York. I have primary direct responsibility for implementation of the remedial action for the 538 Union Avenue Site, 13CVCP081K.

I, Deborah Shapiro am a Qualified Environmental Professional as defined in §43-140. I have primary direct responsibility for implementation of the remedial action for the 538 Union Avenue Site, 13CVCP081K.

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.

Stephen J. Osmundsen, P.E.

Name Stephen J. Osmundsen
NYS PE License Number 056136
Signature [Handwritten Signature]
Date August 23, 2012



Deborah Shapiro, QEP

QEP Name _____

QEP Signature _____

Date _____

EXECUTIVE SUMMARY

Withers Owner, LLC has enrolled in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a 5,000-square foot site located at 538 Union Avenue in Brooklyn, 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 with applicable laws and regulations.

Site Location and Current Usage

The Site is located at 538 Union Avenue in the Williamsburg section of Brooklyn, New York and is identified as Block: 2741; Lots 7 and 8 on the New York City Tax Map. Figure 1 shows the Site location. The Site is comprised of 5,000-square feet and is bounded by Withers Street to the north, a parking lot to the south, a two-story building to the east, and Union Avenue to the west. A map of the site boundary is shown in Figure 2. Currently, the Site is vacant and undeveloped and contains foundation elements associated with the early stages of site redevelopment by a previous developer.

Summary of Proposed Redevelopment Plan

The proposed future use of the Site will consist of a six-story residential building covering 13,380 square feet. Approximately 1,875 square feet of exterior parking for the apartment building will be provided fronting Withers Avenue. The residential building will consist of 13 condominium residences with one unit on the first floor. The building will be slab-on-grade construction, with a concrete/asphalt parking area in the rear portion of the building. The proposed building covers approximately 65% of the lot.

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 and 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 (CPP) included in RAWP;
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds;
3. Establishment of Track 4 Soil Cleanup Objectives (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 SCOs. Appropriate segregation of excavated media on-site;
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 USTs and closure of petroleum spills (if encountered) 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;
9. Collection and analysis of end-point samples to determine the performance of the remedy with respect to the attainment of SCOs;
10. Demarcation of residual soil/fill;
11. Installation of a vapor barrier system beneath the building slab;
12. Installation and operation of an active sub-slab depressurization system;
13. Construction and maintenance of an engineered composite cover consisting of a two foot thick layer of clean cover across the entire Site, an asphalt covered parking lot and

a concrete building slab, to prevent human exposure to residual soil/fill remaining under the Site;

14. Importation of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations;
15. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations;
16. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations;
17. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, and describes all Engineering and Institutional Controls to be implemented at the Site, and lists any changes from this RAWP; and,
18. 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; and,
19. Recording of a Declaration of Covenants and Restrictions that includes a listing of Engineering Controls and a requirement that management of these controls must be in compliance with an approved SMP; and Institutional Controls including 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. This cleanup plan 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 Health and Safety Plan 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. 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 is Jason Cooper and can be reached at 516-576-8844 (office) or 516-833-2535 (cell).

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 includes 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 on-site Project Manager, Withers Owner LLC at 718-302-0008 or NYC Office of Environmental Remediation Project Manager Michael Mandac 212-676-0754.

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 or as specified in the NYCDOB permit.

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 where 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 Withers Owner LLC at 718-302-0008, the NYC Office of Environmental Remediation Project Manager Michael Mandac at 212-676-0754, 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 review in the public document repositories located at the Williamsburg 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. A certification of continued protectiveness of the cleanup will be required from time to time to show that the approved cleanup is still effective.

1.0 REMEDIAL ACTION WORK PLAN

1.1 Site Background

Withers Owner, LLC has enrolled in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 538 Union Avenue in the Williamsburg section of Brooklyn, 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.

1.2 Site Location and Current Usage

The Site is located at 538 Union Avenue in the Williamsburg section of Brooklyn, New York and is identified as Block: 2741; Lots 7 and 8 on the New York City Tax Map. Figure 1 shows the Site location. The Site is comprised of 5,000-square feet and is bounded by Withers Street to the north, a parking lot to the south, a two-story building to the east, and Union Avenue to the west. A map of the site boundary is shown in Figure 2. Currently, the Site is vacant and undeveloped and contains foundation elements associated with the early stages of site redevelopment by a previous developer.

1.3 Proposed Redevelopment Plan

The proposed future use of the Site will consist of a six-story residential building covering 13,380 square feet. Approximately 1,875 square feet of exterior parking for the apartment building will be provided fronting Withers Avenue. The residential building will consist of 13 condominium residences with one unit on the first floor. The building will be slab-on-grade construction, with a concrete/asphalt parking area in the rear portion of the building. The proposed building covers approximately 65% of the lot.

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

1.4 Description of Surrounding Property

The Site is located in a developed area consisting of mixed-use residential and commercial buildings. Withers Street is located to the north of the Site. A parking lot is located to the south of the Site. A two-story building is located to the east. Union Avenue is located to the west.

National Wetlands and the East River are mapped within a one-mile radius of the subject Property. There are no on-site or adjacent bodies of water, wetlands or other environmentally sensitive areas with the exception of the underlying soils and groundwater. The 100 and 500-year Floodplains are mapped within a 1-mile radius of the Property. The shallow groundwater directly underlying the Property is not utilized as a water resource. Figure 2 shows the surrounding land usage.

1.5 Remedial Investigation

A remedial investigation was performed and the results are documented in a companion document called “Remedial Investigation Report, 538 Union Avenue”, dated August 2012 (RIR).

Summary of Past Uses of Site and Areas of Concern

Review of Sanborn Map coverage of the Property indicated that a portion of the Property was initially developed during or prior to 1887 as two stores. Previous occupants of the Property included a dwelling, a junk yard, store, auto repair shop, parking, and manufacturing.

A search of the New York City Department of Finance (NYCDOF) ACRIS database was also conducted for the subject Property. Copies of records are included in the Phase I Environmental Site Assessment (ESA) that was conducted in July 2007. The following is a summary of the ownership history of each lot.

Block: 2741; Lot: 7 Title was transferred from Benny Loparo to Walter Langer on June 26, 1973; from the commissioner of finance to New York City on August 18, 1982; from New York City to Joseph Matarese on March 27, 1985; and, from Barclays Bank of New York to Lake Newell Ltd on August 12, 1998.

Block 2741; Lot: 8 Title was transferred from Havemeyer Properties, Inc. to Biach Russ Co on July 12, 1966; and, from Beach-Russ Company to 544 Union Owner LLC on December 26, 2006.

Based on the results of the Phase I and Remedial Investigation (RI), the AOCs identified for this Site include:

1. Urban Fill - at shallow depths throughout the Site.
2. Soil Vapor - detected in the soil vapor throughout the Site.

Summary of the Work Performed under the Remedial Investigation

The RI consisted of the following scope of work:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Drilled four (4) soil borings across the entire project Site, and collected eight (8) soil samples for chemical analysis from the soil borings to evaluate soil quality;
3. Installed three (3) temporary groundwater monitoring wells throughout the Site, and collected three (3) groundwater samples for chemical analysis to evaluate groundwater quality;
4. Installed three (3) soil vapor probes across the Site and collected three (3) samples for chemical analysis to evaluate soil vapor quality; and
5. All soil and groundwater samples were analyzed for VOCs via EPA Method 8260, SVOCs via EPA Method 8270, Pesticides via EPA Method 8081, PCBs via EPA Method 8082, and TAL Metals. The soil vapor samples were analyzed for VOCs using USEPA Method TO-15.

Summary of Environmental Findings

1. Elevation of the property is approximately 18 feet.
2. Depth to groundwater ranges from 4 to 6 feet below surface grade at the Site.
3. Groundwater flow is generally westerly beneath the Site.
4. Depth to bedrock is undetermined at the Site.
5. The stratigraphy of the Site, from the surface down, consists of urban fill followed by unconsolidated Cretaceous age deposits composed of interbedded layers of silt, sand, and gravel.
6. Three VOCs were detected in the shallow and deep soil samples below the Track 1 SCOs. Methylene chloride was detected in all samples from 8 to 15 ppb. PCE was detected at 1.4 ppb and naphthalene was detected at 2.8 ppb. SVOCs exceeded Track 2 Restricted-Residential SCOs across the entire Site. The SVOCs benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene were detected above the Track 2 Restricted-Residential SCOs across the Site. One soil sample detected Arocolor 1260 and Arocolor 1262 at 150 parts per billion (ppb), which is above the Track 1 SCO but below the Track 2 Restricted-Residential SCO. All other soil samples detected trace levels of PCBs. Pesticides including DDD, DDE, DDT, chlorodane and dieldrin were detected above the Track 1 SCOs but below the Track 2 Restricted-Residential SCOs. Metals including arsenic, barium, cadmium, chromium, copper, lead, mercury and zinc exceeded the Track 1 SCOs and of these arsenic, barium, lead, and mercury also exceeded the Track 2 Restricted-Residential SCOs.
7. Groundwater samples collected during the RI showed a slight exceedence of NYSDEC TOGS 1.1.1 Groundwater Quality Standards (GQS) for VOCs (1,1,1-Trichloroethane) at one of the three locations. SVOCs including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, indeno(1,2,3-cd)pyrene were detected above GQS. Pesticides including 4,4'-DDT, DDE and DDD were detected in groundwater but only DDT at 0.39 ppb exceeded GQS in one location. The RI indicated concentrations of dissolved metals (magnesium, manganese, and sodium)

slightly above the GQS. PCBs were not detected in any of the groundwater samples collected at the Site.

8. Three (3) soil vapor samples collected during the RI contained low level VOCs. The RI showed detections of several chlorinated and petroleum related compounds in all samples. Tetrachloroethylene (PCE) and Trichloroethylene (TCE) were detected at a maximum concentration of 31 ug/m³ and 72.6 ug/m³, respectively. The petroleum related soil vapor detections are attributed to on-site urban fill. The detections of chlorinated solvents are believed to be related to the presence of chlorinated solvents in the groundwater emanating from an upgradient source.

For more detailed results, consult the RIR. 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. The results are summarized on Tables 1 through 11.

2.0 REMEDIAL ACTION OBJECTIVES

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

Soil

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

Groundwater

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

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 nine 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; and
- Land use.

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 are considered in this alternatives analysis for the site. The following remedial action alternatives were considered under this program:

Remedial Alternative #1: Track 1 Cleanup

Alternative 1 is Track 1 alternatives that involve establishment of Track 1 soil cleanup objectives (SCOs) and complete removal of all soil and fill material that exceeds the unrestricted Track 1 SCOs. This would include removing the soil and fill material from across the entire Site to a minimum of 6-feet deep and into the shallow water table, and backfilling the Site to approximately 2-feet below grade. Dewatering would be required and would include a pumping system, settling tanks, treatment system, and the appropriate NYCDEP permit to discharge

groundwater into the sewer system. No engineering or institutional controls can be utilized in a Track 1 cleanup. As part of new building construction, a vapor barrier, an engineered composite cover system and two feet of clean cover for any open/landscaped areas would be installed at the Site.

Remedial Alternative #2: Track 4 Cleanup:

- Establishment of Track 4 SCOs. Under this alternative, soil and fill material would be excavated above Track 4 SCOs. As part of the new development plans, the entire property would be excavated more than two feet below grade. The planned excavation would not extend into the water table and dewatering would not be necessary. Post excavation samples would be collected to confirm the attainment of the Track 4 SCOs;
- Placement of a soil vapor barrier beneath the building slab and along foundation side walls and an active sub-slab depressurization system beneath the foundation to prevent intrusion of soil vapor;
- Placement of an engineered composite cover over the entire Site to eliminate exposure to remaining soil/fill;
- Establishment of Institutional Controls 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
- Recording of a Declaration of Covenants and Restrictions that includes a listing of Engineering Controls and a requirement that management of these controls must be in compliance with an approved SMP; and Institutional Controls including 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 prevent exposure to contaminated on-site soils during remediation/ construction by implementing an approved soil and materials management plan and CAMP. By removing all soil/ fill with contaminant concentrations above Track 1 SCOs, the potential for direct contact with contaminated soil/ fill would be eliminated after remediation/ construction is complete. However, in order to prevent the migration of soil vapor from off-site sources into the proposed building and to prevent associated inhalation exposures, institutional and engineering controls are needed. A Track 1 Remedy cannot employ institutional or engineering controls. Therefore even though Alternative 1 would provide the maximum protection of public health and the environment based on onsite contamination, Alternative 1 would not adequately meet the RAOs of preventing exposure to contaminants in soil vapor from offsite sources and preventing migration of soil vapor into occupied structures without engineering and institutional controls that can be monitored in the long-term. While removal of soil to achieve Track 1 SCOs can be performed, engineering controls are needed to address soil vapors, and thus the final remedial action cannot achieve Track 1 status but can achieve a Track 2 status under existing regulations. The Track 1 cleanup is highly protective of public health and the environment by removing all contaminated soil and fill material above Track 1 SCOs. The Track 1 Cleanup would eliminate any direct contact with soil and fill material and groundwater and any sources of soil vapor. During remediation, this alternative will be protective of human health and the environment through the application of a Site-specific CHASP. Construction workers will be protected from exposure pathways identified in Section 4.6.

Alternative #2 would achieve comparable protection of public health and the environment by removing contaminated soil and fill material above the established Track 4 SCOs and by implementing engineering and institutional controls. As part of this alternative, a composite cover system consisting of at least two feet of clean cover, a concrete building foundation and a paved parking area will be installed over the entire Site to prevent any residents from exposure to contaminated materials. A vapor barrier and a sub-slab depressurization system will also be incorporated into the proposed structure to prevent volatile vapors from entering and accumulating within the new structure. To protect future residents, two feet of soil will be excavated site-wide and removed from the Site for proper off-site disposal. An additional 1-2 feet of soil will be excavated from the vicinity of former soil boring B-10 due to elevated levels of pesticides. This alternative would be consistent with the RAOs and would provide overall protection of public health and the environment in consideration of current and potential future land use.

During remediation, this alternative will be protective of human health and the environment through the application of a site-specific CHASP. By employing CHASP procedures throughout construction, workers will be protected from exposure pathways identified in Section 4.6.

3.2 Balancing Criteria

Compliance with Standards, Criteria and Guidance (SCGs)

Alternative #1 will comply with the SCGs, as all contaminated soil and fill material exceeding Track 1 SCOs would be excavated from the Site, managed under an approved soil management plan, and disposed of in accordance with Federal, State and local regulations

Alternative #2 will comply with the SCGs by establishing Track 4 SCOs. All contaminated soil and fill materials exceeding Track 4 SCOs would be excavated from the Site, managed under an approved soil and materials management plan, and disposed of in accordance with all Federal, State and local regulations.

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.

The **Alternative #1 and #2** are both considered to be effective in protecting human health and the environment in the short term. Alternative 1 would eliminate and alternative 2 would reduce exposure to contaminant sources. The Alternative #1 and #2 would both employ appropriate measures to prevent short term impacts, including a Community Air Monitoring Plan (CAMP) and a Soil/Materials Management Plan (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). Short-term impacts are likely to be higher for Alternative #1 due to excavation of greater amounts of historic fill material. However, focused attention to means and methods during the remedial action during Alternative #1 would minimize or negate the overall impact of these activities and any differences between these alternatives.

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. However, engineering controls are also required for soil vapor management and these EC's prevent the attainment of a Track 1 cleanup status.

Alternative #2 would be effective over the long-term by attaining Track 4 SCOs through the placement of a composite cover over the entire site, establishing use restrictions, establishing a Site Management Plan to ensure long-term management of ECs/ICs, and placing a deed restriction to memorialize these controls for the long term. Groundwater use restrictions will eliminate potential exposure to groundwater and establishment of an SMP and a deed restriction will ensure that this protection remains effective for the long-term. The SMP will ensure long-term effectiveness of all Engineering and Institutional Controls by requiring periodic inspection and certification that these controls and use restrictions continue to be in place and functioning as they were intended assuring that protections designed into the remedy will provide continued high level of protection in perpetuity. Operation of a ventilated parking garage will minimize the potential for accumulation of vapors with the occupied structure and eliminate associated inhalation exposures.

Both alternatives will likely achieve long-term effectiveness for all three media of concern in accordance with the RAOs presented in Section 2.0.

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 unrestricted use SCOs. Alternative 1 would eliminate a greater total mass of contaminants on-site.

Alternative #2 would permanently eliminate the toxicity, mobility, and volume of contaminants from on-site soil in excess of Track 4 SCOs and manages the residual contaminated soil/fill material through the engineered composite cover and adherence to a Site Management Plan. Placement of cover material over the entire Site will lower toxicity by eliminating potential contact with remaining soil above Restricted Use Restricted Residential SCOs.

Both alternatives address off-site soil vapor intrusion through the installation of a soil vapor barrier. Alternative #2 includes incorporation of a vapor barrier and SSD system into the proposed structure will reduce its mobility with respect to migrating into the structure.

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 readily implementable and utilize standard methods that are commonly available and routinely applied by the industry. The equipment and personnel needed to perform the proposed remedial actions are readily available. Space for the soil to be excavated is readily available at soil recycling or beneficial re-use facilities. Clean fill materials needed to fill in over-excavated portions of the Site are available locally. The materials needed to construct the proposed vapor barrier in accordance with ASTM standards are available with the manufacturers

recommended installation procedures. The reliability of each remedy 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.

The capital costs associated with Alternative #1 are much higher than Alternative #2 due to more soil and fill material being excavated/imported and the need for dewatering activities. In both cases, appropriate public health and environmental protections are achieved. However, long term costs for site management are significantly lower for Alternative #1 than for Alternative #2 because Alternative #2 requires adherence to a site management plan, future inspections and operation of the active SSD system.

Both alternatives satisfy the threshold balancing criterion and other criterion listed here, and each is fully protective of public health and the environment, will control migration of contaminants, and reduce both mobility and toxicity.

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.

It is expected that implementation of either alternative in conjunction with the proposed redevelopment would achieve community acceptance as it would result in the cleanup of the Site in conjunction with the proposed redevelopment. This RAWP will be subject to and undergo public review under the NYC VCP and will provide opportunity for detailed public input on the remedial alternatives and the selected remedial action. This public comment will be considered by OER prior to approval of this plan.

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 Site is currently vacant. Half of the Site has been undeveloped for years and the other half was previously an auto repair garage that was demolished in 2008. The Site is considered to be an unattractive blight on the community in its current undeveloped condition. Implementation of either alternative in conjunction with the proposed redevelopment will transform the vacant blighted Site into a new residential building with on-site parking.

The Site is serviced by public transportation in the form of both buses and trains. The area is sewered with municipal water and utilities are readily available. Cultural resources are also available both locally in the Brooklyn and in nearby Manhattan. There are no known natural resources, such as fish and wild life or floodplains, in close proximity to the Site.

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.

Alternative #1 will use a larger quantity of fuel and produce the most greenhouse gases, as it will have the largest volume of material transported to and from the Site.

Alternative #2 requires the removal of 500-800 tons of contaminated soil, which requires far less trucking. Both remedial alternatives are comparable with respect to the opportunity to achieve other sustainable remedial action elements to achieve the RAOs identified in Section 2.0. A complete list of green remedial activities considered as part of the cleanup is included in the Sustainability Statement found in Appendix B.

4.0 REMEDIAL ACTION

4.1 Summary of Preferred Remedial Action

The preferred remedial action alternative is Alternative #2, a Track 4 cleanup utilizing site specific SCOs. 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 and 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 (CPP) included in RAWP;
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds;
3. Establishment of Track 4 Soil Cleanup Objectives (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 SCOs. Appropriate segregation of excavated media on-site;
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 USTs and closure of petroleum spills (if encountered) 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;

9. Collection and analysis of end-point samples to determine the performance of the remedy with respect to the attainment of SCOs;
10. Demarcation of residual soil/fill;
11. Installation of a vapor barrier system beneath the building slab;
12. Installation and operation of an active sub-slab depressurization system;
13. Construction and maintenance of an engineered composite cover consisting of a two foot thick layer of clean cover across the entire Site, an asphalt covered parking lot and a concrete building slab, to prevent human exposure to residual soil/fill remaining under the Site;
14. Importation of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations;
15. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations;
16. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations;
17. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, and describes all Engineering and Institutional Controls to be implemented at the Site, and lists any changes from this RAWP;
18. 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;
19. Recording of a Declaration of Covenants and Restrictions that includes a listing of Engineering Controls and a requirement that management of these controls must be in compliance with an approved SMP; and Institutional Controls including 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 4 Soil Cleanup Objectives (SCOs) are proposed for this project. The SCOs for this Site are listed below and in Table 12. 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 C. The location of planned excavations is shown in Figure 3.

Contaminant	SCOs
VOC, Pesticides, PCBs, Metals	Track 2 Restricted Residential SCOs
Total SVOCs	250 ppm
Mercury	2.5 ppm

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 of off-site is 500-800 tons. The proposed disposal locations for site-derived impacted materials are listed below. Additional disposal locations established at a later date will be reported promptly to the OER Project Manager.

<u>Primary Disposal Facility</u>	<u>Waste Type</u>	<u>Estimated Quantity</u>
Soil Safe, Logan, NJ	Non-hazardous material i.e. historic fill	500-800 tons
<u>Alternate Disposal Facility</u>		Contingency only
Clean Earth of Carteret, Carteret, NJ	Non-hazardous material i.e. historic fill	500-800 tons

End-Point Sampling

Sampling conducted during the Remedial Investigation will constitute as endpoint samples for the majority of the Site. Endpoint samples will only be collected in the vicinity of former soil boring B-10. Removal actions under this plan will be performed in conjunction with remedial endpoint sampling. End-point sampling frequency will consist of the following:

1. For excavations less than 20 feet in total perimeter, at least one bottom sample and one sidewall sample biased in the direction of surface runoff.
2. For excavations 20 to 300 feet in perimeter:
 - a. For surface removals, one sample from the top of each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
 - b. For subsurface removals, one sample from each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
3. For sampling of VOCs, bottom samples should be taken within 24 hours of excavation, and should be taken from the zero to six-inch interval at the excavation floor. Samples taken after 24 hours should be taken at six to twelve inches.
4. 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 pursuant to bullets 1-2 above.

Post-remediation 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. The locations of potential endpoint samples for the remedial excavation are included as Figure 8. Please note that endpoint samples will not be collected for the two-foot deep site-wide excavation. Sampling conducted during the Remedial Investigation will constitute as endpoint samples for the majority of the Site. Endpoint samples will only be collected in the vicinity of former soil boring B-10.

New York State ELAP certified labs will be used for all end-point sample analyses. Laboratories utilized for end-point sample analyses will be reported in the RAR. The RAR will provide a tabular and map summary of all end-point sample results and will include all data including non-detects and applicable standards and/or guidance values. Endpoint samples will be analyzed for trigger analytes (those for which SCO exceedance is identified) utilizing the following methodology.

Soil analytical methods will include:

- Semi-volatile organic compounds by EPA Method 8270;
- The metals arsenic, barium, cadmium, chromium, copper, lead, mercury, and zinc via Methods SW6010 and SW7471B;
- Pesticides by EPA Method 8081; and,
- PCBs by EPA Method 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 excavation endpoint samples will be collected using a decontaminated sampling trowel, hand auger or an unused sterile wooden tongue depressor and placed directly into pre-sterilized laboratory issued containers. The sample containers will be properly labeled and immediately placed on-ice within a cooler. Sample time and location will be recorded on a chain of custody. The samples will be submitted to an ELAP-certified laboratory for analysis of PAHs via EPA

Method 8270, TCL Pesticides via EPA Method 8081 and heavy metals using EPA Method 6000/7000 series. The laboratory will follow the NYSDEC – Analytical Services Protocol dated 1995. The laboratory will compile and submit the data package using NYSDEC ASP Category B deliverables.

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. Collected samples will be appropriately packaged, placed in coolers and shipped or delivered directly to the analytical laboratory by field personnel. Samples will be containerized in appropriate laboratory provided glassware and shipped in plastic coolers. Samples will be preserved to maintain a temperature of 4oC.

Decontamination of non-dedicated sampling equipment will consist of the following:

- Gently tap or scrape to remove adhered soil;
- Rinse with tap water;
- Wash withalconox® detergent solution and scrub;
- Rinse with tap water;
- Rinse with distilled or deionized water;

Prepare field blanks by pouring distilled or deionized water over decontaminated equipment and collecting the water in laboratory provided containers. One field blank and one duplicate field sample per every 20 field samples will also be collected and submitted for analysis. The field blank and field duplicate will include all of the parameters included in the sample analysis.

Import and Reuse of Soils

Import of soils onto the property will be performed in conformance with the Soil/Materials Management Plan in Appendix C. The estimated quantity of soil to be imported into the Site for

backfill and cover soil is 500-800 tons. Since the only excavation required is for contamination removal there are no plans to reuse or relocate any of the on-site soils.

4.3 Engineering Controls

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:

- Two feet of clean fill material site-wide covered with a composite cover system consisting of an asphalt/concrete covered parking lot and concrete building slabs;
- Soil vapor barrier; and
- An active 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:

- 2-feet of clean cover soil site-wide;
- Asphalt/concrete covered parking lot; and
- concrete building slabs.

Figure 9 shows the location of each cover type built at the Site.

The engineered 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 the 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. The vapor barrier system design and installation will include the following:

A Stego™ 20-mil vapor barrier or equivalent vapor barrier or waterproofing membrane that meets or exceeds ASTM's E-1745 standard for installation of a vapor barrier between granular fill and concrete will be selected. The membrane will be installed in accordance with the manufacturer's installation procedures beneath the entire building foundation and up any subgrade sidewalls. Prior to pouring the concrete slab, the Remedial Engineer or his designee will visit the Site to inspect and photograph the installed material. A set of the installation photos will be included in the RAR. The technical specifications for the Stego™ 20-mil vapor barrier are included as Appendix E. The location of the vapor barrier is illustrated on Figure 7.

Sub-Slab Depressurization System

Migration of soil vapor will also be mitigated with the construction of a sub-slab depressurization system. The sub-slab depressurization design and installation will include the following:

The sub-slab depressurization system will consist of a four-inch diameter perforated pipe placed beneath the new concrete floor of the building and vapor barrier. The perforated pipe will be wrapped with a geotextile fabric and placed in a bed of ¾-inch gravel averaging one-foot in thickness and will be interconnected at a central location to a solid pipe that will be extended to the roof through an interior pipe chase. On the roof, a Fantech vapor mitigation fan will be utilized to create a vacuum for this Site. The vapor mitigation fan will be attached to the riser pipe to draw a vacuum on the system, thus creating the depressurization beneath the slab that is required. A diagram of the SSD system layout is provided as Figure 7 and the specification for the Fantech fan are included in Appendix I.

After all the subgrade piping is installed a pilot test will be conducted to determine the suitable model mitigation fan. The pilot test will consist of attaching the 4-inch and 6-inch diameter Fantech Fan to the riser pipe after the concrete slab is poured. During the pilot test the pressure beneath the slab will be measured from a vacuum monitoring point to determine the negative pressure obtained beneath the structure with each fan. It is anticipated that a flow rate of approximately 50 to 100 cubic feet per minute and a vacuum of one to two inches of water will

be achieved with the selected fans. The location of the vacuum monitoring point is illustrated on Figure 7. The results of the pilot test will be included in 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. Procedures for long-term employment of EC/ICs will be established in a Declaration of Covenant and Restrictions (DCR) assigned to the property by the title holder and will be implemented under a site-specific Site Management Plan (SMP) that will be included in the RAR.

Institutional Controls for this remedial action are:

- Recording of an OER-approved Declaration of Covenant and Restrictions (DCR) with the City Register or county clerk, as appropriate. The DCR will include a description of all ECs and ICs, will summarize the requirements of the Site Management Plan, and will note that the property owner and property owner's successors and assigns must comply with the DCR and the approved SMP. The recorded DCR will be submitted in the Remedial Action Report. The DCR will be recorded prior to OER issuance of the Notice of Completion;
- 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 annually and will comply with RCNY §43-1407(1)(3).

- Vegetable gardens and farming on the Site are prohibited;
- 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 residential 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 the DCR and 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 DCR and 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 Voluntary 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 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

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 potential 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. The EA was prepared in accordance with Appendix 3B and Section 3.3 (b) 8 of NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation.

Potential Exposure Pathways

The five elements of an exposure pathway are: 1) a contaminant source; 2) contaminant release and transport mechanisms; 3) a point of exposure; 4) a route of exposure; and 5) a 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.

Potential Route of Exposure

An exposure route is the mechanism by which a receptor comes into contact with a chemical.

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.

Known and Potential Sources

Based on the results of the Phase I and Remedial Investigation, the AOCs identified for this Site include:

1. Urban Fill

In all areas of the Site that were tested, the soil displayed characteristics of historic fill. Elevated levels of several Semi-Volatile Organic Compounds (SVOCs) commonly referred to as Poly Aromatic Hydrocarbons (PAHs), pesticides and metals were detected above Part 375 Unrestricted Use Soil Cleanup Objectives (SCOs) throughout the Site at shallow depths. In addition, the PCB Aroclors 1260 and 1268 were detected above Part 375 Unrestricted Use SCOs in the shallow soils (0-2 feet below surface grade) in one soil boring location.

2. Soil Vapor

VOCs were detected in the soil vapor throughout the Site. The detections of chlorinated solvents are believed to be related to the presence of chlorinated solvents in the groundwater emanating from an upgradient source.

Nature, Extent, Fate and Transport of Contaminants

Based on the results of the RI testing, known source areas on-site are limited to historic fill related contaminants including the following:

Soil:

- SVOCs including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno (1,2,3-cd)pyrene;
- Metals including arsenic, barium, copper, lead, mercury, and zinc were detected in the soil samples above soil cleanup objectives;
- PCBs – Aroclor 1260; and 1268,
- Pesticides – 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, chlordane, and dieldrin.

Soil Vapor:

- Low levels of VOCs were detected in three (3) soil vapor samples collected during the RI. Tetrachloroethylene (PCE) and Trichloroethylene (TCE) were detected at a maximum concentration of 31 ug/m³ and 72.6 ug/m³, respectively.

Groundwater:

- Groundwater samples collected during the RI showed a slight exceedence of GQS for VOCs (1,1,1-Trichloroethane) at one of the three locations. SVOCs including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, indeno(1,2,3-cd)pyrene were detected above GQS. Pesticides including 4,4'-DDT, DDE and DDD were detected in groundwater but only DDT at 0.39 ppb exceeded GQS in one location.

Potential Routes of Exposure

Currently, the Site stands vacant and uncovered allowing for several pathways to exposure including; inhalation, ingestion, and adsorption of Site soils. The potential for exposures due to VOC contamination in the water table exists mainly through potential soil vapor exposure.

Groundwater in the NYC area is not used in any potable well systems. The main contaminants in the Site soils are the metals arsenic, barium, cadmium, chromium, copper, lead, mercury, zinc, SVOCs and select pesticides.

The proposed development of the Site will include soil/fill excavations for remedial purposes and will allow for the potential to expose Site workers and residents/workers of the surrounding neighborhood. Exposure pathways will primarily be inhalation and ingestion. Site workers have the potential to absorb contaminants through direct contact with the soil. The exposures related to construction and/or remediation activities will be limited in duration to the intrusive portions of the work.

Construction and remediation activities may expose local residents primarily through inhalation of fugitive dust and/or soil vapors. A Construction Health and Safety Plan (CHASP) will be implemented during construction/remediation work to maintain safety for on-site workers and

off-site residents. As part of the CHASP, a Community Air Monitoring Plan (CAMP) will be conducted to monitor dust and VOC vapor levels. Action levels developed for the CAMP will allow the Site Safety Officer to alert Site workers to either upgrade their level of PPE or implement dust and vapor suppression. The CHASP is provided in Appendix D.

At the end of construction and remediation, the Site will have engineering controls in-place preventing direct human exposure to any of the contaminated media at the Site.

Existence of Human Health Exposure

A Human Health Exposure requires a complete pathway between the source of contamination and the person being exposed. The pathway must have a point of potential direct contact with contaminated media, an exposure route (i.e. inhalation or ingestion), and a receptor population. If the pathway is not complete, there is no risk of exposure.

Soil contamination on-site will be excavated and disposed, capped via the engineered composite cover (building foundation with vapor barrier), or covered by at least two feet of clean cover material; thereby eliminating the risk of direct exposure. The groundwater contamination will be addressed through the vapor barrier that will be installed as part of the engineered site cap. Groundwater in the New York City area is not used as a potable water source. The vapor barrier and SSD system also mitigates potential soil vapor migration into the proposed building.

Receptor Populations

Currently the Site is vacant. The on-site potential sensitive receptors include adult and child visitors and trespassers and pedestrians. The proposed redevelopment is a six-story, slab on grade, residential building with a paved parking area. Once the Site is redeveloped, the on-site potential sensitive receptors will include adult and child residents, visitors/workers and maintenance staff. There will be no potential off-site receptors after development is complete. Proposed development plans can be found in Appendix F.

Overall Human Health Exposure Assessment

Current potential exposure pathways will be eliminated by the remedial action. During the remedial action, on-site and off-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. Under future conditions, dermal contact and ingestion exposures will be eliminated by removal of all soils above Track 4 SCOs and encapsulation by the building's concrete slab, paved parking area, and a two-foot thick clean fill cover. Inhalation exposures to soil vapors will be prevented by construction of a vapor barrier and, placement of the concrete slab and operation of the SSD system.

5.0 REMEDIAL ACTION MANAGEMENT

5.1 Project Organization and Oversight

Principal personnel who will participate in the remedial action include Deborah Shapiro and Stephen Malinowski; Qualified Environmental Professionals of CA RICH Consultants, Inc. Ms. Shapiro will be responsible for scheduling and coordinating all environmental components of the RAWP. Mr. Malinowski will be responsible for ensuring data quality objectives are obtained by directing sampling personnel with the appropriate procedures and project analytical requirements. The Professional Engineer (PE) for this project is Stephen J. Osmundsen. Mr. Osmundsen will be responsible for the implementation of the remedy as well as ensuring the proper installation of the vapor barrier and SSD components.

5.2 Site Security

Site access will be controlled by having a fence around the entire property with gated entrances for workers. Security cameras will also be located strategically at various locations at the Site.

5.3 Work Hours

The hours of operation for the 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 Jason Cooper of CA RICH Consultants, Inc. 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 HAZWOPPER 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. Exceedences 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/m³) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m³ above the upwind level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m³ above the upwind level, work will be stopped and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m³ of the upwind level and in preventing visible dust migration.

All readings 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 in compliance 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 Mark-out 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.

Equipment and Material Staging

Equipment and materials will be mobilized to the Site via NYCDOT-approved truck routes and will be stored within the boundaries of the Site. Equipment and materials will be stored and staged in a manner that complies with applicable laws and regulations. The location of material storage will change during the project based on logistical constraints. A truck inspection station and gravel apron will be placed at the construction entrance to ensure Site derived material is not tracked off-site.

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.

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 the following: take Union Avenue south to Meeker Avenue; go west on Meeker Avenue for two blocks and turn right onto Metropolitan Avenue, make the first left onto the Brooklyn/Queens Expressway (BQE), take the BQE to the Verrazano Bridge crossing to Staten Island. A figure depicting the local truck route is included as Figure 10.

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; and
- Photograph of notable Site conditions and activities.

The frequency of the reporting period may be revised in consultation with OER's 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.

An alpha numeric site map will be used to identify locations described in reports submitted to OER and is shown in Figure 11.

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.

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 endpoint sampling results and all material characterization results, QA/QC results for endpoint 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.
- 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, Stephen J. Osmundsen, 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 538 Union Avenue Site, 13CVCP081K.

I, Deborah Shapiro, am a qualified Environmental Professional. I had primary direct responsibility for implementation remedial program for the 538 Union Avenue Site, 13CVCP081K.

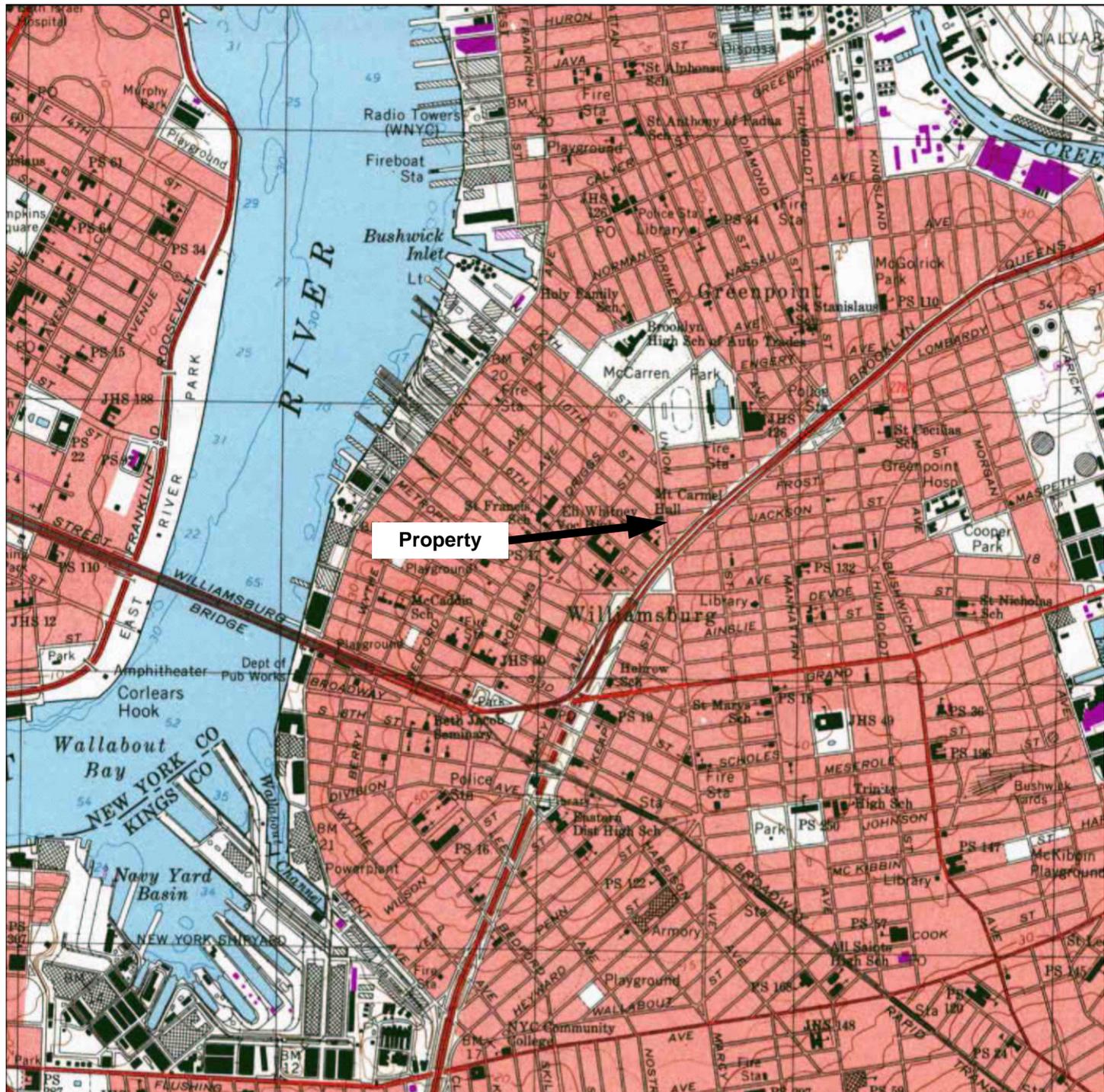
I certify that the OER-approved Remedial Action Work Plan dated August 21, 2012 and Stipulations in a letter dated September day, 2012; if any were implemented and that all requirements in those documents have been substantively complied with. I certify that contaminated soil, fill, liquids or other material from the property were taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.

7.0 SCHEDULE

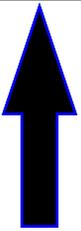
The table below presents a schedule for the proposed remedial action and reporting. If the schedule for remediation and development activities changes, it will be updated and submitted to OER. Currently, a 12 month remediation period is anticipated.

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	2	2
Clean Fill Importation	5	1
Sub-Grade SSD Piping	7	1
Vapor Barrier Installation	8	2
SSD Pilot Test	9	1
Demobilization	10	1
Construction of Building Superstructure	9	78
Installation of Aboveground SSD Components	45	2
SSD System Startup	45	1
Submit Remedial Action Report	52	3

FIGURES



Property



APPROX. SCALE (ft.)



0 24,000 48,000 N

Adapted from USGS 1995 Brooklyn Quadrangle Map.

CA RICH CONSULTANTS, INC.

*Certified Ground Water and Environmental Specialists
17 Dupont Street, Plainview, NY 11803*

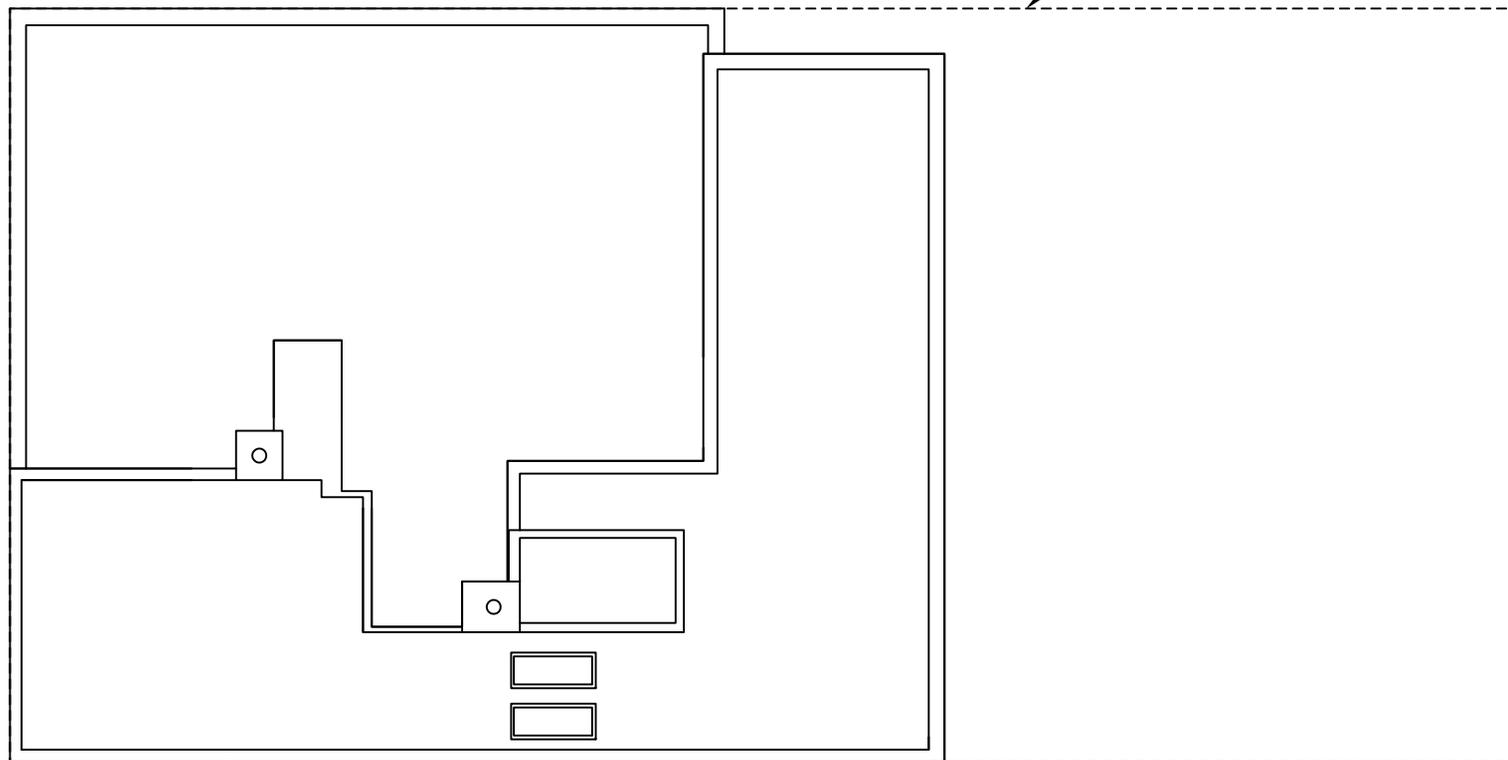
TITLE:		DATE:
Site LOCATION MAP		7/6/12
		SCALE:
FIGURE: 1		DRAWN BY: D.S.
DRAWING:		APPR. BY: STM
538 Union Avenue Brooklyn , New York		



WITHERS STREET

Approximate Property Boundary

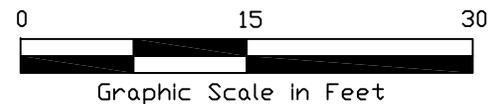
UNION AVENUE



2-STORY BUILDING

PROPOSED NEW BUILDING

PARKING LOT



CA RICH CONSULTANTS, INC.

Environmental Specialists Since 1982
17 Dupont Street, Plainview, New York 11803

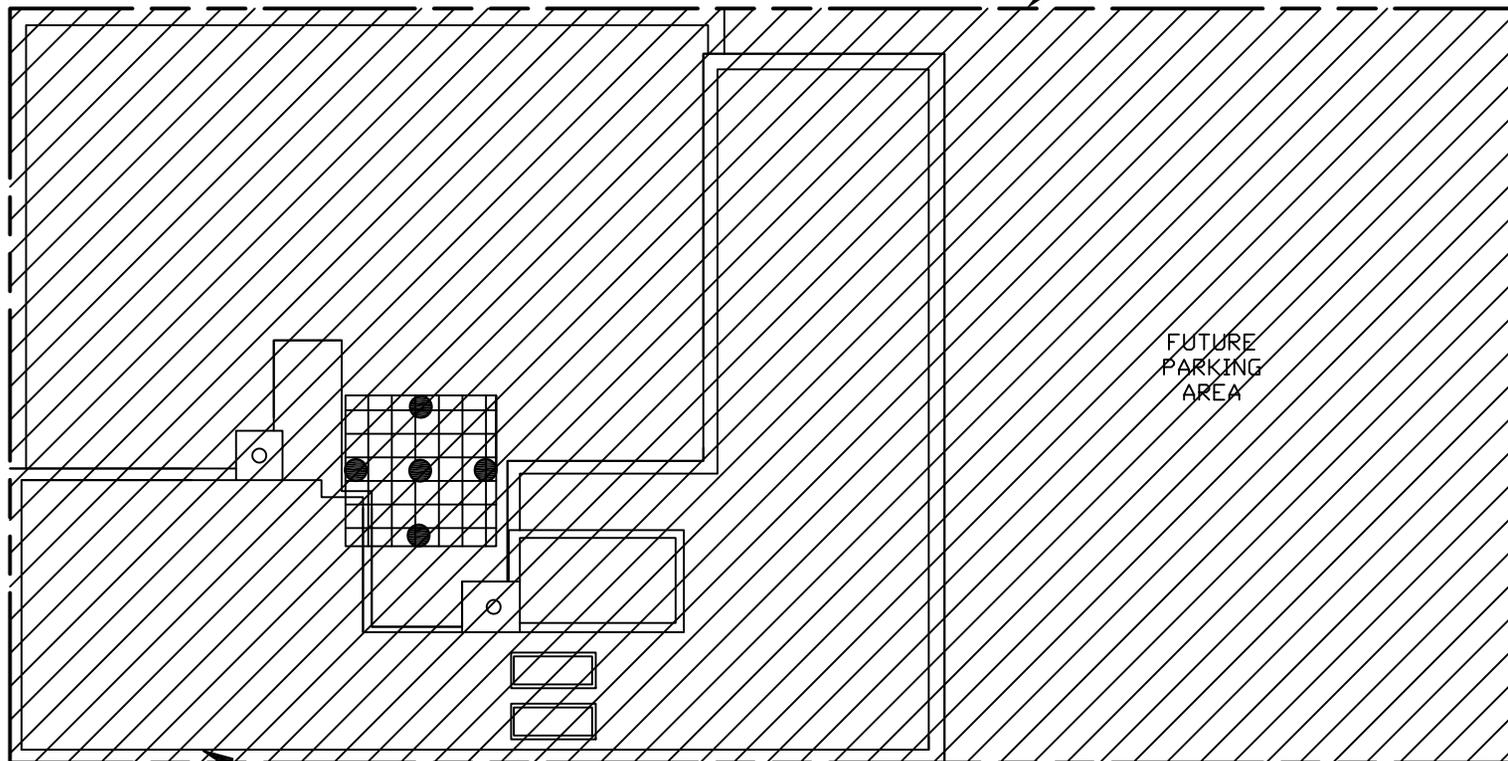
TITLE: Site Plan		DATE: 7/30/12
		SCALE: As Shown
FIGURE: 2	WITHERS OWNER, LLC 538 UNION AVENUE BROOKLYN, NEW YORK	DRAWN BY: S.T.M./T.R.B
DRAWING NO: 2012-1a		APPR. BY: D.S.



WITHERS STREET

Approximate Property Boundary
is Extent of Area of Concern

UNION AVENUE



PROPOSED NEW BUILDING

PARKING LOT

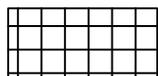
FUTURE
PARKING
AREA

2-STORY BUILDING

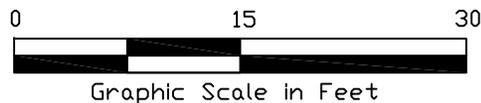
LEGEND



Proposed 2-Foot Deep
Site-Wide Excavation Area



Proposed 3.5-Foot Deep
Remedial Excavation Area



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Environmental Specialists Since 1982
17 Dupont Street, Plainview, New York 11803

STEPHEN J. OSMUNDSEN, PE

Consulting Engineer
514 Pantigo Road #16, East Hampton, NY 11937

TITLE:
Planned Excavation Area

DATE:
8/7/2012

SCALE:
As Shown

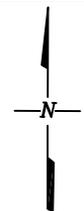
FIGURE:
3

WITHERS OWNER, LLC
538 UNION AVENUE
BROOKLYN, NEW YORK

DRAWN BY:
T.R.B.

DRAWING NO:
2012-5aa

APPR. BY:
S.T.M.



B-7 (0-2')

SVOCs		Metals	
Benzo(a)anthracene	7,800	Arsenic	33.9
Benzo(a)pyrene	6,200	Barium	351
Benzo(b)fluoranthene	8,600	Copper	117
Benzo(k)fluoranthene	9,700	Lead	524
Chrysene	7,800	Mercury	4.34
Dibenzo(a,h)anthracene	1,100	Zinc	453
Indeno(1,2,3-cd)pyrene	3,800	Pesticides	
		4,4'-DDD	44
		4,4'-DDE	100
		4,4'-DDT	490

B-8 (0-2')

SVOCs		Metals	
Benzo(a)anthracene	23,000	Arsenic	48.3
Benzo(a)pyrene	19,000	Barium	523
Benzo(b)fluoranthene	23,000	Cadmium	2.81
Benzo(k)fluoranthene	29,000	Chromium	32.8
Chrysene	25,000	Lead	1,320
Dibenzo(a,h)anthracene	3,100	Mercury	3.93
Indeno(1,2,3-cd)pyrene	8,600	PCBs	
		Aroclor 1260	150
Pesticides		Aroclor 1268	140
4,4'-DDD	300		
4,4'-DDE	180		
4,4'-DDT	890		

WITHERS STREET

Approximate Property Boundary

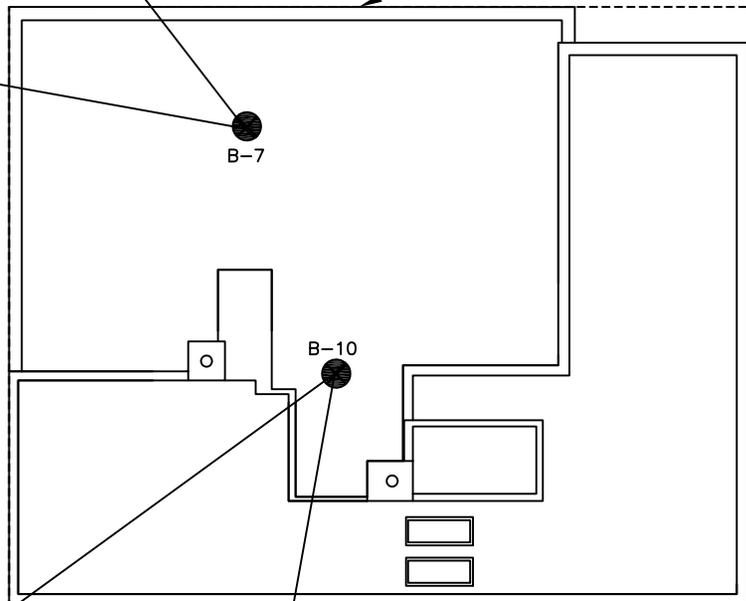
B-7 (2-4')

Metals	
Lead	222
Pesticides	
4,4'-DDE	4.8
4,4'-DDT	20

B-8 (4-6')

Pesticides	
4,4'-DDT	4.8

UNION AVENUE



B-9 (0-2')

SVOCs		Metals	
Benzo(a)anthracene	12,000	Arsenic	71.0
Benzo(a)pyrene	8,800	Copper	199
Benzo(b)fluoranthene	11,000	Lead	649
Benzo(k)fluoranthene	14,000	Mercury	24.5
Chrysene	12,000	Zinc	453
Dibenzo(a,h)anthracene	1,800	Pesticides	
Indeno(1,2,3-cd)pyrene	6,400	4,4'-DDD	37
		4,4'-DDE	28
		4,4'-DDT	180

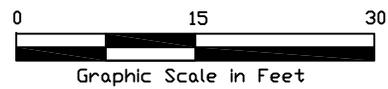
B-10 (0-2')

SVOCs		Metals	
Benzo(a)anthracene	7,900	Arsenic	26.9
Benzo(a)pyrene	6,200	Barium	366
Benzo(b)fluoranthene	8,000	Copper	74.7
Benzo(k)fluoranthene	9,700	Lead	466
Chrysene	7,100	Mercury	10.7
Dibenzo(a,h)anthracene	1,400	Zinc	403
Indeno(1,2,3-cd)pyrene	3,300	Pesticides	
		4,4'-DDD	38
		4,4'-DDE	41
		4,4'-DDT	480
		Dieldrin	7.2

B-10 (2-4')

SVOCs		Metals	
Benzo(a)anthracene	9,800	Barium	409
Benzo(a)pyrene	6,200	Lead	274
Benzo(b)fluoranthene	8,400	Mercury	1.64
Benzo(k)fluoranthene	9,300	Zinc	409
Chrysene	5,900	Pesticides	
Dibenzo(a,h)anthracene	1,200	4,4'-DDD	110
Indeno(1,2,3-cd)pyrene	4,500	4,4'-DDE	180
		4,4'-DDT	890
		Chlordane	790
		Dieldrin	17

PROPOSED NEW BUILDING



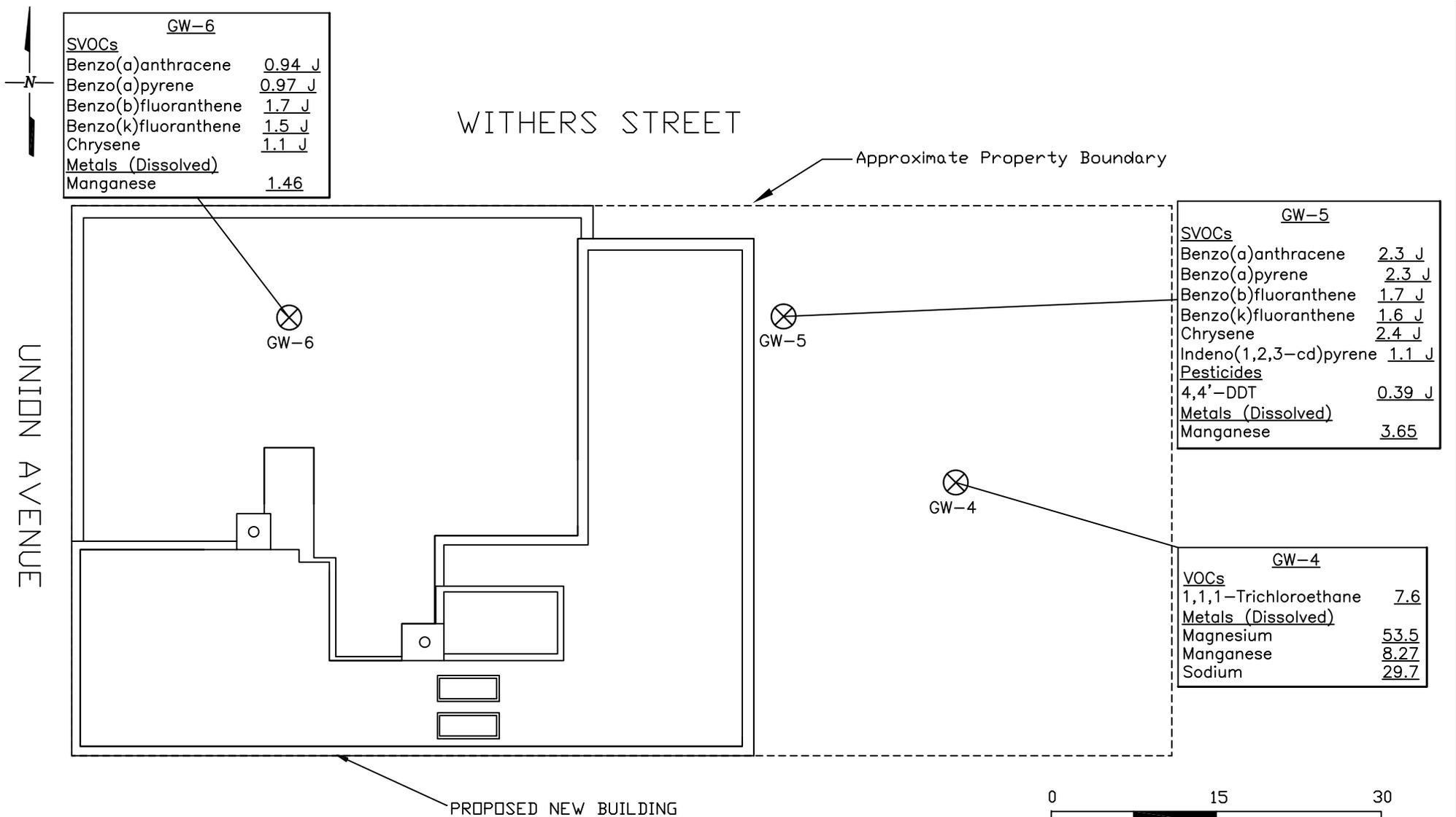
LEGEND

● Soil Boring location

- Notes:
- 1) SVOCs, Pesticides, and PCB concentrations in ug/kg or parts per billion
 - 2) Metal concentrations in mg/kg or parts per million
 - 3) Drawing Adapted From Kutnicki Bernstein Architects Site Plan Dated 1/17/08.

CA RICH CONSULTANTS, INC.
 Environmental Specialists Since 1982
 17 Dupont Street, Plainview, New York 11803

TITLE: Soil Sample Detections Above NYSDEC Part 375 Unrestricted SCO	DATE: 8/1/12
FIGURE: 4	SCALE: As Shown
DRAWING NO.: 2012-2	DRAWN BY: J.T.C./S.T.M.
WITHERS OWNER, LLC 538 UNION AVENUE BROOKLYN, NEW YORK	APPR BY: D.S.



GW-6

SVOCs	
Benzo(a)anthracene	0.94 J
Benzo(a)pyrene	0.97 J
Benzo(b)fluoranthene	1.7 J
Benzo(k)fluoranthene	1.5 J
Chrysene	1.1 J
Metals (Dissolved)	
Manganese	1.46

GW-5

SVOCs	
Benzo(a)anthracene	2.3 J
Benzo(a)pyrene	2.3 J
Benzo(b)fluoranthene	1.7 J
Benzo(k)fluoranthene	1.6 J
Chrysene	2.4 J
Indeno(1,2,3-cd)pyrene	1.1 J
Pesticides	
4,4'-DDT	0.39 J
Metals (Dissolved)	
Manganese	3.65

GW-4

VOCs	
1,1,1-Trichloroethane	7.6
Metals (Dissolved)	
Magnesium	53.5
Manganese	8.27
Sodium	29.7

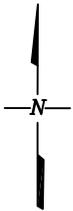
LEGEND

⊗ Groundwater Sample Location

Notes:

- 1) VOCs, SVOCs, and Pesticide concentrations reported in ug/L or parts per billion (ppb)
- 2) Dissolved metal concentrations reported in mg/L or parts per million (ppm)
- 3) Drawing Adapted From Kutnicki Bernstein Architects Site Plan Dated 1/17/08.

CA RICH CONSULTANTS, INC.		
Environmental Specialists Since 1982 17 Dupont Street, Plainview, New York 11803		
TITLE: Groundwater Sample Detections Above NYSDEC TOGS	DATE: 8/1/12	SCALE: As Shown
FIGURE: 5	WITHERS OWNER, LLC 538 UNION AVENUE BROOKLYN, NEW YORK	DRAWN BY: J.T.C.
DRAWING NO: 2012-3		APPR. BY: D.S.

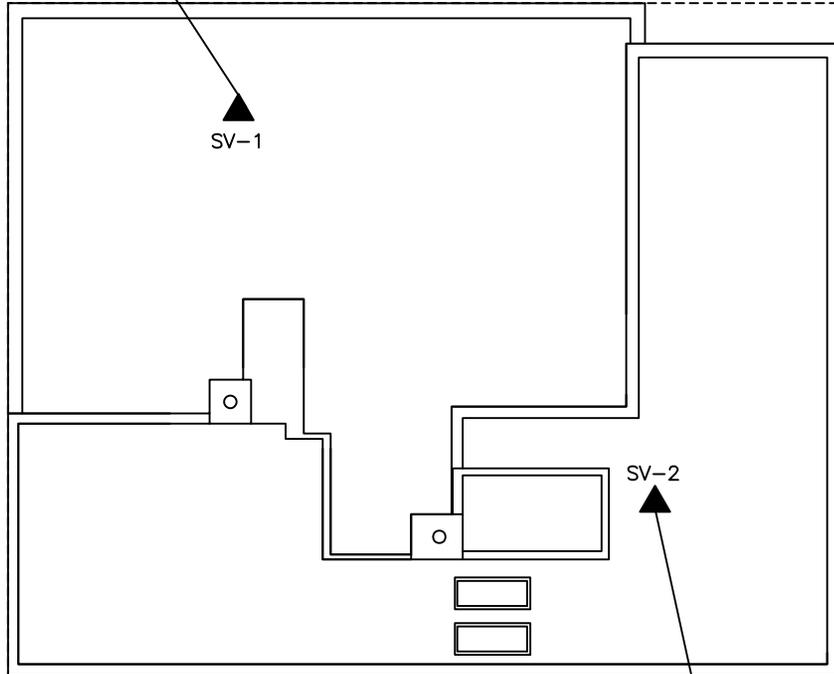


SV-1			
VOCs			
Acetone	1.120	Propylene	170
Chloroform	4.4	1,1,1-Trichloroethane	230
1,1-Dichloroethane	8.9	1,2,4-Trimethylbenzene	44
Dichlorodifluoromethane	3.2	1,3,5-Trimethylbenzene	12
Ethanol	73.5	Tertiary butyl alcohol	34.0
Ethylbenzene	6.1	Tetrachloroethylene	31
4-Ethyltoluene	6.4	Toluene	9.4
Heptane	17	Trichloroethylene	72.6
2-Hexanone	162	Trichlorofluoromethane	7.3
Isopropyl alcohol	93.4	m,p-Xylene	27
Methyl ethyl ketone	398	o-Xylene	13

WITHERS STREET

Approximate Property Boundary

UNION AVENUE



SV-3	
VOCs	
Acetone	1.850
Dichlorodifluoromethane	3.9
Ethanol	120
Ethylbenzene	5.6
4-Ethyltoluene	5.9
Heptane	20
2-Hexanone	202
Isopropyl alcohol	158
Methyl ethyl ketone	575
Propylene	234
1,1,1-Trichloroethane	111
1,2,4-Trimethylbenzene	39
1,3,5-Trimethylbenzene	11
Tertiary butyl alcohol	55.8
Tetrachloroethylene	12
Toluene	8.3
Trichloroethylene	1.5
Trichlorofluoromethane	5.2
m,p-Xylene	24
o-Xylene	13

PROPOSED NEW BUILDING

SV-2			
VOCs			
Acetone	1.300	Methyl ethyl ketone	36.3
Benzene	1.5	Propylene	204
Chloroform	3.3	1,1,1-Trichloroethane	35
1,1-Dichloroethane	5.7	1,2,4-Trimethylbenzene	45
Dichlorodifluoromethane	3.3	1,3,5-Trimethylbenzene	13
Ethanol	88.4	Tertiary butyl alcohol	41.2
Ethylbenzene	8.7	Tetrachloroethylene	25
4-Ethyltoluene	7.4	Toluene	15
Heptane	17	Trichloroethylene	7.0
Hexane	10	m,p-Xylene	36
2-Hexanone	148	o-Xylene	17
Isopropyl alcohol	127		

SV-3



LEGEND

▲ Soil Vapor Point

Notes:

- 1) All concentrations reported in ug/m³
- 2) Drawing Adapted From Kutnicki Bernstein Architects Site Plan Dated 1/17/08.

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17 Dupont Street, Plainview, New York 11803

TITLE: Volatile Organic Compounds Detected in Soil Vapor		DATE: 8/1/12
FIGURE: 6		SCALE: As Shown
DRAWING NO: 2012-4	WITHERS OWNER, LLC 538 UNION AVENUE BROOKLYN, NEW YORK	DRAWN BY: J.T.C.
		APPR. BY: D.S.

Legend

- PVC End Cap
- └ PVC "T" Typ.
- └ PVC 90° Typ.
- 6-inch diameter Sch. 40 Steel Pipe Sleeve through center of grade beam Typ.
- 4" Diameter Perforated PVC Pipe under grade beam
- 4" Diameter Riser Vent to Roof and Dwyer and Dwyer®
- ⊙ Magnehelic Differential Pressure Gauge Range 0–5.0 inches W.C.
- ⊙ Proposed Soil Vapor Point & Vacuum Monitoring Point
- ▨ Proposed extent of Vapor Barrier

UNION AVENUE

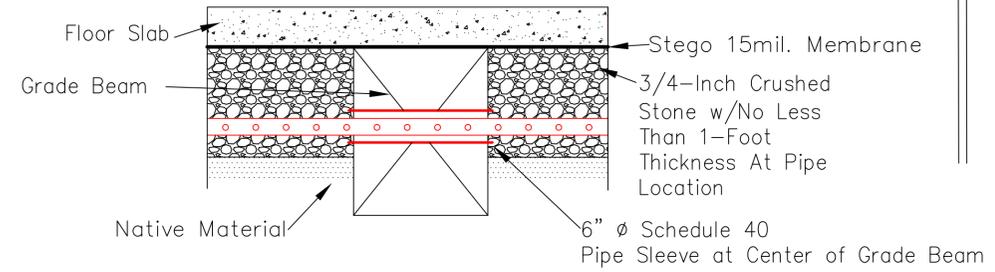
G TRAIN UNDERGROUND

WITHERS STREET

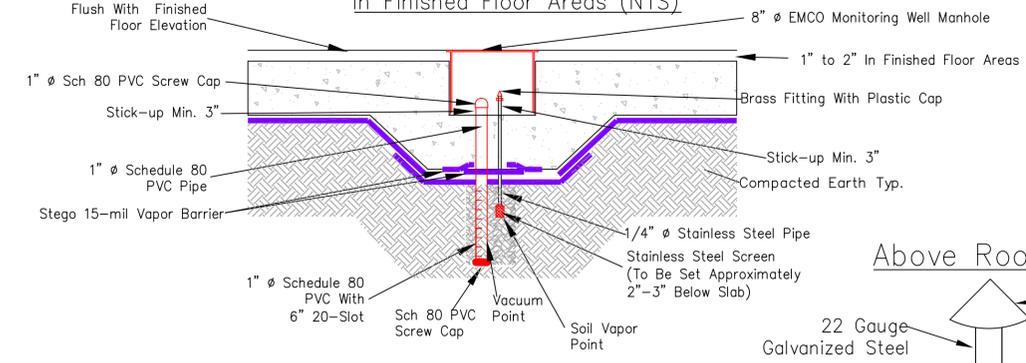
- NOTES:**
- DENOTES PILES ARE 8" MIRCOPILE WITH MIN. EFFECTIVE EMBEDMENT LENGTH OF 40' AND DESIGNED FOR AN ALLOWABLE BEARING CAPACITY OF 40 TONS/PILE. PLEASE REFER TO SOIL REPORT BY GEO TECH CONSULTANTS, LLC FOR ADDITIONAL REQUIREMENTS AND RECOMMENDATION.
 - ⊙ DENOTES PILES ARE TREATED TIMBER PILES WITH CAPACITY OF 30 TONS/PILE. REFER TO SOIL REPORT FOR ADDITIONAL INFORMATION. THE CONTRACTOR SHALL DETERMINE THE PROPER LENGTHS OF PILES TO BE ORDERED AND USED BY DOING 3 TEST PILES WITHIN THE PROPOSED BUILDING AREA AWAY FROM MTA INFLUENCE LINE.
 - PILE CAPS SHOWN "UPLIFT" TO BE DESIGNED WITH ALLOWABLE UPLIFT CAPACITY OF 14 TON PER PILE. THE SHOP DRAWINGS SHALL INCLUDE CONNECTION DETAILS FOR MICROPILES AND PILE CAP THAT CAN HAVE TENSION LOAD CAPACITY.
 - SEE DWG. S2.1A FOR MINPILE LENGTH REQUIRED.



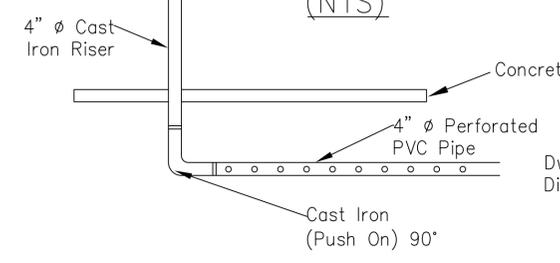
Typical SSD Piping Through Grade Beam Cross-Section (NTS)



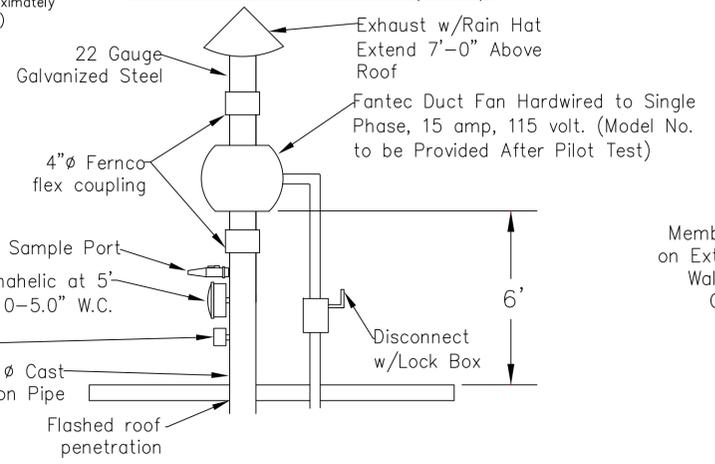
Typical Combined Soil Vapor And Vacuum Points In Finished Floor Areas (NTS)



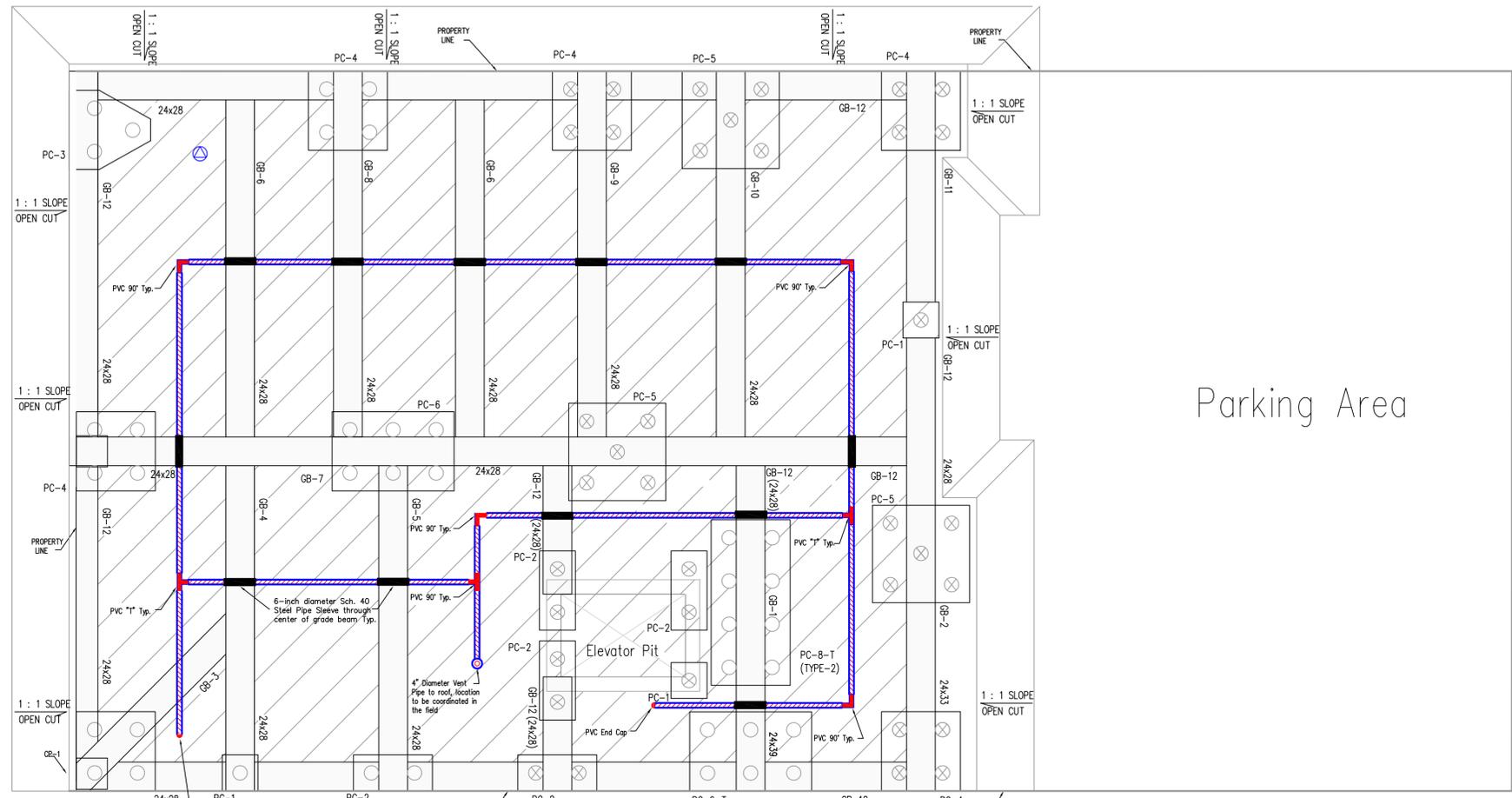
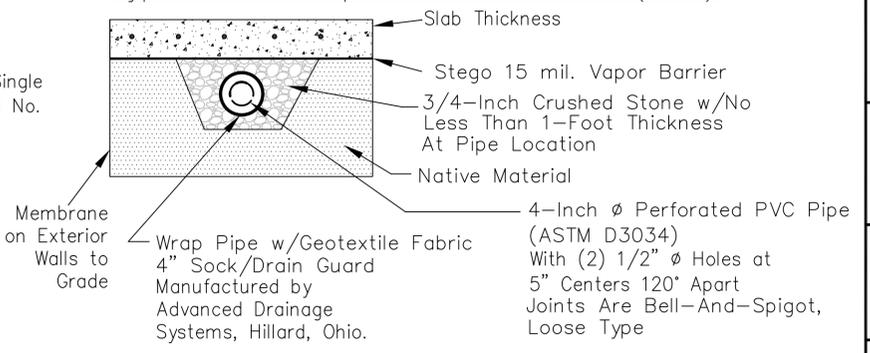
Typical Cast Iron Connection Detail (NTS)



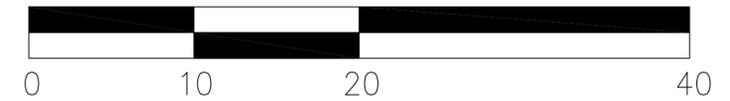
Above Roof Detail (NTS)



Typical Vent Pipe Cross-Section (NTS)



Approx. Scale(ft.)



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Stephen J. Osmundsen, P.E.

Consulting Engineer
514 Pantigo Road #16, East Hampton, NY 11937

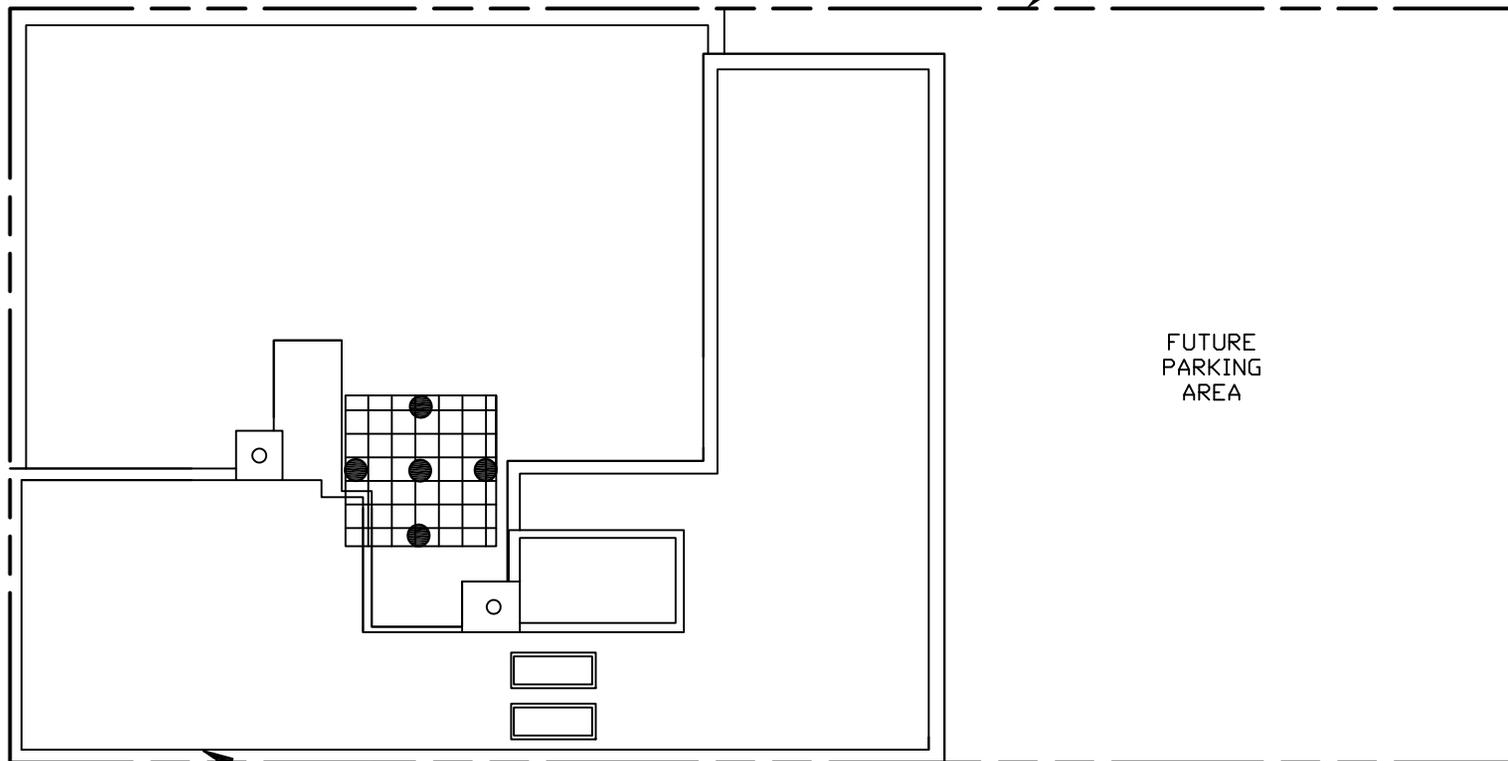
TITLE: Proposed Vapor Barrier & SSDS Layout		DATE: 8/10/2012
FIGURE: 7		SCALE: AS SHOWN
DRAWING NO: 2012-75b	Withers Owner LLC 538 Union Ave. Brooklyn, NY	DRAWN BY: T.R.B./S.T.M.
		APPR BY: S.J.O.



WITHERS STREET

Approximate Property Boundary
is Extent of Area of Concern

UNION AVENUE



PROPOSED NEW BUILDING

PARKING LOT

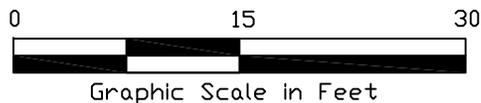
FUTURE
PARKING
AREA

2-STORY BUILDING

LEGEND

● Proposed Soil Endpoint
Sample Location

▢ Proposed 3.5-Foot Deep
Remedial Excavation Area

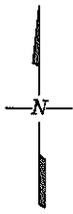


Graphic Scale in Feet

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17 Dupont Street, Plainview, New York 11803

TITLE: Proposed Endpoint Sample Locations		DATE: 8/1/2012
		SCALE: As Shown
FIGURE: 8	WITHERS OWNER, LLC 538 UNION AVENUE BROOKLYN, NEW YORK	DRAWN BY: T.R.B.
DRAWING NO: 2012-5a		APPR. BY: S.T.M.



WITHERS STREET

Approximate Property Boundary

1

2

3

4

UNION AVENUE

A

New Concrete Building

Paved Parking Area

2-STORY BUILDING

B

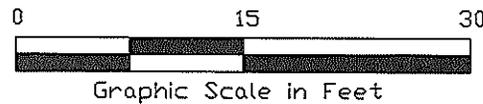
PROPOSED NEW BUILDING

PARKING LOT

LEGEND

Concrete Building Slab with
2-Feet of Clean Soil Below

Paved Parking Area with
2-Feet of Clean Soil Below



CA RICH CONSULTANTS, INC.

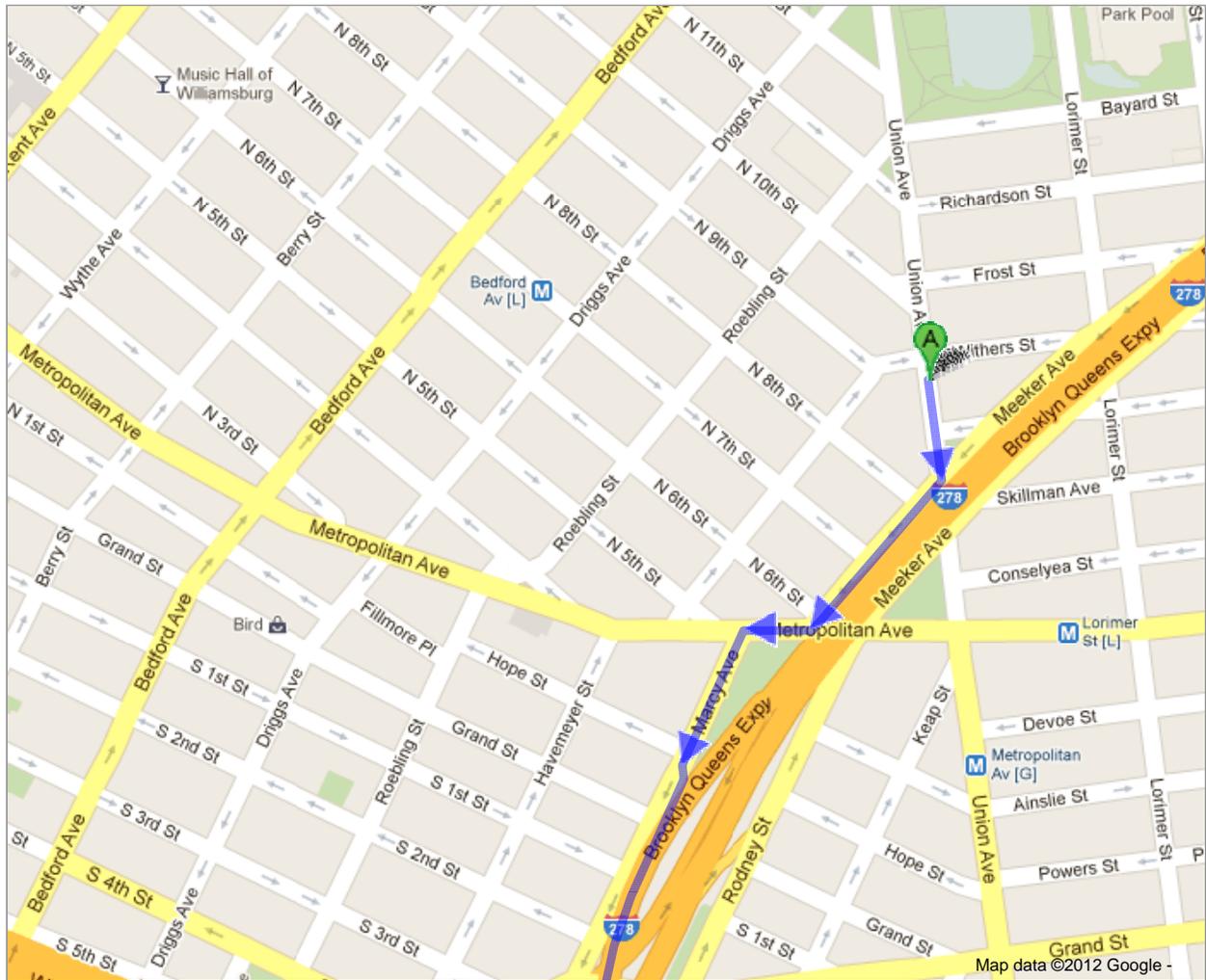
Environmental Specialists Since 1982
17 Dupont Street, Plainview, New York 11803

STEPHEN J. OSMUNDSEN

Consulting Engineer
514 Pantigo Road #16, East Hampton, NY 11937

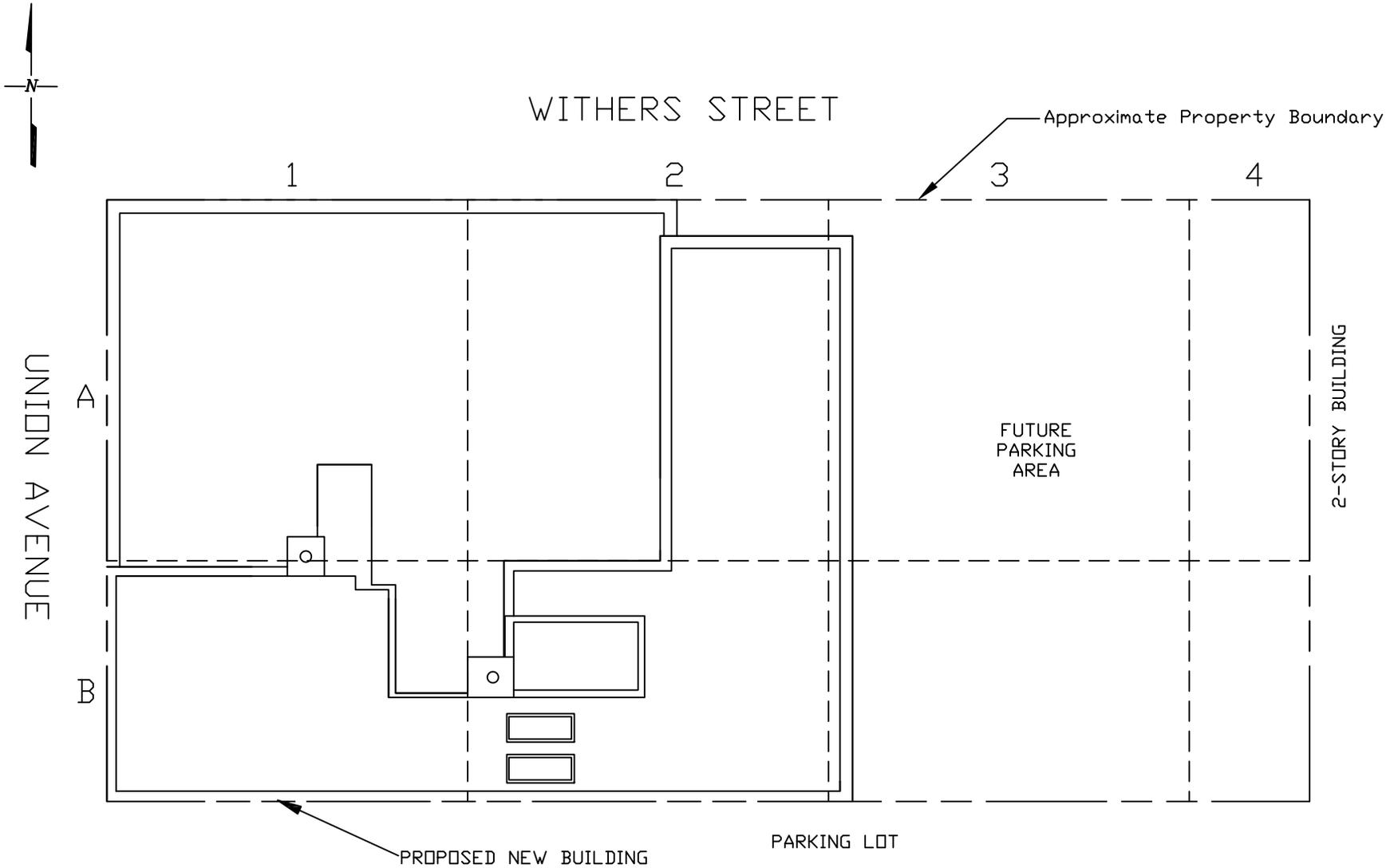
TITLE: Site Map with Composite Cover System		DATE: 8/7/12
FIGURE: g		SCALE: As Shown
DRAWING NO.: 2012-1bc	WITHERS OWNER, LLC 538 UNION AVENUE BROOKLYN, NEW YORK	DRAWN BY: S.T.M.
		APPR. BY: S.J.O.

To see all the details that are visible on the screen, use the "Print" link next to the map.



Local truck route from Union Ave to BQE for outgoing soil disposal shipments

Figure 10



LEGEND

Alphanumeric Grid Are Approximately 30-Feet by 30-Feet



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Environmental Specialists Since 1982
17 Dupont Street, Plainview, New York 11803

TITLE: Site Map with Alphanumeric Grid		DATE: 8/2/12
		SCALE: As Shown
FIGURE: 11	WITHERS OWNER, LLC 538 UNION AVENUE BROOKLYN, NEW YORK	DRAWN BY: S.T.M.
DRAWING NO: 2012-1b		APPR. BY: D.S.

TABLES

Table 1
Analytical Results of Volatile Organic Compounds In Soil Samples

538 Union Avenue
Brooklyn, New York

Sample ID Matrix Date Sampled	B-7 (0-2 feet)	B-7 (2-4 feet)	B-8 (0-2 feet)	B-8 (4-6 feet)	B-9 (0-2 feet)	B-9 (4-6 feet)	B-10 (0-2 feet)	B-10 (2-4 feet)	Field Blank	Trip Blank	NYSDEC	NYSDEC
	Soil 4/25/2012	Aqueous 4/25/2012	Aqueous 4/25/2012	Part 375* Unrestricted SCOs	Part 375* Restricted Residential SCOs							
VOCs via EPA Method 8260	ug/kg	ug/L	ug/L	ug/kg	ug/kg							
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND								
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	0.65 J	ND	ND	ND	680	100,000
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND								
1,1,2-Trichloroethane	ND	ND	ND	ND								
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ND	ND	ND								
1,1,2-Trichloroethane	ND	ND	ND	ND								
1,1-Dichloroethane	ND	ND	270	26,000								
1,1-Dichloroethene	ND	ND	330	100,000								
1,1-Dichloropropene	ND	ND	ND	ND								
1,2,3-Trichlorobenzene	ND	ND	ND	ND								
1,2,3-Trichloropropane	ND	ND	ND	ND								
1,2,4,5-Tetramethylbenzene	ND	ND	ND	ND								
1,2,4-Trichlorobenzene	ND	ND	ND	ND								
1,2,4-Trimethylbenzene	ND	ND	3,600	52,000								
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND								
1,2-Dibromoethane	ND	ND	ND	ND								
1,2-Dichlorobenzene	ND	ND	1,100	100,000								
1,2-Dichloroethane	ND	ND	20	3,100								
1,2-Dichloropropane	ND	ND	ND	ND								
1,3,5-Trimethylbenzene	ND	ND	8,400	52,000								
1,3-Dichlorobenzene	ND	ND	2,400	49,000								
1,3-dichloropropane	ND	ND	ND	ND								
1,4-Dichlorobenzene	ND	ND	1,800	13,000								
1,4-Dioxane	ND	ND	100	13,000								
2,2-Dichloropropane	ND	ND	ND	ND								
2-Butanone	ND	ND	120	NVG								
2-Chloroethyl vinyl ether	ND	ND	ND	ND								
2-Chlorotoluene	ND	ND	ND	ND								
2-Hexanone	ND	ND	ND	ND								
2-Propanol	ND	ND	ND	ND								
4-Chlorotoluene	ND	ND	ND	ND								
4-Isopropyltoluene	ND	ND	ND	ND								
4-Methyl-2-pentanone	ND	ND	ND	ND								
Acetone	ND	ND	50	100,000								
Acrolein	ND	ND	ND	ND								
Acrylonitrile	ND	ND	ND	ND								
Benzene	ND	ND	60	4,800								
Bromobenzene	ND	ND	ND	ND								
Bromochloromethane	ND	ND	ND	ND								
Bromodichloromethane	ND	ND	ND	ND								
Bromoform	ND	ND	ND	ND								
Bromomethane	ND	ND	ND	ND								
Carbon disulfide	ND	ND	ND	ND								
Carbon tetrachloride	ND	ND	760	2,400								
Chlorobenzene	ND	ND	1,100	100,000								
Chlorodifluoromethane	ND	ND	ND	ND								
Chloroethane	ND	ND	ND	ND								
Chloroform	ND	ND	370	49,000								
Chloromethane	ND	ND	ND	ND								
cis-1,2-Dichloroethene	ND	ND	250	100,000								
cis-1,3-Dichloropropene	ND	ND	ND	ND								
Dibromochloromethane	ND	ND	ND	ND								
Dibromomethane	ND	ND	ND	ND								
Dichlorodifluoromethane	ND	ND	ND	ND								
Diisopropyl ether	ND	ND	ND	ND								
Ethanol	ND	ND	ND	ND								
Ethyl acetate	ND	ND	ND	ND								
Ethylbenzene	ND	ND	1,000	41,000								
Freon-114	ND	ND	ND	ND								
Hexachlorobutadiene	ND	ND	ND	ND								
Isopropyl acetate	ND	ND	ND	ND								
Isopropylbenzene	ND	ND	ND	ND								
m,p-Xylene	ND	ND	260	NVG								
Methyl Acetate	ND	ND	ND	ND								
Methyl tert-butyl ether	ND	ND	930	100,000								
Methylene chloride	9.6 B	8.6 B	15 B	7.5 B	10 B	7.5 B	8.6 B	14 B	4.9 B	3.5 B	50	100,000
n-Amyl acetate	ND	ND	ND	ND								
Naphthalene	ND	ND	2.8 J	ND	ND	ND	ND	ND	ND	ND	12,000	100,000
n-Butyl acetate	ND	ND	ND	ND								
n-Butylbenzene	ND	ND	12,000	100,000								
n-Propyl acetate	ND	ND	ND	ND								
n-Propylbenzene	ND	ND	3,900	100,000								
o-Xylene	ND	ND	260	NVG								
p-Diethylbenzene	ND	ND	ND	ND								
p-Ethyltoluene	ND	ND	ND	ND								
sec-Butylbenzene	ND	ND	11,000	100,000								
Styrene	ND	ND	ND	ND								
t-Butyl alcohol	ND	ND	ND	ND								
tert-Butylbenzene	ND	ND	5,900	100,000								
Tetrachloroethane	ND	ND	1.4 J	ND	ND	ND	ND	1.4 J	ND	ND	1,300	19,000
Toluene	ND	ND	700	100,000								
trans-1,2-Dichloroethene	ND	ND	190	NVG								
trans-1,3-Dichloropropene	ND	ND	ND	ND								
Trichloroethene	ND	ND	470	21,000								
Trichlorofluoromethane	ND	ND	ND	ND								
Vinyl acetate	ND	ND	ND	ND								
Vinyl chloride	ND	ND	20	900								

Notes:
 All concentrations are reported in micrograms per kilogram (ug/kg) or parts per billion.
 J - Indicates an estimated value
 NVG - No Value Given
 *6 NYCRR Part 375, Subparts 375-1 to 375-4 & 375-6;
 Table 375-6.8(a)-Restricted and Unrestricted Use Soil Cleanup Objectives

B - Analyte detected in associated Method Blank
 ND - Not detected at or above reporting limits
 ug/kg and ug/L are equal to parts per billion

Table 2
Analytical Results of Semi-Volatile Organic Compounds In Soil Samples

538 Union Avenue
Brooklyn, New York

Sample ID Matrix Date Sampled	B-7 (0-2 feet) Soil 4/25/2012	B-7 (2-4 feet) Soil 4/25/2012	B-8 (0-2 feet) Soil 4/25/2012	B-8 (4-6 feet) Soil 4/25/2012	B-9 (0-2 feet) Soil 4/25/2012	B-9 (4-6 feet) Soil 4/25/2012	B-10 (0-2 feet) Soil 4/25/2012	B-10 (2-4 feet) Soil 4/25/2012	Field Blank Aqueous 4/25/2012	NYSDEC Part 375* Unrestricted SCOs	NYSDEC Part 375* Restricted Residential SCOs
SVOCs via EPA Method 8270											
Units	ug/kg	ug/kg	ug/L	ug/kg	ug/kg						
2-Chlorophenol	ND	ND	ND	NVG	NVG						
4-Chloro-3-methyl phenol	ND	ND	ND	NVG	NVG						
2,4-Dichlorophenol	ND	ND	ND	NVG	NVG						
2,4-Dimethylphenol	ND	ND	ND	NVG	NVG						
2,4-Dinitrophenol	ND	ND	ND	NVG	NVG						
4,6-Dinitro-o-cresol	ND	ND	ND	NVG	NVG						
2-Methylphenol	ND	ND	ND	NVG	NVG						
3&4-Methylphenol	ND	ND	ND	NVG	NVG						
2-Nitrophenol	ND	ND	ND	NVG	NVG						
4-Nitrophenol	ND	ND	ND	NVG	NVG						
Pentachlorophenol	ND	ND	ND	800	6,700						
Phenol	ND	ND	ND	330	100,000						
2,3,4,6-Tetrachlorophenol	ND	ND	ND	NVG	NVG						
2,4,5-Trichlorophenol	ND	ND	ND	NVG	NVG						
2,4,6-Trichlorophenol	ND	ND	ND	NVG	NVG						
Acenaphthene	760	140 J	3,100	ND	4,400	ND	1,400	5,000	ND	20,000	100,000
Acenaphthylene	140 J	ND	440	ND	92 J	ND	180 J	160 J	ND	100,000	100,000
Acetophenone	ND	ND	ND	NVG	NVG						
Anthracene	10,000	250 J	8,200	150 J	29,000	130 J	2,500 J	40,000	ND	100,000	100,000
Atrazine	ND	ND	ND	NVG	NVG						
Benzo(a)anthracene	7,800	700	23,000	90 J	12,000	68 J	7,900	9,800	ND	1,000	1,000
Benzo(a)pyrene	6,200	670	19,000	87 J	8,800	48 J	6,200	6,200	ND	1,000	1,000
Benzo(b)fluoranthene	8,600	680	23,000	130 J	11,000	53 J	8,000	8,400	ND	1,000	1,000
Benzo(g,h,i)perylene	3,200	360	9,600	53 J	4,900	ND	4,400	3,400	ND	100,000	100,000
Benzo(k)fluoranthene	9,700	170 J	29,000	140 J	14,000	43 J	9,700	9,300	ND	800	3,900
4-Bromophenyl phenyl ether	ND	ND	ND	NVG	NVG						
Butyl benzyl phthalate	ND	4,200	ND	NVG	NVG						
1,1'-Biphenyl	ND	ND	ND	NVG	NVG						
Benzaldehyde	ND	ND	ND	NVG	NVG						
2-Chloronaphthalene	ND	ND	ND	NVG	NVG						
4-Chloroaniline	ND	ND	ND	NVG	NVG						
Carbazole	700	ND	ND	ND	ND	ND	ND	ND	ND	NVG	NVG
Caprolactam	ND	ND	ND	NVG	NVG						
Chrysene	7,800	730	25,000	110 J	12,000	78 J	7,100	5,900	ND	1,000	3,900
bis(2-Chloroethoxy)methane	ND	ND	ND	NVG	NVG						
bis(2-Chloroethyl)ether	ND	ND	ND	NVG	NVG						
bis(2-Chloroisopropyl)ether	ND	ND	ND	NVG	NVG						
4-Chlorophenyl phenyl ether	ND	ND	ND	NVG	NVG						
2,4-Dinitrotoluene	ND	ND	ND	NVG	NVG						
2,6-Dinitrotoluene	ND	ND	ND	NVG	NVG						
3,3'-Dichlorobenzidine	ND	ND	ND	NVG	NVG						
Dibenzo(a,h)anthracene	1,100	86 J	3,100	ND	1,800	ND	1,400	1,200	ND	330	330
Dibenzofuran	410	79 J	1,600	ND	3,000	ND	810	4,200	ND	NVG	NVG
Di-n-butyl phthalate	ND	1,500	ND	NVG	NVG						
Di-n-octyl phthalate	ND	780	ND	NVG	NVG						
Diethyl phthalate	ND	ND	ND	NVG	NVG						
Dimethyl phthalate	ND	ND	ND	NVG	NVG						
bis(2-Ethylhexyl)phthalate	490	300	ND	ND	510	ND	ND	1,600	ND	NVG	NVG
Fluoranthene	16,000	1,100	58,000	240 J	31,000	150 J	18,000	28,000	ND	100,000	100,000
Fluorene	600	93 J	2,500	ND	3,200	ND	1,100	4,200	ND	30,000	100,000
Hexachlorobenzene	ND	ND	ND	NVG	NVG						
Hexachlorobutadiene	ND	ND	ND	NVG	NVG						
Hexachlorocyclopentadiene	ND	ND	ND	NVG	NVG						
Hexachloroethane	ND	ND	ND	NVG	NVG						
Indeno(1,2,3-cd)pyrene	3,800	430	8,600	55 J	6,400 E	49 J	3,300	4,500	ND	500	500
Isophorone	ND	ND	ND	NVG	NVG						
2-Methylnaphthalene	110 J	30 J	420	ND	820	ND	310	2,700	ND	NVG	NVG
2-Nitroaniline	ND	ND	ND	NVG	NVG						
3-Nitroaniline	ND	ND	ND	NVG	NVG						
4-Nitroaniline	ND	ND	ND	NVG	NVG						
Naphthalene	230 J	74 J	720	ND	2,600	ND	600	5,000	ND	12,000	100,000
Nitrobenzene	ND	ND	ND	NVG	NVG						
N-Nitroso-di-n-propylamine	ND	ND	ND	NVG	NVG						
N-Nitrosodiphenylamine	ND	ND	ND	NVG	NVG						
Phenanthrene	11,000	1,300	42,000	170 J	31,000	130 J	13,000	42,000	ND	100,000	100,000
Pyrene	16,000	1,400	55,000	260 J	25,000	150 J	16,000	26,000	ND	100,000	100,000
1,2,4,5-Tetrachlorobenzene	ND	ND	ND	NVG	NVG						

Notes:
All concentrations are reported in micrograms per kilogram (ug/kg) or parts per billion.
J - Indicates an estimated value
NVG - No Value Given
ND - Not detected at or above reporting limits
ug/L- and ug/kg equal parts per billion (ppb)

*6 NYCRR Part 375; Subparts 375-1 to 375-4 & 375-6;
Table 375-6.8(a)-Restricted and Unrestricted Use Soil Cleanup Objectives
Bold indicates that value is above 6NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives
Bold and boxed indicates that value is above 6 NYCRR Part 375 Restricted Use Soil Cleanup Objectives.
E - indicates the compound exceeded the instrument's calibration range.

TABLE 3
Analytical Results for Pesticides in Soil Samples
538 Union Avenue
Brooklyn, New York

Sample ID	B-7 (0-2 feet)	B-7 (2-4 feet)	B-8 (0-2 feet)	B-8 (4-6 feet)	B-9 (0-2 feet)	B-9 (4-6 feet)	B-10 (0-2 feet)	B-10 (2-4 feet)	Field Blank	*Part 375	*Part 375
Matrix	Soil	Soil	Aqueous	Unrestricted	Restricted Residential						
Date Sampled	4/25/2012	4/25/2012	4/25/2012	4/25/2012	4/25/2012	4/25/2012	4/25/2012	4/25/2012	4/25/2012	Use	Use
Units	ug/Kg	ug/Kg	ug/L	ug/Kg	ug/Kg						
Pesticides via EPA Method 8081											
4,4'-DDD	44	3.1	300	ND	37	ND	38	110	ND	3.3	13,000
4,4'-DDE	100	4.8	180	1.1	28	ND	41	180	ND	3.3	8,900
4,4'-DDT	490	20	890	4.8	180	ND	480	890	ND	3.3	7,900
Aldrin	ND	ND	ND	5	97						
alpha-BHC	ND	ND	ND	20	480						
beta-BHC	ND	ND	ND	36	360						
Chlordane	ND	790	ND	94	4,200						
Chlorobenzilate	ND	ND	ND	NVG	NVG						
DBCP	ND	ND	ND	NVG	NVG						
delta-BHC	ND	ND	9.8	ND	ND	ND	ND	ND	ND	40	100,000
Dieldrin	2.8	ND	ND	ND	ND	ND	7.2	17	ND	5	200
Endosulfan I	ND	ND	ND	2,400	24,000						
Endosulfan II	ND	ND	56	ND	ND	ND	ND	ND	ND	2,400	24,000
Endosulfan sulfate	ND	ND	ND	2,400	24,000						
Endrin	ND	ND	ND	14	11,000						
Endrin aldehyde	ND C	ND C	22 C	ND C	ND C	ND C	ND	ND	ND	NVG	NVG
Endrin ketone	ND	ND	230 C	ND	ND	ND	ND	ND	ND	NVG	NVG
gamma-BHC	ND	ND	ND	100	1,300						
Heptachlor	ND	ND	28	ND	ND	ND	6.2	11	ND	42	2,100
Heptachlor epoxide	ND	ND	ND	0.48	ND	ND	ND	30	ND	NVG	NVG
Hexachlorobenzene	ND	ND	ND	330	1,200						
Hexachlorocyclopentadiene	ND	ND	ND	NVG	NVG						
Methoxychlor	8.7	ND	ND	ND	ND	ND	ND	27	ND	NVG	NVG
Toxaphene	ND	ND	ND	NVG	NVG						

Notes:

All concentrations are reported in micrograms per kilogram (ug/kg) or parts per billion. ug/kg and ug/L equal parts per billion (ppb)

*6 NYCRR Part 375; Subparts 375-1 to 375-4 & 375-6;

Table 375-6.8(a): Restricted and Unrestricted Use Soil Cleanup Objectives

NVG=No Value Given

ND=Not detected at or above reporting limits

C=calibration %RSD%D exceeded for non-CCC analytes.

Bold and boxed indicates that value is above 6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives.

Table 4
Analytical Results of PCBs In Soil Samples

538 Union Avenue
Brooklyn, New York

Sample ID Matrix Date Sampled	B-7 (0-2 feet) Soil 4/25/2012	B-7 (2-4 feet) Soil 4/25/2012	B-8 (0-2 feet) Soil 4/25/2012	B-8 (4-6 feet) Soil 4/25/2012	B-9 (0-2 feet) Soil 4/25/2012	B-9 (4-6 feet) Soil 4/25/2012	B-10 (0-2 feet) Soil 4/25/2012	B-10 (2-4 feet) Soil 4/25/2012	Field Blank Aqueous 4/25/2012	NYSDEC Part 375* Unrestricted SCOs	NYSDEC Part 375* Restricted Residential SCOs
PCBs via EPA Method 8082 Units	ug/kg	ug/kg	ug/L	ug/kg	ug/kg						
Aroclor 1016	ND	ND	ND	100	1,000						
Aroclor 1221	ND	ND	ND	100	1,000						
Aroclor 1232	ND	ND	ND	100	1,000						
Aroclor 1242	ND	ND	ND	100	1,000						
Aroclor 1248	ND	ND	ND	100	1,000						
Aroclor 1254	ND	ND	ND	100	1,000						
Aroclor 1260	51	ND	150	ND	37	ND	69	66	ND	100	1,000
Aroclor 1268	ND	ND	140	ND	24	ND	66	22	ND	100	1,000
Aroclor 1262	ND	ND	ND	100	1,000						

Notes:
 All concentrations are reported in micrograms per kilogram ($\mu\text{g}/\text{kg}$) or parts per billion. *6 NYCRR Part 375; Subparts 375-1 to 375-4 & 375-6; **Table 375-6.8(a): Restricted and Unrestricted Use Soil Cleanup Objectives**
 $\mu\text{g}/\text{kg}$ and $\mu\text{g}/\text{L}$ equal parts per billion (ppb)
 ND - Not detected at or above reporting limits

Bold and boxed indicates that value is above 6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives.

**Table 5
Analytical Results of Metals In Soil Samples**

**538 Union Avenue
Brooklyn, New York**

Sample ID Matrix Date Sampled	B-7 (0-2 feet) Soil 4/25/2012	B-7 (2-4 feet) Soil 4/25/2012	B-8 (0-2 feet) Soil 4/25/2012	B-8 (4-6 feet) Soil 4/25/2012	B-9 (0-2 feet) Soil 4/25/2012	B-9 (4-6 feet) Soil 4/25/2012	B-10 (0-2 feet) Soil 4/25/2012	B-10 (2-4 feet) Soil 4/25/2012	Field Blank aqueous 4/25/2012	NYSDEC Part 375* Unrestricted SCOs	NYSDEC Part 375* Restricted Residential SCOs
Units	mg/kg	mg/kg	mg/L	mg/kg	mg/kg						
Metals via EPA Method 3050B											
Aluminum	4,180	11,400	4,180	9,670	4,410	5,720	5,130	3,880	0.0266	NVG	NVG
Antimony	ND	ND	ND	NVG	NVG						
Arsenic	33.9	3.17	48.3	2.70	71.0	3.42	26.9	9.64	ND	13	16
Barium	351	78.0	523	34.6	328	35.8	366	409	0.0153 J	350	400
Beryllium	ND	ND	ND	7.2	72						
Cadmium	1.25	ND	2.81	ND	2.21	ND	1.37	1.11	ND	2.5	4.3
Calcium	6,270	1,790	4,220	910	5,500	819	18,800	40,100	4.58	NVG	NVG
Chromium	20.4	18.8	32.8	15.5	24.6	17.4	20.7	13.8	ND	30	180
Cobalt	ND	ND	ND	NVG	NA						
Copper	117	29.4	189	13.3	199	14.9	74.7	35.7	ND	50	270
Iron	20,500	21,700	20,000	18,700	16,100	20,700	17,400	18,100	0.0852	NVG	NVG
Lead	524	222	1,320	22.0	649	22.3	466	274	ND	63	400
Magnesium	1,310	2,250	1,550	1,500	1,360	1,440	1,780	4,180	0.846	NVG	NVG
Manganese	224	301	246	326	244	397	260	315	ND	1,600	2,000
Mercury	4.34	0.126	3.93	0.0516	24.5	0.0407	10.7	1.64	ND	0.18	0.81
Nickel	15.9	13.7	21.0	11.9	15.8	11.8	16.5	9.74	ND	30	310
Potassium	785	1,080	714	808	946	866	1,020	1,220	0.652	NVG	NVG
Selenium	0.423 J	ND	0.525 J	ND	0.470 J	ND	2.89	1.42	ND	3.9	180
Silver	0.322	ND	0.820	ND	0.436 J	ND	0.226 J	0.157 J	ND	2	180
Sodium	273	76.1	447	46.7	217	50.9	397	320	3.59	NVG	NVG
Thallium	ND	0.831	ND	0.482 J	ND	0.505 J	ND	0.488 J	ND	NVG	NVG
Vanadium	23.3	30.3	33.9	23.9	21.5	25.4	22.1	14.3	ND	NVG	NVG
Zinc	453	119	734	30.2	453	33.3	403	409	0.0153 J	109	10,000

Notes:

All concentrations are reported in milligrams per kilogram (mg/kg) or parts per million.

ND - Not detected at or above reporting limits

J - Indicates an estimated value

mg/kg equals parts per million (ppm)

NVG - No Value Given

Mercury analyzed via EPA Method 7471B

Bold indicates that value is above 6 NYCRR Part 375 Unrestricted Soil Cleanup Objectives.

Bold and boxed indicates that value is above Part 375 Restricted Residential Soil Cleanup Objectives.

*6 NYCRR Part 375; Subparts 375-1 to 375-4 & 375-6;

Table 375-6.8(a): Restricted and Unrestricted Use Soil Cleanup Objectives

Table 6				
Analytical Results for Volatile Organic Compounds In Groundwater				
538 Union Avenue				
Brooklyn, New York				
Sample ID	GW-4	GW-5	GW-6	NYSDEC
Matrix	groundwater	groundwater	groundwater	TOGs*
Date Sampled	4/25/2012	4/25/2012	4/25/2012	
Volatile Organic Compounds				
Units	ug/L	ug/L	ug/L	ug/L
Acetone	ND	ND	ND	50
Acrolein	ND	ND C	ND C	5
Benzene	ND	ND	ND	1
Bromobenzene	ND	ND	ND	5
Bromochloromethane	ND	ND	ND	5
Bromodichloromethane	ND	ND	ND	50
Bromoform	ND C	ND C	ND	50
Bromomethane	ND	ND	ND	5
2-Butanone (MEK)	ND	ND	ND	50
n-Butylbenzene	ND	ND	ND	5
sec-Butylbenzene	ND	ND	ND	5
tert-Butylbenzene	ND	ND	ND	5
Carbon disulfide	0.50 J	ND	ND	NVG
Carbon tetrachloride	ND	ND	ND	5
Chlorobenzene	ND	ND	ND	5
Chloroethane	ND C	ND C	ND	5
Chloroform	ND	ND	ND	7
Chloromethane	ND C	ND C	ND	NVG
o-Chlorotoluene	ND	ND	ND	5
p-Chlorotoluene	ND	ND	ND	5
1,2-Dibromo-3-Chloropropane	ND C	ND C	ND C	0.04
Dibromochloromethane	ND	ND	ND	50
1,2-Dibromoethane	ND	ND	ND	NVG
1,2-Dichlorobenzene	ND	ND	ND	3
1,3-Dichlorobenzene	ND	ND	ND	3
1,4-Dichlorobenzene	ND	ND	ND	3
Dichlorodifluoromethane	ND	ND	ND	5
1,1-Dichloroethane	ND	0.81 J	0.78 J	5
1,2-Dichloroethane	ND	ND	ND	0.6
1,1-Dichloroethene	ND	ND	ND	5
cis-1,2-Dichloroethene	ND	ND	ND	5
trans-1,2-Dichloroethene	ND	ND	ND	5
1,2-Dichloropropane	ND	ND	ND	1
1,3-Dichloropropane	ND	ND	ND	5
2,2-Dichloropropane	ND	ND	ND	5
1,1-Dichloropropene	ND	ND	ND	5
cis-1,3-Dichloropropene	ND	ND	ND	0.4
trans-1,3-Dichloropropene	ND	ND	ND	0.4
Ethylbenzene	ND	ND	ND	5
Hexachlorobutadiene	ND	ND	ND	0.5
Isopropylbenzene	ND	ND	ND	5
p-Isopropyltoluene	ND	ND	ND	5
Methyl Tert Butyl Ether	0.77 J	0.50 J	ND	10
4-Methyl-2-Pentanone (MIBK)	ND	ND	ND	NVG
Methylene bromide	ND	ND	ND	NVG
Methylene Chloride	3.7 B	3.6 B	3.7 B	5
Naphthalene	ND	ND	ND	10
n-Propylbenzene	ND	ND	ND	5
Styrene	ND	ND	ND	5
1,1,1,2-Tetrachloroethane	ND	ND	ND	5
1,1,2,2-Tetrachloroethane	ND	ND	ND	5
Tetrachloroethene	ND	ND	ND	5
Toluene	ND	ND	ND	5
1,2,3-Trichlorobenzene	ND	ND	ND	5
1,2,4-Trichlorobenzene	ND	ND	ND	5
1,1,1-Trichloroethane	ND	7.6	ND	5
1,1,2-Trichloroethane	ND	ND	ND	1
Trichloroethene	ND	ND	ND	5
Trichlorofluoromethane	ND	ND C	ND C	5
1,2,3-Trichloropropane	ND C	ND C	ND C	0.04
1,2,4-Trimethylbenzene	ND	ND	ND	5
1,3,5-Trimethylbenzene	ND	ND	ND	5
Vinyl chloride	ND	ND	ND	2
m,p-Xylene	ND	ND	ND	5
o-Xylene	ND	ND	ND	5
Xylene (total)	ND	ND	ND	5
Notes:				
ug/L - micrograms per liter or parts per billion				
ND - Not detected at or above laboratory detection limits				
NVG - No Value Given				
C - Calibration %RSD/% D exceeded for non-CCC analytes				
B - Analyte detected in associated Method Blank				
J - Estimated Value				
Boxed and bold indicates exceedance groundwater standards or guidance values				
*NYSDEC Technical and Operational Guidance Series (1.1.1)				
Ambient Water Quality Standards and Guidance Values				
and Groundwater Effluent Limitations; June 1998				

Table 7				
Analytical Results for Semi-Volatile Organic Compounds In Groundwater				
538 Union Avenue				
Brooklyn, New York				
Sample ID	GW-4	GW-5	GW-6	NYSDEC
Matrix	groundwater	groundwater	groundwater	TOGS*
Date Sampled	4/25/2012	4/25/2012	4/25/2012	
Semi-Volatile Organic Compounds				
Units	<u>ug/L</u>	<u>ug/L</u>	<u>ug/L</u>	<u>ug/L</u>
2-Chlorophenol	ND	ND	ND	NVG
4-Chloro-3-methyl phenol	ND	ND	ND	NVG
2,4-Dichlorophenol	ND	ND	ND	5
2,4-Dimethylphenol	ND	ND	ND	50
2,4-Dinitrophenol	ND	ND	ND	10
4,6-Dinitro-2-methylphenol	ND	ND	ND	NVG
2-Methylphenol	ND	ND	ND	1
3+4-Methylphenols	ND	ND	ND	1
2-Nitrophenol	ND	ND	ND	NVG
4-Nitrophenol	ND	ND	ND	NVG
Pentachlorophenol	ND	ND	ND	NVG
Phenol	ND	ND	ND	1
2,4,5-Trichlorophenol	ND	ND	ND	NVG
2,4,6-Trichlorophenol	ND	ND	ND	NVG
Acenaphthene	ND	ND	0.62 J	20
Acenaphthylene	ND	ND	ND	NVG
Acetophenone	ND	ND	ND	NVG
Anthracene	ND	3.1 J	ND	50
Atrazine	ND	ND	ND	7.5
Benzo(a)anthracene	ND	2.3 J	0.94 J	0.002
Benzo(a)pyrene	ND	2.3 J	0.97 J	0.002
Benzo(b)fluoranthene	ND	1.7 J	1.7 J	0.002
Benzo(g,h,i)perylene	ND	0.98 J	ND	NVG
Benzo(k)fluoranthene	ND	1.6 J	1.5 J	0.002
4-Bromophenyl-phenylether	ND	ND	ND	NVG
Butylbenzylphthalate	ND	ND	ND	50
1,1' -Biphenyl	ND	ND	ND	5
Benzaldehyde	ND	ND	ND	NVG
2-Chloronaphthalene	ND	ND	ND	10
4-Chloroaniline	ND	ND	ND	5
Carbazole	ND	ND	ND	NVG
Caprolactam	ND	ND	ND	NVG
Chrysene	ND	2.4 J	1.1 J	0.002
bis(2-Chloroethoxy)methane	ND	ND	ND	5
bis(2-Chloroethyl)ether	ND	ND	ND	1
bis(2-Chloroisopropyl)ether	ND	ND	ND	NVG
4-Chlorophenyl-phenylether	ND	ND	ND	NVG
2,4-Dinitrotoluene	ND	ND	ND	5
2,6-Dinitrotoluene	ND	ND	ND	5
3,3-Dichlorobenzidine	ND	ND	ND	5
Dibenzo(a,h)anthracene	ND	ND	ND	NVG
Dibenzofuran	ND	ND	ND	NVG
Di-n-butylphthalate	ND	ND	ND	50
Di-n-octyl phthalate	ND	ND	ND	50
Diethylphthalate	ND	ND	ND	50
Dimethylphthalate	ND	ND	ND	50
bis(2-Ethylhexyl)phthalate	ND	ND	ND	5
Fluoranthene	ND	4.6 J	1.9 J	50
Fluorene	ND	ND	ND	50
Hexachlorobenzene	ND	ND	ND	0.04
Hexachlorobutadiene	ND	ND	ND	0.5
Hexachlorocyclopentadiene	ND	ND	ND	5
Hexachloroethane	ND	ND	ND	5
Indeno(1,2,3-cd)pyrene	ND	1.1 J	ND	0.002
Isophorone	ND	ND	ND	50
2-Methylnaphthalene	ND	ND	ND	NGV
2-Nitroaniline	ND	ND	ND	5
3-Nitroaniline	ND	ND	ND	5
4-Nitroaniline	ND	ND	ND	5
Naphthalene	ND	ND	ND	10
Nitrobenzene	ND	ND	ND	0.4
N-Nitroso-di-n-propylamine	ND	ND	ND	NVG
N-Nitrosodiphenylamine	ND	ND	ND	50
Phenanthrene	ND	3.2 J	1.9 J	50
Pyrene	ND	5.3 J	2.0 J	50
<i>Notes:</i>				
<i>ug/L - micrograms per liter or parts per billion</i>				
<i>ND - Not detected at or above laboratory detection limits</i>				
<i>NVG - No Value Given</i>				
<i>J - Estimated Value</i>				
Boxed and bold indicates exceedance of groundwater standards or guidance values				
<i>*NYSDEC Technical and Operational Guidance Series (1.1.1)</i>				
<i>Ambient Water Quality Standards and Guidance Values</i>				
<i>and Groundwater Effluent Limitations; June 1998</i>				

Table 8

Analytical Results for Pesticides In Groundwater

**538 Union Avenue
Brooklyn, New York**

Sample ID	GW-4	GW-5	GW-6	NYSDEC TOGS*
Matrix	groundwater	groundwater	groundwater	
Date Sampled	4/25/2012	4/25/2012	4/25/2012	
Pesticides				
Units	<u>ug/L</u>	<u>ug/L</u>	<u>ug/L</u>	<u>ug/L</u>
Aldrin	ND	ND	ND	ND
alpha-BHC	ND	ND	ND	0.01
beta-BHC	ND	ND	ND	0.04
delta-BHC	ND	ND	ND	0.04
gamma-BHC	ND	ND	ND	0.05
alpha-Chlordane	ND	ND	ND	0.05
gamma-Chlordane	ND	ND	ND	0.05
Dieldrin	ND	ND	ND	0.004
4,4-DDD	ND	0.092 JP	0.041 JP	0.3
4,4-DDE	ND	0.043 J	0.030 J	0.2
4,4-DDT	ND	0.39 J	0.059 J	0.2
Endrin	ND	ND	ND	ND
Endosulfan Sulfate	ND	ND	ND	NVG
Endrin aldehyde	ND	ND	ND	5
Endosulfan I	ND	ND	ND	NVG
Endosulfan II	ND	ND	ND	NVG
Heptachlor	ND	ND	ND	0.04
Heptachlor epoxide	ND	ND	ND	0.03
Methoxychlor	ND	ND	ND	35
Endrin ketone	ND	ND	ND	5
Toxaphene	ND	ND	ND	0.06

Notes:

ug/L - micrograms per liter or parts per billion

ND - Not detected at or above laboratory detection limits

P- >40% diff for detected concentration between the two GC columns

NVG - No Value Given

J - Estimated Value

Boxed and bold indicates exceedance of groundwater standards or guidance values

**NYSDEC Technical and Operational Guidance Series (1.1.1)*

Ambient Water Quality Standards and Guidance Values

and Groundwater Effluent Limitations; June 1998

Table 9
Analytical Results for PCBs In Groundwater
538 Union Avenue
Brooklyn, New York

Sample ID Matrix Date Sampled	GW-4 groundwater 4/25/2012	GW-5 groundwater 4/25/2012	GW-6 groundwater 4/25/2012	NYSDEC TOGS**
PCBs				
Units	<u>ug/L</u>	<u>ug/L</u>	<u>ug/L</u>	<u>ug/L</u>
Aroclor-1016	ND	ND	ND	0.09 *
Aroclor-1221	ND	ND	ND	0.09 *
Aroclor-1232	ND	ND	ND	0.09 *
Aroclor-1242	ND	ND	ND	0.09 *
Aroclor-1248	ND	ND	ND	0.09 *
Aroclor-1254	ND	ND	ND	0.09 *
Aroclor-1260	ND	ND	ND	0.09 *
Aroclor-1262	ND	ND	ND	0.09 *
Aroclor-1268	ND	ND	ND	0.09 *

Notes:

ug/L - micrograms per liter or parts per billion

ND - Not detected at or above laboratory detection limits

** Applies to the sum of these compounds*

***NYSDEC Technical and Operational Guidance Series (1.1.1)*

Ambient Water Quality Standards and Guidance Values

and Groundwater Effluent Limitations; June 1998

Table 10

Analytical Results for Total Metals In Groundwater

**538 Union Avenue
Brooklyn, New York**

Sample ID	GW-4	GW-5	GW-6	NYSDEC TOGS*
Matrix	groundwater	groundwater	groundwater	
Date Sampled	4/25/2012	4/25/2012	4/25/2012	
Total Metals				
Units	<u>mg/L</u>	<u>mg/L</u>	<u>mg/L</u>	<u>mg/L</u>
Aluminum	182	690	98.9	NVG
Antimony	ND	ND	ND	0.003
Arsenic	0.0879	0.196	0.209	0.025
Barium	1.70	13.0	12.1	1.0
Beryllium	ND	ND	ND	0.003
Cadmium	ND	0.0151	0.0234	0.005
Calcium	204	469	610	NVG
Chromium	0.490	1.32	0.510	0.50
Cobalt	0.0404	0.0813	0.0336	NVG
Copper	0.676	3.20	3.30	0.2
Iron	498	1,240	445	0.3
Lead	1.09	22.4	18.3	0.025
Magnesium	89.3	143	86.2	35
Manganese	16.9	38.5	10.1	0.3
Mercury	0.00109	0.0566	0.0312	0.0007
Nickel	0.385	0.959	0.408	1
Potassium	65.1	85.8	32.1	NVG
Selenium	ND	ND	0.0128 J	0.01
Silver	ND	0.0128 J	0.0158 J	0.05
Sodium	23.4	22.5	14.2	20
Thallium	0.0133 J	0.0252	ND	0.0005
Vanadium	0.633	1.18	0.511	NVG
Zinc	1.46	8.68	10.6	2

Notes:

mg/L - milligrams per liter or parts per million

ND - Not detected at or above laboratory detection limits

NVG - No Value Given

J - Estimated Value

Boxed and bold indicates exceedance of groundwater standards or guidance values

**NYSDEC Technical and Operational Guidance Series (1.1.1)*

Ambient Water Quality Standards and Guidance Values

and Groundwater Effluent Limitations; June 1998

Table 10

**Analytical Results for Dissolved Metals In Groundwater
538 Union Avenue
Brooklyn, New York**

Sample ID Matrix Date Sampled	GW-4 groundwater 4/25/2012	GW-5 groundwater 4/25/2012	GW-6 groundwater 4/25/2012	NYSDEC TOGS*
Dissolved Metals				
Units	<u>mg/L</u>	<u>mg/L</u>	<u>mg/L</u>	<u>mg/L</u>
Aluminum	0.155	0.0540	0.125	NVG
Antimony	ND	ND	ND	0.003
Arsenic	ND	ND	ND	0.025
Barium	0.282	0.151	0.134	1.0
Beryllium	ND	ND	ND	0.003
Cadmium	ND	ND	ND	0.005
Calcium	225	179	314	NVG
Chromium	ND	ND	ND	0.50
Cobalt	0.00826 J	0.00693 J	0.00608 J	NVG
Copper	ND	ND	ND	0.2
Iron	0.118	0.260	0.121	0.3
Lead	ND	0.0105 J	0.00605 J	0.025
Magnesium	53.5	22.3	28.4	35
Manganese	8.27	3.65	1.46	0.3
Mercury	ND	ND	ND	0.0007
Nickel	0.0176 J	0.00737 J	0.00778 J	1
Potassium	44.8	21.9	13.8	NVG
Selenium	ND	ND	ND	0.01
Silver	ND	ND	ND	0.05
Sodium	29.7	19.5	11.4	20
Thallium	ND	ND	ND	0.005
Vanadium	ND	ND	ND	NVG
Zinc	0.00579 J	0.0116 J	0.0335	2

Notes:

mg/L - milligrams per liter or parts per million

ND - Not detected at or above laboratory detection limits

NVG - No Value Given

J - Estimated Value

Boxed and bold indicates exceedance of groundwater standards or guidance values

**NYSDEC Technical and Operational Guidance Series (1.1.1)
Ambient Water Quality Standards and Guidance Values
and Groundwater Effluent Limitations; June 1998*

Table 11
Analytical Results of Volatile Organic Compounds Detected In Soil Vapor Samples
538 Union Avenue, Brooklyn, NY

Sample ID Matrix Date Sampled	SV-1 Soil Vapor 4/27/2012	SV-2 Soil Vapor 4/27/2012	SV-3 Soil Vapor 4/27/2012
Volatile Organic Compounds via EPA Method TO-15			
Units	<u>ug/m³</u>	<u>ug/m³</u>	<u>ug/m³</u>
Acetone	1,120 a	1,300 a	1,850 a
1,3-Butadiene	ND	ND	ND
Benzene	ND	1.5	ND
Bromodichloromethane	ND	ND	ND
Bromoform	ND	ND	ND
Bromomethane	ND	ND	ND
Bromoethene	ND	ND	ND
Benzyl Chloride	ND	ND	ND
Carbon disulfide	ND	ND	ND
Chlorobenzene	ND	ND	ND
Chloroethane	ND	ND	ND
Chloroform	4.4	3.3	ND
Chloromethane	ND	ND	ND
3-Chloropropene	ND	ND	ND
2-Chlorotoluene	ND	ND	ND
Carbon tetrachloride	ND	ND	ND
Cyclohexane	ND	ND	ND
1,1-Dichloroethane	8.9	5.7	ND
1,1-Dichloroethylene	ND	ND	ND
1,2-Dibromoethane	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND
1,4-Dioxane	ND	ND	ND
Dichlorodifluoromethane	3.2	3.3	3.9
Dibromochloromethane	ND	ND	ND
trans-1,2-Dichloroethylene	ND	ND	ND
cis-1,2-Dichloroethylene	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND
m-Dichlorobenzene	ND	ND	ND
o-Dichlorobenzene	ND	ND	ND
p-Dichlorobenzene	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND
Ethanol	73.5	88.4	120
Ethylbenzene	6.1	8.7	5.6
Ethyl Acetate	ND	ND	ND
4-Ethyltoluene	6.4	7.4	5.9
Freon 113	ND	ND	ND
Freon 114	ND	ND	ND
Heptane	17	17	20
Hexachlorobutadiene	ND	ND	ND
Hexane	ND	10	ND
2-Hexanone	162	148	202
Isopropyl Alcohol	93.4	127	158
Methylene chloride	ND	ND	ND
Methyl ethyl ketone	398 a	363 a	575 a
Methyl Isobutyl Ketone	ND	ND	ND
Methyl Tert Butyl Ether	ND	ND	ND
Methylmethacrylate	ND	ND	ND
Propylene	170	204	234 a
Styrene	ND	ND	ND
1,1,1-Trichloroethane	230	35	111
1,1,2,2-Tetrachloroethane	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND
1,2,4-Trimethylbenzene	44	45	39
1,3,5-Trimethylbenzene	12	13	11
2,2,4-Trimethylpentane	ND	ND	ND
Tertiary Butyl Alcohol	34.0	41.2	55.8
Tetrachloroethylene	31	25	ND
Tetrahydrofuran	ND	ND	ND
Toluene	9.4	15	8.3
Trichloroethylene	72.6	7.0	1.5
Trichlorofluoromethane	7.3	ND	5.2
Vinyl chloride	ND	ND	ND
Vinyl Acetate	ND	ND	ND
m,p-Xylene	27	36	24
o-Xylene	14	17	13
Xylenes (total)	40	53.4	37

Notes:
All concentrations are shown in ug/m³-micrograms per cubic meter
All samples collected over 2 hour period
J - Indicates an estimated value
a - Results is from Run #2
ND - Not detected at or above reporting limits

Table 12
Track 4 Site Specific Soil Cleanup Objectives (SSSCOs)
538 Union Avenue
Brooklyn, New York

Compound/Constituent	Track 4 SSSCOs
VOCs	Restricted Residential SCOs
SVOCs	Total SVOCs <250 PPM
Pesticides	Restricted Residential SCOs
PCBs	Restricted Residential SCOs
Metals except Mercury	Restricted Residential SCOs
Mercury	2.5 PPM

Notes:

VOCs = Volatile Organic Compound

SVOC = Semi-Volatile Organic Compounds

PCBs = Polychlorinated Biphenyls

APPENDIX A

Citizen Participation Plan

Appendix A

CITIZEN PARTICIPATION PLAN

The NYC Office of Environmental Remediation and Withers Owner LLC 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, Withers Owner LLC 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, Michael Mandac, 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. Withers Owner LLC will inspect the repositories to ensure that they are fully populated with project information. The repository for this project is:

Williamsburg Library

240 Division Avenue, Brooklyn, NY 11211-7323

718-302-3485

Hours of Operation:

Mon. 10am to 6pm

Tues. 1pm to 8pm

Wed. 10am to 6pm

Thurs. 10pm to 6pm

Fri. 10 am to 6pm

Sat. Closed

Sun. 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 Withers

Owner LLC, reviewed and approved by OER prior to distribution and mailed by Withers Owner LLC. 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:

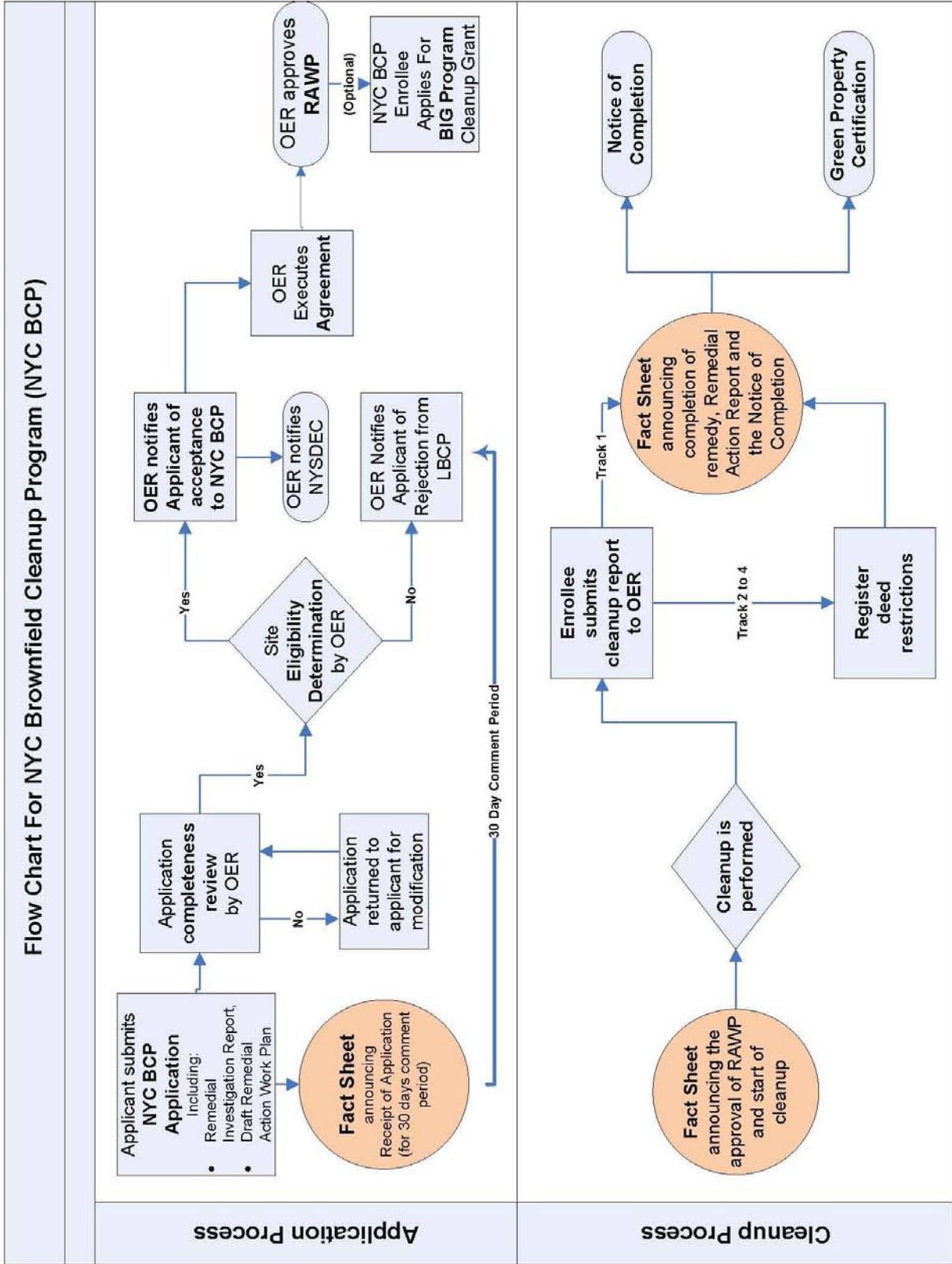
- **Public Notice of the availability of the Remedial Investigation Report and Remedial Action Work Plan and a 30-day public comment period on the Remedial Action Work Plan.**

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.



APPENDIX B

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. If possible, Withers Owner LLC will reuse clean, non-virgin materials; 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. 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.

Conversion to Clean Fuels. Use of clean fuel improves NYC's air quality by reducing harmful emissions. An estimate of the volume of clean fuels used during remedial activities will be quantified and reported in the RAR.

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

Storm-water Retention. Storm-water retention improves water quality by lowering the rate of combined storm-water and sewer discharges to NYC's sewage treatment plants during periods of precipitation, and reduces the volume of untreated influent to local surface waters. An estimate of the enhanced storm-water retention capability of the redevelopment project will be included in the RAR.

Paperless Voluntary Cleanup Program. Withers Owner, LLC is participating in OER's Paperless Voluntary 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. Withers Owner, LLC 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.

Trees and Plantings. Trees and other plantings provide habitat and add to NYC's environmental quality in a wide variety of ways. Native plant species and native habitat provide optimal support to local fauna, promote local biodiversity, and require less maintenance. An estimate of the land area that will be vegetated, including the number of trees planted or preserved, will be reported in square feet in the RAR.

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. If possible, Withers Owner LLC will reuse clean, non-virgin materials; 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.

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.

Conversion to Clean Fuels. Use of clean fuel improves NYC's air quality by reducing harmful emissions. An estimate of the volume of clean fuels used during remedial activities will be quantified and reported in the RAR.

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.

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

Storm-water Retention. Storm-water retention improves water quality by lowering the rate of combined storm-water and sewer discharges to NYC's sewage treatment plants during periods of precipitation, and reduces the volume of untreated influent to local surface waters.

An estimate of the enhanced storm-water retention capability of the redevelopment project will be included in the RAR.

Paperless Brownfield Cleanup Program. Withers Owner, LLC is participating in OER's Paperless Voluntary 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. Withers Owner, LLC 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.

Trees and Plantings. Trees and other plantings provide habitat and add to NYC's environmental quality in a wide variety of ways. Native plant species and native habitat provide optimal support to local fauna, promote local biodiversity, and require less maintenance.

An estimate of the land area that will be vegetated, including the number of trees planted or preserved, will be reported in square feet in the RAR.

APPENDIX C

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.

The planned route on local roads for trucks leaving the Site is the following: take Union Avenue south to Meeker Avenue, go west on Meeker Avenue, turn right onto Metropolitan Avenue, first left onto the Brooklyn/Queens Expressway(BQE), and take BQE to the Verrazano Bridge crossing to Staten Island. A figure depicting the local truck route is included as Figure 10. 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 Brooklyn, 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 Materials Reuse On-Site

The redevelopment plan does not include the reuse of any soil from the Site.

Organic matter (wood, roots, stumps, etc.) or other waste derived from clearing and grubbing of the Site will not be buried on-site. Soil or fill excavated from the Site for grading or other purposes will not be reused within a cover soil layer or within landscaping berms.

1.8 Demarcation

After completion of hotspot removal and any other invasive remedial activities, and prior to backfilling, the top of the residual soil/fill will be defined by one of three methods: (1) placement of a demarcation layer. The demarcation layer will consist of geosynthetic fencing or equivalent material to be placed on the surface of residual soil/fill to provide an observable reference layer. A description or map of the approximate depth of the demarcation layer will be provided in the SMP; or (2) a land survey of the top elevation of residual soil/fill before the placement of cover soils, pavement and associated sub-soils, or other materials or structures or, (3) all materials beneath the approved cover will be considered impacted and subject to site management after the remedy is complete. Demarcation may be established by one or any combination of these three methods. As appropriate, a map showing the method of demarcation for the Site and all associated documentation will be presented in the RAR.

This demarcation will constitute the top of the site management horizon. Materials within this horizon require adherence to special conditions during future invasive activities as defined in the Site Management Plan.

1.9 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 utilized for this project are NYSDEC's Restricted Residential SCOs as listed in Table 13.

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 NYSDEC.

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.

1.10 Fluids Management

All liquids to be removed from the Site, including dewatering fluids, will be handled, transported and disposed in accordance with applicable laws and regulations. Liquids discharged into the New York City sewer system will receive prior approval by New York City Department of Environmental Protection (NYCDEP). The NYCDEP regulates discharges to the New York City sewers under Title 15, Rules of the City of New York Chapter 19. Discharge to the New York City sewer system will require an authorization and sampling data demonstrating that the groundwater meets the City's discharge criteria. The dewatering fluid will be pretreated as necessary to meet the NYCDEP discharge criteria. If discharge to the City sewer system is not appropriate, the dewatering fluids will be managed by transportation and disposal at an off-site treatment facility.

Discharge of water generated during remedial construction to surface waters (i.e. a stream or river) is prohibited without a SPDES permit issued by NYSDEC.

1.11 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.

1.12 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 NYSDEC 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.

1.13 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.

APPENDIX D

Construction Health and Safety Plan



Construction Health & Safety Plan

**538 Union Avenue
Brooklyn, NY 11211-1209**

August 2012

Prepared for:

**Withers Owner, LLC
250 Greenpoint Avenue
Brooklyn, NY 11222**

Prepared by:

**CA RICH CONSULTANTS, INC.
17 Dupont Street
Plainview, New York 11803-1614**

Construction Health & Safety Plan

Soil Excavation

**538 UNION AVENUE
Brooklyn, New York 11211-1209
Block: 2741; Lots: 7 and 8**

1.0 INTRODUCTION

This Construction Health and Safety Plan (“CHASP”) is developed for utilization during construction activities located at the above-referenced site in Brooklyn, New York (the Site or Property). The HASP is to be enforced by CA RICH’s Project Health and Safety Manager, the on-site Health & Safety Coordinator (HSC) or their assignee. The on-site HSC will interact with the Project Manager and is vested with the authority to make field decisions including the termination of on-site activities if an imminent health and safety hazard, condition or related concern arises. Information and protocol in the CHASP is applicable to all on-site personnel who will be entering the designated work zone.

2.0 POTENTIAL HAZARDS

2.1 Chemical Hazards

The known chemicals or constituents of concern according to CA RICH’s Remedial Investigation Report (RIR) consist of the metals, arsenic, barium, copper, lead, mercury, and zinc; pesticides, 4,4’-DDD, 4,4’-DDE, 4,4’-DDT, chlordane, and dieldrin; PCB, Aroclor 1260 and 1268; and Semi-Volatile Organic Compounds (SVOCs), benzo(a)anthracene, benzo(a)pyrene, benzo(b)flouranthene, benzo(k)flouranthene, chrysene, dibenzo(a,h)anthracene, and indeno (1,2,3-cd)pyrene which were detected in Site soils above New York State Department of Environmental Conservation (NYSDEC) Part 375 guidance values.

During the construction activities, CA RICH will operate as if there is a potential hazard from the above-listed compounds. Physical properties and toxicological information is included in Appendix A.

2.2 Other Health & Safety Risks

Normal physical hazards associated with using excavation equipment and hand tools as well as hazards associated with adverse climatic conditions (heat & cold) or physical site-related debris represent a certain degree of risk to be assumed by on-site personnel.

Certain provisions in this Plan, specifically the use of personnel protective equipment, may tend to increase the risk of physical injury, as well as susceptibility to cold or heat stress. This is primarily due to restrictions in dexterity, hearing, sight, and normal body heat transfer inherent in the use of protective gear.

3.0 RISK MANAGEMENT

3.1 Work / Exclusion Zones

The subject Property is currently vacant. The Tax Map designation for the Property is Block: 2741; Lots 7 and 8. The project plans currently anticipate a two-foot deep site-wide excavation and a 3.5-foot excavation at one specific location due to the presence of pesticides. All work (including, but not limited to the grading and excavation) activities conducted will establish a work/exclusion zone. Access to this area will be limited to properly trained, properly protected personnel directly involved with the work. Enforcement of the work/exclusion zone boundaries is the responsibility of the on-site Health & Safety Coordinator (HSC) or his/her properly trained assignee.

3.2 Personnel Protection

Health & Safety regulatory personnel have developed different levels of personnel protection to deal with differing degrees of potential risks of exposure to chemical constituents. The levels are designated as **A**, **B**, **C**, and **D** and are ranked according to the amount of personnel protection afforded by each level. Level **A** is the highest level of protection and Level **D** is the lowest level of protection.

The different levels are primarily dependent upon the degree of respiratory protection necessary, in conjunction with appropriate protective clothing. Levels of protection mandate a degree of respiratory protection. However, flexibility exists within the lower levels (B, C, and D) concerning proper protective clothing.

The four levels of protection were developed for utilization in situations which involve suspected or known atmospheric and/or environmental hazards including airborne contamination and skin-affecting substances. It is anticipated that all of the work will be performed using Level D protection (no respiratory protection with protective clothing requirements limited to long sleeved shirts, long pants or coveralls, work gloves and leather work boots).

Level D may be modified by the HSC to include protective clothing or equipment (Saran-coated disposable coveralls or PVC splash suits, safety glasses, hard hat with face shield, and chemically resistant boots) based upon physical hazards, skin contact concerns, and real-time monitoring.

Real-time air monitoring for total airborne organics using either an Organic Vapor Analyzer (OVA) or a Photo-Ionization Detector (PID) will determine if and when an upgrade from Level D to a higher level of respiratory protection is warranted. Decisions for an upgrade from Level D to higher levels of protection, mitigative actions, and/or suspension of work are the responsibility of the Project Manager and/or the designated on-site HSC.

3.3 Air Monitoring

The HSC or his/her properly trained assignee will conduct "Real Time" air monitoring for total organic vapors and total particulates. 'Real-time' monitoring refers to the utilization of instrumentation, which yields immediate measurements. The utilization of real time monitoring helps determine immediate or long-term risks to on-site personnel and the general public, the appropriate level of personnel respiratory protection necessary, and actions to mitigate the recognized hazard.

3.3.1. Particulate Monitoring

A. Instrumentation

Dust particulates in air will be monitored using a light scattering technique MINIRAM Model PDM-3 Miniature Real-time Aerosol Monitor (MINIRAM) or equivalent. The MINIRAM is capable of measuring airborne dust particles within the range of 10 to 100,000 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). Particulate monitoring will only be necessary during major excavation activities.

B. Application

Dust monitoring will occur at regular intervals during major excavation activities. Monitoring will be conducted in upgradient and downgradient locations, relative to prevailing wind direction) along the perimeter of the work zone. The HSC or his assignee will perform the monitoring. As outlined in the NYSDOH Community Air Monitoring Plan, if particulate levels in the downwind location are $150 \text{ mg}/\text{m}^3$ greater than those measured in the upwind location, dust suppression techniques shall be employed.

3.3.2 Organic Vapor

A. Instrumentation

Real-time monitoring for total organic vapor (TOV) utilizes either a PID or flame ionization detector (FID). The appropriate PID is an intrinsically safe HNU Systems Model PI-101, MiniRae PID or equivalent, which is factory calibrated to benzene. The appropriate FID is a Foxboro model 128 OVA or equivalent, which is factory calibrated to methane.

B. Application

Organic vapor monitoring is performed as outlined in the NYSDOH Community Air Monitoring Plan. Specifically, monitoring shall be conducted at the downwind perimeter of the work zone periodically during work activities. If TOV levels exceed 5 milligrams per meter cubed (mg/m^3) above established pre-work background levels, work activities will be halted and monitoring will be continued under the provision of a Vapor Emission Response Plan (outlined in Section 5).

3.4 Worker Training

Personnel overseeing the excavation of the contaminated soil will be properly trained. This includes the Health & Safety Coordinator and the Project Health and Safety Manager.

Prior to any work, all workers involved with the project should be aware of the potential chemical, physical and biological hazards discussed in this document, as well as the general safety practices outlined below. A safety briefing by the on-site HSC and/or assistant assignee shall take place at the outset of work activities.

The HSC will be available to address environmentally-related health & safety issues a site worker (such as an equipment operator or laborer) may have regarding the site conditions. Once an issue is brought to the HCS's attention, he or she will evaluate the issue and apply the procedures outlined in this Health & Safety Plan.

3.5 General Safety Practices

The following safety practices shall be followed by all project personnel.

1. Avoid unnecessary skin exposure to subsurface materials. Sleeved shirts tucked into long pants (or coveralls), work gloves, and steel-toe leather work boots are required unless modified gear is approved by the HSC. Remove any excess residual soil from clothes prior to leaving the site.
2. No eating, drinking, gum or tobacco chewing, or smoking allowed in designated work areas. Thoroughly wash hands prior to these activities outside the work area. Avoid sitting on the ground during breaks or while eating and drinking. Thoroughly wash all exposed body areas at the end of the workday.
3. Some symptoms of acute exposure include: dizziness, light-headedness, drowsiness, headache, and nose/eye/skin irritation. If these symptoms are experienced or strong odor is detected, leave the work area and immediately report the incident to the on-site HSC.

3.6 Enforcement

Enforcement of the Site Safety Plan will be the responsibility of the HSC or the assignee. The Coordinator should be on-site as needed, based on the work being performed and performs or directly oversees all aspects of the Health & Safety Plan including: air monitoring; environmental mitigation; personnel respiratory and skin protection; general safety practices; documentation; emergency procedures and protocol; and reporting and recordkeeping as described below.

3.7 Reporting & Recordkeeping

Incidents involving injury, symptoms of exposure, discovery of potentially hazardous materials, or unsafe work practices and/or conditions should be immediately reported to the HSC.

A logbook must be maintained on-site to document all aspects of HASP enforcement. The log is paginated and dated with entries made on a daily basis in waterproof ink, initialed by the HSC or assignee. Log entries should include date and time of instrument monitoring, instrument type, measurement method, test results, calibration and maintenance information, as well as appropriate mitigative actions responding to detections. Miscellaneous information to be logged may include weather conditions, reported complaints or symptoms, regulatory inspections, and reasons to upgrade personnel protection above the normal specification (Level D).

3.8 Mitigative Measures

The primary mitigative measure anticipated for this project is dust suppression. Prior to commencing work each day, the excavation contractor should attach a hose to a nearby fire hydrant and attach a spray nozzle to the hose. This should be used to hose down trucks as they leave the Site and to set up a misting operation when excavating soil on dry days. The excavation contractor must obtain the necessary hydrant permit.

4.0 EMERGENCIES

4.1 EMERGENCY RESPONSE SERVICES

- | | | |
|-----|--|-----------------------|
| (1) | HOSPITAL
Brooklyn Hospital Center: Williamsburg Center
99 Division Avenue
Brooklyn, NY 11211 | (718) 599-6200 |
| (2) | AMBULANCE | 911 |
| (3) | FIRE DEPARTMENT
HAZARDOUS MATERIALS | 911 |
| (4) | POLICE DEPARTMENT | 911 |
| (5) | POISON CONTROL CENTER | (800) 222-1222 |

The preceding list and associated attached map (Figure 1) illustrating the fastest route to the nearest hospital must be conspicuously posted in areas of worker congregation and adjacent to all on-site telephones (if any).

4.2 EMERGENCY PROCEDURES

4.2.1 Contact or Exposure to Suspected Hazardous Materials

In the event of a fire, chemical discharge, medical emergency, workers are instructed to immediately notify the HSC and proper emergency services (posted). Should physical contact with unknown or questionable materials occur, immediately wash the affected body areas with clean water and notify the HSC. Anyone experiencing symptoms of exposure should exit the work area, notify the HSC, and seek medical attention.

4.2.2 Ingress/egress

Clear paths of ingress/egress to work zones and site entrances/exits must be maintained at all times. Unauthorized personnel are restricted from accessing the site.

5.0 COMMUNITY AIR MONITORING PLAN

Real-time air monitoring, for volatile compounds and particulate levels at the perimeter of the work area is necessary. This plan includes the following:

- Volatile organic compounds must be monitored at the downwind perimeter of the work area on a continuous basis. If total organic vapor levels exceed 5 ppm above background, work activities must be halted and monitoring continued under the provisions of a Vapor Emission Response Plan. All readings must be recorded and be available for regulatory personnel to review.
- Particulates should be continuously monitored upwind, downwind and within the work area at temporary particulate monitoring stations during excavation activities. If the downwind particulate level is 150 µg/m³ greater than the upwind particulate level, then dust suppression techniques must be employed. All readings must be recorded and be available for regulatory personnel to review.

Vapor Emissions Response Plan

If the ambient air concentration of organic vapors exceeds 5 ppm above background at the perimeter of the work area, activities will be halted and monitoring continued. If the organic vapor level decreases below 5 ppm above background, work activities can resume. If the organic vapor levels are greater than 5 ppm over background but less than 25 ppm over background at the perimeter of the work area, activities can resume provided:

- The organic vapor level 200 ft. downwind of the work area or half the distance to the nearest residential or commercial structure, whichever is less, is below 5 mg/m³ over background.

If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown. When work shutdown occurs, downwind air monitoring as directed by the Safety Officer will be implemented to ensure that vapor emission does not impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission section.

Major Vapor Emission

If any organic levels greater than 5 ppm over background are identified 200 feet downwind from the work area or half the distance to the nearest residential or commercial property, whichever is less, the site soil will be misted with water and the downwind area will be monitored. If the water mist does not mitigate the elevated levels all work activities must be halted.

If, following the cessation of the work activities, or as the result of an emergency, organic levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest residential or commercial property from the work area, then the air quality must be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20 Foot Zone).

If efforts to abate the emission source are unsuccessful and, if organic vapor levels are approaching 5 ppm above background for more than 30 minutes in the 20 Foot Zone, then the Major Vapor Emission Response Plan shall automatically be placed into effect;

However, the Major Vapor Emission Response Plan shall be immediately placed into effect if organic vapor levels are greater than 10 ppm above background.

Major Vapor Emission Response Plan

Upon activation, the following activities will be undertaken:

1. All Emergency Response Contacts as listed in the Health & Safety Plan of the Remedial Action Plan will go into effect.
2. The local police authorities will immediately be contacted by the Safety Officer and advised of the situation.
3. Frequent air monitoring will be conducted at 30 minute intervals within the 20 Foot Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the Safety Officer.

6.0 HEALTH & SAFETY PLAN REFERENCES

1. American Conference Governmental Industrial Hygienists, 1989; Threshold Limit Values and Biological Exposure Indices, 111 Pp.
2. Geoenvironmental Consultants, Inc.; 1987; Safety & Operations At Hazardous Materials Sites.
3. NIOSH Guide To Chemical Hazards, 2002, US Department Of Health And Human Services, Centers For Disease Control.
4. US Department Of Labor Occupational Safety & Health Administration, 1989; Hazardous Waste Operations And Emergency Response Interim Final Rule, 29 CFR Part 1910.
5. Sax, N. I. Dangerous Properties Of Industrial Materials; © 1984.
6. CA RICH Consultants, Inc.; July 2012; Remedial Investigation Report.

7.0 KEY PERSONNEL

<u>Responsibility</u>	<u>Name and Phone Number</u>	<u>Task Description</u>
Remedial Engineer	<u>Stephen Osmundsen (516) 669-1123</u>	Oversee all technical aspects of the project
Project Manager	<u>Deborah Shapiro (516) 576-8844</u>	Coordinate and facilitate implementation of all aspects of the project
Site Safety Officer	<u>Jason Cooper (516) 576-8844</u>	Coordinate and inspect all health and safety operations from the project site
Site Contact	<u>Terry Jacobs (718) 938-1145</u>	
Project Manager Alternate	<u>Stephen Malinowski (516) 576-8844</u>	
Site Safety Officer Alternate	<u>Jessica Proscia (516) 576-8844</u>	
Client Representative	<u>Terry Jacobs (718) 938-1145</u>	

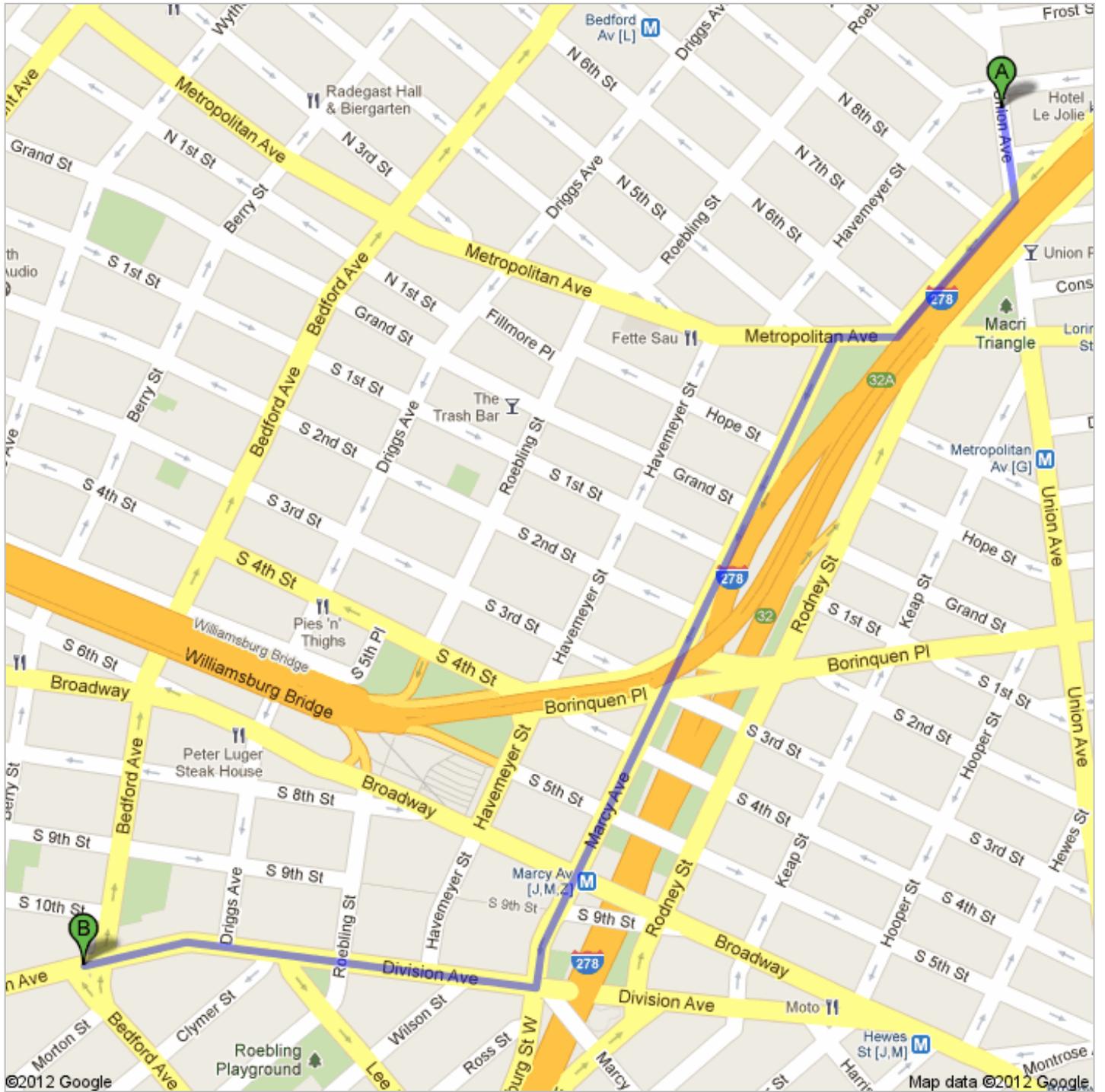
**Figure 1
Hospital Location & Directions**



Directions to 99 Division Ave, Brooklyn, NY 11211

1.1 mi – about 5 mins

Hospital Map



A 538 Union Ave, Brooklyn, NY 11211

1. Head **south** on **Union Ave** toward **Jackson St** go 354 ft
total 354 ft

 2. Take the 1st right onto **Meeker Ave** go 0.1 mi
total 0.2 mi

 3. Turn right onto **Metropolitan Ave** go 240 ft
total 0.2 mi

 4. Take the 1st left onto **Marcy Ave** go 0.5 mi
About 3 mins total 0.8 mi

 5. Turn right onto **Division Ave** go 0.3 mi
Destination will be on the right
About 1 min total 1.1 mi

B 99 Division Ave, Brooklyn, NY 11211

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Map data ©2012 Google

Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left.

APPENDIX A

Physical Properties and Toxicological Information


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Arsenic (inorganic compounds, as As)		CAS 7440-38-2 (metal)	
As (metal)		RTECS CG0525000 (metal)	
Synonyms & Trade Names Arsenic metal: Arsenia Other synonyms vary depending upon the specific As compound. [Note: OSHA considers "Inorganic Arsenic" to mean copper acetoarsenite & all inorganic compounds containing arsenic except ARSINE.]		DOT ID & Guide 1558 152 (metal) 1562 152 (dust)	
Exposure Limits	NIOSH REL: Ca C 0.002 mg/m ³ [15-minute] See Appendix A		
	OSHA PEL: [1910.1018] TWA 0.010 mg/m ³		
IDLH Ca [5 mg/m ³ (as As)] See: 7440382	Conversion		
Physical Description Metal: Silver-gray or tin-white, brittle, odorless solid.			
MW: 74.9	BP: Sublimes	MLT: 1135°F (Sublimes)	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA	Sp.Gr: 5.73 (metal)	
Fl.P: NA	UEL: NA	LEL: NA	
Metal: Noncombustible Solid in bulk form, but a slight explosion hazard in the form of dust when exposed to flame.			
Incompatibilities & Reactivities Strong oxidizers, bromine azide [Note: Hydrogen gas can react with inorganic arsenic to form the highly toxic gas arsine.]			
Measurement Methods NIOSH 7300, 7301, 7303, 7900, 9102; OSHA ID105 See: NMAM or OSHA Methods			
Personal Protection & Sanitation (See protection) Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated/Daily Remove: When wet or contaminated Change: Daily Provide: Eyewash, Quick drench		First Aid (See procedures) Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately	
Respirator Recommendations (See Appendix E) NIOSH At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode (APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted acid gas canister having an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus Important additional information about respirator selection			
Exposure Routes inhalation, skin absorption, skin and/or eye contact ingestion			
Symptoms Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, respiratory irritation, hyperpigmentation of skin, [potential occupational carcinogen]			
Target Organs Liver, kidneys, skin, lungs, lymphatic system			
Cancer Site [lung & lymphatic cancer]			
See also: INTRODUCTION See ICSC CARD: 0013 See MEDICAL TESTS: 0017			

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Cadmium dust (as Cd)		CAS 7440-43-9 (metal)	
Cd (metal)		RTECS EU9800000 (metal)	
Synonyms & Trade Names Cadmium metal: Cadmium Other synonyms vary depending upon the specific cadmium compound.		DOT ID & Guide 2570 154 (cadmium compound)	
Exposure Limits	NIOSH REL*: Ca See Appendix A [*Note: The REL applies to all Cadmium compounds (as Cd).]		
	OSHA PEL*: [1910.1027] TWA 0.005 mg/m ³ [*Note: The PEL applies to all Cadmium compounds (as Cd).]		
IDLH Ca [9 mg/m ³ (as Cd)] See: IDLH INDEX	Conversion		
Physical Description Metal: Silver-white, blue-tinged lustrous, odorless solid.			
MW: 112.4	BP: 1409°F	MLT: 610°F	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 8.65 (metal)
Fl.P: NA	UEL: NA	LEL: NA	
Metal: Noncombustible Solid in bulk form, but will burn in powder form.			
Incompatibilities & Reactivities Strong oxidizers; elemental sulfur, selenium & tellurium			
Measurement Methods NIOSH 7048 , 7300 , 7301 , 7303 , 9102 ; OSHA ID121 , ID125G , ID189 , ID206 See: NMAM or OSHA Methods			
Personal Protection & Sanitation (See protection) Skin: No recommendation Eyes: No recommendation Wash skin: Daily Remove: No recommendation Change: Daily		First Aid (See procedures) Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately	
Respirator Recommendations (See Appendix E) NIOSH At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode (APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus Escape: (APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus Important additional information about respirator selection			
Exposure Routes inhalation, ingestion			
Symptoms 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]			
Target Organs respiratory system, kidneys, prostate, blood			
Cancer Site [prostatic & lung cancer]			
See also: INTRODUCTION See ICSC CARD: 0020 See MEDICAL TESTS: 0035			

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Chromium metal		CAS 7440-47-3	
Cr		RTECS GB4200000	
Synonyms & Trade Names Chrome, Chromium		DOT ID & Guide	
Exposure Limits	NIOSH REL: TWA 0.5 mg/m ³ See Appendix C		
	OSHA PEL*: TWA 1 mg/m ³ See Appendix C [*Note: The PEL also applies to insoluble chromium salts.]		
IDLH 250 mg/m ³ (as Cr) See: 7440473	Conversion		
Physical Description Blue-white to steel-gray, lustrous, brittle, hard, odorless solid.			
MW: 52.0	BP: 4788°F	MLT: 3452°F	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 7.14
Fl.P: NA	UEL: NA	LEL: NA	
Noncombustible Solid in bulk form, but finely divided dust burns rapidly if heated in a flame.			
Incompatibilities & Reactivities Strong oxidizers (such as hydrogen peroxide), alkalis			
Measurement Methods NIOSH 7024 , 7300 , 7301 , 7303 , 9102 ; OSHA ID121 , ID125G See: NMAM or OSHA Methods			
Personal Protection & Sanitation (See protection) Skin: No recommendation Eyes: No recommendation Wash skin: No recommendation Remove: No recommendation Change: No recommendation		First Aid (See procedures) Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately	
Respirator Recommendations NIOSH			
Up to 2.5 mg/m³: (APF = 5) Any quarter-mask respirator. Click here for information on selection of N, R, or P filters.*			
Up to 5 mg/m³: (APF = 10) Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100, P100. Click here for information on selection of N, R, or P filters.* (APF = 10) Any supplied-air respirator*			
Up to 12.5 mg/m³: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode* (APF = 25) Any powered air-purifying respirator with a high-efficiency particulate filter.*			
Up to 25 mg/m³: (APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters. (APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter* (APF = 50) Any self-contained breathing apparatus with a full facepiece (APF = 50) Any supplied-air respirator with a full facepiece			
Up to 250 mg/m³: (APF = 2000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode			
Emergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode (APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus			
Escape: (APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus			

[Important additional information about respirator selection](#)

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin; lung fibrosis (histologic)

Target Organs Eyes, skin, respiratory system

See also: [INTRODUCTION](#) See [ICSC CARD: 0029](#) See [MEDICAL TESTS: 0052](#)

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Copper (dusts and mists, as Cu)		CAS 7440-50-8
Cu		RTECS GL5325000
Synonyms & Trade Names Copper metal dusts, Copper metal fumes		DOT ID & Guide
Exposure Limits	NIOSH REL*: TWA 1 mg/m ³ [*Note: The REL also applies to other copper compounds (as Cu) except Copper fume.] OSHA PEL*: TWA 1 mg/m ³ [*Note: The PEL also applies to other copper compounds (as Cu) except copper fume.]	
IDLH 100 mg/m ³ (as Cu) See: 7440508	Conversion	
Physical Description Reddish, lustrous, malleable, odorless solid.		
MW: 63.5	BP: 4703°F	MLT: 1981°F
VP: 0 mmHg (approx)	IP: NA	Sp.Gr: 8.94
Fl.P: NA	UEL: NA	LEL: NA
Noncombustible Solid in bulk form, but powdered form may ignite.		
Incompatibilities & Reactivities Oxidizers, alkalis, sodium azide, acetylene		
Measurement Methods NIOSH 7029, 7300, 7301, 7303, 9102; OSHA ID121, ID125G See: NMAM or OSHA Methods		
Personal Protection & Sanitation (See protection) Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet or contaminated Change: Daily		First Aid (See procedures) Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
Respirator Recommendations NIOSH/OSHA Up to 5 mg/m³: (APF = 5) Any quarter-mask respirator. Click here for information on selection of N, R, or P filters.* Up to 10 mg/m³: (APF = 10) Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100, P100. Click here for information on selection of N, R, or P filters.* (APF = 10) Any supplied-air respirator* Up to 25 mg/m³: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode* (APF = 25) Any powered air-purifying respirator with a high-efficiency particulate filter.* Up to 50 mg/m³: (APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters. (APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter* (APF = 50) Any self-contained breathing apparatus with a full facepiece (APF = 50) Any supplied-air respirator with a full facepiece Up to 100 mg/m³: (APF = 2000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode Emergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode (APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus Escape:		

(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. [Click here](#) for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
[Important additional information about respirator selection](#)

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Irritation eyes, respiratory system; cough, dyspnea (breathing difficulty), wheezing

Target Organs Eyes, skin, respiratory system, liver, kidneys (increase(d) risk with Wilson's disease)

See also: [INTRODUCTION](#) See ICSC CARD: [0240](#) See MEDICAL TESTS: [0057](#)

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Lead		CAS 7439-92-1	
Pb		RTECS OF7525000	
Synonyms & Trade Names Lead metal, Plumbum		DOT ID & Guide	
Exposure Limits	NIOSH REL*: TWA (8-hour) 0.050 mg/m ³ See Appendix C [*Note: The REL also applies to other lead compounds (as Pb) -- see Appendix C.]		
	OSHA PEL*: [1910.1025] TWA 0.050 mg/m ³ See Appendix C [*Note: The PEL also applies to other lead compounds (as Pb) -- see Appendix C.]		
IDLH 100 mg/m ³ (as Pb) See: 7439921	Conversion		
Physical Description A heavy, ductile, soft, gray solid.			
MW: 207.2	BP: 3164 °F	MLT: 621 °F	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 11.34
Fl.P: NA	UEL: NA	LEL: NA	
Noncombustible Solid in bulk form.			
Incompatibilities & Reactivities Strong oxidizers, hydrogen peroxide, acids			
Measurement Methods NIOSH 7082, 7105, 7300, 7301, 7303, 7700, 7701, 7702, 9100, 9102, 9105; OSHA ID121, ID125G, ID206 See: NMAM or OSHA Methods			
Personal Protection & Sanitation (See protection) Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: Daily Remove: When wet or contaminated Change: Daily		First Aid (See procedures) Eye: Irrigate immediately Skin: Soap flush promptly Breathing: Respiratory support Swallow: Medical attention immediately	
Respirator Recommendations (See Appendix E) NIOSH/OSHA Up to 0.5 mg/m³: (APF = 10) Any air-purifying respirator with an N100, R100, or P100 filter (including N100, R100, and P100 filtering facepieces) except quarter-mask respirators. Click here for information on selection of N, R, or P filters. (APF = 10) Any supplied-air respirator Up to 1.25 mg/m³: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode (APF = 25) Any powered, air-purifying respirator with a high-efficiency particulate filter Up to 2.5 mg/m³: (APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters. (APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode (APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter (APF = 50) Any self-contained breathing apparatus with a full facepiece (APF = 50) Any supplied-air respirator with a full facepiece Up to 50 mg/m³: (APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode Up to 100 mg/m³: (APF = 2000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode Emergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode (APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus Escape:			

(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. [Click here](#) for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
[Important additional information about respirator selection](#)

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms 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

Target Organs Eyes, gastrointestinal tract, central nervous system, kidneys, blood, gingival tissue

See also: [INTRODUCTION](#) See ICSC CARD: [0052](#) See MEDICAL TESTS: [0127](#)

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Mercury compounds [except (organo) alkyls] (as Hg)

CAS 7439-97-6 (metal)

Hg (metal)

RTECS OV4550000 (metal)

Synonyms & Trade Names

Mercury metal: Colloidal mercury, Metallic mercury, Quicksilver
Synonyms of "other" Hg compounds vary depending upon the specific compound.

DOT ID & Guide

2809 172 (metal)

Exposure Limits

NIOSH REL: Hg Vapor: TWA 0.05 mg/m³ [skin]
Other: C 0.1 mg/m³ [skin]

OSHA PEL : C 0.1 mg/m³

IDLH 10 mg/m³ (as Hg) See:
7439976

Conversion

Physical Description

Metal: Silver-white, heavy, odorless liquid. [Note: "Other" Hg compounds include all inorganic & aryl Hg compounds except (organo) alkyls.]

MW: 200.6

BP: 674 F

FRZ: -38 F

Sol: Insoluble

VP: 0.0012 mmHg

IP: ?

Sp.Gr: 13.6 (metal)

Fl.P: NA

UEL: NA

LEL: NA

Metal: Noncombustible Liquid

Incompatibilities & Reactivities

Acetylene, ammonia, chlorine dioxide, azides, calcium (amalgam formation), sodium carbide, lithium, rubidium, copper

Measurement Methods

NIOSH 6009; OSHA ID140
See: [NMAM](#) or [OSHA Methods](#)

Personal Protection & Sanitation (See protection)

Skin: Prevent skin contact
Eyes: No recommendation
Wash skin: When contaminated
Remove: When wet or contaminated
Change: Daily

First Aid (See procedures)

Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations

Mercury vapor: NIOSH

Up to 0.5 mg/m³:

(APF = 10) Any chemical cartridge respirator with cartridge(s) providing protection against the compound of concern
(APF = 10) Any supplied-air respirator

Up to 1.25 mg/m³:

(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered, air-purifying respirator with cartridge(s) providing protection against the compound of concern (canister)

Up to 2.5 mg/m³:

(APF = 50) Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against the compound of concern
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode/PAPRTS(canister)
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 10 mg/m³:

(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection

against the compound of concern/Any appropriate escape-type, self-contained breathing apparatus

Other mercury compounds: NIOSH/OSHA

Up to 1 mg/m³:

(APF = 10) Any chemical cartridge respirator with cartridge(s) providing protection against the compound of concern

(APF = 10) Any supplied-air respirator

Up to 2.5 mg/m³:

(APF = 25) Any supplied-air respirator operated in a continuous-flow mode

(APF = 25) Any powered, air-purifying respirator with cartridge(s) providing protection against the compound of concern (canister)

Up to 5 mg/m³:

(APF = 50) Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against the compound of concern

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern

(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode/PAPRTS(canister)

(APF = 50) Any self-contained breathing apparatus with a full facepiece

(APF = 50) Any supplied-air respirator with a full facepiece

Up to 10 mg/m³:

(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern/Any appropriate escape-type, self-contained breathing apparatus

[Important additional information about respirator selection](#)

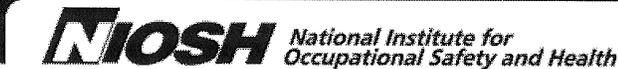
Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms 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

Target Organs Eyes, skin, respiratory system, central nervous system, kidneys

See also: [INTRODUCTION](#) See ICSC CARD: [0056](#) See MEDICAL TESTS: [0136](#)

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Zinc oxide		CAS 1314-13-2	
ZnO		RTECS ZH4810000	
Synonyms & Trade Names Zinc peroxide		DOT ID & Guide 1516 143	
Exposure Limits	NIOSH REL: Dust: TWA 5 mg/m ³ C 15 mg/m ³ Fume: TWA 5 mg/m ³ ST 10 mg/m ³		
	OSHA PEL : TWA 5 mg/m ³ (fume) TWA 15 mg/m ³ (total dust) TWA 5 mg/m ³ (resp dust)		
IDLH 500 mg/m ³ See: 1314132	Conversion		
Physical Description White, odorless solid.			
MW: 81.4	BP: ?	MLT: 3587 F	Sol(64°F): 0.0004%
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 5.61
Fl.P: NA	UEL: NA	LEL: NA	
Noncombustible Solid			
Incompatibilities & Reactivities Chlorinated rubber (at 419 F), water [Note: Slowly decomposed by water.]			
Measurement Methods NIOSH 7303, 7502; OSHA ID121, ID143 See: NMAM or OSHA Methods			
Personal Protection & Sanitation (See protection) Skin: No recommendation Eyes: No recommendation Wash skin: No recommendation Remove: No recommendation Change: No recommendation		First Aid (See procedures) Breathing: Respiratory support	
Respirator Recommendations NIOSH/OSHA Up to 50 mg/m³: (APF = 10) Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100, P100. Click here for information on selection of N, R, or P filters. (APF = 10) Any supplied-air respirator Up to 125 mg/m³: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode (APF = 25) Any powered air-purifying respirator with a high-efficiency particulate filter. Up to 250 mg/m³: (APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters. (APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode (APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter (APF = 50) Any self-contained breathing apparatus with a full facepiece (APF = 50) Any supplied-air respirator with a full facepiece Up to 500 mg/m³: (APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode Emergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode (APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus Escape: (APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus Important additional information about respirator selection			

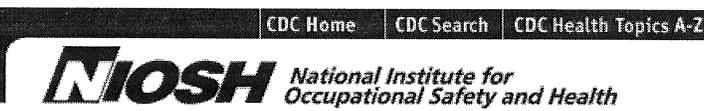
Exposure Routes inhalation

Symptoms Metal fume fever: chills, muscle ache, nausea, fever, dry throat, cough; lassitude (weakness, exhaustion); metallic taste; headache; blurred vision; low back pain; vomiting; malaise (vague feeling of discomfort); chest tightness; dyspnea (breathing difficulty), rales, decreased pulmonary function

Target Organs respiratory system

See also: [INTRODUCTION](#) See ICSC CARD: [0208](#) See MEDICAL TESTS: [0246](#)

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Coal tar pitch volatiles		CAS 65996-93-2
		RTECS GF8655000
Synonyms & Trade Names Synonyms vary depending upon the specific compound (e.g., pyrene, phenanthrene, acridine, chrysene, anthracene & benzo(a)pyrene). [Note: NIOSH considers coal tar, coal tar pitch, and creosote to be coal tar products.]		DOT ID & Guide 2713 <u>153</u> (acridine)
Exposure Limits	NIOSH REL: Ca TWA 0.1 mg/m ³ (cyclohexane-extractable fraction) See Appendix A See Appendix C OSHA PEL: TWA 0.2 mg/m ³ (benzene-soluble fraction) [1910.1002] See Appendix C	
IDLH Ca [80 mg/m ³] See: 65996932	Conversion	
Physical Description Black or dark-brown amorphous residue.		
Properties vary depending upon the specific compound.		
Combustible Solids		
Incompatibilities & Reactivities Strong oxidizers		
Measurement Methods OSHA 58 See: NMAM or OSHA Methods		
Personal Protection & Sanitation (See protection) Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: Daily Remove: No recommendation Change: Daily		First Aid (See procedures) Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
Respirator Recommendations NIOSH At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode (APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus Important additional information about respirator selection		
Exposure Routes inhalation, skin and/or eye contact		
Symptoms Dermatitis, bronchitis, [potential occupational carcinogen]		
Target Organs respiratory system, skin, bladder, kidneys		
Cancer Site [lung, kidney & skin cancer]		
See also: INTRODUCTION See ICSC CARD: 1415 See MEDICAL TESTS: 0054		

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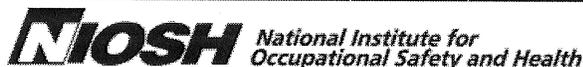
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Dieldrin		CAS 60-57-1	
C₁₂H₈Cl₆O		RTECS IO1750000	
Synonyms & Trade Names HEOD; 1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo,exo-5,8-dimethanonaphthalene		DOT ID & Guide 2761 151	
Exposure Limits	NIOSH REL: Ca TWA 0.25 mg/m ³ [skin] See Appendix A OSHA PEL: TWA 0.25 mg/m ³ [skin]		
IDLH Ca [50 mg/m ³] See: 60571	Conversion		
Physical Description Colorless to light-tan crystals with a mild, chemical odor. [insecticide]			
MW: 380.9	BP: Decomposes	MLT: 349°F	Sol: 0.02%
VP(77°F): 8 x 10 ⁻⁷ mmHg	IP: ?		Sp.Gr: 1.75
Fl.P: NA	UEL: NA	LEL: NA	
Noncombustible Solid			
Incompatibilities & Reactivities Strong oxidizers, active metals such as sodium, strong acids, phenols			
Measurement Methods NIOSH S283 (II-3) See: NMAM or OSHA Methods			
Personal Protection & Sanitation (See protection) Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated/Daily Remove: When wet or contaminated Change: Daily Provide: Eyewash, Quick drench		First Aid (See procedures) Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately	
Respirator Recommendations NIOSH At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode (APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus Important additional information about respirator selection			
Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact			
Symptoms Headache, dizziness; nausea, vomiting, malaise (vague feeling of discomfort), sweating; myoclonic limb jerks; clonic, tonic convulsions; coma; [potential occupational carcinogen]; in animals: liver, kidney damage			
Target Organs central nervous system, liver, kidneys, skin			
Cancer Site [in animals: lung, liver, thyroid & adrenal gland tumors]			
See also: INTRODUCTION See ICSC CARD: 0787 See MEDICAL TESTS: 0077			

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Endrin		CAS 72-20-8	
C₁₂H₈Cl₆O		RTECS IO1575000	
Synonyms & Trade Names 1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo,endo-5,8-dimethanonaphthalene; HexadrinU		DOT ID & Guide 2761 151	
Exposure Limits	NIOSH REL: TWA 0.1 mg/m ³ [skin] OSHA PEL: TWA 0.1 mg/m ³ [skin]		
IDLH 2 mg/m ³ See: 72208	Conversion		
Physical Description Colorless to tan, crystalline solid with a mild, chemical odor. [insecticide]			
MW: 380.9	BP: Decomposes	MLT: 392 F (Decomposes)	Sol: Insoluble
VP: Low	IP: ?		Sp.Gr: 1.70
Fl.P: NA	UEL: NA	LEL: NA	
Noncombustible Solid, but may be dissolved in flammable liquids.			
Incompatibilities & Reactivities Strong oxidizers, strong acids, parathion [Note: May emit hydrogen chloride & phosgene when heated or burned.]			
Measurement Methods NIOSH 5519 See: NMAM or OSHA Methods			
Personal Protection & Sanitation (See protection) Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet or contaminated Change: Daily Provide: Eyewash, Quick drench		First Aid (See procedures) Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately	
Respirator Recommendations NIOSH/OSHA Up to 1 mg/m³: (APF = 10) Any air-purifying half-mask respirator with organic vapor cartridge(s) in combination with an N95, R95, or P95 filter. The following filters may also be used: N99, R99, P99, N100, R100, P100. Click here for information on selection of N, R, or P filters. (APF = 10) Any supplied-air respirator Up to 2 mg/m³: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode (APF = 25) Any powered air-purifying respirator with an organic vapor cartridge in combination with a high-efficiency particulate filter. (APF = 50) Any air-purifying full-facepiece respirator equipped with organic vapor cartridge(s) in combination with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filter. (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters. (APF = 50) Any self-contained breathing apparatus with a full facepiece (APF = 50) Any supplied-air respirator with a full facepiece Emergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode (APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus Important additional information about respirator selection			
Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact			

Symptoms Epileptiform convulsions; stupor, headache, dizziness; abdominal discomfort, nausea, vomiting; insomnia; aggressiveness, confusion; drowsiness, lassitude (weakness, exhaustion); anorexia; in animals: liver damage

Target Organs central nervous system, liver

See also: [INTRODUCTION](#) See ICSC CARD: [1023](#) See MEDICAL TESTS: [0092](#)

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APPENDIX E

Vapor Barrier Specifications



STEGO® VAPOR BARRIER

ASTM E 1745 Class A-B-C Compliant

STEGO® WRAP VAPOR BARRIER

represents a recent breakthrough in state-of-the-art plastic extrusion processes. By combining multi-layer extrusion technology with our proven trade secret blend of prime virgin resins and additives, we at Stego Industries have produced an ASTM E 1745 Class A polyolefin VAPOR BARRIER. Stego's emphasis has always been very low permeance (the most important quality according to industry experts). Our latest blend continues to provide next to zero permeance, while exceeding ASTM E 1745 Class A requirements for puncture resistance and tensile strength. All this comes with the same competitive pricing our customers have come to expect.

FEATURES & BENEFITS

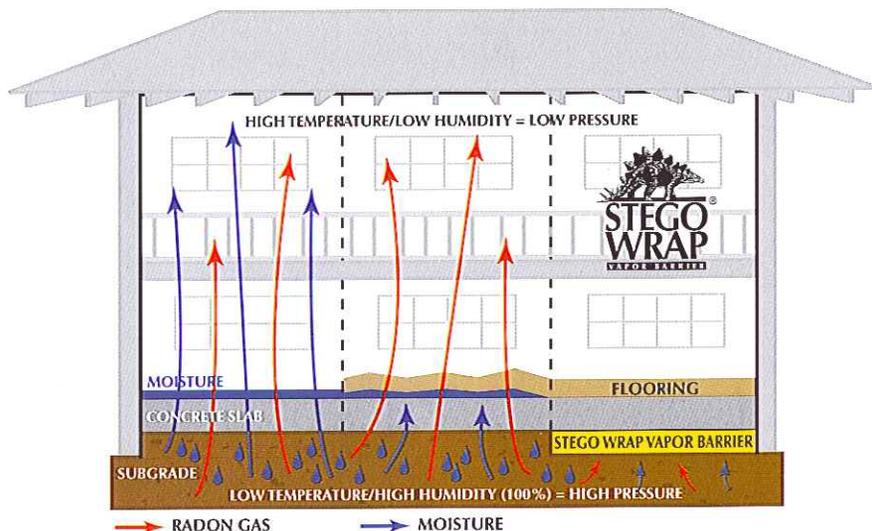
Unsurpassed Permeance Characteristics

Life of the Building Protection

Exceptional Tear and Puncture Resistance

Easy, Reliable Installation

Competitively Priced



Regardless of the location of the water table, humidity below concrete slabs approximates 100%. Typical below slab vapor pressure is more than twice that of building interiors at room temperature, creating vapor drive from the substrate, up through the slab, and into the building.

THE STEGO® ADVANTAGES

SUPERIOR DEFENSE Against Floor Failures:

Experts say "the need for a vapor barrier (as opposed to a vapor retarder) is becoming increasingly clear." Concrete Construction Magazine, August 2003, p.18.

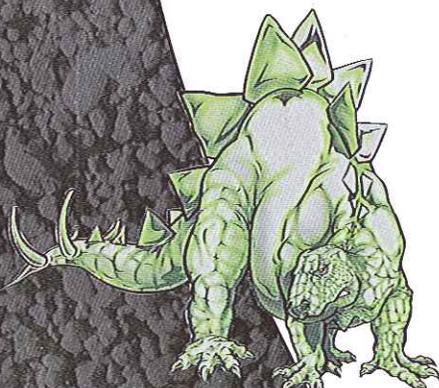
Infiltration of moisture through concrete slabs is a major building defect liability. Stego Wrap Vapor Barrier has an extremely low water vapor transmission rate (WVTR)(0.006 grains/ft²/hour) preventing water vapor, soil gases (i.e. Radon), alkaline salts and soil sulfates from compromising the integrity of the building envelope and leading to serious problems with the concrete slab, floor coverings and indoor air quality. Stego Wrap Vapor Barrier is the best protection against these costly failures.

MOLD PREVENTION:

Mold needs three things to survive: moisture, sustained temperature (between 50° and 122° F), and a food source (dust, drywall, etc.). In any given building environment, contractors can only control one of these variables: moisture. Mold spores are present in 100% of building interiors. If moisture is allowed into your building environment, mold can and will grow. Toxic molds like *Stachybotrys* can be fatal for nearly 5% of people (Institute of Medicine 1993), and cause a variety of serious health problems in others. Several recent well-publicized cases involving toxic mold have resulted in multimillion-dollar insurance settlements. Many of the nation's leading Insurance companies have severely limited or removed coverage for mold claims fearing that these claims will bankrupt their companies. Now more than ever, it is critically important that extra attention be paid to preventing the intrusion of moisture vapor from your below-slab environment. Stego Wrap Vapor Barrier offers the level of protection that many architects are now seeking and is considered to be inexpensive insurance against these costly failures.

LONGEVITY AND STRENGTH:

Stego Wrap Vapor Barrier is NOT made with recycled materials and will not disintegrate. Prime, virgin resins are the key. Molecules within Stego Wrap "interlock" to provide strength, durability and unprecedented resistance to moisture vapor and radon gas. Stego Wrap's puncture resistance is legendary. Stego Wrap will not tear, crack, flake, snag or puncture, even when 18,000 lb. laser-screed machines are driving directly across the barrier. (See the reverse side for Stego Wrap Vapor Barrier's specifications)



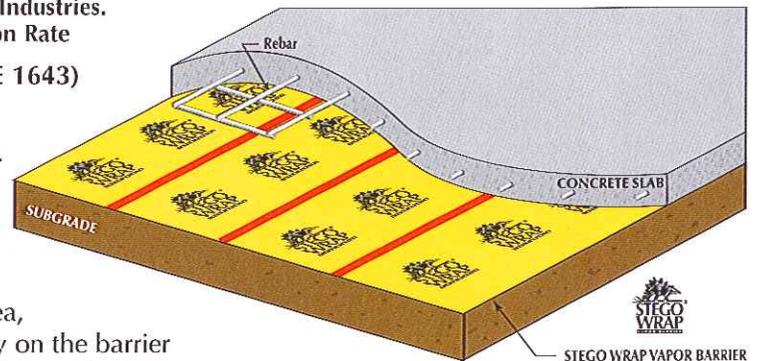
STEGO® WRAP VAPOR BARRIER SPECIFICATIONS

PROPERTIES	TEST METHOD	ASTM E 1745 Class A Requirements	TEST RESULT	EXPLANATION
Permeance	ASTM E 96	0.3 perms	0.012 perms * 0.006 WVTR	Very Impermeable to Water Vapor
Puncture Resistance	ASTM D 1709	2200 grams	Method A 2700 grams Method B 2445 grams	Resistant to puncturing from construction abuse
Tensile Strength	ASTM D 882	45.6 lbf./in.	76.6 lbf./in.	Will not tear easily
Chemical Resistance	ASTM E 154		Unaffected	Acids, alkali and fungi in soil or trace chemicals will not affect membrane
Methane Transmission Rate	ASTM D 1434		**149.6 GTR 2.12 x 10 ⁻⁶ perms	Greatly impedes the transmission of methane gas
Petroleum Resistance	ASTM E 154		0.013 perms	Little or no effect on permeance
Life Expectancy	ASTM E 154		Indefinite	Will not deteriorate/decompose below concrete slabs when buried
Thickness			15 mils	Stronger, tougher and less permeable than much thicker membranes
Roll Dimensions			14 ft. X 140 ft.	1,960 ft ² /roll - allows for a minimum of seams
Roll Weight			140 lbs.	Easy to unroll and install

All testing from "production" runs at labs independent of Stego Industries.
* WVTR water vapor transmission rate **GTR = Gas Transmission Rate

INSTALLATION INSTRUCTIONS: (Based on ASTM E 1643)

Unroll Stego Wrap over the area where the slab is to be poured. Stego Wrap should completely cover the pour area. Overlap seams 6 inches and tape using Stego Tape. All penetrations and blockouts should be sealed using a combination of Stego Wrap, Stego Tape and/or Stego Mastic. If the Stego Wrap is damaged, cut a rectangular piece from the Stego Wrap roll, place over the damaged area, and tape around all edges. Concrete may be poured directly on the barrier or a sand/gravel base can be used.

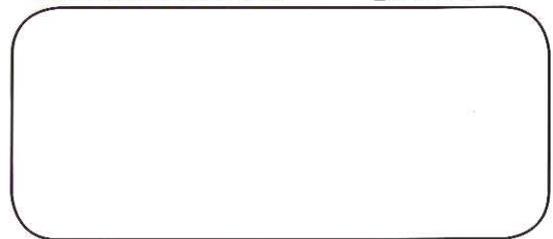


STEGO® TAPE:

STEGO WRAP RED POLYETHYLENE TAPE (4" x 180'/roll) is specially designed to seal seams and penetrations on Stego Wrap installations. The rubber-based, pressure-sensitive adhesive provides permanent bonding and quick-stick properties. The area to be bonded should be free of dust, dirt and moisture. If properly installed Stego Tape will provide years of continuous protection.

WARRANTY: STEGO INDUSTRIES, LLC believes, to the best of its knowledge, that specifications and recommendations herein are accurate and reliable. However, since site conditions and installations are not within our control, STEGO INDUSTRIES, LLC does not guarantee results from use of the information provided and disclaims all liability from any loss or damage. NO WARRANTY EXPRESS OR IMPLIED IS GIVEN AS TO THE MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, OR OTHERWISE WITH RESPECT TO THE PRODUCTS REFERRED TO.

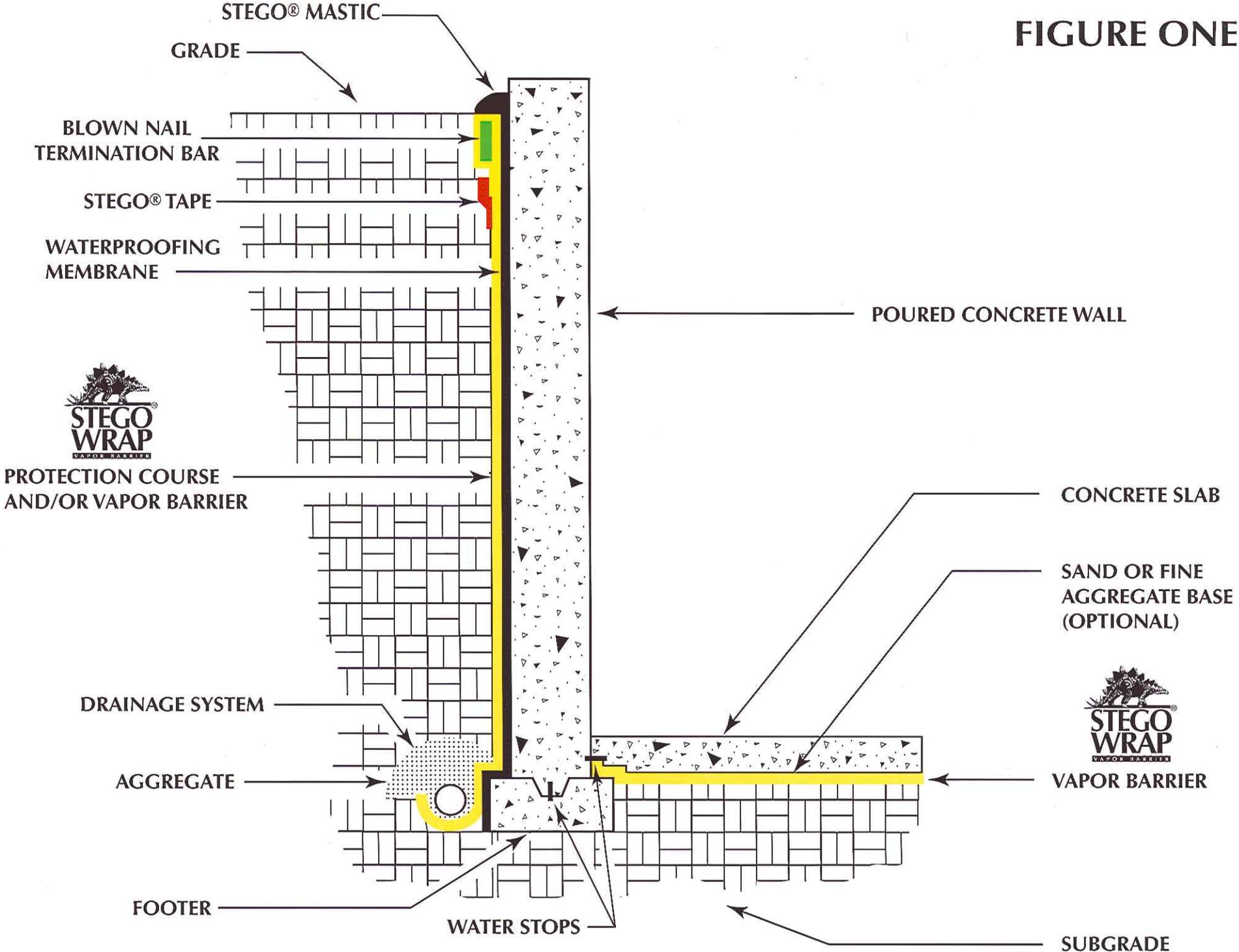
DISTRIBUTED BY:



WWW.STEGOINDUSTRIES.COM

Stego Industries, LLC • San Clemente, CA • TEL: 949-257-4100 • FAX: 949-257-4113

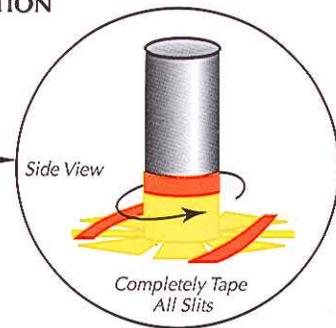
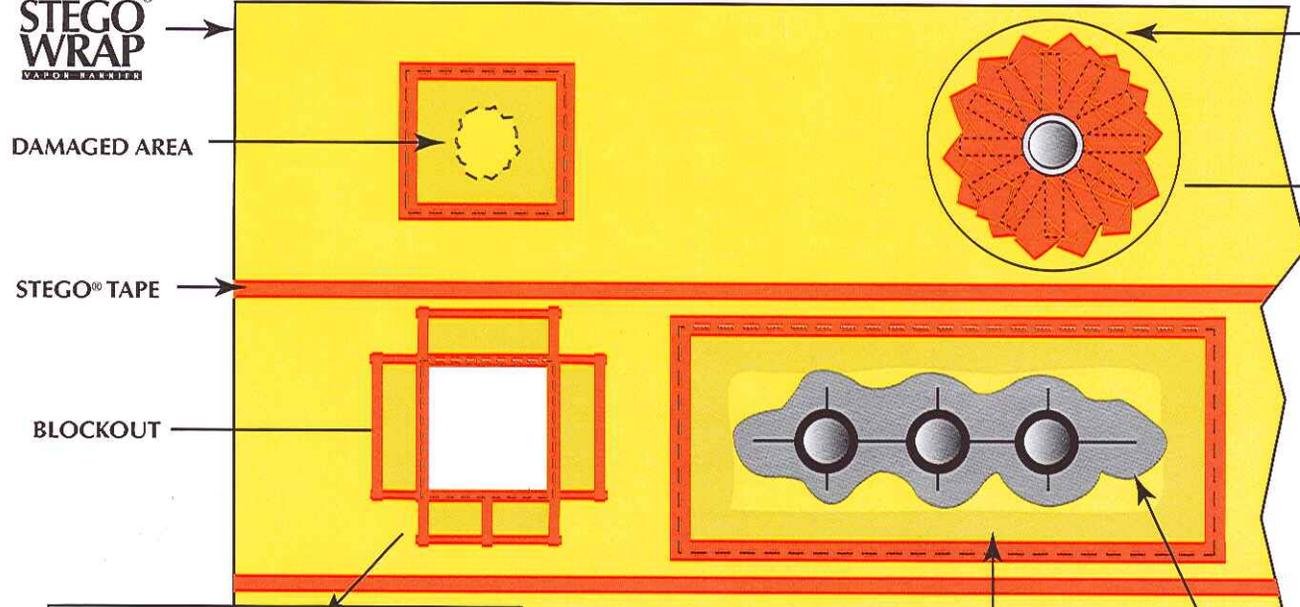
FIGURE ONE





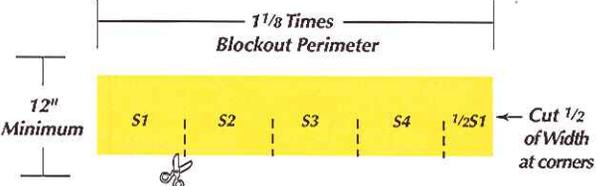
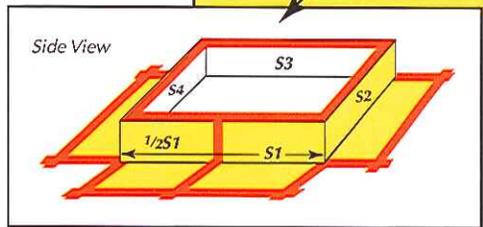
All patches must cover damaged area by 6" on all sides.

FIGURE TWO



PIPE PENETRATION CONSTRUCTING A PIPE BOOT FROM STEGO WRAP

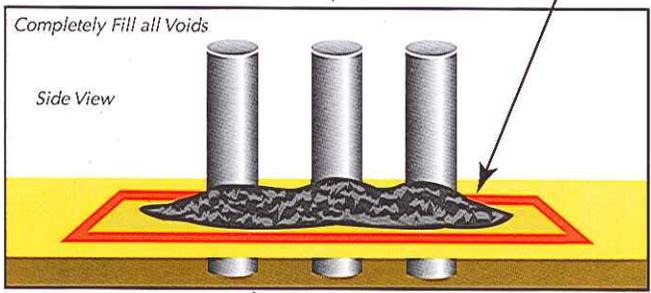
- 1) Cut a piece of Stego Wrap.
Width: Minimum 12"
Length: 1 1/2 times the pipe circumference
- 2) With scissors, cut slits half the width of the film.
- 3) Wrap boot around pipe as shown; tape onto pipe and completely taping the base to Stego Wrap barrier using Stego Tape.



BLOCKOUT CONSTRUCTING A BLOCKOUT BOOT FROM STEGO WRAP

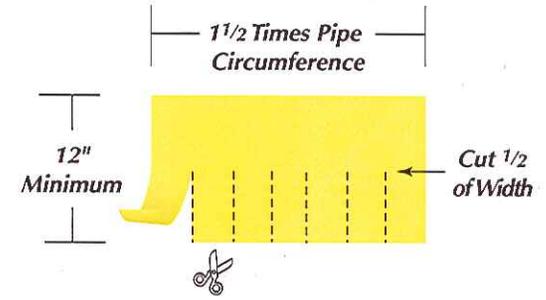
- 1) Cut a piece of Stego Wrap.
Width: Minimum 12"
Length: 1 1/8 times perimeter of blockout
• (S1 + S2 + S3 + S4 + 1/2 S1)
- 2) With scissors, cut flaps half the width of the film at the corners of each side of the blockout.
- 3) Wrap the boot around the blockout as shown; tape the overlap, tape the film onto the top of the blockout and completely tape the flaps to Stego Wrap barrier using Stego Tape.

PIPE PENETRATION ALTERNATE USING STEGO MASTIC TO SEAL PIPES



PIPE PENETRATION ALTERNATE USING STEGO MASTIC TO SEAL PIPES

- 1) Cut out a small area around pipes.
- 2) Cut a patch of Stego Wrap extending at least 6" past the cut out in all directions.
- 3) Cut X's or small circles in the patch and install over pipes.
- 4) Overlap at least 6" and tape with Stego Tape.
- 5) Build up 40-60 mils of mastic, or as needed to completely fill all voids between the pipe and Stego Wrap.
- 6) Allow 24 hours for maximum cure before concrete pour.





INSTALLATION INSTRUCTIONS

STEGO® WRAP VAPOR BARRIER /RETARDER

IMPORTANT: Please read these installation instructions completely, prior to beginning any Stego Wrap installation to ensure suitable use of the product. The following installation instructions are based on ASTM E 1643 - Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.

UNDER-SLAB INSTRUCTIONS:

1. Stego Wrap can be installed over an aggregate, sand or tamped earth base. It is not necessary to have a perfectly smooth 1" to 3" sand base, as Stego Wrap is tough enough to withstand rugged construction environments.
2. Unroll Stego Wrap over the area where the slab is to be poured. Stego Wrap should completely cover the pour area. All joints/seams both lateral and butt should be overlapped six inches and taped using Stego Tape.

NOTE: The area of adhesion should be free from dust, dirt and moisture to allow maximum adhesion of the pressure sensitive tape.

3. The most efficient installation methodology includes placing Stego Wrap on top of the footing and against the vertical wall. Stego Wrap will then be sandwiched between the footing, vertical wall and poured concrete floor. (See Figure #1). This placement will help protect the concrete slab from external moisture sources after the slab has been poured.
4. **IMPORTANT: ALL PENETRATIONS MUST BE SEALED.** All pipe, ducting, rebar, wire penetrations and blockouts should be sealed using Stego Wrap, Stego Tape and/or Stego Mastic. Individual pipe penetrations should be sealed using a pipe boot constructed of Stego Wrap and Stego Tape (see figure #2 Pipe Penetration Detail). Multiple pipe penetrations in close proximity and very small pipes may be sealed using Stego Wrap and Stego Mastic for ease of installation (see figure #2 Alternate Pipe Penetration).

5. In the event that Stego Wrap is damaged during or after installation, repairs must be made. Cut a piece of Stego Wrap large enough to cover any damage by a minimum overlap of six inches in all directions. Clean all adhesion areas of dust, dirt and moisture. Tape down all edges using Stego Tape. (See Figure #2).
6. Many vapor retarder manufacturers recommend a 3-inch to 6-inch layer of fine washed gravel or sand (cushion layer) on top of the retarder before the pour to guard against the possibility of damage due to the placement of reinforcement and concrete. **This is permissible, but not a necessity with Stego Wrap.** Stego Wrap is strong enough to withstand normal construction traffic without a protective layer. In fact, ACI guidelines and many flooring companies recommend placement of the concrete slab directly on the vapor barrier/retarder. This eliminates the potential for water to be trapped in the blotter layer and ultimately resurfacing through the slab adversely affecting the flooring system.

NOTE: There are well-publicized pros and cons regarding different approaches to vapor barrier placement. Consult local building codes and regulations and ACI guidelines along with the design or architectural firm's recommendations before proceeding.

REMEMBER: If damaged, Stego Wrap must be repaired using the techniques outlined above.

VERTICAL WALL INSTRUCTIONS:

1. Install an approved waterproofing membrane according to the manufacturer's installation instructions. This may include sheet goods, or liquid applied membranes be they roll, brush or spray.
2. While the membrane is still tacky, install Stego Wrap as a protective course/vapor barrier over the applied waterproofing membrane. Using a termination bar with concrete nails at the termination of the waterproofing membrane is advisable in some applications. (See Figure #1).
3. Supervised care must be taken during back filling against the material so that it is not damaged or punctured. If damage occurs, patch using the techniques outlined above.

WARNING: Any untreated punctures, tears or damage during back filling will greatly reduce the effectiveness of Stego Wrap as a protection course/vapor barrier.



Stego® Wrap Class A Vapor Retarders

STEGO INDUSTRIES, LLC



Vapor Retarders
07260, 03300

1. Product Name

Stego Wrap Class A Vapor Retarder

2. Manufacturer

Stego Industries, LLC
232 Avenida Fabricante, Suite 103
San Clemente, CA 92672
Sales, Technical Assistance
Ph: (877) 464-7834
Fx: (949) 257-4113
www.stegoindustries.com

3. Product Description

USES: Stego Wrap Vapor Retarder is used as an exceptional vapor retarder, and as a protection course for below grade waterproofing applications.

COMPOSITION: Stego Wrap is a multi-layer plastic extrusion manufactured with only the highest grade of prime, virgin, polyolefin resins.

SIZE: Stego Wrap Class A comes in rolls 14' x 210' or 2,940 ft²

WEIGHT: Stego Wrap Class A rolls weigh approximately 141 lb.

4. Technical Data

APPLICABLE STANDARDS

American Society for Testing & Materials (ASTM)

- ASTM E 1745 - Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs
- ASTM D 882 - Test Methods for Tensile Properties of Thin Plastic Sheeting
- ASTM D 1709 - Test Methods for Impact Resistance of Plastic Film by Free-Falling Dart Method
- ASTM E 96 - Test Methods for Water Vapor Transmission of Materials
- ASTM E 154 - Test Methods for Water Vapor Retarders Used in Contact with Earth under Concrete Slabs, on Walls, or as Ground Cover

- ASTM E 631 - Terminology of Building Constructions
- ASTM F 1249 - Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor
- ASTM E 1643 - Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs

American Concrete Institute (ACI)

- ACI 302.1R-96 Minimum Thickness (10-mils)

ENVIRONMENTAL FACTORS

Stego Wrap Vapor Retarder can be used in systems for the control of soil gases (radon, methane), soil poisons (oil by-products) and sulfates.

5. Installation

UNDERSLAB: Unroll Stego Wrap Vapor Retarder over an aggregate, sand or tamped earth base. Overlap all seams a minimum of 6" and tape using Stego Tape. All penetrations must be sealed using a combination of Stego Wrap, Stego Tape and/or Stego Mastic.

VERTICAL WALL: Install Stego Wrap over the waterproofing membrane while still tacky. Mechanically fasten Stego Wrap to the wall at the top with termination bar and concrete nails. Drape Stego Wrap down across the footer and under the french drain.

6. Availability & Cost

Stego Wrap Class A is available nationally via building supply distributors. For current cost information, contact your local Stego Wrap distributor or Stego Industries' sales department.

7. Warranty

Stego Industries, LLC believes to the best of its knowledge, that specifications and recommendations herein are accurate and reliable. However, since site conditions are not within its control, Stego Industries does not guarantee results from the use of the information provided and disclaims all liability from any loss or damage. No warranty, express or implied, is given as to the merchantability, fitness for a particular purpose, or otherwise with respect to the products referred to.

8. Maintenance

None required.

9. Technical Services

Technical advice, custom CAD drawings, and additional information can be obtained by contacting Stego Industries' technical assistance department or via the website: www.stegoindustries.com

10. Filing Systems

- SpecSource
- Stego Industries' website
- MasterSpec

TABLE 1: PHYSICAL PROPERTIES OF STEGO WRAP CLASS A VAPOR RETARDER

Property & Test	Stego Wrap Class A
Underslab Vapor Retarders, ASTM E 1745 Class A, B & C	Exceeds
Water Vapor Permeance, ASTM E 96 & ASTM F 1249	0.036 perms
Tensile Strength, ASTM D 882	54.4 lbf./in.
Puncture Resistance, ASTM D 1709	2340 grams
Chemical Resistance, ASTM E 154	Unaffected
Life Expectancy, ASTM E 154	Indefinite
Thickness	10 mils





Stego® Mastic

STEGO INDUSTRIES, LLC



Vapor Retarders
07260, 03300

1. Product Name
Stego Mastic

2. Manufacturer

Stego Industries, LLC
232 Avenida Fabricante, Suite 103
San Clemente, CA 92672
Sales, Technical Assistance
Ph: (877) 464-7834
Fx: (949) 257-4113
www.stegoindustries.com

3. Product Description

USES: Stego Mastic is designed to be used as a waterproofing and vapor retardant membrane for use in conjunction with Stego Wrap Vapor Retarder/Barrier. Stego Mastic can be used as an alternate to boots for pipe penetrations in Stego Wrap Vapor Barrier. Stego Mastic can also be used as a primary waterproofing for below grade walls.

COMPOSITION: Stego Mastic is a medium-viscosity, water-based, polymer-modified anionic bituminous/asphalt emulsion, which exhibits bonding, elongation and waterproofing characteristics.

SIZE: Stego Mastic comes in 5 gallon buckets.

4. Technical Data

APPLICABLE STANDARDS

American Society for Testing and Materials (ASTM)

- ASTM 412
- ASTM E 154 Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover
- ASTM G 23 Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials (Withdrawn 2000)
- ASTM E 96 Standard Test Methods for Water Vapor Transmission of Materials
- ASTM D 751 Standard Test Methods for Coated Fabrics
- ASTM D 1434 Standard Test Method for Determining Gas Permeability Characteristics of Plastic Film and Sheeting

- ASTM C 836 Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course.
- ASTM E 1643 Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.

5. Installation

PREPARATION

- A test application simulating the project environment should always be done prior to final usage of Stego Mastic.
- All Surfaces should be dry and free of loose materials, oils and other contaminants. The surfaces should be cleaned in the same fashion as the test surface in order to ensure proper results.
- Store above 40°F

PENETRATIONS

For small pipe and rebar penetrations in Stego Wrap Vapor Barrier cut Stego Wrap just big enough for the penetration. Liberally apply Stego Mastic around the penetration to keep the integrity of the membrane intact. Stego Mastic can be applied by brush, roller, or sprayer.

NOTE: 1: For larger penetrations or wide cut-outs of Stego Wrap, use Stego Wrap and Stego Red Polyethylene Tape to construct boots. 2: Solvent-based products should not be applied over this product.

CLEANING

Clean all tools with kerosene and/or oil-based cleaners.

6. Availability & Cost

Stego Mastic is available nationally via building supply distributors. For current cost information, contact your local Stego distributor or Stego Industries' sales department.

7. Warranty

Stego Industries, LLC believes to the best of its knowledge, that specifications and recommendations herein are accurate and reliable. However, since site conditions are not within its control, Stego Industries does not guarantee results from the use of the information provided and disclaims all liability from any loss or damage. No warranty, express or implied, is given as to the merchantability, fitness for a particular purpose, or otherwise with respect to the products referred to.

8. Maintenance

None required.

9. Technical Services

Technical advice, custom CAD drawings, and additional information can be obtained by contacting Stego Industries' technical assistance department or by visiting the website: www.stegoindustries.com

10. Filing Systems

- Stego Industries' website

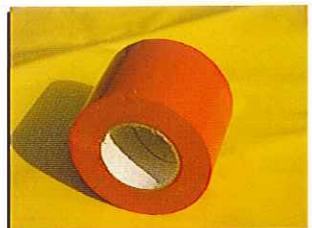
TABLE 1: PHYSICAL PROPERTIES OF STEGO MASTIC

Property and Test	Stego Mastic
Tensile, ASTM 412	32 psi / 3860%
Resistance to Decay, ASTM E 154	9% perm loss
Accelerated Aging, ASTM G 23	No Effect
Permeance, ASTM E 96	0.17 Perms
Hydrostatic Water Pressure, ASTM D 751	28 psi
Methane Transmission Rate, ASTM D 1434	0
Adhesion to Concrete & Masonry, ASTM C 836	7 lbf./in.
Hardness, ASTM C 836	85
Crack Bridging, ASTM C 836	No Cracking
Low Temp Flexibility, ASTM C 836	No Cracking at -20°C
Resistance to Acids:	
Acetic	30%
Sulfuric and Hydrochloric	15%
Temperature Effect:	
Stable	248°F
Flexible	13°F





Stego® Tape
STEGO INDUSTRIES, LLC



Vapor Retarders
07260, 03300

1. Product Name
Stego Tape

2. Manufacturer

Stego Industries, LLC
232 Avenida Fabricante, Suite 103
San Clemente, CA 92672
Sales, Technical Assistance
Ph: (877) 464-7834
Fx: (949) 257-4113
www.stegoindustries.com

3. Product Description

USES: Stego Tape is a low permeance tape designed for protective sealing, hanging, seaming, splicing, and patching applications where a highly conformable material is required. It has been engineered to bond specifically to Stego Wrap Vapor Retarder/Barrier, making it ideal for sealing Stego Wrap seams and penetrations.

COMPOSITION: Stego Tape is composed of a high-density polyethylene film and a rubber-based, pressure-sensitive adhesive.
SIZE: Stego Tape comes in 4" wide, 180 ft. long rolls. Stego Tape ships 12 rolls in a case.

4. Technical Data

APPLICABLE STANDARDS

American Society for Testing & Materials (ASTM)

- ASTM D 1000 Standard Test Method for Pressure-Sensitive Adhesive-Coated Tapes Used for Electrical and Electronic Applications
- ASTM E 1643 - Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs

5. Installation

SEAMS:

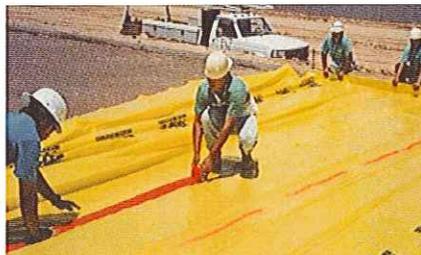
Overlap Stego Wrap 6 inches and seal with Stego Tape. Make sure the area of adhesion is free from dust, dirt and moisture to allow maximum adhesion of the pressure sensitive tape.

PIPE BOOTS:

- 1) Cut a piece of Stego Wrap.
Width: minimum 12"
Length: 1 1/2 times the pipe circumference
- 2) With scissors, cut slits half the width of the film.
- 3) Wrap boot around pipe and tape onto pipe, completely taping the base to Stego Wrap using Stego Tape.

Stego Tape should be installed above 40 °F

Note: See Stego's installation instructions for complete instructions and detailed drawings. Each user should make their own tests to determine the products



suitability for their own intended use and shall assume all risks and liability in connection therewith.

6. Availability & Cost

Stego Tape is available nationally via building supply distributors. For current cost information, contact your local Stego distributor or Stego Industries' sales department.

7. Warranty

Stego Industries, LLC believes to the best of its knowledge, that specifications and recommendations herein are accurate and reliable. However, since site conditions are not within its control, Stego Industries does not guarantee results from the use of the information provided and disclaims all liability from any loss or damage. No warranty, express or implied, is given as to the merchantability, fitness for a particular purpose, or otherwise with respect to the products referred to.

8. Maintenance

None required.

9. Technical Services

Technical advice, custom CAD drawings, and additional information can be obtained by contacting Stego Industries' technical assistance department or by visiting the website: www.stegoindustries.com

10. Filing Systems

- Stego Industries' website

TABLE 1: PHYSICAL PROPERTIES OF STEGO TAPE

Property	Stego Tape
Total Thickness	8 mils
Permeance	0.23 perms
Tensile Strength	25 lbs./in. width
Elongation (at break)	80%
Adhesion	35-oz./in. width
Ultraviolet Resistance	Excellent





Stego® Cold Weather Tape

STEGO INDUSTRIES, LLC



Vapor Retarders
07260, 03300

1. Product Name
Stego Cold Weather Tape

2. Manufacturer
Stego Industries, LLC
232 Avenida Fabricante, Suite 103
San Clemente, CA 92672
Sales, Technical Assistance
Ph: (877) 464-7834
Fx: (949) 257-4113
www.stegoindustries.com

3. Product Description
USES: Stego Cold Weather Tape is a low permeance tape designed for protective sealing, hanging, seaming, splicing, and patching applications where a highly conformable material is required. It has been engineered to bond specifically to Stego Wrap 10-mil and 15-mil at cold temperatures making it ideal for sealing Stego Wrap seams and penetrations in cold weather.
COMPOSITION: Stego Cold Weather Tape is composed of a high-density polyethylene film and a rubber-based, pressure-sensitive adhesive.
SIZE: Stego Cold Weather Tape comes in 4" wide, 180 ft. long rolls. Tape ships 12 rolls in a case.

4. Technical Data
APPLICABLE STANDARDS
American Society for Testing & Materials (ASTM)

- ASTM D 1000 Standard Test Method for Pressure-Sensitive Adhesive-Coated Tapes Used for Electrical and Electronic Applications
- ASTM E 1643 - Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs

5. Installation
SEAMS:
Overlap Stego Wrap 6 inches and seal with Stego Cold Weather Tape. Make sure the area of adhesion is free from dust, dirt and moisture to allow maximum adhesion of the pressure sensitive tape.

PIPE BOOTS:
1) Cut a piece of Stego Wrap.
Width: minimum 12"
Length: 1 1/2 times the pipe circumference
2) With scissors, cut slits half the width of the film.
3) Wrap boot around pipe and tape onto pipe, completely taping the base to Stego Wrap using Stego Cold Weather Tape.

Stego Cold Weather Tape can be installed in extremely low temperatures.

Note: See Stego's installation instructions for complete instructions and detailed drawings. Each user should make their own



tests to determine the products suitability for their own intended use and shall assume all risks and liability in connection therewith.

6. Availability & Cost
Stego Cold Weather Tape is available nationally via building supply distributors. For current cost information, contact your local Stego distributor or Stego Industries' sales department.

7. Warranty
Stego Industries, LLC believes to the best of its knowledge, that specifications and recommendations herein are accurate and reliable. However, since site conditions are not within its control, Stego Industries does not guarantee results from the use of the information provided and disclaims all liability from any loss or damage. No warranty, express or implied, is given as to the merchantability, fitness for a particular purpose, or otherwise with respect to the products referred to.

8. Maintenance
None required.

9. Technical Services
Technical advice, custom CAD drawings, and additional information can be obtained by contacting Stego Industries' technical assistance department or by visiting the website: www.stegoindustries.com

10. Filing Systems
• Stego Industries' website

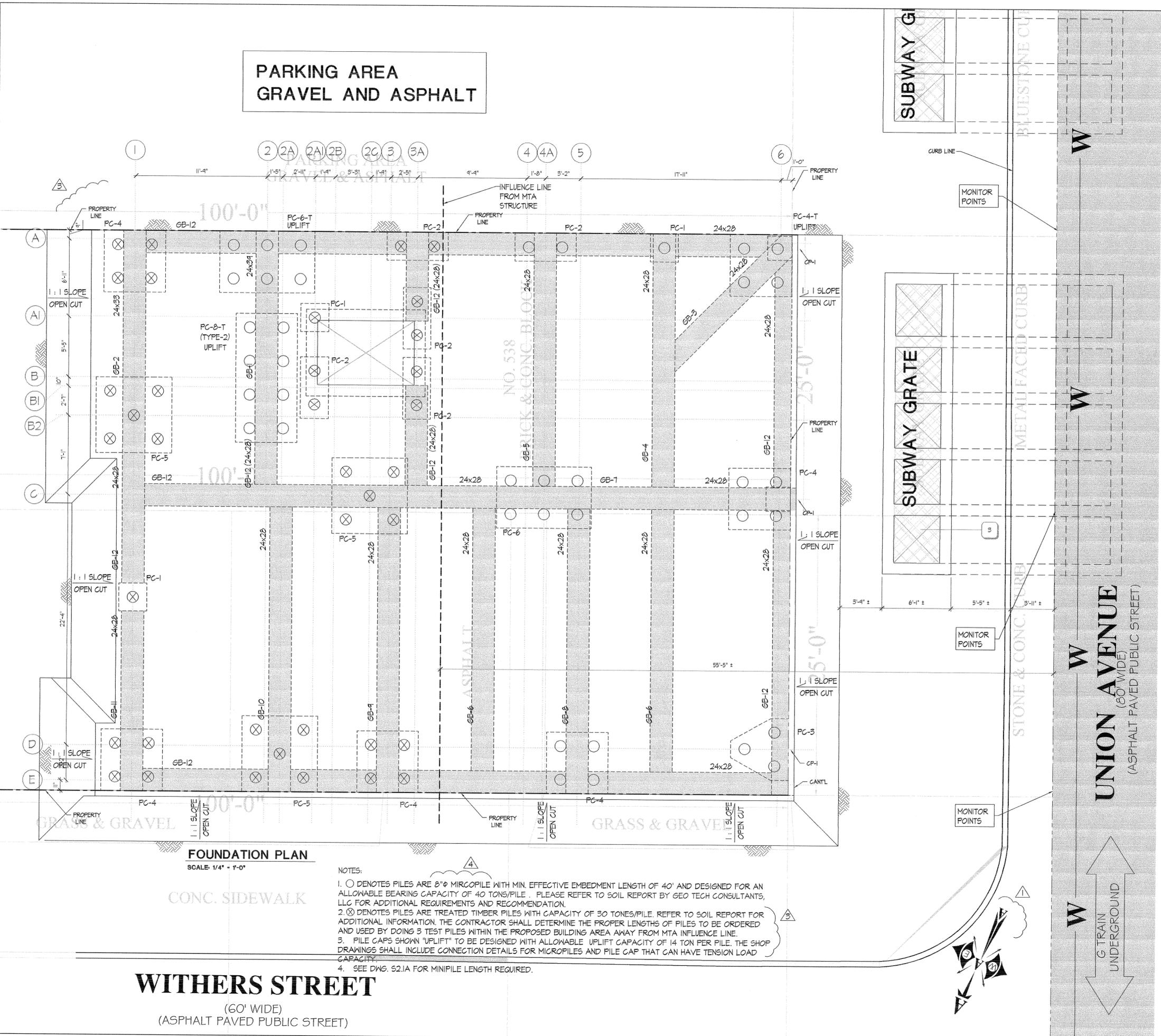
TABLE 1: PHYSICAL PROPERTIES OF STEGO COLD WEATHER TAPE

Property	Stego Cold Weather Tape
Total Thickness	8.5 mils
Permeance	0.09 perms
Tensile Strength	21 lbs./in. width
Elongation (at break)	100%
Adhesion	35-oz./in. width
Cold Temperature Resistance	Excellent

APPENDIX F

Proposed Site Development Plans

**PARKING AREA
GRAVEL AND ASPHALT**



FOUNDATION PLAN
SCALE: 1/4" = 1'-0"

- NOTES:
- DENOTES PILES ARE 8"Ø MICROPILE WITH MIN. EFFECTIVE EMBEDMENT LENGTH OF 40' AND DESIGNED FOR AN ALLOWABLE BEARING CAPACITY OF 40 TONS/PILE. PLEASE REFER TO SOIL REPORT BY GEO TECH CONSULTANTS, LLC FOR ADDITIONAL REQUIREMENTS AND RECOMMENDATION.
 - ⊗ DENOTES PILES ARE TREATED TIMBER PILES WITH CAPACITY OF 30 TONS/PILE. REFER TO SOIL REPORT FOR ADDITIONAL INFORMATION. THE CONTRACTOR SHALL DETERMINE THE PROPER LENGTHS OF PILES TO BE ORDERED AND USED BY DOING 3 TEST PILES WITHIN THE PROPOSED BUILDING AREA AWAY FROM MTA INFLUENCE LINE.
 - PILE CAPS SHOWN "UPLIFT" TO BE DESIGNED WITH ALLOWABLE UPLIFT CAPACITY OF 14 TON PER PILE. THE SHOP DRAWINGS SHALL INCLUDE CONNECTION DETAILS FOR MICROPILES AND PILE CAP THAT CAN HAVE TENSION LOAD CAPACITY.
 - SEE DWG. S2.1A FOR MINPILE LENGTH REQUIRED.

WITHERS STREET
(60' WIDE)
(ASPHALT PAVED PUBLIC STREET)

FOUNDATION PLAN LEGEND AND NOTES

P	DENOTES CONCRETE PEIR. SEE SCHEDULE FOR REINF.
PC	DENOTES CONCRETE PILE CAP. SEE SCHEDULE FOR REINF. & SIZE
GB	DENOTES CONCRETE GRADE BEAM. SEE SCHEDULE FOR REINF. & SIZE
C	DENOTES STEEL COLUMNS. SEE SCHEDULE FOR SIZE

- DO NOT SCALE. VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS PRIOR TO START OF CONSTRUCTION.
- SCHEDULED MARK DESIGNATIONS ARE TYPICAL TO THE PROJECT AND MAY NOT NECESSARILY BE FOUND ON THIS PLAN.
- UNLESS NOTED OTHERWISE ON PLANS AND/OR DETAILS, DEPTH OF FOOTING DIMENSIONS INDICATED IN THE G.S.N. ARE MINIMUMS. FOUNDATION CONTRACTOR SHALL COORDINATE WITH SOIL REPORT AND ALL TRADES TO INSURE THAT THESE MINIMUMS ARE SUFFICIENT FOR THE WORK. SEE TYPICAL DETAILS FOR ADDITIONAL REQUIREMENTS.
- BUILDING CONCRETE SLAB ON GRADE SHALL BE AS NOTED ON PLAN. VERIFY EXACT SIZE AND LOCATION OF DERESSED AND/OR RAISED SLABS WITH ARCHIT. DRAWINGS. FOR SIDEWALK LOCATION, SEE ARCHIT. DRAWINGS. FOR ADDITIONAL INFORMATION, SEE G.S.N. AND TYPICAL DETAILS.
- CONCRETE C.J. - IF SHOWN ON PLAN INDICATES LOCATION OF EITHER KEYED OR SAWCUT CONTROL JOINT IN CONCRETE SLAB ON GRADE AT CONTRACTOR'S OPTION. SEE G.S.N. AND TYPICAL DETAILS. C.J. LOCATION MAY NOT SHOWN ON STRUCTURAL DWGS. SEE ARCH DWGS FOR EXACT LOCATIONS.
- MAS. C.J. - IF SHOWN ON PLAN INDICATES MASONRY CONTROL JOINT IN MASONRY WALL. SEE G.S.N. AND TYPICAL DETAILS. MAS. C.J. LOCATION MAY NOT SHOWN ON STRUCTURAL DWGS. SEE ARCH DWGS FOR EXACT LOCATIONS.

- MICROPILE INSTALLATION NOTES:**
- ALL PILES SHALL BE INSTALLED AT LOCATIONS AS SHOWN ON CONTRACT DRAWINGS.
 - LAYOUT OF PILE LOCATIONS BY GC (SURVEYED IN PLACE).
 - UTILITY IDENTIFICATION AND EXPLORATION AS NECESSARY BY GC.
 - THE DIAMETER OF THE CUTTING FLUID OF THE CASING SHALL NOT EXCEED THE OUTER DIAMETER OF THE CASING BY 1/4-INCH.
 - "GROUT" TO BE MIXTURE OF SAND AND CEMENT-GROUT TO ATTAIN SPECIFIED STRENGTH.
 - A SET OF SIX 2-INCH BY 2-INCH CUBES OF GROUT SHALL BE TAKEN EACH DAY DURING WHICH MICROPILES ARE GROUTED. CUBES SHALL BE THEN TESTED BY AN INDEPENDENT TESTING LABORATORY IN ACCORDANCE WITH THE CONTRACT SPECS.

- MICROPILE INSTALLATION PROCEDURE:**
- MOBILIZATION TO SITE.
 - SET UP RIG ON PROPER LOCATION AND PLUMB MUST.
 - DRILL IN FILES USING DUPLEX DRILLING METHODS. FLUSH WITH WATER ONLY. NOTES: OUTSIDE CASING TO BE ADVANCED 2-DIAMETERS OR 2-FOOT MIN. PRIOR TO CLEANING.
 - CASING IS DRILLED-IN TO THE BOTTOM OF THE GROUT (BOND) ZONE AS INDICATED ON DRAWINGS.
 - FLUSH HOLE CLEAN OF SOILS, IF FILE TIP IS BELOW GHT. FLUID LEVEL INSIDE CASING TO BE MAINTAINED AT TOP OF FILE DURING CLEAN OUT. A BUCKET OR AUGER MAY BE USED TO CLEAN HOLE. (AIR MAY BE USED IN COMPACTED TILL OR ROCK.)
 - PLACE 3/4-INCH DIAMETER PVC GROUT TUBE TO WITHIN 2- FEET OF BOTTOM OF CASING, AND GROUT THE PILE FROM THE BOTTOM TO DISPLACE THE DRILLING FLUID. CONTINUE GROUTING UNTIL GOOD GROUT FLOWS OUT THE TOP OF THE PILE.
 - INTRODUCE REINFORCING THREADBAR WITH SPACERS, AND PUSH TO THE BOTTOM OF THE PILE.
 - START PULLING THE CASING IN 5-FOOT INCREMENTS WHILE PUMPING GROUT AND MAINTAINING 75 PSI GROUT PRESSURE BUT NOT EXCEEDING 100 PSI. NOTE: GROUTING OF THE BOND ZONE WILL CEASE IF OVER 150% OF ITS THEORETICAL VOLUME IS PUMPED IN. ACTUAL VOLUME TO BE SPECIFIED BY CONTRACTOR.
 - WHEN CASING REACHES THE ELEVATION REQUIRED BY THE INFLUENCE LINE IT SHALL BE PUSHED BACK DOWN 5- FEET.
 - CUT THREADBAR TO PROPER ELEVATION AS SHOWN ON CONTRACT DRAWINGS.
 - IF THE INSTALLATION OF ADDITIONAL PILES IN THE SAME CAP SHALL NOT BE INSTALLED UNTIL GROUT HAS CURED FOR AT LEAST 24 HOURS.

- MICROPILE DESIGN CRITERIA:**
- DESIGN MICROPILES PER NYC BUILDING CODE 21-100, TABLE II-3.
 - USE LATEST AISC DESIGN METHOD TO DESIGN MICROPILE AS FREE-STANDING COLUMN FROM BOTTOM OF PILE CAP TO NYCT INFLUENCE LINE, USING K=1.

DATE	PERMIT ISSUES
05/19/08	REVISION 05
05/13/08	REVISION 04
05/07/08	REVISION 03
04/25/08	REVISION 02
04/07/08	REVISION 01

Kutnicki Bernstein Architects
434 BROADWAY, New York, NY, 10013 P: 212.431.5552 F: 212.431.5663

STRUCTURAL ENGINEER:
MIC STRUCTURAL ENGINEERING PLLC
1017 AVENUE OF AMERICAS, 4th FL.,
NEW YORK, N.Y. 10018
P: (212) 274-8720 F: (212) 274-8731

MECHANICAL ENGINEERS:
LASTILO BODAK ENGINEERS
NEW YORK, NY 10018
P: (212) 643-1444 F: (212) 643-3456

PROJECT:
538-540 Union Ave.
BROOKLYN, N.Y.

CLIENT:
3100819797

ADDRESS:
538-540 Union Ave.
BROOKLYN, N.Y.



FOUNDATION PLAN

DWG BY: AQ DATE: 05-19-08
SCALE: JOB NO: 07-078

EXAMINED FOR THE STATE OF NEW YORK
PRELIMINARY SEAL FOR NO. 275
JUN 4 2008
YOMAY ALBO

S2.1

APPENDIX G

**Environmental Investigations and Reports
(electronic copies on CD)**

APPENDIX H

Sample Non-Hazardous Waste Manifest

Log Number

SOIL SAFE, INC.

NON-HAZARDOUS MATERIAL MANIFEST

GENERATOR

Generator Name WITHERS OWNERS Generator Site/Location SAME
 Address 544 UNION AVENUE Address _____
BROOKLYN, NY
 Phone No. _____ Phone No. _____

Approval Number

Description of Material
 Non-Regulated Petroleum
 Contaminated Soil
 Non DOT/RCRA Regulated

GROSS
TARE
NET
TONNAGE

I hereby certify that the above named material does not contain free liquid as defined by 40 CFR Part 260.10 or any applicable state law, is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations.

Generator Authorized Agent Name _____ Signature _____ Shipment Date _____

TRANSPORTER

Transporter Name _____ Driver Name (Print) _____
 Address _____ Vehicle License No. / State / EPA No. _____
 _____ Truck Number _____

I hereby certify that the above named material was picked up at the generator site listed above.

I hereby certify that the above named material was delivered without incident to the destination listed below.

Driver Signature _____ Shipment Date _____ Driver Signature _____ Delivery Date _____

DESTINATION

Site Name Soil Safe, Inc. - Bridgeport Phone No. 1-856-467-8030
 Address 378 Route 130 Logan Township, NJ 08085

No left turn on Rt. 130 North into the facility.
 Business hours are: Monday through Friday 7 AM to 5 PM. 5 PM to 10 PM By Appointment only. Saturday by appointment only.

I hereby certify that the above named material has been accepted and to the best of my knowledge the foregoing is true and accurate.

Name of Authorized Agent _____ Signature _____ Receipt Date _____
 White - Facility Green - Facility Yellow - Generator Pink - Broker Goldenrod - Contractor Blue - Trucking Co.

APPENDIX I

Specifications for Vapor Mitigation Fan



Fantech

*Trust the
Industry
Standard!*

Improved UV resistance!

HP Series Fans for Radon Applications

Why put your reputation at stake by installing a fan you know won't perform like a Fantech? For nearly fourteen years, Fantech has manufactured quality ventilation equipment for radon applications. Fantech is the fan radon contractors have turned to in over 1,000,000 successful radon installations worldwide.

Fantech HP Series Fans Provide the Solutions to meet the challenges of radon applications:

HOUSING

- UV resistant, UL listed durable plastic
- UL Listed for use in commercial applications
- Factory sealed to prevent leakage
- Watertight electrical terminal box
- Approved for mounting in wet locations - i.e. Outdoors

MOTOR

- Totally enclosed for protection
- High efficiency EBM motorized impeller
- Automatic reset thermal overload protection
- Average life expectancy of 7-10 years under continuous load conditions



RELIABILITY

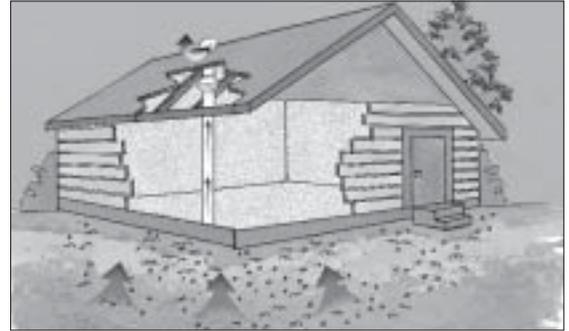
- Five Year Full Factory Warranty
- Over 1,000,000 successful radon installations worldwide





HP Series Fans are specially designed with higher pressure capabilities for radon mitigation applications

Fantech has developed the HP Series fans specifically to suit the higher pressure capability requirements needed in radon mitigation applications. Most radon mitigators who previously used the Fantech FR Series fans have switched to the new HP Series.



Performance Data

Fan Model	Volts	Wattage Range	Max. Amps	CFM vs. Static Pressure in Inches W.G.								Max. Ps	
				0"	0.5"	0.75"	1.0"	1.25"	1.5"	1.75"	2.0"		
HP2133	115	14 - 20	0.17	134	68	19	-	-	-	-	-	-	0.84
HP2190	115	60 - 85	0.78	163	126	104	81	58	35	15	-	-	1.93
HP175	115	44 - 65	0.57	151	112	91	70	40	12	-	-	-	1.66
HP190	115	60 - 85	0.78	157	123	106	89	67	45	18	1	-	2.01
HP220	115	85 - 152	1.30	344	260	226	193	166	137	102	58	-	2.46



Performance Curves

Fantech provides you with independently tested performance specifications.

The performance curves shown in this brochure are representative of the actual test results recorded at Texas Engineering Experiment Station/Energy Systems Lab, a recognized testing authority for HVI. Testing was done in accordance with AMCA Standard 210-85 and HVI 915 Test Procedures. Performance graphs show air flow vs. static pressure.

Use of HP Series fans in low resistance applications such as bathroom venting will result in elevated sound levels. We suggest FR Series or other Fantech fans for such applications.

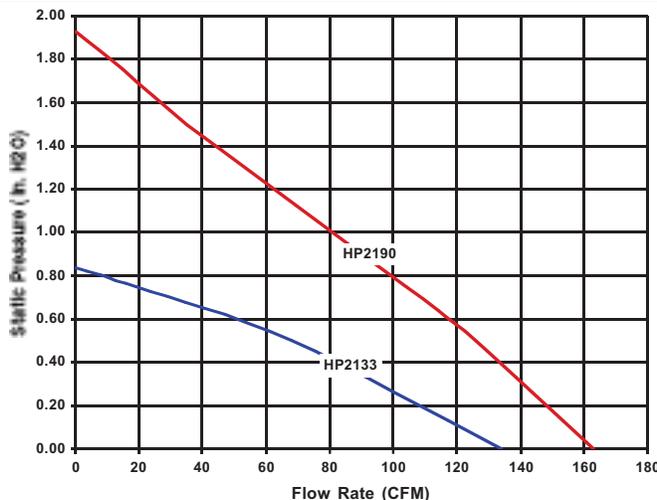


HP FEATURES INCLUDE:

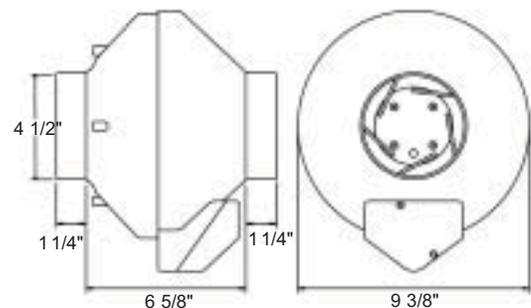
- Improved UV resistant housings approved for commercial applications.
- UL Approved for Wet Locations (Outdoors)
- Sealed housings and wiring boxes to prevent Radon leakage or water penetration
- Energy efficient permanent split capacitor motors
- External wiring box



HP2133 and 2190 Radon Mitigation Fans



Tested with 4" ID duct and standard couplings.



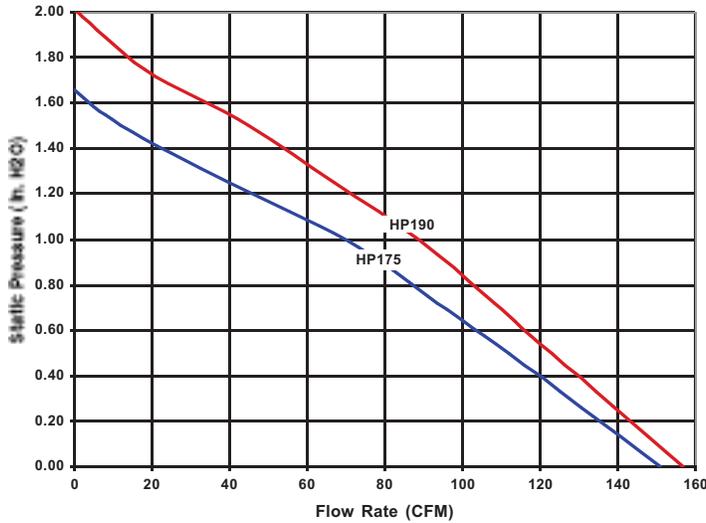
HP2133 – For applications where lower pressure and flow are needed. Record low power consumption of 14-20 watts! Often used where there is good sub slab communication and lower Radon levels.

HP2190 – Performance like the HP190 but in a smaller housing. Performance suitable for the majority of installations.

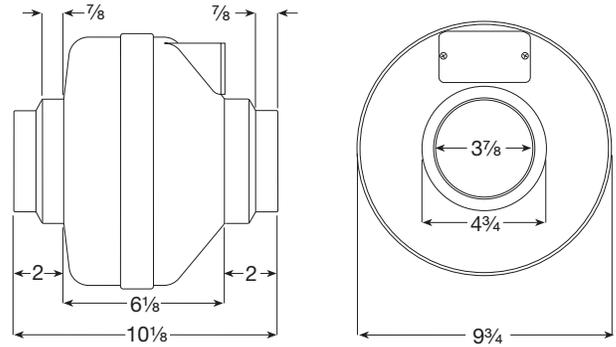
Fans are attached to PVC pipe using flexible couplings.

For 4" PVC pipe use Indiana Seals #156-44, Pipeconx PCX 56-44 or equivalent.
For 3" PVC pipe use Indiana Seals #156-43, Pipeconx PCX 56-43 or equivalent.

HP175 and HP190 Radon Mitigation Fans



Tested with 4" ID duct and standard couplings.



HP175 – The economical choice where slightly less air flow is needed. Often used where there is good sub slab communication and lower Radon levels.

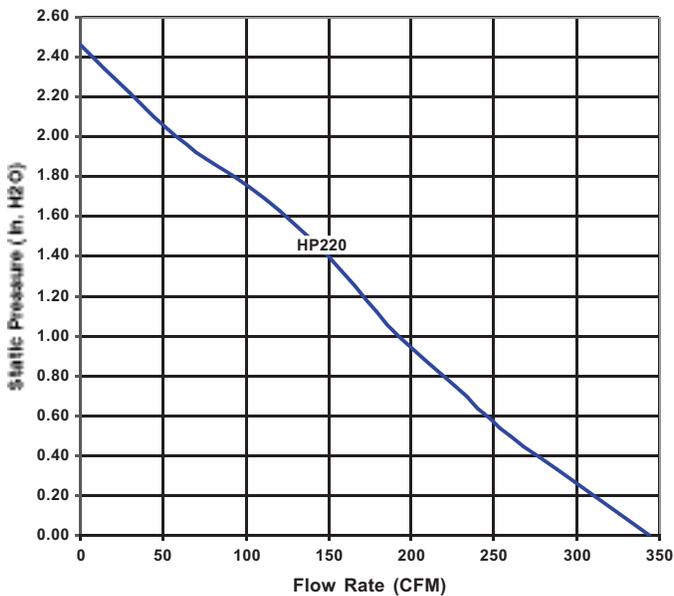
HP190 – *The standard for Radon Mitigation.* Ideally tailored performance curve for a vast majority of your mitigations.

Fans are attached to PVC pipe using flexible couplings.

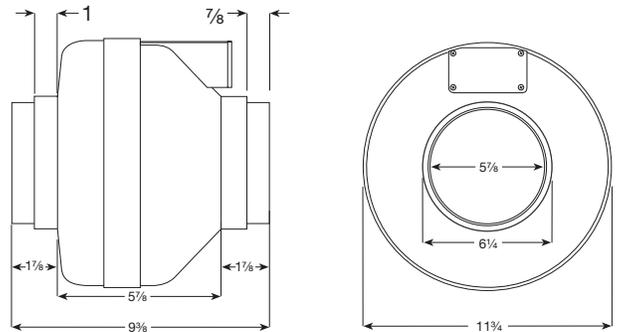
For 4" PVC pipe use Indiana Seals #151-44, Pipeconx PCX 51-44 or equivalent.

For 3" PVC pipe use Indiana Seals #156-43, Pipeconx PCX 56-43 or equivalent.

HP220 Radon Mitigation Fan



Tested with 6" ID duct and standard couplings.



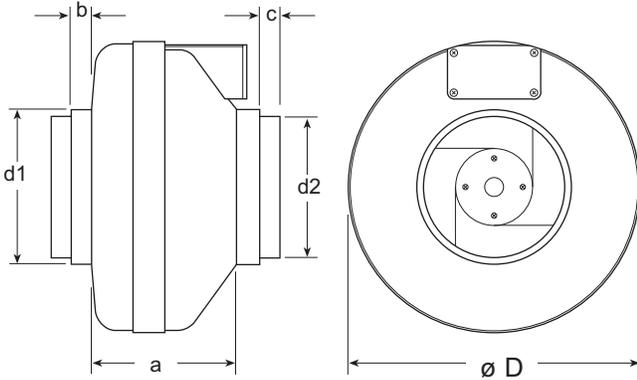
HP 220 – Excellent choice for systems with elevated radon levels, poor communication, multiple suction points and large subslab footprint. Replaces FR 175.

Fans are attached to PVC pipe using flexible couplings.

For 4" PVC pipe use Indiana Seals #156-64, Pipeconx PCX 56-64 or equivalent.

For 3" PVC pipe use Indiana Seals #156-63, Pipeconx PCX 56-63 or equivalent.

The Original Mitigator – Fantech's FR Series Fans



Dimensional Data

model	øD	d1	d2	a	b	c
FR100	9 1/2	3 7/8	4 7/8	5 1/4	7/8	7/8
FR110	9 1/2	3 7/8	4 7/8	5 1/4	7/8	7/8
FR125	9 1/2	—	4 7/8	5 1/4	7/8	—
FR140	11 3/4	5 7/8	6 1/4	5 7/8	1	7/8
FR150	11 3/4	5 7/8	6 1/4	5 7/8	1	7/8
FR160	11 3/4	5 7/8	6 1/4	6 3/8	1	7/8
FR200	13 1/4	7 7/8	9 7/8	6 1/4	1 1/2	1 1/2
FR225	13 1/4	7 7/8	9 7/8	6 1/4	1 1/2	1 1/2
FR250	13 1/4	—	9 7/8	6 1/4	—	1 1/2

All dimensions in inches



Performance Data

Fan Model	Max. RPM	Volts	Wattage Range	Max. Amps	CFM vs. Static Pressure in Inches W.G.							Max. Ps	Duct Dia.
					0"	0.2"	0.4"	0.6"	0.8"	1.0"	1.5"		
FR100	2865	115	33-42	0.44	108	100	72	54	19	—	—	.86"	4"
FR110	2761	115	58-75	0.67	167	150	133	113	88	63	4	1.60"	4"
FR125	2859	115	38-47	0.47	131	120	88	62	14	—	—	.82"	5"
FR140	2832	115	45-60	0.52	214	190	162	132	99	46	—	1.15"	6"
FR150	2411	115	73-90	0.78	243	220	196	170	142	114	18	1.56"	6"
FR160	2539	115	98-124	1.09	289	260	233	206	179	154	89	2.32"	6"
FR200	2507	115	102-123	1.07	408	360	308	259	213	173	72	2.14"	8"
FR225	2964	115	105-144	1.28	429	400	366	332	297	260	168	2.48"	8"
FR250	2817	115	127-230	2.08	563	600	493	456	419	381	294	2.95"	10"

FR Series performance is shown with ducted outlet. Per HVI's Certified Ratings Program, charted air flow performance has been derated by a factor based on actual test results and the certified rate at .2 inches WG.

Five (5) Year Warranty

THIS WARRANTY SUPERSEDES ALL PRIOR WARRANTIES

FOR FACTORY RETURN YOU MUST:

- 1) Have a Return Materials Authorization (RMA) number. This number may be obtained by calling FANTECH, INC. at 1-800-747-1762. Please have Bill of Sale available.
- 2) The RMA number must be clearly displayed on the outside of the carton, or delivery will be refused.
- 3) All product being returned must be shipped prepaid and be accompanied with a copy of the Bill of Sale.
- 4) Product will be replaced/repaired and shipped back to buyer. No credits will be issued.

DURING THE FIRST THIRTY (30) DAYS:

FANTECH, INC. will replace any product which has a factory defect in workmanship or material. Product may be returned to either the point of purchase or the FANTECH factory, together with Bill of Sale, for an immediate replacement.

DURING THE FIRST THREE (3) YEARS: (excluding the above 30 day period)

FANTECH, Inc. will replace any product which has a factory defect in workmanship or material. Product must be returned to the FANTECH factory, together with Bill of Sale, and identified with an RMA number.

DURING YEARS FOUR (4) and FIVE (5):

FANTECH, INC. will repair or replace any product which has a factory defect in workmanship or material. Product must be returned to the Fantech FACTORY, together with a Bill of Sale, and identified with an RMA number.

THE FOLLOWING WARRANTIES DO NOT APPLY:

Damages from shipping, either concealed or visible. Claim must be filed with the carrier.

Damages resulting from improper wiring or installation.

Damages caused by acts of nature, or resulting from improper consumer procedures such as:

- Improper Maintenance,
- Misuse, abuse, abnormal use, or accident, or
- Incorrect electrical voltage or current.

Removal or alterations made on the FANTECH label control number or date of manufacture.

Any other warranty, expressed, written or implied, and to any consequential or incidental damages, loss of property, revenues, or profit, or costs of removal, installation or reinstallation, for any breach of warranty.

WARRANTY VALIDATION:

The end user must keep a copy of the Bill of Sale to verify purchase date.



1712 Northgate Blvd.
Sarasota, Florida 34234
Phone: 800-747-1762
Fax: 800-487-9915
Phone: 941-309-6000
Fax: 941-309-6099
www.fantech-us.com
e-mail: info@fantech-us.com

Distributed by:

APPENDIX J

**Generic Procedures for Management of Underground Storage Tanks
Identified Under the NYC VCP**

Appendix J

GENERIC PROCEDURES FOR MANAGEMENT OF UNDERGROUND STORAGE TANKS IDENTIFIED UNDER THE NYC VCP

Prior to Tank removal, the following procedures should be followed:

- Remove all fluid to its lowest draw-off point.
- Drain and flush piping into the tank.
- Vacuum out the “tank bottom” consisting of water product and sludge.
- Dig down to the top of the tank and expose the upper half.
- Remove the fill tube and disconnect the fill, gauge, product, vent lines and pumps. Cap and plug open ends of lines.
- Temporarily plug all tank openings, complete the excavation, remove the tank and place it in a secure location.
- Render the tank safe and check the tank atmosphere to ensure that petroleum vapors have been satisfactorily purged from the tank.
- Clean tank or remove to storage yard for cleaning.
- If the tank is to be moved, it must be transported by licensed waste transporter. Plug and cap all holes prior to transport leaving a 1/8 inch vent hole located at the top of the tank during transport.
- After cleaning, the tank must be made acceptable for disposal at a scrap yard, cleaning the tanks interior with a high pressure rinse and cutting the tank in several pieces.

During the tank and pipe line removal, the following field observations should be made and recorded:

- A description and photographic documentation of the tank and pipe line condition (pitting, holes, staining, leak points, evidence of repairs, etc.).
- Examination of the excavation floor and sidewalls for physical evidence of contamination (odor, staining, sheen, etc.).
- Periodic field screening (through bucket return) of the floor and sidewalls of the excavation, with a calibrated Photo -Ionization Detector (PID).

Impacted Soil Excavation Methods

The excavation of the impacted soil will be performed following the removal of the existing tanks. Soil excavation will be performed in accordance with the procedures described under Section 5.5 of Draft DER-10 as follows:

- A description and photographic documentation of the excavation.
- Examination of the excavation floor and sidewalls for physical evidence of contamination (odor, staining, sheen, etc.).
- Periodic field screening (through bucket return) of the floor and sidewalls of the excavation, with calibrated PID.

Final excavation depth, length, and width will be determined in the field, and will depend on the horizontal and vertical extent of contaminated soils as identified through physical examination (PID response, odor, staining, etc.). Collection of verification samples will be performed to evaluate the success of the removal action as specified in this document.

The following procedure will be used for the excavation of impacted soil (as necessary and appropriate):

- Wear appropriate health and safety equipment as outlined in the Health and Safety Plan.
- Prior to excavation, ensure that the area is clear of utility lines or other obstructions. Lay plastic sheeting on the ground next to the area to be excavated.
- Using a rubber-tired backhoe or track mounted excavator, remove overburden soils and stockpile, or dispose of, separate from the impacted soil.

- If additional UST's are discovered, the NYSDEC will be notified and the best course of action to remove the structure should be determined in the field. This may involve the continued trenching around the perimeter to minimize its disturbance.
- If physically contaminated soil is present (e.g., staining, odors, sheen, PID response, etc.) an attempt will be made to remove it, to the extent not limited by the site boundaries or the bedrock surface. If possible, physically impacted soil will be removed using the backhoe or excavator, segregated from clean soils and overburden, and staged on separated dedicated plastic sheeting or live loaded into trucks from the disposal facility. Removal of the impacted soils will continue until visibly clean material is encountered and monitoring instruments indicate that no contaminants are present.
- Excavated soils which are temporarily stockpiled on-site will be covered with tarp material while disposal options are determined. Tarp will be checked on a daily basis and replaced, repaired or adjusted as needed to provide full coverage. The sheeting will be shaped and secured in such a manner as to drain runoff and direct it toward the interior of the property.
- Once the site representative and regulatory personnel are satisfied with the removal effort, verification of confirmatory samples will be collected from the excavation in accordance with DER-10.