

**107 UNION STREET
BROOKLYN, NEW YORK**

Remedial Action Work Plan

NYC VCP Number: 12CBCP054K

Prepared for:

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REMEDIAL ACTION WORK PLAN

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L I S T O F A C R O N Y M S

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
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
VCA	Voluntary Cleanup Agreement
VOC	Volatile Organic Compound

CERTIFICATION

I, Edward S. Wong, am a Professional Engineer licensed in the State of New York. I have a primary direct responsibility for implementation of the remedial action for 107 Union Street, Brooklyn, New York.

I, Scott A. Yanuck am a Qualified Environmental Professional as defined in §43-140. I have primary direct responsibility for implementation of the remedial action for 107 Union Street, Brooklyn, New York.

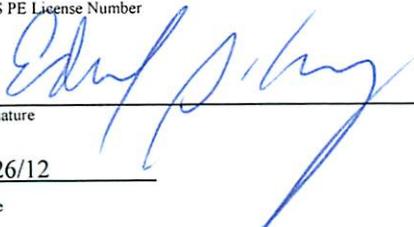
I certify that this Remedial Action Work Plan (RAWP) has a plan for handling, transport and disposal of soil, fill, fluids and other materials removed from the property in accordance with applicable City, State and Federal laws and regulations. Importation of all soil, fill and other material from off-Site 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.

Edward S. Wong

Name

071703

NYS PE License Number



Signature

4/26/12

Date



Scott A. Yanuck

QEP Name



QEP Signature

4/26/12

Date

E X E C U T I V E S U M M A R Y

Passiv House Xperimental LLC has enrolled in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a 2,300-square foot site located at 107 Union Street in Kings County, 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 107 Union Street in the Columbia Street section in Brooklyn, New York and is identified as Block 335 and Lot 42 on the New York City Tax Map. Figure 1.0 shows the Site location. The Site is 2,300-square feet and is bounded by residential properties to the north, Union Street to the south, mixed-use residential and commercial properties to the east, and industrial, manufacturing, and commercial properties to the west. A map of the site boundary is shown in Figure 3.0. Currently, the Site is vacant and undeveloped, and covered with grass, gravel, and weeds. Previous Environmental Investigations can be found in Appendix F.

Summary of Proposed Redevelopment Plan

The proposed future use of the Site will consist of a 4,600 square foot, two-family, four-story residential building with a ground floor studio apartment. Layout of the proposed site development is presented in Figure 4.0. The current zoning designation is M1-1, high performance light manufacturing. Although the proposed usage at the property is inconsistent with existing zoning, a Board of Standards and Appeals (BSA) calendar #134-10-BZ has been issued for the construction of a Group 2 (residential) building within this manufacturing zone.

The proposed building will be slab-on-grade, and soils will be excavated in locations of building footings to a depth of approximately 4' below current grade. Groundwater at the Site is

approximately 7' below grade, and will not be encountered during excavation. Additionally, to the north of the building will be a rear yard.

Summary of the Remedy

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

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and implementation of a Citizen Participation Plan. This can be found in Appendix A.
2. Perform a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
4. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
5. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
6. Establishment of Track 4 Soil Cleanup Objectives (SCOs).
7. Excavation of contaminated soil and fill material exceeding the Track 4 SCOs across the entire site to a depth of two feet below grade. Excavation to a depth of four feet for development purposes.
8. Screening of excavated soil and fill material during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.

9. Removal of underground storage tanks and closure of petroleum spills if any, in compliance with applicable local, state, and federal laws and regulations, should they be encountered.
10. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media onsite.
11. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
12. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
13. Installation of a vapor barrier system beneath the building slab.
14. Construction and maintenance of an engineered composite cover consisting of a concrete building slab to prevent human exposure to residual soil and fill materials remaining under the site.
15. Submission of a 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.
16. Submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual historic fill contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency.
17. 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 Scott A. Yanuck and can be reached at (631) 673 0612.

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

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

Odor, Dust and Noise Control. This cleanup plan includes actions for odor and dust control. These actions are designed to prevent off-Site odor and dust nuisances and include steps to be taken if nuisances are detected. Generally, dust is managed by application of physical covers and by water sprays. Odors are controlled by limiting the area of open excavations, physical covers, spray foams and by a series of other actions (called operational measures). The project is also required to comply with NYC noise control standards. If you observe problems in these areas, please contact the onsite Project Manager Scott A. Yanuck, (631) 673 0612, or NYC Office of Environmental Remediation Project Manager Michael Mandac at (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 8am until 4pm Monday to Friday.

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

Complaint Management. The contractor performing this cleanup is required to address all complaints. If you have any complaints, you can call the facility Project Manager Scott A. Yanuck at (631) 673 0612, 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. For Soil Transport Truck Route, see Figure 6.0.

Soil Chemical Testing and Screening. All excavations will be supervised by a trained and properly qualified environmental professional. In addition to extensive sampling and chemical

testing of soils on the Site, excavated soil will be screened continuously using hand-held instruments, by sight, and by smell to ensure proper material handling and management, and community protection.

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

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

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

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

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

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

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

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

R E M E D I A L A C T I O N W O R K P L A N

1.0 SITE BACKGROUND

Passiv House Xperimental LLC has enrolled in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 107 Union Street in the Columbia Street section of Kings County, 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 alternatives analysis that includes consideration of a permanent cleanup, and provides a description of the selected remedial action. The remedial action described in this document provides for the protection of public health and the environment, complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

1.1 SITE LOCATION AND CURRENT USAGE

The Site is located at 107 Union Street in the Columbia Street section in Brooklyn, New York and is identified as Block 335 and Lot 42 on the New York City Tax Map. Figure 1.0 shows the Site location. The Site is 2,300-square feet and is bounded by residential properties to the north, Union Street to the south, mixed-use residential and commercial properties to the east, and industrial, manufacturing, and commercial properties to the west. A map of the site boundary is shown in Figure 2.0. Currently, the Site is vacant and undeveloped, and covered with grass, gravel, and weeds. Surrounding site use is shown in Figure 3.0.

1.2 PROPOSED REDEVELOPMENT PLAN

The proposed future use of the Site will consist of a 4,600 square foot, two-family, four-story residential building with a ground floor studio apartment. Layout of the proposed site development is presented in Figure 4.0, with additional diagrammatical information in Appendix E.. The current zoning designation is M1-1, high performance light manufacturing. Although the

proposed usage at the property is inconsistent with existing zoning, a Board of Standards and Appeals (BSA) calendar #134-10-BZ has been issued for the construction of a Group 2 (residential) building within this manufacturing zone.

The proposed building will be slab-on-grade, and soils will be excavated in locations of building footings to a depth of approximately one foot below current grade under the slab (1.75 feet below existing grade), four feet below grade at cap/footing locations. The rear yard, to the north of the proposed building, will be excavated to two feet below grade. Groundwater at the Site is approximately 7' below grade, and will not be encountered during excavation. An estimated 290 tons will be removed from the site. See Figures 5.0, 5.1, and Table 2 for additional details.

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

1.3 DESCRIPTION OF SURROUNDING PROPERTY

The property lies within a manufacturing neighborhood, with scattered single and two-family homes and small commercial units. Many of the manufacturing properties are single story, occupying between 5,000 and 10,000 square feet, whilst commercial and residential properties are generally two and three stories high. A large three-story strip of commercial units occupies the area to the east of the subject property and a number of one-story commercial and industrial properties are located to the west of the Site. Union Street lies to the south, and a number of three-story residential properties lie to the north. There is one sensitive receptor within a 500-foot radius of the Site. Cobble Hill Playgroup Inc., listed on the OER's *SPEED* application as a Daycare Center, is located approximately 490 feet to the east-southeast of the Site. Special care must be taken to ensure this facility is not adversely affected by remedial work. Figure 3.0 shows the surrounding land usage. Special care will consist of proper placement and use of the perimeter monitoring.

1.4 REMEDIAL INVESTIGATION

A remedial investigation was performed and the results are documented in a companion document called “*Remedial Investigation Report, 107 Union Street, Brooklyn, New York*”, dated March 28, 2012 (RIR).

According to Mr. Hernan Galvis, a representative of Passiv House Xperimental LLC, the property was previously occupied by a slab-on-grade one-story live poultry market and slaughterhouse, which was destroyed by a fire circa 2006. The remains of the former building were demolished circa 2007. Historical Sanborn maps confirm that the property previously maintained ‘Lees Live Poultry Market’ from sometime between 1915 and 1938, until at least 2007, after which there are no available Sanborn maps.

The AOCs identified for this site include:

1. A former live poultry market and livestock slaughterhouse occupied the Site for approximately 60 years, and was demolished circa 2007. Concern is for historic fill, building debris and possible heating oil usage at the site.

Summary of work performed under the Remedial Investigation:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed two soil borings across the entire project Site, and collected four soil samples for chemical analysis, to establish soil quality at the Site;
3. Installed one on-site groundwater monitoring well and collected one groundwater samples for filtered and unfiltered chemical analysis to evaluate groundwater quality;
4. Installed two soil vapor probes around Site perimeter and collected two samples for chemical analysis.

Summary of environmental findings:

1. Elevation of the property ranges from 14 to 15 feet.
2. Depth to groundwater ranges from 5 to 7 feet at the Site.
3. Groundwater flow is generally from east to west beneath the Site.

4. Depth to bedrock is more than 100 feet below grade at the Site.
5. The known stratigraphy at the site; site soils consist of 6 to 6.5 feet of fill material, construction debris, cinders and coal, followed by fine well sorted sands to the end of boring, which is 10 feet. According to a geotechnical boring conducted in December 2007, a fine to medium grained sand extended to the end of their boring at 32 feet below grade.
6. Soil/fill samples collected during the RI showed detections of VOCs at depths of 0-2 feet and 10-12 feet below grade which did not exceed the NYSDEC Part 375 Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs). Several semi volatile organic compounds (SVOCs) were detected in both soil samples collected from 0-2 feet below grade interval, at concentrations slightly exceeding the NYSDEC Restricted Use (Track 2) Restricted-Residential SCOs; these included benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene. The RI showed elevated concentrations of two metals (lead and mercury) slightly exceeding the Track 2 Restricted-Residential SCOs in the both samples collected from 0-2 feet below grade interval. Pesticides were detected at elevated concentrations in both samples in the 0-2 feet below grade interval, with 4,4'-DDT exceeding the Track 2 Restricted-Residential SCOs but below the Track 2 Commercial SCOs and 4,4'-DDE exceeding the Track 2 Residential SCOs but below the Track 2 Restricted-Residential SCOs. SVOCs, metals, or pesticides were not detected at concentrations exceeding the Track 1 SCOs from the 10-12 foot below grade interval. The RI did not show any detections of PCBs at the site at any depth.
7. A groundwater sample collected at the site during the RI indicated that VOCs, SVOCs, pesticides, and PCBs did not exceed their respective NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Groundwater Quality Standards (GWQS). Several metals (arsenic, beryllium, manganese, selenium, and iron) were detected in the unfiltered groundwater sample collected from B-1W at concentrations exceeding their respective GWQS. In the filtered sample collected at the same location, only selenium slightly exceeded the GQWS.

8. Soil vapor samples collected during the RI showed a wide variety of VOCs at low concentrations consisting mainly of BTEX and associated compounds. These compounds are most commonly associated with a spill of automotive fuel or heating oil. The absence of MTBE in vapor suggests an older spill, possibly located off-site. Past uses of the property do not indicate automotive fueling activities or other automotive fuel sources, but may have included the use of heating oil. Carbon tetrachloride, 1,1,1-trichloroethane, tetrachloroethylene, and trichloroethylene were not detected in either of the soil vapor samples. Soil samples (both deep and shallow) did not contain any VOCs in excess of Track 1 SCOs. Groundwater did not contain any VOCs. Together, these observations suggest an offsite source area. While no standards exist for soil vapor, no compounds exceed the Guidance for Evaluating Soil Vapor Intrusion in the State of New York (Final October 2006).

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.

2.0 REMEDIAL ACTION OBJECTIVES

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

Groundwater

- Prevent direct exposure to contaminated groundwater.

Soil

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

Soil Vapor

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

3.0 REMEDIAL ALTERNATIVES ANALYSIS

The following remedial action alternatives were considered under this program:

Remedial Alternative #1: Track 1 Cleanup

Remedial Alternative #1 includes removal of all soil and fill material that exceeds the NYSDEC Part 375 Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs). This would include removing the soil and fill material from across the entire Site to a depth of at least 12 feet below grade, including the soil and fill material beneath the water table, and backfilling the site approximately to the approximate development depth of two feet below grade. Dewatering would be required in order to excavate the contaminated soil and fill material below the saturated zone or water table (expected to be five to seven feet below grade). Dewatering for this site would require a pumping system, settling tanks, possibly a treatment system, and the appropriate NYCDEP permits for discharged the groundwater into the sewer system. A vapor barrier, an engineering composite cover, and two feet of clean cover for any open/landscaped areas would be installed at the site. Site controls would be implemented at the site to prevent exposure to the on-site workers and the surrounding community. Site controls would include a Construction Health and Safety Plan (CHASP), a Soils and Materials Management Plan, and a Community Air Monitoring Plan (CAMP).

Remedial Alternative #2: Track 4 Cleanup

Remedial Alternative #2 includes establishing Track 4 SCOs and the removal of all soil and fill material that exceed the established Track 4 SCOs. This remedial alternative addresses the subsurface soil contaminated based on the development plans for the site. As part of the development plans, the entire property will be excavated to two feet below grade; the building footings and the elevator pit will be excavated to four feet below grade. The planned excavations do not extend into the water table. End point samples would need to be collected in order to confirm the attainment of the Track 4 SCOs. If the Track 4 SCOs are attained, engineering and institutional controls would be implemented at the site, including a vapor barrier, an engineered composite cover, two feet of clean cover for any open/landscaped areas, a deed restriction, and a site management plan for the management of any residual soil and fill material. Site controls would be implemented at the site to prevent exposure to the on-site

workers and the surrounding community. Site controls would include a Construction Health and Safety Plan (CHASP), a Soils and Materials Management Plan, and a Community Air Monitoring Plan (CAMP)

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.

The Track 1 cleanup is highly protective of public health and the environment by removing all of the contaminated soil and fill material above the Track 1 SCOs. The Track 1 cleanup would eliminate any direct contact with soil and fill material and groundwater and any on-site sources of soil vapors. Installing a vapor barrier and engineered composite cover will minimize the potential for any on-site or off-site soil vapor migration into the building.

The Track 4 cleanup is also highly protective of public health and the environmental by remove contaminated soil and fill material above the established Track 4 SCOs and by implement engineering and institutional controls, include a vapor barrier and an engineered composite cover. The Track 4 cleanup will minimize the potential for direct contact with contaminated soil and fill material by implemented an approved soil and materials management plan and a CAMP during remediation, eliminate any direct contact with residual contaminated soil and fill material and groundwater, and minimize the potential for any on-site or off-site soil vapor migration into the building by installing a vapor barrier and an engineering composite cover.

3.2. BALANCING CRITERIA

Compliance with Standards, Criteria and Guidance (SCGs)

Alternative #1 would comply with the SCGs, as all contaminated soil and fill material exceeding the Track 1 SCOs would be excavated from the site, managed under an approved soil and materials management plan, and disposed of in accordance with all local, state, and federal applicable regulations.

Alternative #2 would also comply with the SCGs by establishing Track 4 SCOs. All contaminated soil and fill materials exceeding the 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 local, state, and federal applicable 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.

Both alternatives have similar short-term effectiveness and effects on public health and the environment during implementation of the remedial action, as each requires excavation. As such, both alternatives would have site controls would be implemented through approved RAWP at the site to prevent exposure to the on-site workers and the surrounding community, including a CHASP, an approved soil and materials management plan, and a CAMP. Short-term impacts are likely to be higher for Alternative #1 due to excavation of greater amounts of historical fill material. However, a 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 is a permanent remedy and allows the property to be used for any purposes. Alternative #2 is also an effective remedy and allows the property to be used for restricted residential purposes. Alternative #2 requires engineering and institutional controls and adherence to a site management plan to maintain permanent protections, in addition to future inspections to determine the permanence of the engineering controls implemented at the site. Both alternatives address offsite soil vapor intrusion through the installation of a soil vapor barrier.

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 provides a significant reduction in toxicity, mobility or volume of contaminated material because all soil or fill material in excess of Unrestricted Use SCOs are permanently removed from the property. Alternative #2 removes a portion of the contaminated

soil and fill material (in excess of the Restricted Use Restricted-Residential SCOs) for development purposes and manages the residual contaminated soil and 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. Groundwater use restrictions will reduce toxicity by ensuring that there is no direct contact with on-Site groundwater in the future. Establishment of a Site Management Plan and placement of a deed restriction to memorialize these controls will ensure long-term management of these Engineering and Institutional Controls and provide assurance that protective levels of toxicity and mobility will continue in perpetuity. Both alternatives address offsite soil vapor intrusion through the installation of a soil vapor barrier.

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. They use standard materials and services and well established technology. The reliability of each remedy is also high. There are no special difficulties associated with any of the activities proposed.

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 higher than Alternative #2 due to more soil and fill material being excavated and importing backfill. 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 and future inspections.

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, will comply with SCGs, are effective for the short-term and long-term, are implementable, and reduces both mobility and toxicity.

Community Acceptance

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

Based on the overall goals of the remedial program and initial observations by the project team, both of the alternatives for the Site are acceptable to the community. This RAWP will be subject to and undergo public review under the NYC VCP and will provide the 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.

On March 21, 2012, the Board of Standards and Appeals granted a variance to the Site, for the construction of a new two-family residential building in an M1-1 district, contrary to use, floor area, height, and setback.

Both alternatives provide protection of public health and the environment for both the proposed use of the Site. Both alternatives provide a remedial action that is beneficial to the surrounding community and is consistent with the goals of the City for remediating and redeveloping brownfield sites.

Both alternatives for remedial action at the site are comparable with respect to the proposed use and to land uses in the vicinity of the Site. The proposed use is partially inconsistent with the existing zoning designation for the property but is consistent with recent development patterns. The Site is surrounded by commercial and manufacturing properties and both alternatives provide comprehensive protection of public health and the environment for these uses. Improvements in the current brownfield condition of the property achieved by both alternatives are also consistent with the City's goals for cleanup of contaminated land and bringing such properties into productive reuse. Both alternatives are equally protective of natural resources and cultural resources. This RAWP will be subject to undergo public review under the NYC VCP and will provide the opportunity for detailed public input on the land use factors described in this section. This public comment will be considered by OER prior to approval of this plan.

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 gasses, as it will have the largest volume of material to truck off site. Alternative #2 requires only the

removal of minor amounts contaminated soil that would not otherwise be removed for construction. Both remedial alternatives are comparable with respect to the opportunity to achieve other sustainable remedial action elements. A Sustainability Statement can be found in Appendix B.

4.0 REMEDIAL ACTION

4.1 SUMMARY OF PREFERRED REMEDIAL ACTION

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

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and implementation of a Citizen Participation Plan.
2. Perform a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
4. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
5. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
6. Establishment of Track 4 Soil Cleanup Objectives (SCOs).
7. Excavation of contaminated soil and fill material exceeding the Track 4 SCOs across the entire site to a depth of two feet below grade. Excavation to a depth of four feet for development purposes.

8. Screening of excavated soil and fill material during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.
9. Removal of underground storage tanks and closure of petroleum spills if any, in compliance with applicable local, state, and federal laws and regulations, should they be encountered.
10. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media onsite.
11. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
12. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
13. Installation of a vapor barrier system beneath the building slab.
14. Construction and maintenance of an engineered composite cover consisting of a concrete building slab to prevent human exposure to residual soil and fill materials remaining under the site.
15. Submission of a 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.
16. Submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual historic fill contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency.
17. 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 shown below. 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 5.0.

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.

Contaminant	SCOs
Lead	1,000 ppm
Mercury	2.5 ppm
SVOCs (total)	250 ppm

Estimated Soil/Fill Removal Quantities

The total quantity of soil/fill expected to be excavated and disposed off-Site is 290 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. A pre-approval letter from all disposal facilities will be provided to OER prior to any soil/fill material removal from the site. If a different or additional disposal facility(ies) for the soil/fill material is selected, OER will be notified in advance and documentation of the facility permitting and acceptance criteria, rationale for acceptance and final disposal documentation will be provided in the RAR.

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

<u>Disposal Facility</u>	<u>Waste Type</u>	<u>Estimated Quantities</u>
Permitted facility to be named	Historic Fill	290 tons

End-Point Sampling

Removal actions under this plan will be performed in conjunction with remedial end-point 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:
 - 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.
 - 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 volatile organics, 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 1-3 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.

New York State ELAP certified labs will be used for all end-point sample analyses. Labs 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. End-point samples will be analyzed for trigger analytes (those for which an SCO exceedance is identified) utilizing the following methodology:

Soil analytical methods will include:

- Semi-volatile organic compounds by EPA Method 8270;
- Target Analyte List metals by EPA Method 6020 for lead and mercury only; and
- Pesticides by EPA Method 8081.

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

One duplicate sample and field and lab blank samples will be analyzed to assess sampling and lab artifacts. The chemical analytical laboratory used is NYS ELAP certified and is York Analytical Laboratories (10854) for soils and groundwater.

Import and Reuse of Soils

Import of soils onto the property and reuse of soils already onsite will be performed in conformance with the Soil/Materials Management Plan in Appendix C. The estimated quantity of soil to be imported into the Site for backfill and cover soil is 46 cubic yards. The estimated quantity of onsite soil/fill expected to be reused/relocated on Site is 0 tons.

4.3 ENGINEERING CONTROLS

Engineering Controls were employed in the remedial action to address residual contamination remaining at the site. The Site has one primary Engineering Control Systems. This is:

- An engineered composite cover consisting of the proposed concrete foundation slab and two feet of clean cover material in any open/landscaped areas, and
- Soil vapor barrier. See Figure 7.0 for Proposed Vapor Barrier Layout.

The engineered composite cover would be comprised of:

- Two feet of clean fill material in landscaped areas (open space);
- Concrete foundation building slab; and
- Concrete sidewalks;

The engineered composite cover is a permanent engineering control for the Site. The system will be inspected and reported at specified intervals as required by this RAWP and the SMP. A Soil Management Plan will be included in the Site Management Plan and will outline the procedures to be followed in the event that the composite cover system and underlying residual soil/fill is disturbed after the remedial action is complete. Maintenance of this composite cover system will be described in the Site Management Plan in the RAR.

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

- Barrier Bac VB-350 16-millimeter vapor retarder system or OER approved equivalent will be installed under building slab, and sealed at all penetrations and edges using specialized vapor barrier tape. See Appendix G for details.

- Stamped design drawings detailing installation will be submitted to OER prior to construction.

See Appendices for additional information including design drawings and diagrams and manufacturer documentation.

4.4 INSTITUTIONAL CONTROLS

Institutional Controls (IC) have been incorporated in this remedial action to manage residual soil/fill and other media and render the Site protective of public health and the environment. Institutional Controls are listed below. Long-term employment of EC/ICs will be 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 an 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 potentially exposed population. The sampling data from the RI were evaluated to determine whether there is any health risk by characterizing the exposure setting, identifying exposure pathways, and evaluating contaminant fate and transport. This EA was prepared in accordance with Appendix 3B and Section 3.3 (b) 8 of the NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation.

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.

Known and Potential Sources & Nature, Extent, Fate and Transport of Contaminants

Based on the RIR, known source areas onsite are limited to historical fill in the top two feet below grade. Soil/fill samples collected during the RI showed VOCs and PCBs were all below Track 1 Unrestricted Use SCOs and Track 2 Restricted Residential SCOs. Five metals were observed with contamination exceeding Track 2 Restricted Residential SCOs, four of which were also above Track 1 Unrestricted Use SCOs. All metals exceedances were limited shallow (0-2 foot) samples. Five SVOCs were observed at levels exceeding Track 1 SCOs. Finally, two Pesticides were detected at concentrations above the Track 1 Unrestricted Use SCOs. The observed soil contamination corresponds well with the AOCs. Groundwater samples collected

during the RI did not detect VOCs, SVOCs or PCBs exceeding their GQS standards. Five of the metals detected in the unfiltered sample, and one detected in the filtered sample, exceeded the TOGS 1.1.1 Class GA Guidance Values in the one unfiltered sample.

Soil vapor samples collected during the RI showed a wide variety of VOCs at low concentrations, consisting mainly of BTEX and associated compounds at concentrations generally below 49 µg/m³. These compounds are most commonly associated with a spill of automotive fuel or heating oil. The absence of MTBE in vapor suggests an older spill. Past uses of the property do not indicate automotive fueling activities or other automotive fuel sources, but may have included the use of heating oil. Carbon tetrachloride, 1,1,1-trichloroethane, tetrachloroethylene, and trichloroethylene were not detected in both soil vapor samples. Soil samples (both deep and shallow) did not contain any VOCs in excess of NYSDEC Part 375 Unrestricted SCOs for unrestricted use. Groundwater did not contain any VOCs exceeding the GQS. Together, these observations suggest an offsite source area. While no standards exist for soil vapor, no compounds exceed the Guidance for Evaluating Soil Vapor Intrusion in the State of New York (Final October 2006).

Potential Routes of Exposure

Currently, the site stands vacant and uncovered allowing for several pathways to exposure including; inhalation, ingestion, and absorption of site soils. The potential for exposures due to the low-level 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 site soils are the metals arsenic, lead, and mercury and SVOCs. Groundwater at the site does not have any VOC concentrations exceeding the GQS standards.

The proposed development of the site will include soil/fill excavations for both remedial and construction 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. Limited dewatering activities will also provide direct routes of exposure to

on-site workers. 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 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 levels 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 techniques. The Construction Health and Safety Plan 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 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 four-story, slab-on-grade, two-family residential building with a ground floor studio apartment. There will be a 4th

floor roof terrace, a 2nd floor rear porch, and a ground level rear yard. During redevelopment of the Site, the on-site potential sensitive receptors will include construction workers and possibly pedestrians and nearby residents. Once the Site is redeveloped, the on-site potential sensitive receptors will include adult and child residents, visitors and maintenance staff. There will be no potential offsite receptors after development is complete. Proposed Development Plans can be found in Appendix E.

Overall Human Health Exposure Assessment

Current potential exposure pathways will be eliminated by the remedial action. During the remedial action, on-site and offsite 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 Construction Health and Safety Plan. Under future conditions, dermal contact and ingestions exposures will be eliminated by removal of all soils above Track 2 Restricted-Residential SCOs and encapsulation by the building's concrete slab, the rear patio and a two-foot cap of topsoil in the rear landscaped area. Inhalation exposures to soil vapors will be prevented by construction of a vapor barrier and placement of a concrete slab

5.0 REMEDIAL ACTION MANAGEMENT

5.1 PROJECT ORGANIZATION AND OVERSIGHT

Principal personnel who will participate in the remedial action include Scott A. Yanuck and Chris Connolley. The Professional Engineer (PE) is Edward S. Wong. The Qualified Environmental Professionals (QEP) for this project is Scott A. Yanuck.

5.2 SITE SECURITY

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

5.3 WORK HOURS

The hours for operation of remedial construction will be from 8 to 4. 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 Scott A. Yanuck. Remedial work performed under this RAWP will be in full compliance with applicable health and safety laws and regulations, including Site and OSHA worker safety requirements and HAZWOPER requirements. Confined space entry, if any, will comply with OSHA requirements and industry standards and will address potential risks. The parties performing the remedial construction work will ensure that performance of work is in compliance with the HASP and applicable laws and regulations. The HASP pertains to remedial and invasive work performed at the Site until the issuance of the Notice of Completion.

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

Personnel entering any exclusion zone will be trained in the provisions of the HASP and be required to sign an HASP acknowledgment. Site-specific training will be provided to field

personnel. Additional safety training may be added depending on the tasks performed. Emergency telephone numbers will be posted at the site location before any remedial work begins. A safety meeting will be conducted before each shift begins. Topics to be discussed include task hazards and protective measures (physical, chemical, environmental); emergency procedures; PPE levels and other relevant safety topics. Meetings will be documented in a log book or specific form.

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

5.5 COMMUNITY AIR MONITORING PLAN

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

Periodic monitoring for VOCs will be performed during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. Periodic monitoring during sample collection, for instance, will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. Depending upon the proximity of potentially exposed individuals, continuous monitoring may be performed during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence. Exceedances of action levels observed during performance of the Community Air Monitoring Plan (CAMP) will be reported to the OER Project Manager and included in the Daily Report.

VOC Monitoring, Response Levels, and Actions

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

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.
- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shutdown.

All 15-minute readings must be recorded and be available for OER personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

Particulate Monitoring, Response Levels, and Actions

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

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed $150 \text{ mcg}/\text{m}^3$ above the upwind level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than $150 \text{ mcg}/\text{m}^3$ above the upwind level, work will be stopped and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within $150 \text{ mcg}/\text{m}^3$ of the upwind level and in preventing visible dust migration.

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

5.6 AGENCY APPROVALS

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

5.7 SITE PREPARATION

Pre-Construction Meeting

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

Mobilization

Mobilization will be conducted as necessary for each phase of work at the Site. Mobilization includes field personnel orientation, equipment mobilization (including securing all sampling equipment needed for the field investigation), marking/staking sampling locations and utility mark-outs. Each field team member will attend an orientation meeting to become familiar with the general operation of the Site, health and safety requirements, and field procedures.

Utility Marker Layouts, Easement Layouts

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

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

Equipment and Material Staging

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

Stabilized Construction Entrance

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

Truck Inspection Station

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

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 east on Union Street, south on Columbia Street, west on Woodhull Street, join Brooklyn/Queens Expressway and take to Verrazano Bridge crossing to Staten Island.

5.9 DEMOBILIZATION

Demobilization will include:

- As necessary, restoration of temporary access areas and areas that may have been disturbed to accommodate support areas (e.g., staging areas, decontamination areas, storage areas, temporary water management areas, and access area);

- Removal of sediment from erosion control measures and truck wash and disposal of materials in accordance with applicable laws and regulations;
- Equipment decontamination, and;
- General refuse disposal.

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

5.10 REPORTING AND RECORD KEEPING

Daily Reports

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

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

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

communicated directly to the OER project manager by personal communication. Daily reports will be included as an Appendix in the Remedial Action Report.

An alpha-numeric site map will be used to identify locations described in reports submitted to OER and is shown in Figure 2.0.

Record Keeping and Photo-Documentation

Job-site record keeping for all remedial work will be performed. These records will be maintained on-Site during the project and will be available for inspection by OER staff. Representative photographs will be taken of the Site prior to any remedial activities and during major remedial activities to illustrate remedial program elements and contaminant source areas. Photographs will be submitted at the completion of the project in the RAR in digital format (i.e. jpeg files).

5.11 COMPLAINT MANAGEMENT

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

5.12 DEVIATIONS FROM THE REMEDIAL ACTION WORK PLAN

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

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

5.13 DATA USABILITY SUMMARY REPORT

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

6.0 REMEDIAL ACTION REPORT

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

- Information required by this RAWP;
- As-built drawings for all constructed remedial elements, required certifications, manifests and other written and photographic documentation of remedial work performed under this remedy;
- Site Management Plan;
- Description of any changes in the remedial action from the elements provided in this RAWP and associated design documents;
- Tabular summary of all end point sampling results and all material characterization results, QA/QC results for end-point sampling, and other sampling and chemical analysis performed as part of the remedial action and DUSR;
- Test results or other evidence demonstrating that remedial systems are functioning properly;
- Account of the source area locations and characteristics of all contaminated material removed from the Site including a map showing source areas;
- Account of the disposal destination of all contaminated material removed from the Site. Documentation associated with disposal of all material will include transportation and disposal records, and letters approving receipt of the material.
- Account of the origin and required chemical quality testing for material imported onto the Site.
- Recorded Declaration of Covenants and Restrictions.
- 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, Scott A. Yanuck, 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 107 Union Street, Brooklyn, New York Site (NYC VCP Project #12CVCP054K).

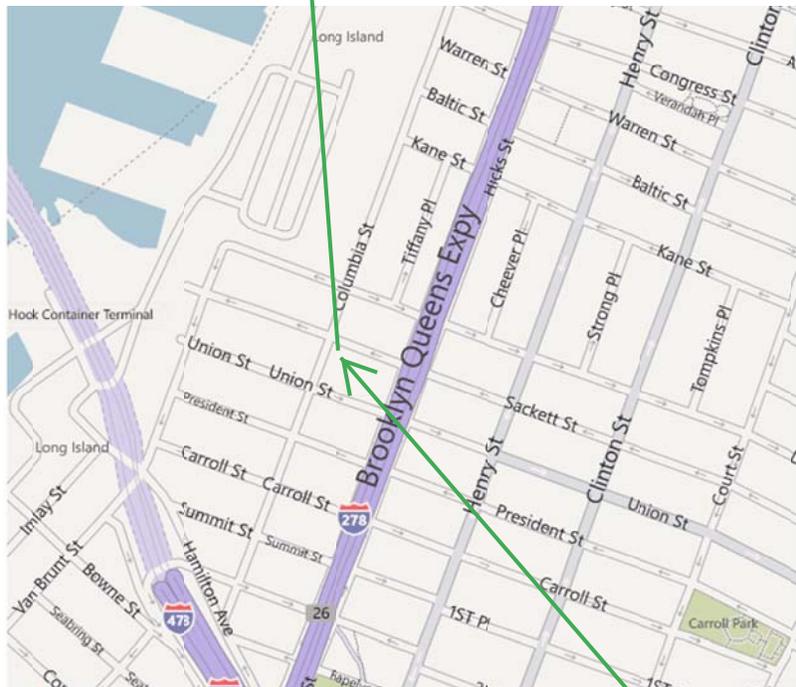
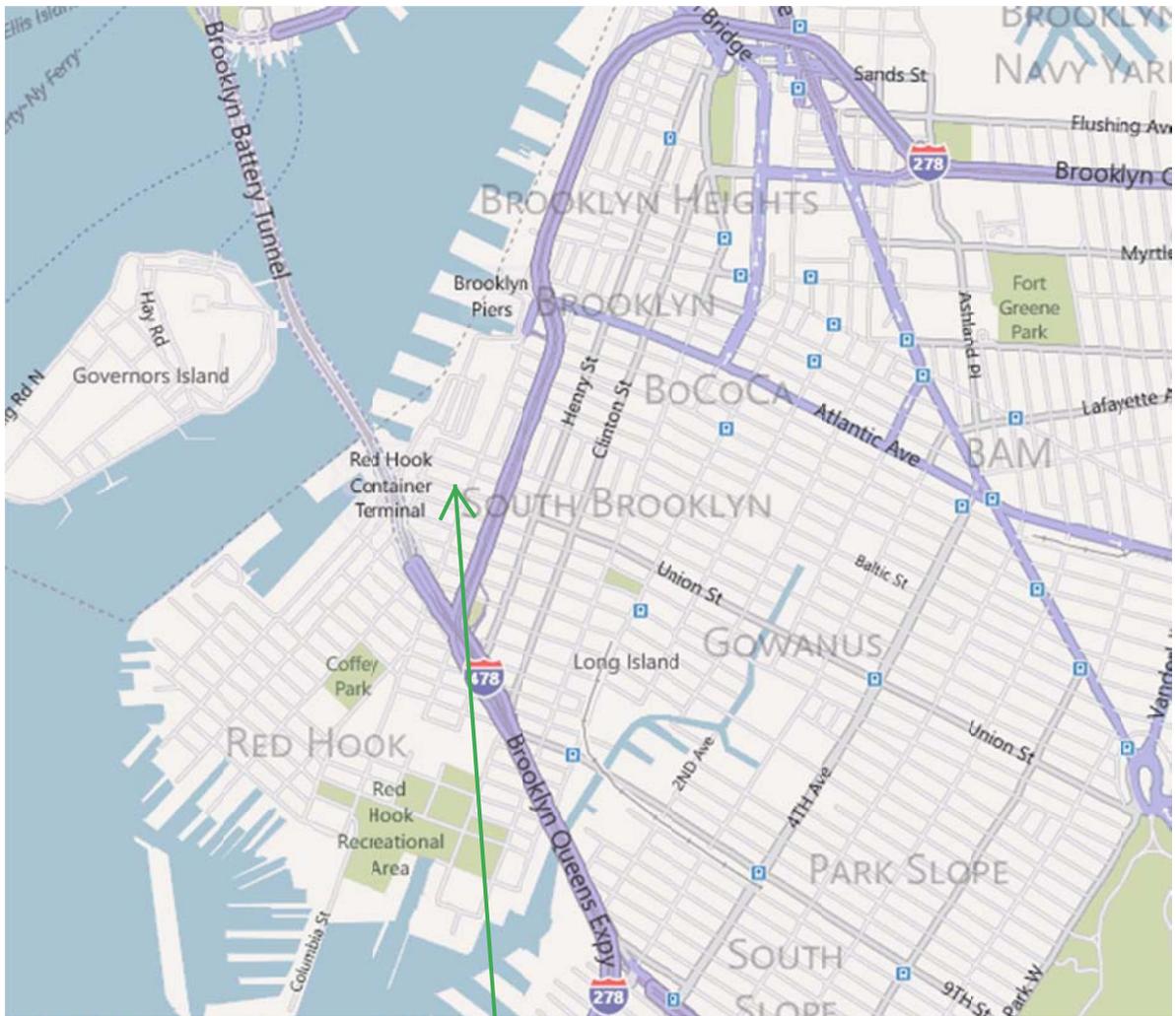
I, Edward S. Wong, am currently a professional engineer licensed by the State of New York. I had primary direct responsibility for implementation of the remedial program for the 107 Union Street, Brooklyn, New York Site (NYC VCP Project #12CVCP054K).

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

7.0 SCHEDULE

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

Schedule Milestone	Weeks from Remedial Action Start	Duration (weeks)
OER Approval of RAWP	0	4
Fact Sheet 2 announcing start of remedy	0	1
Mobilization	1	2
Remedial Excavation	3	2
Demobilization	5	2
Record Declaration of Covenants and Restrictions	7	1
Submit Remedial Action Report	8	2



LEA, 53 West Hills Road, Suite 1, Huntington Station, New York 11746

Figure 1.0 Site Location
107 Union Street
Brooklyn, New York

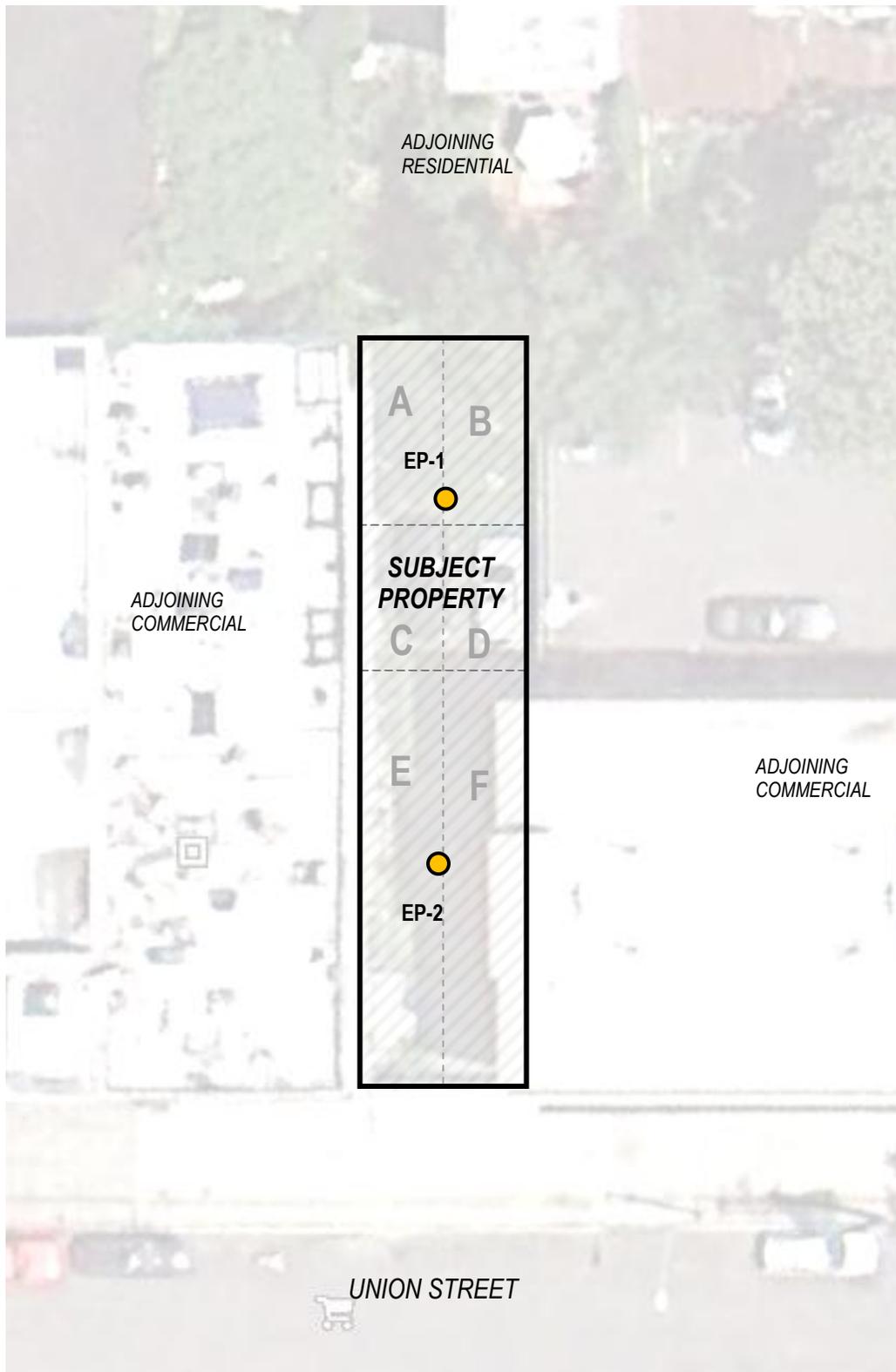


FIGURE 2.0
 SITE SKETCH WITH ALPHA-
 NUMERICAL GRID AND
 PROPOSED ENDPOINT SAMPLE
 LOCATIONS

PROJECT #: 12-152
 DRAWING DATE: 3-20-2012
 DRAWN BY: CJC
 CHECKED BY: TJ



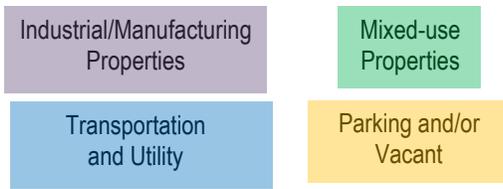
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 FAX: 631-427-5323
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107 Union Street
 Brooklyn, New York



53 West Hills Road, Suite 1
Huntington Station, NY 11746

PHONE: 631-673-0612
FAX: 631-427-5323

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FIGURE 3.0
MAP OF SURROUNDING
PROPERTY USAGE

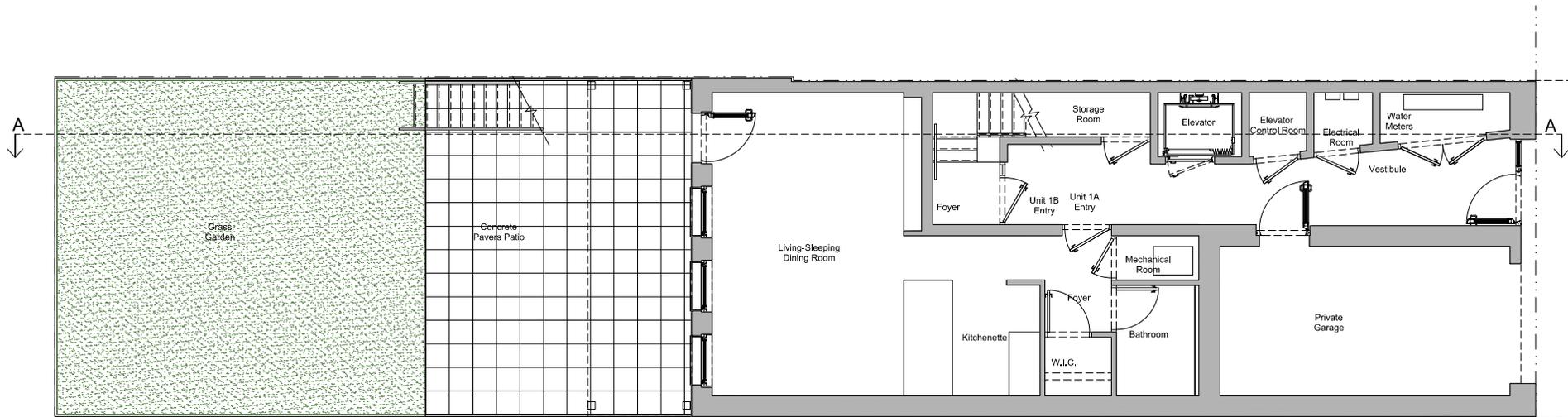
107 Union Street
Brooklyn, New York

PROJECT #: 12-152
DRAWING DATE: 3-19-2012
DRAWN BY: CJC
CHECKED BY: TJ

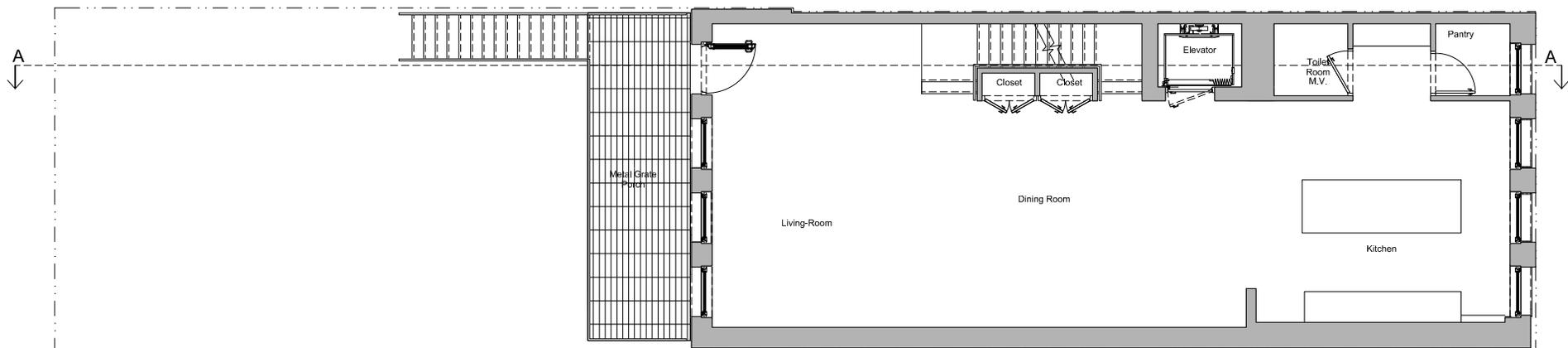


NOT TO SCALE

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1 First Floor
3/32" = 1'-0"



2 Second Floor
3/32" = 1'-0"

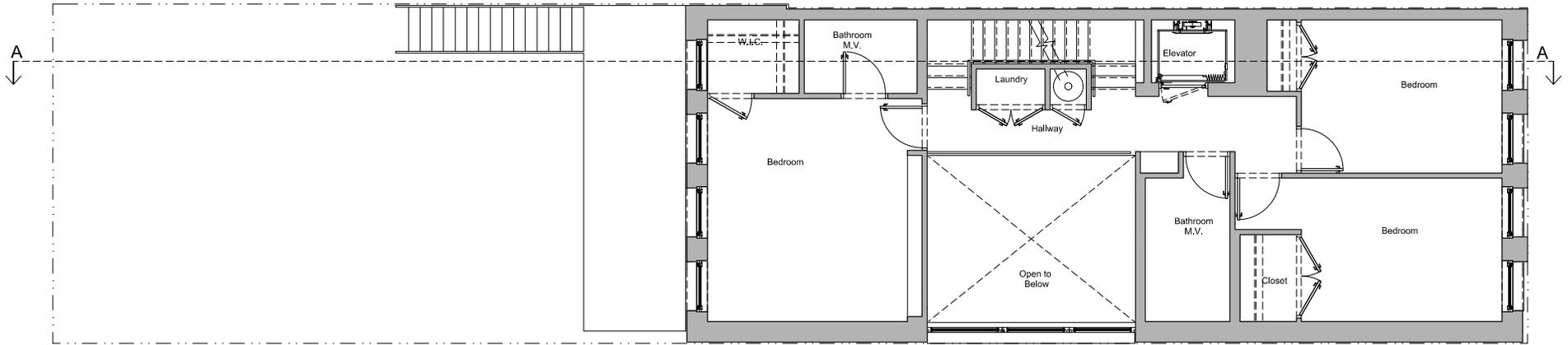
107 Union st.

1st & 2nd Floors

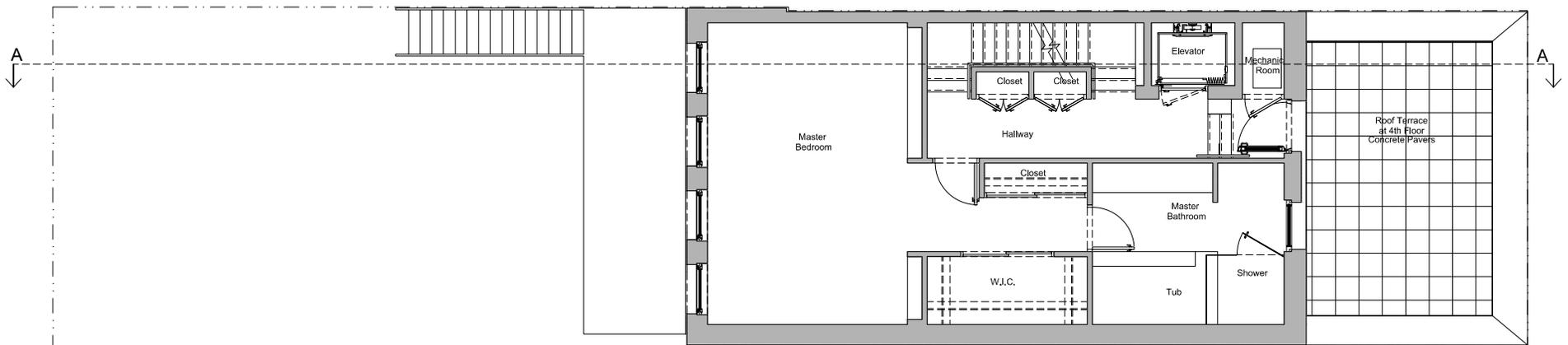
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Date: 02-17-2012

Checked: HG
Revision:

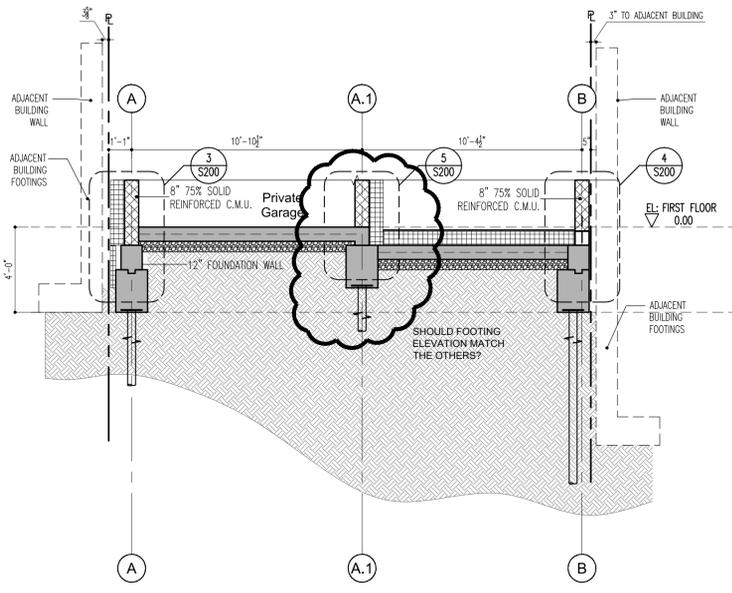
Figure 4.1
Re-development Plans
107 Union Street
Brooklyn, NY



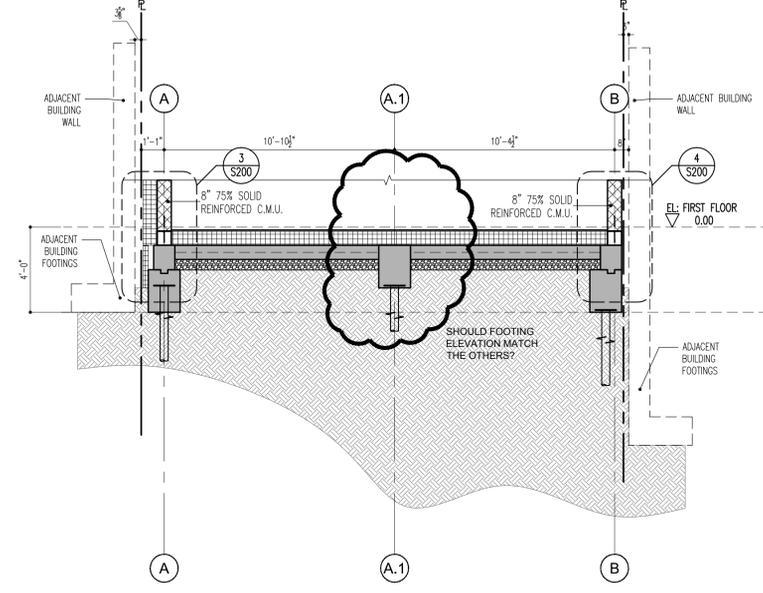
3 3rd Floor
3/32" = 1'-0"



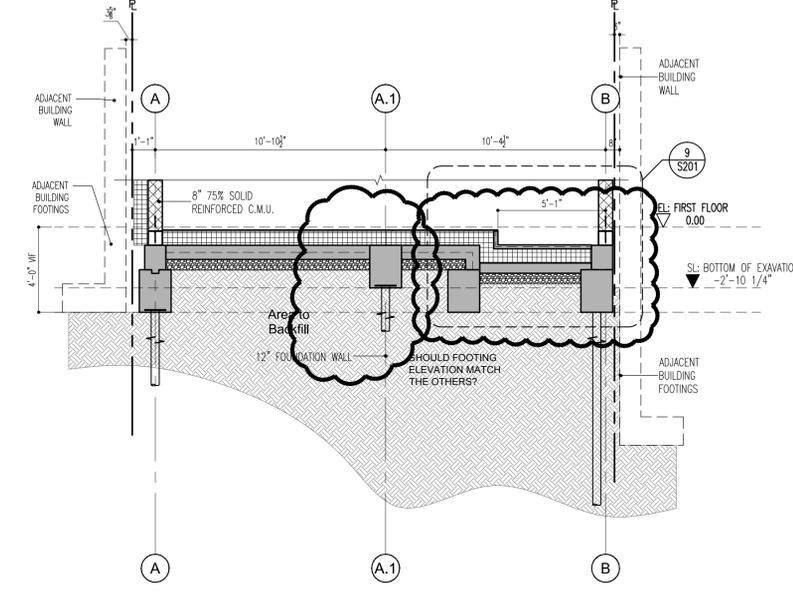
4 4th Floor
3/32" = 1'-0"



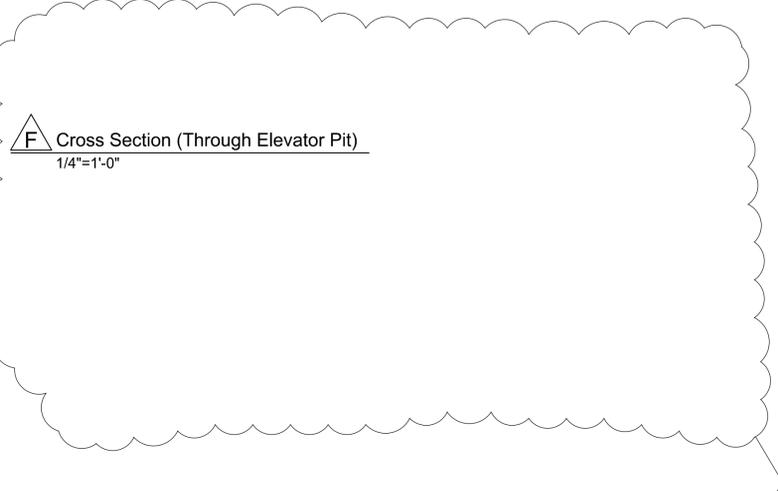
C Cross Section
1/4"=1'-0"



D Cross Section
1/4"=1'-0"



E Cross Section (Through Elevator Pit)
1/4"=1'-0"



F Cross Section (Through Elevator Pit)
1/4"=1'-0"

Revision No.	Date	Remarks
1	1/26/2012	ENGINEERING COORDINATION
2	03/08/2012	DESIGN UPDATE

DOB Stamps and Signatures:

Orient and affix BIS job number label here

Project:
 Proposed Building at
 107 Union St
 Brooklyn, NY 11231
 Block: 335, Lot: 42

Title:
 Foundation Details
Figure 4.4
 Re-development Plans
 107 Union Street
 Brooklyn, NY

SEAL & SIGNATURE: _____ DATE: Sept 28-2011
 PROJECT No: 10-02
 DRAWN BY: OG
 CHK BY: HG
 DWG No: F-002_02
 CADD FILE No: 5 of 12

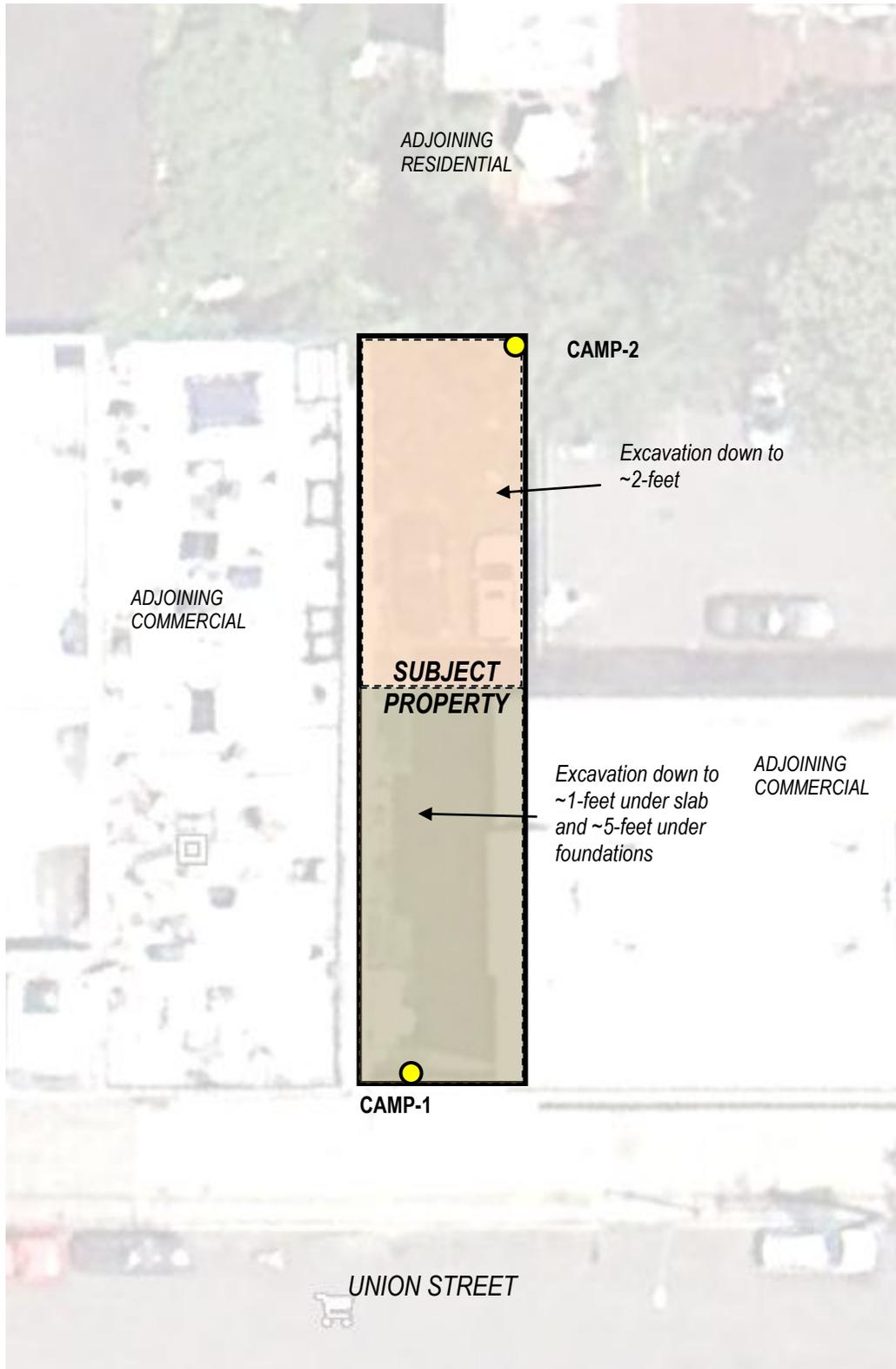


FIGURE 5.0
EXCAVATION AND CAMP
SAMPLE LOCATIONS

107 Union Street
 Brooklyn, New York

PROJECT #: 12-152
 DRAWING DATE: 3-20-2012
 DRAWN BY: CJC
 CHECKED BY: TJ
 REVISED BY: SAY



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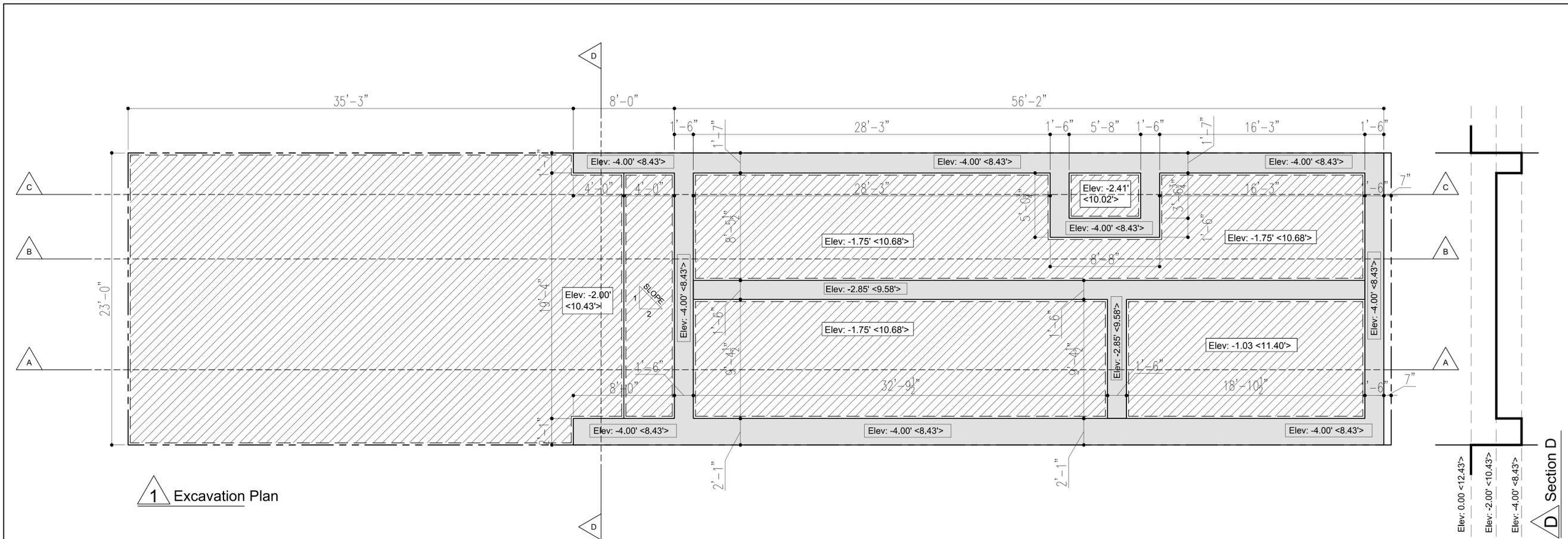
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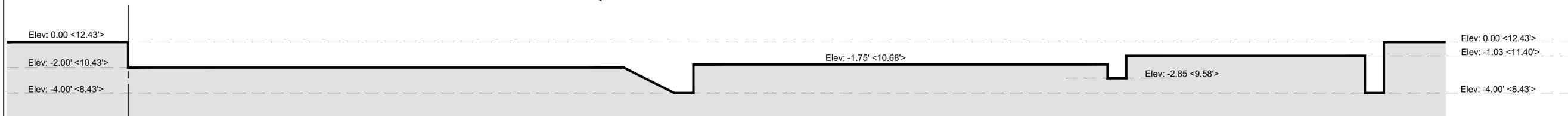
53 West Hills Road, Suite 1
 Huntington Station, NY 11746

PHONE: 631-673-0612
 FAX: 631-427-5323

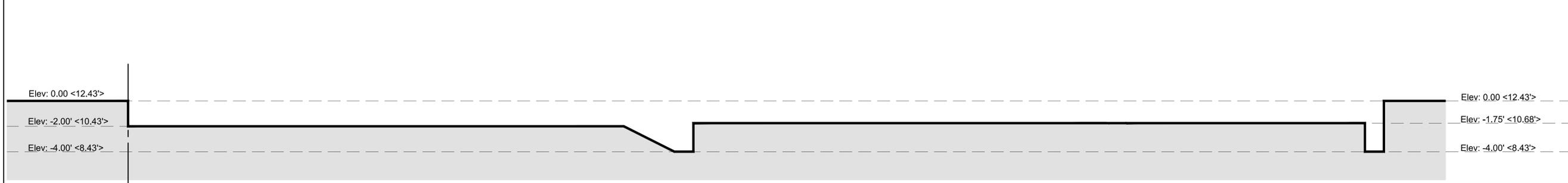
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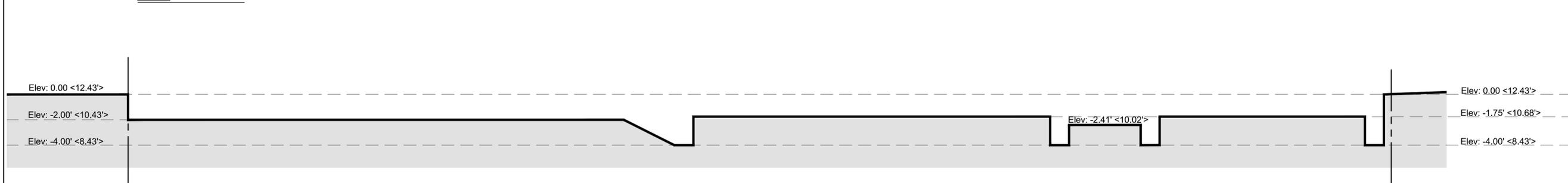
1 Excavation Plan



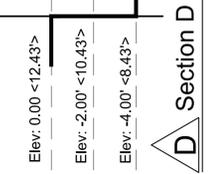
A Section A



B Section B



C Section C



D Section D

ARCHITECT OF RECORD:
Fractal
 ARCHITECTURE PLLC.
 Hernan J. Galvis R.A. NYS 031134
 131 Union St, Brooklyn, NY 11231
 T: 718.875.4599

Design Team:
G
ateliers
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STRUCTURAL ENGINEER:
 ANTHONY GENNARO P.E.
 14 BEENA WAY MANALAPAN, N.J. 07726
 T: 732-972-8496 F: 732-972-7562

CIVIL ENGINEER:
 ATLAS TECHNICAL ASSOCIATES, INC.
 60 SACKETT STREET BROOKLYN, NY 11231
 T: (718) 625-0747 F: (718) 625-0133

MECHANICAL ENGINEER:
 TSF ENGINEERING, P.C.
 200 Park Ave. South NY, NY
 T: 212.253.7303, F: 212.253.6512

OWNER:
 Passiv House Xperimental LLC131 Union st,
 Brooklyn, NY 11231
 T: 718.875.4599

Drawing scales as indicated are for reference only and are not intended to accurately depict actual or designed conditions. Written dimensions shall govern.
 Contractor to notify the architect of any discrepancy between field conditions and the drawings.

Revision No.	Date	Remarks

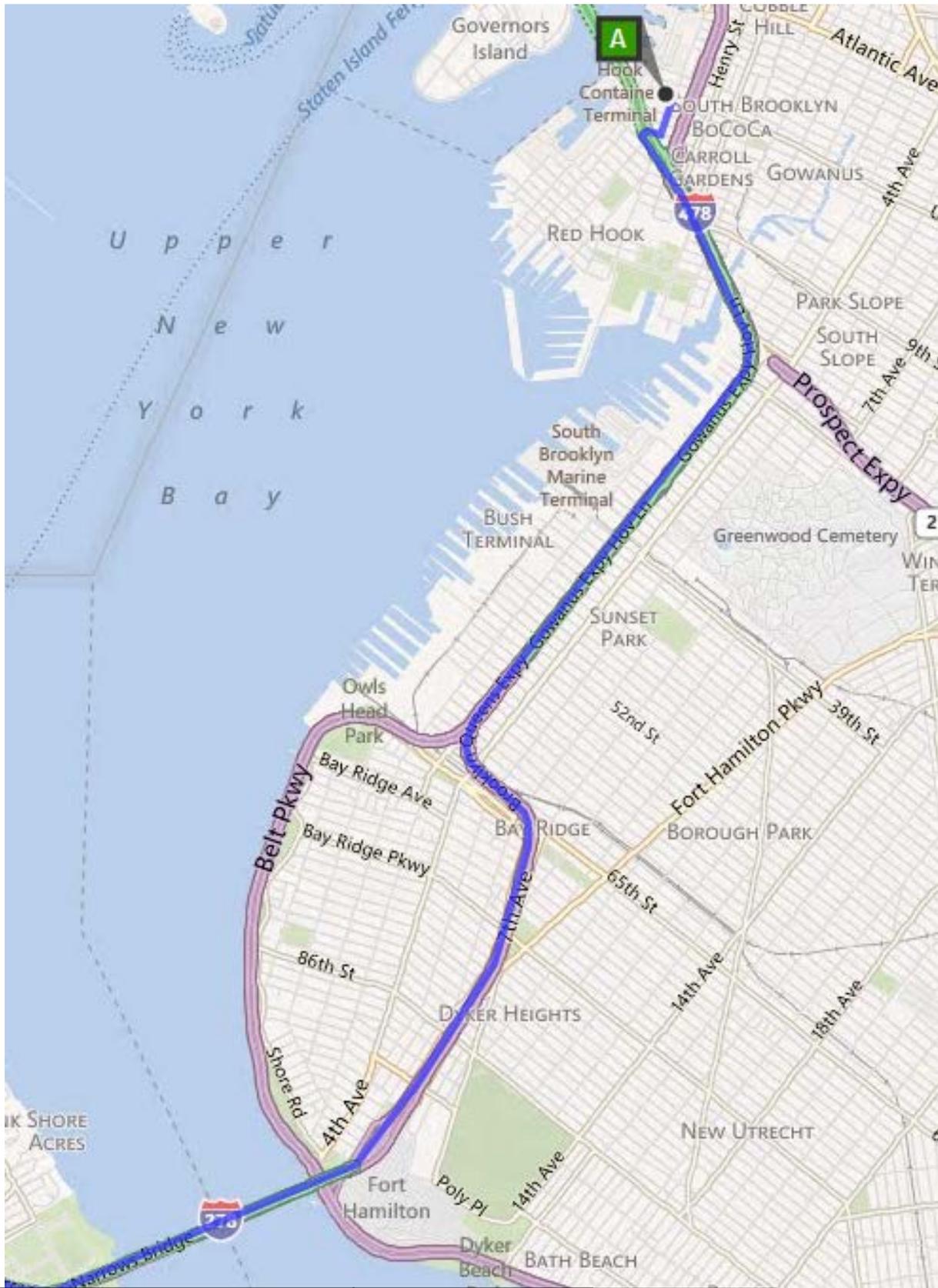
DOB Stamps and Signatures:

Orient and affix BIS job number label here

Project:
 Proposed Building at
 107 Union st
 Brooklyn, NY 11231
 Block: 335, Lot: 42

Title:
Excavation Diagrams
Figure 5.1
 Detailed Excavation Diagram
 107 Union Street
 Brooklyn, NY

SEAL & SIGNATURE	DATE: 04-09-2012
	PROJECT No: 10-02
	DRAWN BY: OG
	CHK BY: HG
	DIWG No:
	S-500 .00
	CADD FILE No: --- of ---



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FIGURE 6.0
TRUCK ROUTE FOR SOIL
TRANSPORT

107 Union Street
Brooklyn, New York

PROJECT #: 12-152

DRAWING DATE: 3-20-2012

DRAWN BY: CJC

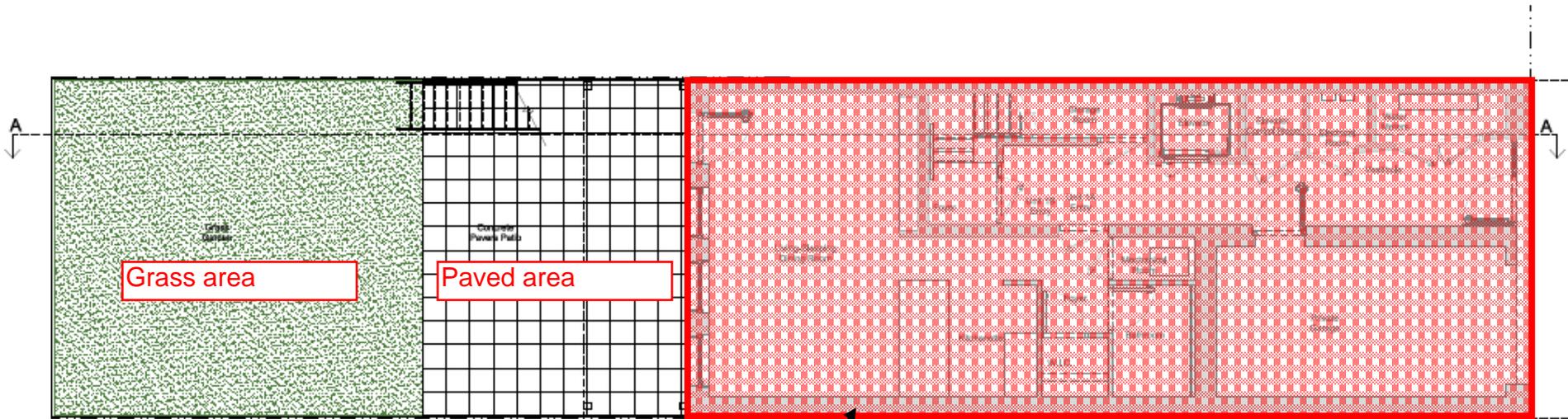
CHECKED BY: TJ

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1 First Floor
3/32" = 1'-0"

Barrier BAC VS Series - Soil Vapor Barrier
 Located beneath the entire foot print of the proposed building



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 Huntington Station, NY 11746

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FIGURE 7.0
 PROPOSED GROUND FLOOR
 WITH VAPOR BARRIER LAYOUT

107 UNION STREET
 BROOKLYN
 NEW YORK

PROJECT # : 12-152
 DRAWING DATE: 4-6-2012
 DRAWN BY: CJC
 CHECKED BY: SAY



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SIDEWALK

RAWP TABLE 1

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

Restricted Use Soil Cleanup Objectives							
Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
Metals							
Arsenic	7440-38-2	16 ^f	16 ^f	16 ^f	16 ^f	13 ^f	16 ^f
Barium	7440-39-3	350 ^f	400	400	10,000 ^d	433	820
Beryllium	7440-41-7	14	72	590	2,700	10	47
Cadmium	7440-43-9	2.5 ^f	4.3	9.3	60	4	7.5
Chromium, hexavalent ^h	18540-29-9	22	110	400	800	1 ^e	19
Chromium, trivalent ^h	16065-83-1	36	180	1,500	6,800	41	NS
Copper	7440-50-8	270	270	270	10,000 ^d	50	1,720
Total Cyanide ^h		27	27	27	10,000 ^d	NS	40
Lead	7439-92-1	400	400	1,000	3,900	63 ^f	450
Manganese	7439-96-5	2,000 ^f	2,000 ^f	10,000 ^d	10,000 ^d	1600 ^f	2,000 ^f
Total Mercury		0.81 ^j	0.81 ^j	2.8 ^j	5.7 ^j	0.18 ^f	0.73
Nickel	7440-02-0	140	310	310	10,000 ^d	30	130
Selenium	7782-49-2	36	180	1,500	6,800	3.9 ^f	4 ^f
Silver	7440-22-4	36	180	1,500	6,800	2	8.3
Zinc	7440-66-6	2200	10,000 ^d	10,000 ^d	10,000 ^d	109 ^f	2,480
PCBs/Pesticides							
2,4,5-TP Acid (Silvex)	93-72-1	58	100 ^a	500 ^b	1,000 ^c	NS	3.8
4,4'-DDE	72-55-9	1.8	8.9	62	120	0.0033 ^{e1}	17
4,4'-DDT	50-29-3	1.7	7.9	47	94	0.0033 ^{e1}	136
4,4'-DDD	72-54-8	2.6	13	92	180	0.0033 ^{e1}	14

Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
Aldrin	309-00-2	0.019	0.097	0.68	1.4	0.14	0.19
alpha-BHC	319-84-6	0.097	0.48	3.4	6.8	0.04 ^k	0.02
beta-BHC	319-85-7	0.072	0.36	3	14	0.6	0.09
Chlordane (alpha)	5103-71-9	0.91	4.2	24	47	1.3	2.9
delta-BHC	319-86-8	100 ^a	100 ^a	500 ^b	1,000 ^c	0.04 ^k	0.25
Dibenzofuran	132-64-9	14	59	350	1,000 ^c	NS	210
Dieldrin	60-57-1	0.039	0.2	1.4	2.8	0.006	0.1
Endosulfan I	959-98-8	4.8 ⁱ	24 ⁱ	200 ⁱ	920 ⁱ	NS	102
Endosulfan II	33213-65-9	4.8 ⁱ	24 ⁱ	200 ⁱ	920 ⁱ	NS	102
Endosulfan sulfate	1031-07-8	4.8 ⁱ	24 ⁱ	200 ⁱ	920 ⁱ	NS	1,000 ^c
Endrin	72-20-8	2.2	11	89	410	0.014	0.06
Heptachlor	76-44-8	0.42	2.1	15	29	0.14	0.38
Lindane	58-89-9	0.28	1.3	9.2	23	6	0.1
Polychlorinated biphenyls	1336-36-3	1	1	1	25	1	3.2

Semivolatiles

Acenaphthene	83-32-9	100 ^a	100 ^a	500 ^b	1,000 ^c	20	98
Acenaphthylene	208-96-8	100 ^a	100 ^a	500 ^b	1,000 ^c	NS	107
Anthracene	120-12-7	100 ^a	100 ^a	500 ^b	1,000 ^c	NS	1,000 ^c
Benz(a)anthracene	56-55-3	1 ^f	1 ^f	5.6	11	NS	1 ^f
Benzo(a)pyrene	50-32-8	1 ^f	1 ^f	1 ^f	1.1	2.6	22
Benzo(b)fluoranthene	205-99-2	1 ^f	1 ^f	5.6	11	NS	1.7
Benzo(g,h,i)perylene	191-24-2	100 ^a	100 ^a	500 ^b	1,000 ^c	NS	1,000 ^c
Benzo(k)fluoranthene	207-08-9	1	3.9	56	110	NS	1.7

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

Restricted Use Soil Cleanup Objectives

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

All Soil clean up objectives (SCOs) are in parts per million (ppm).

NS=Not specified. See Technical Support Document (TSD).

Footnotes:

- ^a The SCOs for residential, restricted-residential and ecological resources use were capped at a maximum value of 100 ppm, see TSD Section 9.3.
- ^b The SCOs for commercial use were capped at a maximum value of 500 ppm, see TSD Section 9.3.
- ^c The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1000 ppm, see TSD Section 9.3.
- ^d The SCOs for metals were capped at a maximum value of 10,000 ppm, see TSD Section 9.3.
- ^e For constituents where the calculated SCO was lower than the Contract Required Quantitation Limit (CRQL), the CRQL is used as the SCO value.
- ^f For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the DEC/DOH rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.
- ^g SCO is the sum of DDD, DDE and DDT.
- ^h The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.
- ⁱ This SCO is for the sum of Endosulfan I, Endosulfan II and Endosulfan Sulfate.
- ^j This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts), see TSD table 5.6-1.
- ^k This SCO is derived from data on mixed isomers of BHC.
- ^l This SCO is for the sum of DDD, DDE and DDT.

TABLE 2

<u>Disposal Facility</u>	<u>Waste Type</u>	<u>Source of Waste</u>	<u>Estimated Quantities</u>
Permitted facility to be named	Historic Fill	Rear yard 2' cut $2' \times 23' \times 35.25' = 56.6 \text{ cy}$	~85 tons
Permitted facility to be named	Historic Fill	Under slab 1.75' cut $1.75' \times 23' \times 56.16' = 83.72 \text{ cy}$	~125 tons
Permitted facility to be named	Historic Fill	From 4' x 3' foundation excavations (already cut 1.75') $2.25' \times 3' \times 193' = 48.25 \text{ cy}$	~72 tons
Permitted facility to be named	Historic Fill	From 2.85' x 2' interior foundation excavations (already cut 1.75') $1.1' \times 2' \times 66' = 5.4 \text{ cy}$	~8 tons
Permitted facility to be named	Historic Fill	Totals: 193.97 cubic yards	~290 tons

Assumes 1.5 tons per cubic yard of material

TABLE 3

<u>Facility for Backfill Materials</u>	<u>Material Type</u>	<u>Estimated Quantities</u>
Facility to be named	Certified Clean RCA or Virgin Stone	~33 cubic yards
Facility to be named	Certified Clean Topsoil	~13 cubic yards

APPENDIX A

Citizen Contact Information

CITIZEN PARTICIPATION PLAN

The NYC Office of Environmental Remediation and Laurel Environmental Associates, Ltd. 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, Laurel Environmental Associates, Ltd. 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. Laurel Environmental Associates, Ltd. will inspect the repositories to ensure that they are fully populated with project information. The repository for this project is:

Carroll Garden branch of the Brooklyn Public Library

396 Clinton Street, Brooklyn, New York 11231

(718) 596-6972

Hours

Mon 10:00 AM - 6:00 PM

Tue 1:00 PM - 8:00 PM

Wed 10:00 AM - 8:00 PM

Thu 10:00 AM - 6:00 PM

Fri 10:00 AM - 6:00 PM

Sat 10:00 AM - 5:00 PM

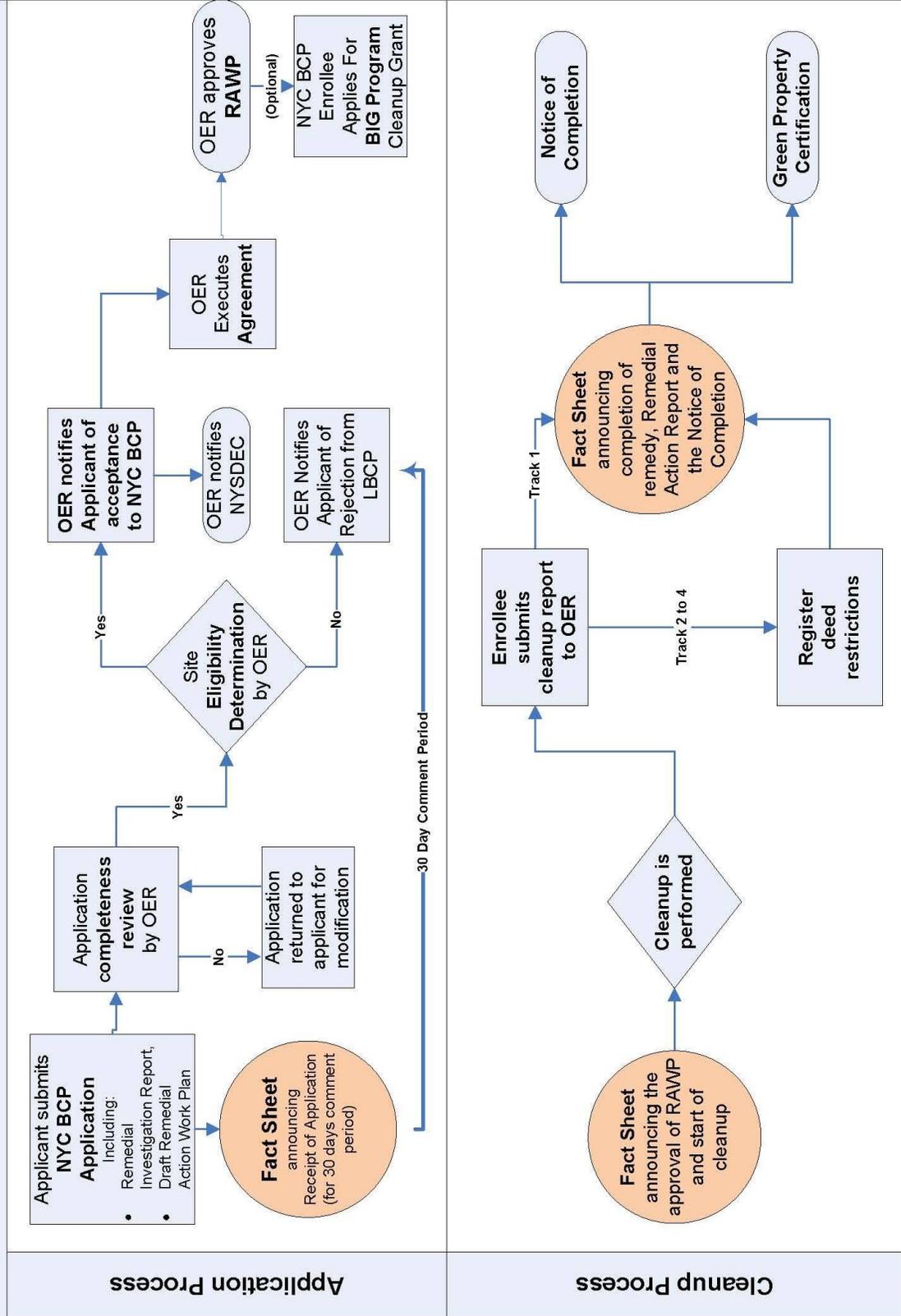
Sun closed

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.

Identify Issues of Public Concern. Laurel Environmental Associates, Ltd. is required to identify whether there are specific issues of concern to stakeholders proximate to the project site. Such issues include but are not limited to interests of Environmental Justice communities. Laurel Environmental Associates, Ltd. should list any site-specific issues of public concern and the method that they will be used resolved them. If needed, contact OER for additional guidance on how to identify issues of public concern.

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 Laurel Environmental Associates, Ltd., reviewed and approved by OER prior to distribution and mailed by Laurel Environmental Associates, Ltd. 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.

Flow Chart For NYC Brownfield Cleanup Program (NYC BCP)



- **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

SUSTAINABILITY STATEMENT

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

OER strongly recommends, but does not require, that the Enrollee employ sustainable means to implement the selected remedy defined in this RAWP and subsequent redevelopment including those that take into consideration the sustainability goals defined in PlaNYC. Such goals include: maximizing the recycling and reuse of clean, non-virgin materials; reducing the consumption of virgin and non-renewable resources; minimizing energy consumption and greenhouse gas emissions; improving energy efficiency; and enhancing biodiversity during landscaping associated with Site development.

In the sections below, and in additional sections included as appropriate, provide a summary of green remedial and sustainability elements planned for the cleanup and redevelopment process. Innovation is strongly encouraged. If a specific section included in this template below is not planned for the Site it should be deleted from this Statement.

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.

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.

A vapor barrier on-site will reduce the likelihood of re-contamination at the 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.

Storm-water volume retention is a part of the remediation and redevelopment at this site. Special care to keep all storm water on-site during the remediation will be taken. An estimate of the enhanced storm-water retention capability of the redevelopment project will be included in the RAR.

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

The number of Green Buildings that are associated with this brownfield redevelopment property will be reported in the RAR. The total square footage of green building space created

as a function of this brownfield redevelopment will be quantified for residential uses. The developer plans to construct a building that will conform to the German Passivhaus Standards.

Paperless Voluntary Cleanup Program. Laurel Environmental Associates, Ltd. 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. Laurel Environmental Associates, Ltd. 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.

The design of the proposed building includes the protection of existing trees, using temporary tree guards, tree pits, and the removal and planting of trees within the guidelines New York City Department of Parks and Recreation Street Tree Standards. All necessary permits will be obtained for any removal, relocation, and planting, prior to commencement of work.

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

SOIL/MATERIALS MANAGEMENT PLAN

1.1 SOIL SCREENING METHODS

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

1.2 STOCKPILE METHODS

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

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

1.3 CHARACTERIZATION OF EXCAVATED MATERIALS

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

1.4 MATERIALS EXCAVATION, LOAD-OUT AND DEPARTURE

The PE/QEP overseeing the remedial action will:

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

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

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

1.5 OFF-SITE MATERIALS TRANSPORT

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

Outbound truck transport routes are shown in Figure 6.0. 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 Kings County, 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

Soil and fill that is derived from the property that meets the soil cleanup objectives established in this plan will not be reused on-Site.

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 are listed in Table 1.0.

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

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

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

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

Source Screening and Testing

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

- Trucks with imported fill material will be in compliance with applicable laws and regulations and will enter the Site at designated locations;
- The PE/QEP is responsible to ensure that every truck load of imported material is inspected for evidence of contamination; and

- Fill material will be free of solid waste including pavement materials, debris, stumps, roots, and other organic matter, as well as ashes, oil, perishables or foreign matter.

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

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

1.10 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 (NYC DEP). The NYC DEP 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 NYC DEP 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 New York State Department of Environmental Conservation.

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 NYS DEC Spill Hotline. These findings will be included in the daily report. If previously unidentified contaminant sources are found during on-Site remedial excavation or development-related excavation, sampling will be performed on contaminated source material and surrounding soils and reported to OER. Chemical analytical testing will be performed for TAL metals, TCL volatiles and semi-volatiles, TCL pesticides and PCBs, as appropriate.

1.13 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 AND SAFETY PLAN

VACANT BROWNFIELD SITE
NYC VCP NUMBER 12CVCP054K
107 Union Street, Brooklyn
NEW YORK 11561

April 2012
LEA PROJECT # 12-152

Sheila Bubka, CIH

Sheila Bubka, CIH
Health and Safety Officer
AIHA Certification Number 6111

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HEALTH AND SAFETY PLAN FOR USE DURING REMEDIAL ACTION AND CONSTRUCTION

1.0 PURPOSE

The purpose of this Construction Health and Safety Plan (CHASP) is to assign responsibilities, establish minimum personnel protection standards and operating procedures and provide for contingencies that may arise while operations are being performed at the subject site, 107 Union Street, Brooklyn, New York. The proposed Remedial Action will include the removal of historic fill from the site.

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

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

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

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

The Site is currently a vacant fenced lot. Soils will be field screened with a Photoionization Detector (PID) to determine the presence of organic contamination. If an emergency occurs during the measures, which in any event may impact the surrounding community, all appropriate emergency resources listed under the Emergency Contingency Plan Section of this plan will be immediately notified.

2.0 HAZARD EVALUATION

Elevated levels of volatile organic compounds (VOCs) in the atmosphere are not expected to occur during on-site activities. However, the presence of VOCs will be evaluated using a Photoionization Detector (PID). Results from the air monitoring will determine if Level D personnel protection of workers is appropriate or a higher level of protection is required.

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

Table 1
Atmospheric Hazard Guidelines

<u>Hazard</u>	<u>Monitoring Equipment</u>	<u>Measured Level</u>	<u>Action</u>
Explosive Atmosphere	Combustible Gas Indicator	<10% LEL	Continue investigation.
		10%-20% LEL	Continue on-site monitoring with extreme caution as higher levels are encountered.
		>20% LEL	Explosion hazard. Withdraw from area immediately.
Oxygen	Multi RAE	Oxygen conc. <19.5%	Withdraw from area. NOTE: Combustible gas readings are not valid in atmosphere with oxygen levels of less than 19.5%
		19.5% - 23.5%	Continue investigation with caution.
		>23.5%	Fire hazard potential. Discontinue investigation. Withdraw from area.
Organic gases and vapors	PID	Background	Continue work
		5 ppm	Temporarily halt work until average readings drop below 5 ppm
		5 - 25 ppm	Halt work, identify and remedy or abate source
		Above 15 ppm	Continue work once average readings drop below 5 ppm Work must be shut down. Evaluate alternative approaches

Notes:

1. LEL = Lower Explosive Limit

3.0 SITE CONTROL

3.1 Site Work Locations:

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

3.2 Work Zones:

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

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

Contamination Reduction Zone - This zone will occur at the interface between the Exclusion Zone ("Hot Zone") and Support Zone ("Clean Zone") and shall provide a transfer of personnel and equipment to and from the Support Zone to the Exclusion Zone. This zone is for the decontamination of personnel and equipment prior to entering the Support Zone, and for the physical segregation of the Support Zone and Exclusion Zone. The contamination reduction zone will be placed along the front of the Site. Access to the Site by the public will be restricted during the Remedial Action and Construction.

Support Zone - This area is the remainder of the work Site and project Site. The support zone will be staged near company vehicles on Union Street. The function of the Support Zone includes:

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

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

3.3 Dust and Odors:

If during sampling, dust or odors emanating from contaminated soils are deemed excessive at adjoining properties and commercial businesses, the sampling process will include misting with water to keep dust levels to a minimum.

3.4 Security:

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

At the end of each work day, the site will be secured with a locked gate and 6 foot chain link fencing.

3.5 Site Communications:

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

4.0 PERSONAL PROTECTIVE EQUIPMENT

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

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

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

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

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

Table 2
LEVEL C PROTECTION

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

*Optional, as applicable.

Table 3
LEVEL B PROTECTION

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

* Optional, as applicable

5.0 PERSONNEL SAFETY/HYGIENE

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

1. If Level B or C protection must be worn, eating, drinking, chewing gum or tobacco, smoking or any practice that increases the probability of hand-to-mouth transfer and ingestion of materials is prohibited in the Exclusion and Contamination Reduction Zones. All workers must be trained, medically qualified and fit tested in the use of respirators.
2. Hands and face must be thoroughly washed before eating, drinking or any other personal hygiene activities.
3. No excessive facial hair, which interferes with a satisfactory fit of the mask to face seal, is allowed for personnel to wear respiratory protective equipment.

6.0 PERSONNEL TRAINING

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

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

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

7.0 DECONTAMINATION PROCEDURES

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

8.0 EMERGENCY CONTINGENCY PLAN

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

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

A. Local Resource

Fire Department: **911**

Police Department: **911**

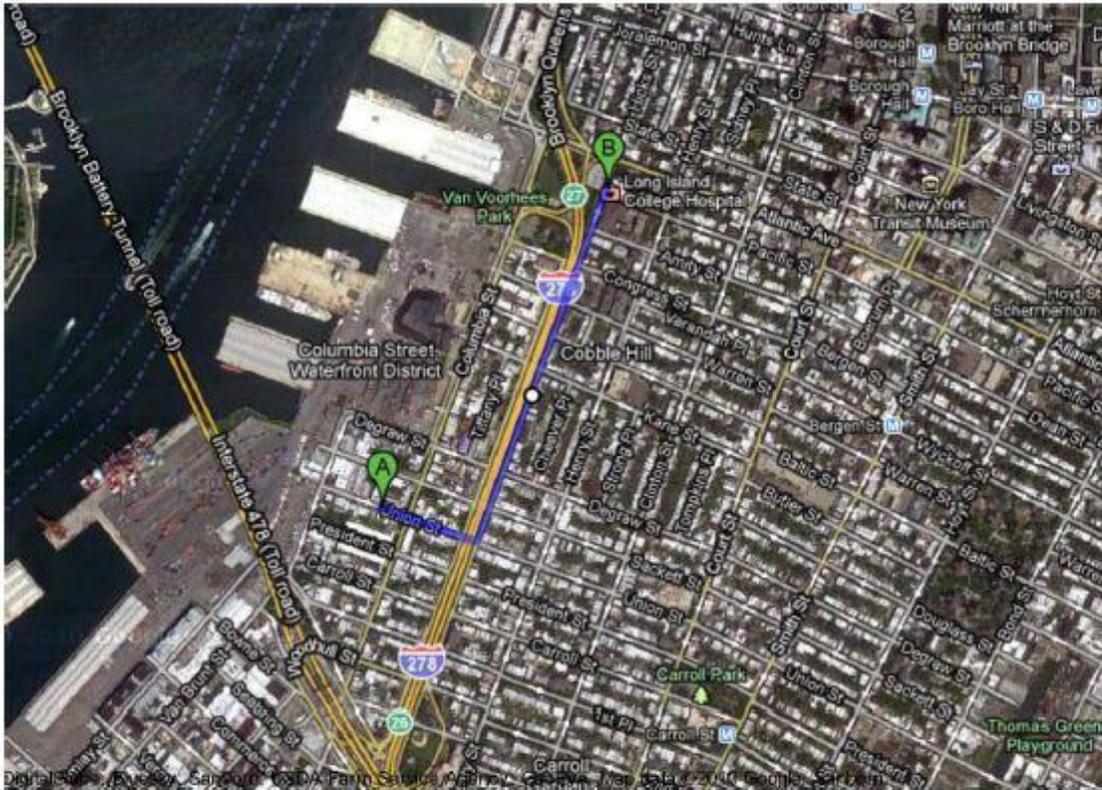
B. Hazardous Waste Spills

New York State Department of Environmental Conservation **1-800-457-7362**

New York City Health, **212-788-5099**

Laurel Environmental Associates, Ltd.: Nights and Weekend Emergencies **516-971-6332**

C. Hospital



Driving directions to Long Island College Hospital of Brooklyn

(718) 780-1000



107 Union St
Brooklyn, NY 11231

1. Head **east** on **Union St** toward **Columbia St**

0.1 mi

2. Take the 2nd left onto **Hicks St**

0.5 mi



Long Island College Hospital of Brooklyn
339 Hicks Street
NY 11201
(718) 780-1000

9.0 HEAT STRESS CASUALTY PREVENTION PLAN

A. Identification and Treatment

1) HEAT EXHAUSTION

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

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

2) HEAT STROKE

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

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

B. Prevention of Heat Stress

- 1) One of the major causes of heat casualties is the depletion of body fluids. On-site there will be plenty of fluids available. Personnel should replace water and salts lost from perspiration. Salts can be replaced by either a 0.1% salt solution, more heavily salted foods, or commercial mixes such as Gatorade®.
- 2) A work schedule will be established so that the majority of the work day will be during the morning hours of the day before ambient air temperature levels reach their highs if high air temperatures are anticipated.
- 3) A work/rest guideline will be implemented for personnel required to wear Level B protection, if this situation arises. This guideline is as follows:

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

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

LOG FOR ALL PERSONNEL ENTERING THE SUBJECT PROPERTY

SITE:

LOCATION:

The undersigned certify that they have read this Health and Safety Plan document, understand it, and will comply with its provisions.

Name (Please Print)	Affiliation	Date	Time
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			

Appendix

Material Data Sheets

**VOLATILE ORGANIC COMPOUNDS
(VOCs)**

Volatile Organic Compounds - VOCs

What are VOCs?

Volatile Organic Compounds (VOCs) are chemicals that evaporate easily at room temperature. The term "organic" indicates that the compounds contain carbon. VOC exposures are often associated with an odor while other times there is no odor. Both can be harmful. There are thousands of different VOCs produced and used in our daily lives. Some examples are:

- Benzene
- Toluene
- Methylene
- Chloride
- Formaldehyde
- Xylene
- Ethylene glycol
- Texanol
- 1,3-butadiene

Where do VOCs come from?

Many products emit or "off-gas" VOCs. Some examples of VOC emission sources are:

- Paints
- Varnishes
- Moth balls
- Solvents
- Gasoline
- Newspaper
- Cooking
- Cleaning Chemicals
- Vinyl floors
- Carpets
- Photocopying
- Upholstery Fabrics
- Adhesives
- Sealing Caulks
- Cosmetics
- Air Fresheners
- Fuel Oil
- Vehicle Exhaust
- Pressed wood furniture
- Environmental Tobacco Smoke (Secondhand smoke)

What levels of VOC are typical in the home?

As of July, 2003 neither Minnesota nor the federal government have set standards for VOC levels in non-occupational settings. However, some guidelines are available. MDH has established Health Risk Values (HRVs) for some contaminants in air for several different exposure situations. For more information on these HRVs go to MDH Health Risk Values Website.

Many studies have shown VOC levels are higher in indoor air than outdoor air. The U.S. Environmental Protection Agency (EPA) Total Exposure Assessment Methodology (TEAM) studies have found indoor VOC levels that were 2 to 5 times higher than outdoors.

Levels of VOC exposure in indoor air vary widely depending on:

- the volume of air in the room/building
- the rate at which the VOC is off-gassed
- the building ventilation rate
- outdoor concentrations

Along with the concentration of VOCs in a given environment, the time an individual spends in that environment is important in determining exposure.

What are the health effects of VOC exposure?

Acute

- Eye irritation / watering
- Nose irritation
- Throat irritation
- Headaches
- Nausea / Vomiting
- Dizziness
- Asthma exacerbation

Chronic

- Cancer
- Liver damage
- Kidney damage
- Central Nervous System damage.



Indoor Air Unit
 P.O. Box 64975
 St. Paul, MN, 55164-0975
 651-201-4601 or 800-798-9050
www.health.state.mn.us/divs/eh/air

Volatile Organic Compounds - VOCs - page 2

Most studies to date have been conducted on single chemicals. Less is known about the health effects of combined chemical exposure. The best health protection measure is to limit your exposure to products and materials that contain VOCs when possible. If you think you may be having health problems caused by VOC exposure consult an occupational/environmental health physician who specializes in this area

Are some people at greater risk from VOC exposure than others?

Persons with respiratory problems such as asthma, young children, elderly, and persons with heightened sensitivity to chemicals may be more susceptible to illness from VOC exposure.

How can I tell what levels of VOC are in my home?

Some home screening kits are available to measure total volatile organic compound (TVOC) levels, and some individual VOCs. These home sampling kits should be viewed as providing "ballpark" amount of VOCs in the indoor air. Conditions such as ventilation, temperature and humidity can cause VOC concentrations to fluctuate daily

Prior to testing conduct an inspection of your home for some common sources of VOCs such as:

- New carpeting
- New furniture
- Idling automobile in attached garage
- Recent painting
- Chemicals stored in the home
- Recently applied adhesives
- New plastic or electronic devices

Once you determine the probable source of VOCs, steps can be taken to reduce your exposure. If you are unable to determine the source, a professional indoor air quality investigator / industrial hygienist can be consulted. MDEH has a service provider list along with recommendations on selection. MDH also has a guidance document that can be used for investigating possible VOC contamination entitled "Indoor Air Sampling at VOC contaminated sites"

How do I reduce the levels of VOCs in my home?

Most products containing VOCs will off-gas within a short period of time although some will continue to give off trace amounts of VOCs for a long period of time. The best means of reducing VOC exposure is to eliminate products containing VOCs or use low emitting VOC products.

Some steps you can take to reduce your exposure to VOC in the home are:

- Source control
 - eliminate products from home that have high levels of VOCs
 - purchase new products that contain low or no VOCs (environmentally preferable purchasing)
- Ventilation - open doors and windows, use fans.
- Control climate - as temperature and humidity increase some chemicals will off gas more.
- Treat the source - airtight sealers can be used to coat over some products. However, caution is advised in choosing the coating product as this could introduce new VOCs into the air while controlling for others.
- Air cleaners - look for ones with activated charcoal filtration designed to remove chemicals from the air.
- Remove unused chemicals from the home. Check with city or county for household hazardous waste collection sites.
- Perform renovations when home is unoccupied.

For more information on VOCs or other Indoor Air Quality Issues Contact:

**The Minnesota Department of Health
Indoor Air Unit**

625 Robert Street North, PO Box 64975

St. Paul, MN 55164-0975

651/201-4601 or 800/798-9050

View the Air Quality web page at:

www.health.state.mn.us/divs/eh/air

To require this document in another form contact:

Call 651/201-4601. TTY: 651/201-5797 or Minnesota Relay Service TTY: 1-800/627-3529.

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**SEMI-VOLATILE ORGANIC COMPOUNDS
(SVOCs)**



U.S. Environmental Protection Agency

Mid-Atlantic Brownfields

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Semi-Volatile Organic Compounds

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This Fact Sheet is presented by the U. S. Environmental Protection Agency, Region III (EPA) to assist in the selection of analytical parameters and the associated Quality Assurance and Quality Control (QA/QC) procedures to be utilized in Phase II Environmental Assessments under the U.S. Environmental Protection Agency (EPA) Brownfields initiative. This fact sheet is presented for informational purposes only, and should not be construed as a federal policy or directive. The Brownfields Coordinator for this region may be reached at 215-814-5000.

A semivolatile organic compound is an organic compound which has a boiling point higher than water and which may vaporize when exposed to temperatures above room temperature. Semivolatile organic compounds include phenols and polynuclear aromatic hydrocarbons (PAH).

LIST OF SEMIVOLATILE ORGANIC COMPOUNDS *

- Phenol
- Bis(2-chloroethyl)ether
- 2-Chlorophenol
- 1,3-Dichlorobenzene
- 1,4-Dichlorobenzene
- 1,2-Dichlorobenzene
- 2-Methylphenol
- Bis(2-chloroisopropyl)ether
- 4-Methylphenol
- n-Nitroso-di-n-propylamine
- Hexachloroethane
- Nitrobenzene
- Isophorone
- 2-Nitrophenol
- 2,4-Dimethylphenol
- Bis(2-chloroethoxy)methane
- 2,4-Dichlorophenol
- 1,2,4-Trichlorobenzene
- Naphthalene
- 4-Chloroaniline
- Hexachlorobutadiene
- 4-Chloro-3-methylphenol
- 2-Methylnaphthalene
- Hexachlorocyclopentadiene
- 2,4,6-Trichlorophenol
- 2,4,5-Trichlorophenol
- 2-Chloronaphthalene
- 2-Nitroaniline
- Dimethylphthalate
- Acenaphthylene
- 2,6-Dinitrotoluene

- 3-Nitroaniline
- Acenaphthene
- 2,4-Dinitrophenol
- 4-Nitrophenol
- 4-Bromophenyl-phenylether
- Hexachlorobenzene
- Pentachlorophenol
- Phenanthrene
- Anthracene
- Carbazole
- Di-n-butylphthalate
- Fluoranthene
- Pyrene
- Butylbenzylphthalate
- 3,3'-Dichlorobenzidine
- Benzo(a)anthracene
- Chrysene
- Bis(2-ethylhexyl)phthalate
- Di-n-octylphthalate
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Benzo(a)pyrene
- Indeno(1,2,3-cd)pyrene
- Dibenz(a,h)anthracene
- Benzo(g,h,i)perylene

* Please note: The list above corresponds to the EPA Contract Laboratory Program (CLP) semivolatile organic list, and is not a complete list of all toxic semivolatile organic compounds. If the site history suggests a semivolatile organic compound may be present which is not on this list, the compound should be included in the requested analysis.

ANALYSIS METHODS

Please note that the methods listed below are EPA approved and the most commonly used by EPA and their contractors. However, they are not the only methods for the analysis of semivolatile organic compounds. In addition, these are not drinking water test methods.

METHOD	APPLICABLE MATRICES
EPA 625 or 1625 (1)	Aqueous
EPA SW-846 3010 or 3020/8250 or 8270 (2)	Aqueous
EPA SW-846 3500 or 3550/8250 or 8270 (2)	Soil/Sediment & Waste
EPA CLP Statement of Work 3/90	Aqueous & Soil/Sediment
EPA SW-846 8100 or 8310 (2) 610 (1)	Water and Soil/Sediment for PAH
EPA SW-846 8040 (2) or 604 (1)	Water and Soil/Sediment for Phenols

1. U.S. Environmental Protection Agency (EPA). 1992. *Test Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater*. Washington, D.C. July.
2. EPA. 1986. *Test Methods for Evaluating Solid Waste*. SW-846. Washington, D.C. September.

COLLECTION MEDIA/VOLUME

Listed below are the EPA-recommended preservation and holding times as well as suggested glassware.

MATRIX	GLASSWARE	VOLUME	PRESERVATIVE	HOLDING TIME
Soil/Sediment	8-oz wide mouthed jar	1 8-oz jar	ice to 4° C	14 days
Aqueous	32-oz amber bottle	2 amber bottles	ice to 4° C	7 days
Waste	8-oz wide mouth jar	1 8-oz jar	none required (ice preferred)	none (try not to exceed 14 days)

MINIMUM LABORATORY QUALITY CONTROL MEASURES

The laboratory should have Standard Operating Procedures available for review for the semivolatile organic compound analyses and for all associated methods needed to complete the semivolatile analysis, such as total solids, instrument maintenance, sample handling, and sample documentation procedures. In addition, the laboratory should have a Laboratory Quality Assurance/Quality Control Statement available for review which includes all key personnel qualifications.

QC TYPE	FREQUENCY OF ANALYSIS	ACCEPTABLE LIMITS
Gas Chromatograph/Mass Spectrometer (GC/MS) Tuning	Once per day or more frequently if required by method	See method criteria for acceptable limits
Initial Calibration	Prior to analysis of samples (minimum three concentration levels for every compound and an instrument blank)	% Relative Standard Deviation of Response Factors of ≤ 30 (see method for any allowable variations), and a minimum Response Factor of ≥ 0.05 (see method for calculation)
Continuing Calibration	Once per day (mid-level standard containing all compounds) or more frequently if required by method	% Difference for Response Factor of ≤ 25 (see method for any allowable variations), and a minimum Response Factor of ≥ 0.05 (see method for calculation)
Method Blank	Once per extraction batch	See method for allowable limits
Internal Standards	Six per sample (see method for suggested internal standard compounds)	-50% to + 100% of Daily standard area and retention time shift (limits depend if packed or capillary column, see method)

Matrix Spike/Matrix Spike Duplicate	One set of MS/MSD per 20 samples or analysis set	See method for allowable limits
Surrogate Spikes	Added to each sample (see method for suggested surrogate compounds)	Report recovery

MINIMUM DATA PACKAGE REQUIREMENTS

- Sample results in a tabular form (if soil or sediment) reported on a dry weight basis.
- Report % moisture or % solids for all soil and sediment samples.
- Report sample volumes or weights, as well as any dilution factors, for each sample analysis.
- Return copy of the chain of custody form sent with the samples with laboratory receipt acknowledgment, and the internal or laboratory chain of custody forms.
- Method blank results.
- GC/MS tuning data summary.
- GC/MS initial and continuing calibration data summary forms.
- GC/MS internal standard data for samples and associated daily standard.
- Surrogate spike recoveries, either on a separate table or with the results, including laboratory QC limits.
- Matrix spike recovery tables, including laboratory recovery and relative percent difference QC limits.
- Date samples were analyzed, on a separate sheet, tune sheet, or results page.
- Optional: sample, standard and blank chromatograms, quantitation sheets, mass spectra, instrument run logs, and total solids logs.

Note: The optional QC must be maintained by laboratory for at least one year for possible future QC audits.

[[Region 3 HSCD](#) | [Region 3](#) | [EPA Superfund](#)]

United States Environmental Protection Agency, 1650 Arch Street, Philadelphia, PA 19103-2029
Phone: (800) 438-2474

[EPA Home](#) | [Privacy and Security Notice](#) | [Contact Us](#)

Last updated on Wednesday, September 28th, 2005
URL: <http://www.epa.gov/reg3hwmd/bfs/regional/analytical/semi-volatile.htm>

This fact sheet answers the most frequently asked health questions (FAQs) about polycyclic aromatic hydrocarbons (PAHs). For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

What are polycyclic aromatic hydrocarbons?

(Pronounced pōl'i-sī/klik ār'e-māt'ik hi'dre-kar/benz)

Polycyclic aromatic hydrocarbons (PAHs) are a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat. PAHs are usually found as a mixture containing two or more of these compounds, such as soot.

Some PAHs are manufactured. These pure PAHs usually exist as colorless, white, or pale yellow-green solids. PAHs are found in coal tar, crude oil, creosote, and roofing tar, but a few are used in medicines or to make dyes, plastics, and pesticides.

What happens to PAHs when they enter the environment?

- PAHs enter the air mostly as releases from volcanoes, forest fires, burning coal, and automobile exhaust.
- PAHs can occur in air attached to dust particles.
- Some PAH particles can readily evaporate into the air from soil or surface waters.
- PAHs can break down by reacting with sunlight and other chemicals in the air, over a period of days to weeks.

- PAHs enter water through discharges from industrial and wastewater treatment plants.
- Most PAHs do not dissolve easily in water. They stick to solid particles and settle to the bottoms of lakes or rivers.
- Microorganisms can break down PAHs in soil or water after a period of weeks to months.
- In soils, PAHs are most likely to stick tightly to particles; certain PAHs move through soil to contaminate underground water.
- PAH contents of plants and animals may be much higher than PAH contents of soil or water in which they live.

How might I be exposed to PAHs?

- Breathing air containing PAHs in the workplace of coking, coal-tar, and asphalt production plants; smoke-houses; and municipal trash incineration facilities.
- Breathing air containing PAHs from cigarette smoke, wood smoke, vehicle exhausts, asphalt roads, or agricultural burn smokes.
- Coming in contact with air, water, or soil near hazardous waste sites.
- Eating grilled or charred meats; contaminated cereals, flour, bread, vegetables, fruits, meats; and processed or pickled foods.
- Drinking contaminated water or cow's milk.



Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08855



24 Hour Emergency Telephone: 908-852-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-8886

Outside U.S. And Canada
Chemtrec: 703-527-3887

THIS INFORMATION IS NOT TO BE USED FOR THE
PURPOSE OF DETERMINING THE TOXICITY OF
A PRODUCT OR THE TOXICITY OF A SUBSTANCE
OR FOR THE PURPOSE OF DETERMINING THE
TOXICITY OF A SUBSTANCE OR FOR THE PURPOSE
OF DETERMINING THE TOXICITY OF A SUBSTANCE

All non-emergency questions should be directed to Customer Service (1-800-562-2537) for assistance.

ANTHRACENE

1. Product Identification

Synonyms: Paranaphthalene; Green Oil; Anthracene 90-95%
CAS No.: 120-12-7
Molecular Weight: 178.23
Chemical Formula: (C₆H₄CH)₂
Product Codes: B490

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	H
Anthracene	120-12-7	99 - 100%	

3. Hazards Identification

Emergency Overview

WARNING! MAY CAUSE IRRITATION TO SKIN, EYES, AND

unconscious person. Get medical attention.

Skin Contact:

Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists.

Eye Contact:

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Call a physician if irritation persists.

5. Fire Fighting Measures

Fire:

Flash point: 121C (250F) CC

Low fire hazard when exposed to heat or flames.

Explosion:

Above the flash point, explosive vapor-air mixtures may be formed. Will burst into flame on contact with chromic acid.

Fire Extinguishing Media:

Water spray, dry chemical, alcohol foam, or carbon dioxide.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

Material Safety Data Sheet

Pyrene, 98+%(gc)

ACC# 27452

Section 1 - Chemical Product and Company Identification

MSDS Name: Pyrene, 98+%(gc)

Catalog Numbers: AC180830000, AC180830250, AC180831000, AC180832500

Synonyms: Benzo[def]phenanthrene

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
129-00-0	Pyrene, ca	96.0	204-927-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow powder.

Danger! Cancer hazard. May be fatal if inhaled. Causes respiratory tract irritation. May be harmful if swallowed. Causes skin irritation. May cause eye irritation. May cause cancer based on animal studies. The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: Causes skin irritation. Prolonged and/or repeated contact may cause irritation and/or dermatitis. Dermal applications may cause hyperemia (an excess of blood in a part), weight loss, and hematopoietic changes.

Ingestion: May cause digestive tract disturbances. The toxicological properties of this substance have not been fully investigated. May be harmful if swallowed.

Inhalation: May be fatal if inhaled. Causes respiratory tract irritation. Inhalation of dust may cause respiratory tract irritation.

Chronic: May cause cancer according to animal studies. Chronic effects may include leukocytosis and lengthened chronaxy of the leg muscle flexors.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Pyrene, ca	0.2 mg/m ³ TWA (as benzene soluble aerosol) (listed under Coal tar pitches).	0.1 mg/m ³ TWA (cyclohexane-extractable fraction) (listed under Coal tar pitches). 80 mg/m ³ IDLH (listed under Coal tar pitches).	0.2 mg/m ³ TWA (as benzene soluble fraction) (listed under Coal tar pitches).

OSHA Vacated PELs: Pyrene, ca: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: yellow

Odor: None reported.

pH: Not available.

Vapor Pressure: < 1 mm Hg @20C

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 404 deg C @ 760.00mmHg

Freezing/Melting Point: 156 deg C

Decomposition Temperature: Not available.

Solubility: 1.271

Specific Gravity/Density: Not available.

Molecular Formula: C₁₆H₁₀

Molecular Weight: 202.25

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Physical: No information available.

Other: Reported BCF: rainbow trout, 72; goldfish, 457; fathead minnow, 600-970. Based on these values, minimal to moderate bioconcentration of pyrene in aquatic organisms would be expected.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	DOT regulated - small quantity provisions apply (see 49CFR173.4)	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 129-00-0 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 129-00-0: Effective 6/1/87, Sunset 6/1/97

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 129-00-0: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

CAS# 129-00-0: 1000 lb TPQ (lower threshold); 10000 lb TPQ (upper threshold)

SARA Codes

CAS # 129-00-0: acute, chronic.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

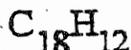
International Chemical Safety Cards

BENZ(a)ANTHRACENE

ICSC: 0385

BENZ(a)ANTHRACENE

1,2-Benzoanthracene
Benzo(a)anthracene
2,3-Benzphenanthrene
Naphthanthracene



Molecular mass: 228.3

CAS # 56-55-3

RTECS # CV9275000

ICSC # 0385

EC # 601-033-00-9

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.		Water spray, powder. In case of fire in the surroundings: all extinguishing agents allowed.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		AVOID ALL CONTACT!	
• INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
• SKIN		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
• EYES		Safety goggles, face shield, or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• INGESTION		Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth.
SPILLAGE DISPOSAL		STORAGE	PACKAGING & LABELLING

ENVIRONMENTAL DATA	In the food chain important to humans, bioaccumulation takes place, specifically in seafood.
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NOTES

This substance is one of many polycyclic aromatic hydrocarbons - standards are usually established for them as mixtures, e.g., coal tar pitch volatiles. However, it may be encountered as a laboratory chemical in its pure form. Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken. Do NOT take working clothes home. Tetraphene is a common name.

ADDITIONAL INFORMATION

ICSC: 0385

BENZ(a)ANTHRACENE

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**IMPORTANT
LEGAL
NOTICE:**

Neither the CEC or the IPCS nor any person acting on behalf of the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: ; Flammability: 1; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash hands before eating. Avoid contact with eyes, skin, and clothing. Use only with adequate ventilation. Avoid breathing dust.

Storage: Store in a tightly closed container. Store in a cool, dry area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Conditions to Avoid: Dust generation.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 218-01-9: GC0700000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 218-01-9:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans
- **California:** carcinogen, initial date 1/1/90
- **NTP:** Suspect carcinogen (listed as Polycyclic aromatic hydrocarbons).
- **IARC:** Group 1 carcinogen (listed as Coal tar pitches).

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Neurotoxicity: No information available.

Mutagenicity: Chrysene was mutagenic to *S. Typhimurium* in the presence of an exogenous metabolic system.

Other Studies: Genotoxicity : *Salmonella typhimurium* TA97,TA98,TA100 with metabolic activation positive (Sakai.M.et al *Mutat.Res*1985); *Saccharomyces cerevisiae* (Miotic recombination) D3 strain 330mg/kg negative.

Section 12 - Ecological Information

Ecotoxicity: Water flea LC50 = 1.9 mg/L; 2 Hr.; Unspecified Fish toxicity : LC50 (96hr) *Neaethes arenacedentata* >1ppm.(Rossi,S.S. et al *Marine Pollut. Bull.* 1978)

Invertebrate toxicity : lethal treshold concentration (24hr) *Daphnia Magna* 0,7æg/l.(* Newsted,J.L. et al *Environ. Toxicol. Chem.* 1987) Bioaccumulation : 24hr *Daphnia Magna* log bioconcentration factor 3.7845 (*)

Environmental: Degradation studies : biodegraded by white rot fungus (Proc.Annu.Meet.Am.Wood-Preserv.Assoc.1989) May be utilised by axenic cultures of microorganisms e.g. *Pseudomonas pancimobilis* EPA505, which may have novel degradative systems(Mueller,J.G. et al *ppl.Environ.Microbiol.*1990; Mueller, J.G. et al *Environ.Sci.Technol.*1991).

Physical: Not found.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. CAS# 218-01-9 is listed as a Priority Pollutant under the Clean Water Act.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 218-01-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Chrysene, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: CAS# 218-01-9: 0.35 µg/day NSRL (oral).

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

T

Risk Phrases:

R 45 May cause cancer.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 53 Avoid exposure - obtain special instructions before use.

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions/safety data sheets.

WGK (Water Danger/Protection)

CAS# 218-01-9: No information available.

Canada - DSL/NDSL

CAS# 218-01-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

Canadian Ingredient Disclosure List

CAS# 218-01-9 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

Material Safety Data Sheet

Benzo[a]pyrene, 98%

ACC# 37175

Section 1 - Chemical Product and Company Identification

MSDS Name: Benzo[a]pyrene, 98%

Catalog Numbers: AC105600000, AC105600010, AC105601000, AC377200000, AC377200010, AC377201000 AC377201000

Synonyms: 3,4-Benzopyrene; 3,4-Benzpyrene; Benzo[def]chrysene.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
50-32-8	Benzo[a]pyrene	>96	200-028-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow to brown powder.

Danger! May cause heritable genetic damage. Cancer hazard. May cause harm to the unborn child. May impair fertility. May cause eye, skin, and respiratory tract irritation. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Target Organs: Reproductive system.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated. May be harmful if inhaled.

Chronic: May cause cancer in humans. May cause reproductive and fetal effects. Laboratory experiments have resulted in mutagenic effects.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Benzo[a]pyrene	0.2 mg/m ³ TWA (as benzene soluble aerosol) (listed under Coal tar pitches).	0.1 mg/m ³ TWA (cyclohexane-extractable fraction) (listed under Coal tar pitches). 80 mg/m ³ IDLH (listed under Coal tar pitches).	0.2 mg/m ³ TWA (as benzene soluble fraction) (listed under Coal tar pitches).

OSHA Vacated PELs: Benzo[a]pyrene: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: yellow to brown

Odor: faint aromatic odor

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 495 deg C @ 760 mm Hg

Freezing/Melting Point: 175 - 179 deg C

Decomposition Temperature: Not available.

Solubility: 1.60x10⁻³ mg/l @25°C

Specific Gravity/Density: Not available.

Molecular Formula: C₂₀H₁₂

Molecular Weight: 252.31

RCRA U-Series:

CAS# 50-32-8: waste number U022.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOL (Benzo{a} pyrene)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOL (Benzo{a} pyrene)
Hazard Class:	9	9
UN Number:	UN3077	UN3077
Packing Group:	III	III

Section 15 - Regulatory Information**US FEDERAL****TSCA**

CAS# 50-32-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 50-32-8: 1 lb final RQ; 0.454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 50-32-8: acute, chronic.

Section 313

This material contains Benzo[a]pyrene (CAS# 50-32-8, >96%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. CAS# 50-32-8 is listed as a Priority Pollutant under the Clean Water Act.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 50-32-8 can be found on the following state right to know lists: California,

shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. MAY CAUSE ALLERGIC SKIN REACTION. MAY AFFECT LIVER, KIDNEY, BLOOD AND CENTRAL NERVOUS SYSTEM. COMBUSTIBLE.

J.T. Baker SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate
Flammability Rating: 2 - Moderate
Reactivity Rating: 0 - None
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT
Storage Color Code: Red (Flammable)

Potential Health Effects

Inhalation:

Inhalation of dust or vapors can cause headache, nausea, vomiting, extensive sweating, and disorientation. The predominant reaction is delayed intravascular hemolysis with symptoms of anemia, fever, jaundice, and kidney or liver damage.

Ingestion:

Toxic. Can cause headache, profuse perspiration, listlessness, dark urine, nausea, vomiting and disorientation. Intravascular hemolysis may also occur with symptoms similar to those noted for inhalation. Severe cases may produce coma with or without convulsions. Death may result from renal failure.

Skin Contact:

Can irritate the skin and, on prolonged contact, may cause rashes and allergy. "Sensitized" individuals may suffer a severe dermatitis.

Eye Contact:

Vapors and solid causes irritation, redness and pain. Very high exposures can damage the nerves of the eye.

Chronic Exposure:

Has led to cataract formation in eyes. May cause skin allergy.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin, blood or vascular disorders or impaired respiratory function may be more susceptible to the effects of the substance. Particularly susceptible individuals are found in the general population, most commonly in dark skinned races.

manner that does not disperse dust into the air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from any source of heat or ignition. Keep away from moisture and oxidizers. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

- OSHA Permissible Exposure Limit (PEL):
10 ppm, 50 mg/m³.

- ACGIH Threshold Limit Value (TLV):

TWA= 10 ppm, 52 mg/m³

STEL= 15 ppm, 79 mg/m³.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded, a half-face respirator with an organic vapor cartridge and particulate filter (NIOSH type P95 or R95 filter) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece respirator with an organic vapor cartridge and particulate filter (NIOSH P100 or R100 filter) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. Please note that N series filters are not recommended for this material. For emergencies or instances where the exposure levels are not known, use

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Strong oxidizers, strong alkalis and strong mineral acids, mixtures of aluminum trichloride and benzoyl chloride. Reacts violently with chromic anhydride. Melted naphthalene will attack some forms of plastics, rubber, and coatings.

Conditions to Avoid:

Avoid heat, sparks, flames and other ignition sources and incompatibles.

11. Toxicological Information

Oral rat LD50: 490 mg/kg;

Inhalation rat LC50: 340 mg/m³, 1 hour;

Skin rabbit LD50: > 20 g/kg;

Irritation data: skin (open Draize) rabbit 495 mg, mild; eye (standard Draize) rabbit 100 mg, mild;

Investigated as a tumorigen, mutagen and reproductive effector.

----- \Cancer Lists \

Ingredient	---NTP Carcinogen---		IARC Categ
	Known	Anticipated	
Naphthalene (91-20-3)	No	No	None

12. Ecological Information

Environmental Fate:

When released into the soil, this material may biodegrade to a moderate extent.

When released into the soil, this material is expected to leach into groundwater.

When released into the soil, this material is expected to quickly evaporate. When

released to water, this material is expected to quickly evaporate. When released into

water, this material may biodegrade to a moderate extent. When released into the

water, this material is expected to have a half-life between 1 and 10 days. This

material may bioaccumulate to some extent. When released into the air, this material

is expected to be readily degraded by reaction with photochemically produced

hydroxyl radicals. When released into the air, this material is expected to have a half-

life of less than 1 day.

Environmental Toxicity:

No information found.

Ingredient	Korea	--Canada--		Phil.
		DSL	NDSL	
Naphthalene (91-20-3)	Yes	Yes	No	Yes

-----\Federal, State & International Regulations - Part 1\-----

Ingredient	-SARA 302-		-SARA 313-	
	RQ	TPQ	List	Chemical C
Naphthalene (91-20-3)	No	No	Yes	No

-----\Federal, State & International Regulations - Part 2\-----

Ingredient	CERCLA	-RCRA-	-TSCA-
		261.33	8(d)
Naphthalene (91-20-3)	100	U165	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
Reactivity: No (Pure / Solid)

Australian Hazchem Code: 2Z
Poison Schedule: S6
WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 2 Flammability: 2 Reactivity: 0

Label Hazard Warning:

WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. MAY CAUSE ALLERGIC SKIN REACTION. MAY AFFECT LIVER, KIDNEY, BLOOD AND CENTRAL NERVOUS SYSTEM. COMBUSTIBLE.

Label Precautions:

- Avoid contact with eyes, skin and clothing.
- Avoid prolonged or repeated contact with skin.
- Avoid breathing dust.
- Avoid breathing vapor.
- Keep container closed.
- Use only with adequate ventilation.
- Wash thoroughly after handling.

This information was last updated on July 15, 2004. We have tried to make it as accurate and useful as possible, but can take no responsibility for its use, misuse, or accuracy. We have not verified this information, and cannot guarantee that it is up-to-date.

given here.)

ORL-RAT LDLO 1500 mg kg⁻¹

IPR-RAT LDLO 250 mg kg⁻¹

ITR-RAT LDLO 25 mg kg⁻¹

IPR-MUS LDLO 100 mg kg⁻¹

Transport information

(The meaning of any UN hazard codes which appear in this section is given here.)

Hazard class 4.1. Packing group III. UN No 1325.

Personal protection

Safety glasses and gloves. Good ventilation and an inert atmosphere if working with powdered material.

[[Return to Physical & Theoretical Chemistry Lab. Safety home page.](#)]

This information was last updated on September 17, 2003. We have tried to make it as accurate and useful as possible, but can take no responsibility for its use, misuse, or accuracy. We have not verified this information, and cannot guarantee that it is up-to-date.

given here.)

IPR-MUS LD50 3.5 mg kg⁻¹

Risk phrases

(The meaning of any risk phrases which appear in this section is given here.)

R11 R36 R37 R38 (all for the powdered material only).

Transport information

(The meaning of any UN hazard codes which appear in this section is given here.)

UN Nos: 3089 (very fine powder), 3077 (fine powder); otherwise considered non-hazardous for air, sea and road freight.

Personal protection

Suitable ventilation if handling powder.

[Return to [Physical & Theoretical Chemistry Lab. Safety home page.](#)]

This information was last updated on November 16, 2004. Although we have tried to make it as accurate and useful as possible, we can take no responsibility for its use or misuse.

spontaneously. May react violently with titanium, ammo nium nitrate, potassium perchlorate, hydrazoic acid. Incompatible with acids, oxidizing agents, sulfur.

Toxicology

Carcinogen. Toxic by all routes of entry. May cause sensitization by skin contact. Typical TLV 0.05 mg/m³

Toxicity data

(The meaning of any toxicological abbreviations which appear in this section is given here.)

IPR-RAT LD50 250 mg kg⁻¹

Risk phrases

(The meaning of any risk phrases which appear in this section is given here.)

R10 R17 R36 R37 R38 R40 R42 R43.

Transport information

(The meaning of any UN hazard codes which appear in this section is given here.)

UN No 3089. Packing group II. Hazard class 4.1.

Personal protection

Good ventilation. Wear gloves and safety glasses when handling the powder.

Safety phrases

(The meaning of any safety phrases which appear in this section is given here.)

S16 S22 S26 S36.

PESTICIDES AND PCBs



Health & Safety
Specific Chemicals
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Assessing Health Risks from Pesticides

January 1999
735-F-99-002

The Federal Government, in cooperation with the States, carefully regulates pesticides to ensure that they do not pose unreasonable risks to human health or the environment. As part of that effort, the Environmental Protection Agency (EPA) requires extensive test data from pesticide producers that demonstrate pesticide products can be used without posing harm to human health and the environment. EPA scientists and analysts carefully review these data to determine whether to register (license) a pesticide product or a use and whether specific restrictions are necessary. This fact sheet is a brief overview of EPA's process for assessing potential risks to human health when evaluating pesticide products.

Background

There are more than 865 active ingredients registered as pesticides, which are formulated into thousands of pesticide products that are available in the marketplace. About 350 pesticides are used on the foods we eat, and to protect our homes and pets.

EPA plays a critical role in evaluating these chemicals prior to registration, and in reevaluating older pesticides already on the market, to ensure that they can be used with a reasonable certainty of no harm. The process EPA uses for evaluating the health impacts of a pesticide is called risk assessment.

EPA uses the National Research Council's four-step process for human health risk assessment:

- Step One: Hazard Identification
- Step Two: Dose-Response Assessment
- Step Three: Exposure Assessment
- Step Four: Risk Characterization

Step One: Hazard Identification (Toxicology)

The first step in the risk assessment process is to identify potential health effects that may occur from different types of pesticide exposure. EPA considers the full spectrum of a pesticide's potential health effects.

Generally, for human health risk assessments, many toxicity studies are conducted on animals by pesticide companies in independent laboratories and evaluated for acceptability by EPA scientists. EPA evaluates pesticides for a wide range of adverse effects, from eye and skin irritation to cancer and birth defects in laboratory animals. EPA may also consult the public literature or other sources of supporting information on any aspect of the chemical.

Step Two: Dose-Response Assessment

Paracelsus, the Swiss physician and alchemist, the "father" of modern toxicology (1493-1541) said,

"The dose makes the poison."

In other words, the amount of a substance a person is exposed to is as important as how toxic the chemical might be. For example, small doses of aspirin can be beneficial to people, but at very high doses, this common medicine can be deadly. In some individuals, even at very low doses, aspirin may be deadly.

Dose-response assessment involves considering the dose levels at which adverse effects were observed in test animals, and using these dose levels to calculate an equal dose in humans.

Step Three: Exposure Assessment

People can be exposed to pesticides in three ways:

1. Inhaling pesticides (inhalation exposure),
2. Absorbing pesticides through the skin (dermal exposure), and
3. Getting pesticides in their mouth or digestive tract (oral exposure).

Depending on the situation, pesticides could enter the body by any one or all of these routes. Typical sources of pesticide exposure include:

- **Food**
Most of the foods we eat have been grown with the use of pesticides. Therefore, pesticide residues may be present inside or on the surfaces of these foods.
- **Home and Personal Use Pesticides**
You might use pesticides in and around your home to control insects.

Step Two: Dose-Response Assessment

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Step Three: Exposure Assessment

People can be exposed to pesticides in three ways:

considered, and broad conclusions are made. EPA's role is to evaluate both toxicity and exposure and to determine the risk associated with use of the pesticide.

Simply put,

$$\text{RISK} = \text{TOXICITY} \times \text{EXPOSURE}.$$

This means that the risk to human health from pesticide exposure depends on both the toxicity of the pesticide and the likelihood of people coming into contact with it. At least *some* exposure and *some* toxicity are required to result in a risk. For example, if the pesticide is very poisonous, but no people are exposed, there is no risk. Likewise, if there is ample exposure but the chemical is non-toxic, there is no risk. However, usually when pesticides are used, there is some toxicity and exposure, which results in a potential risk.

EPA recognizes that effects vary between animals of different species and from person to person. To account for this variability, *uncertainty factors* are built into the risk assessment. These uncertainty factors create an additional margin of safety for protecting people who may be exposed to the pesticides. FQPA requires EPA to use an extra 10-fold safety factor, if necessary, to protect infants and children from effects of the pesticide.

Types of Toxicity Tests EPA Requires for Human Health Risk Assessments

EPA evaluates studies conducted over different periods of time and that measure specific types of effects. These tests are evaluated to screen for potential health effects in infants, children and adults.

Acute Testing: Short-term exposure; a single exposure (dose).

- Oral, dermal (skin), and inhalation exposure
- Eye irritation
- Skin irritation
- Skin sensitization
- Neurotoxicity

Sub-chronic Testing: Intermediate exposure; repeated exposure over a longer period of time (i.e., 30-90 days).

- Oral, dermal (skin), and inhalation
- Neurotoxicity (nerve system damage)

Chronic Toxicity Testing: Long-term exposure; repeated exposure lasting for most of the test animal's life span. Intended to determine the effects of a pesticide after prolonged and repeated exposures.

- Chronic effects (non-cancer)
- Carcinogenicity (cancer)

Developmental and Reproductive Testing: Identify effects in the fetus of an exposed pregnant female (birth defects) and how pesticide exposure affects the ability of a test animal to successfully reproduce.

Mutagenicity Testing: Assess a pesticide's potential to affect the cell's genetic components.

Hormone Disruption: Measure effects for their potential to disrupt the endocrine system. The endocrine system consists of a set of glands and the hormones they produce that help guide the development, growth, reproduction, and behavior of animals including humans.

Risk Management

Once EPA completes the risk assessment process for a pesticide, we use this information to determine if (when used according to label directions), there is a reasonable certainty that the pesticide will not harm a person's health.

Using the conclusions of a risk assessment, EPA can then make a more informed decision regarding whether to approve a pesticide chemical or use, as proposed, or whether additional protective measures are necessary to limit occupational or non-occupational exposure to a pesticide. For example, EPA may prohibit a pesticide from being used on certain crops because consuming too much food treated with the pesticide may result in an unacceptable risk to consumers. Another example of protective measures is requiring workers to wear personal protective equipment (PPE) such as a respirator or chemical resistant gloves, or not allowing workers to enter treated crop fields until a specific period of time has passed.

If, after considering all appropriate risk reduction measures, the pesticide still does not meet EPA's safety standard, the Agency will not allow the proposed chemical or use. Regardless of the specific measures enforced, EPA's primary goal is to ensure that legal uses of the pesticide are protective of human health, especially the health of children, and the environment.

Human Health Risk Assessment and the Law

Federal law requires detailed evaluation of pesticides to protect human health and the environment. In 1996, Congress made significant changes to strengthen pesticide laws through the Food Quality Protection Act (FQPA). Many of these changes are key elements of the current risk assessment process. FQPA required that EPA consider:

- **A New Safety Standard:** FQPA strengthened the safety standard that pesticides must meet before being approved for use. EPA must ensure with a reasonable certainty that no harm will result from the legal uses of the pesticide.
- **Exposure from All Sources:** In evaluating a pesticide, EPA must estimate the combined risk from that pesticide from all non-occupational sources, such as:
 - Food Sources
 - Drinking Water Sources
 - Residential Sources
- **Cumulative Risk:** EPA is required to evaluate pesticides in light of similar toxic effects that different pesticides may share, or "a common mechanism of toxicity." At this time, EPA is developing a methodology for this type of assessment.
- **Special Sensitivity of Children to Pesticides:** EPA must ascertain whether there is an increased susceptibility from exposure to the pesticide to infants and children. EPA must build an additional 10-fold safety factor into risk assessments to ensure the protection of infants and children, unless it is determined that a lesser margin of safety will be safe for infants and children.

For More Information

If you would like more information about EPA's pesticide programs, contact the Communication Service Branch at (703) 305-5017 or visit the [Pesticides Web site](#).

For more information on specific pesticides, or to inquire about the symptoms of pesticide poisoning, call the National Pesticide Information Center (NPIC), a toll-free hotline information at: 1-800-858-7378, or visit their [Web site](#) [EPA Disclaimer](#).

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Last updated on Monday, May 19th, 2003
URL: <http://www.epa.gov/pesticides/factsheets/riskassess.htm>

What is a Pesticide?

A pesticide is any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest. Pests can be insects, mice and other animals, unwanted plants (weeds), fungi, or microorganisms like bacteria and viruses. Though often misunderstood to refer only to *insecticides*, the term pesticide also applies to herbicides, fungicides, and various other substances used to control pests. Under United States law, a pesticide is also any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant.

Many household products are pesticides. Did you know that all of these common products are considered pesticides?

- Cockroach sprays and baits
- Insect repellents for personal use.
- Rat and other rodent poisons.
- Flea and tick sprays, powders, and pet collars.
- Kitchen, laundry, and bath disinfectants and sanitizers.
- Products that kill mold and mildew.
- Some lawn and garden products, such as weed killers.
- Some swimming pool chemicals.

By their very nature, most pesticides create some risk of harm to humans, animals, or the environment because they are designed to kill or otherwise adversely affect living organisms. At the same time, pesticides are useful to society because of their ability to kill potential disease-causing organisms and control insects, weeds, and other pests. In the United States, the Office of Pesticide Programs of the Environmental Protection Agency is chiefly responsible for regulating pesticides. Biologically-based pesticides, such as pheromones and microbial pesticides, are becoming increasingly popular and often are safer than traditional chemical pesticides.

Here are some common kinds of pesticides and their function:

Algicides

Control algae in lakes, canals, swimming pools, water tanks, and other sites.

Antifouling agents

Kill or repel organisms that attach to underwater surfaces, such as boat bottoms.

Antimicrobials

Kill microorganisms (such as bacteria and viruses).

Attractants

Attract pests (for example, to lure an insect or rodent to a trap). (However, food is not considered a pesticide when used as an attractant.)

Biocides

Kill microorganisms.

Disinfectants and sanitizers

Kill or inactivate disease-producing microorganisms on inanimate objects.

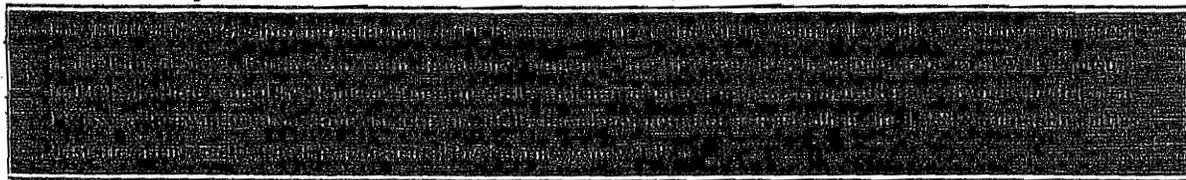
Fungicides

Kill fungi (including blights, mildews, molds, and rusts).

Fumigants

Produce gas or vapor intended to destroy pests in buildings or soil.

This fact sheet answers the most frequently asked health questions (FAQs) about polychlorinated biphenyls. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.



What are polychlorinated biphenyls?

Polychlorinated biphenyls are mixtures of up to 209 individual chlorinated compounds (known as congeners). There are no known natural sources of PCBs. PCBs are either oily liquids or solids that are colorless to light yellow. Some PCBs can exist as a vapor in air. PCBs have no known smell or taste. Many commercial PCB mixtures are known in the U.S. by the trade name Aroclor.

PCBs have been used as coolants and lubricants in transformers, capacitors, and other electrical equipment because they don't burn easily and are good insulators. The manufacture of PCBs was stopped in the U.S. in 1977 because of evidence they build up in the environment and can cause harmful health effects. Products made before 1977 that may contain PCBs include old fluorescent lighting fixtures and electrical devices containing PCB capacitors, and old microscope and hydraulic oils.

What happens to PCBs when they enter the environment?

- PCBs entered the air, water, and soil during their manufacture, use, and disposal; from accidental spills and leaks during their transport; and from leaks or fires in products containing PCBs.
- PCBs can still be released to the environment from hazardous waste sites; illegal or improper disposal of industrial wastes and consumer products; leaks from old electrical transformers containing PCBs; and burning of some wastes in incinerators.
- PCBs do not readily break down in the environment and thus may remain there for very long periods of time. PCBs can travel long distances in the air and be deposited in areas far away from where they were released. In water, a small amount of PCBs may remain dissolved, but most stick to organic particles and bottom sediments. PCBs also bind strongly to soil.
- PCBs are taken up by small organisms and fish in water. They are also taken up by other animals that eat these

aquatic animals as food. PCBs accumulate in fish and marine mammals, reaching levels that may be many thousands of times higher than in water.

How might I be exposed to PCBs?

- Using old fluorescent lighting fixtures and electrical devices and appliances, such as television sets and refrigerators, that were made 30 or more years ago. These items may leak small amounts of PCBs into the air when they get hot during operation, and could be a source of skin exposure.
- Eating contaminated food. The main dietary sources of PCBs are fish (especially sportfish caught in contaminated lakes or rivers), meat, and dairy products.
- Breathing air near hazardous waste sites and drinking contaminated well water.
- In the workplace during repair and maintenance of PCB transformers; accidents, fires or spills involving transformers, fluorescent lights, and other old electrical devices; and disposal of PCB materials.

How can PCBs affect my health?

The most commonly observed health effects in people exposed to large amounts of PCBs are skin conditions such as acne and rashes. Studies in exposed workers have shown changes in blood and urine that may indicate liver damage. PCB exposures in the general population are not likely to result in skin and liver effects. Most of the studies of health effects of PCBs in the general population examined children of mothers who were exposed to PCBs.

Animals that ate food containing large amounts of PCBs for short periods of time had mild liver damage and some died. Animals that ate smaller amounts of PCBs in food over several weeks or months developed various kinds of health effects, including anemia; acne-like skin conditions; and liver, stomach, and thyroid gland injuries. Other effects

ToxFAQs™ Internet address is <http://www.atsdr.cdc.gov/toxfaq.html>

of PCBs in animals include changes in the immune system, behavioral alterations, and impaired reproduction. PCBs are not known to cause birth defects.

How likely are PCBs to cause cancer?

Few studies of workers indicate that PCBs were associated with certain kinds of cancer in humans, such as cancer of the liver and biliary tract. Rats that ate food containing high levels of PCBs for two years developed liver cancer. The Department of Health and Human Services (DHHS) has concluded that PCBs may reasonably be anticipated to be carcinogens. The EPA and the International Agency for Research on Cancer (IARC) have determined that PCBs are probably carcinogenic to humans.

How can PCBs affect children?

Women who were exposed to relatively high levels of PCBs in the workplace or ate large amounts of fish contaminated with PCBs had babies that weighed slightly less than babies from women who did not have these exposures. Babies born to women who ate PCB-contaminated fish also showed abnormal responses in tests of infant behavior. Some of these behaviors, such as problems with motor skills and a decrease in short-term memory, lasted for several years. Other studies suggest that the immune system was affected in children born to and nursed by mothers exposed to increased levels of PCBs. There are no reports of structural birth defects caused by exposure to PCBs or of health effects of PCBs in older children. The most likely way infants will be exposed to PCBs is from breast milk. Transplacental transfers of PCBs were also reported. In most cases, the benefits of breast-feeding outweigh any risks from exposure to PCBs in mother's milk.

How can families reduce the risk of exposure to PCBs?

- You and your children may be exposed to PCBs by eating fish or wildlife caught from contaminated locations. Certain states, Native American tribes, and U.S. territories have issued advisories to warn people about PCB-contaminated fish and fish-eating wildlife. You can reduce your family's exposure to PCBs by obeying these advisories.
- Children should be told not play with old appliances,

electrical equipment, or transformers, since they may contain PCBs.

- Children should be discouraged from playing in the dirt near hazardous waste sites and in areas where there was a transformer fire. Children should also be discouraged from eating dirt and putting dirty hands, toys or other objects in their mouths, and should wash hands frequently.
- If you are exposed to PCBs in the workplace it is possible to carry them home on your clothes, body, or tools. If this is the case, you should shower and change clothing before leaving work, and your work clothes should be kept separate from other clothes and laundered separately.

Is there a medical test to show whether I've been exposed to PCBs?

Tests exist to measure levels of PCBs in your blood, body fat, and breast milk, but these are not routinely conducted. Most people normally have low levels of PCBs in their body because nearly everyone has been environmentally exposed to PCBs. The tests can show if your PCB levels are elevated, which would indicate past exposure to above-normal levels of PCBs, but cannot determine when or how long you were exposed or whether you will develop health effects.

Has the federal government made recommendations to protect human health?

The EPA has set a limit of 0.0005 milligrams of PCBs per liter of drinking water (0.0005 mg/L). Discharges, spills or accidental releases of 1 pound or more of PCBs into the environment must be reported to the EPA. The Food and Drug Administration (FDA) requires that infant foods, eggs, milk and other dairy products, fish and shellfish, poultry and red meat contain no more than 0.2-3 parts of PCBs per million parts (0.2-3 ppm) of food. Many states have established fish and wildlife consumption advisories for PCBs.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2000. Toxicological profile for polychlorinated biphenyls (PCBs). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop B-29, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 404-498-0093. ToxFAQs™ Internet address is <http://www.atsdr.cdc.gov/toxfaq.html>. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.



METALS

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Introduction

The **term heavy metal** refers to any metallic chemical element that is toxic or poisonous at low concentrations. Examples of heavy metals are mercury (Hg), cadmium (Cd), arsenic (As), chromium (Cr), thallium (Tl), and lead (Pb).

Heavy metals are natural components of the Earth's crust. They cannot be degraded or destroyed. They enter our bodies via food, drinking water and air. As trace elements, some heavy metals (e.g. copper, zinc) are essential to maintain the metabolism of the human body. However, at higher concentrations they can cause metal poisoning could result, for instance, from drinking-water contamination (e.g. lead pipes), high concentrations near emission sources, or intake via the food chain.

Heavy metals are dangerous because they tend to **bioaccumulate**. Bioaccumulation means an increase of a chemical in a biological organism over time, compared to the chemical's concentration in the environment. Heavy metals accumulate in living things any time they are taken up and stored faster than they are broken down or excreted.

Heavy metals can enter a water supply by industrial and consumer waste, or even from acidic rain that releases heavy metals into streams, lakes, rivers, and groundwater.

Environmental and health risks.

Now we are going to describe the effects of the heavy metals in the environment. The three most prominent are Lead, Cadmium, and Mercury.

Effects of Antimony on the environment

Antimony is a metal used in the compound antimony trioxide, a flame retardant. It can also be found in pigments, dyes, and ceramics and glass. Exposure to high levels of antimony for short periods of time causes nausea and vomiting. There is little information on the effects of long-term antimony exposure, but it is a suspected human carcinogen. Antimony compounds do not bioaccumulate in aquatic life.

Effects of Cadmium on the environment

Cadmium derives its toxicological properties from its chemical similarity to zinc an essential micronutrient for humans. Cadmium is biopersistent and, once absorbed by an organism, remains resident for months (years for humans) although it is eventually excreted.

In humans, long-term exposure is associated with renal dysfunction. High exposure can lead to osteoporosis. Cadmium has been linked to lung cancer, although data concerning the latter are difficult to interpret due to confounding factors. Cadmium may also produce bone defects (osteomalacia, osteoporosis) in humans and animals. In animals, it is linked to increased blood pressure and effects on the myocardium in animals, although most human findings are inconclusive.

The average daily intake for humans is estimated as 0.15µg from air and 1µg from water. Smoking can lead to the inhalation of around 2-4µg of cadmium, but levels may vary widely.

In what form is emitted Cadmium?

Cadmium is produced as an inevitable by-product of zinc (or occasionally lead) refining, since these are found within the raw ore. However, once collected the cadmium is relatively easy to recycle.

The most significant use of cadmium is in nickel/cadmium batteries, as rechargeable or secondary power sources. They have high output, long life, low maintenance and high tolerance to physical and electrical stress. Cadmium's corrosion resistance, particularly in high stress environments such as marine and aerospace applications, is required; the coating is preferentially corroded if damaged. Other uses of cadmium are in PVC, in alloys and electronic compounds. Cadmium is also present as an impurity in several products such as fertilisers, detergents and refined petroleum products.

In the general, non-smoking population the major exposure pathway is through food, via the addition of cadmium to agricultural soil from various sources (atmospheric deposition and fertiliser application) and uptake by plants. Additional exposure to humans arises through cadmium in ambient air and drinking water.

Effects of Chromium on the environment

Chromium is used in metal alloys and pigments for paints, cement, paper, rubber, and other materials. It can irritate the skin and cause ulceration. Long-term exposure can cause kidney and liver damage, circulatory and nerve tissue damage. Chromium often accumulates in aquatic life, adding to the danger of exposure if you have been exposed to high levels of chromium.

Effects of Copper on the environment

Copper is an essential substance to human life, but in high doses it can cause anemia, liver and kidney damage and intestinal irritation. People with Wilson's disease are at greater risk for health effects from overexposure. Copper normally occurs in drinking water from copper pipes, as well as from additives designed to prevent corrosion.

Effects of Lead on the environment

In humans exposure to lead can result in a wide range of biological effects depending on the level and duration of exposure. Various effects occur over a broad range of doses, with the developing foetus and infant being more vulnerable. High levels of exposure may result in toxic biochemical effects in humans which in turn cause problems such as anaemia, effects on the kidneys, gastrointestinal tract, joints and reproductive system, and acute effects on the nervous system.

Lead poisoning, which is so severe as to cause evident illness, is now very rare indeed. At intermediate levels of exposure, however, there is persuasive evidence that lead can have small, subtle, subclinical effects, particularly on children's mental and physical developments. Some studies suggest that there may be a loss of up to 2 IQ points for a child with a blood lead level of 10 to 20µg/dl in young children.

Average daily lead intake for adults in the UK is estimated at 1.6µg from air, 20µg from drinking water and 1.2µg from food. Although most people receive the bulk of their lead intake from food, in specific populations other sources can be important, such as water in areas with lead piping and plumbers' solvent water, air near point of source, lead paint flakes in old houses or contaminated land. Lead in the air contributes to lead levels in food through deposition of rain containing the metal, on crops and the soil. For the majority of people in the UK, however, the intake is well below the provisional tolerable weekly intake recommended by the UN Food and Agriculture Organisation and the World Health Organisation.

In what form is emitted lead?

Lead in the environment arises from both natural and anthropogenic sources. Exposure can occur through food, air, soil and dust from old paint containing lead. In the general non-smoking, adult population pathway is from food and water. Food, air, water and dust/soil are the major potential exposure pathways for young children. For infants up to 4 or 5 months of age, air, milk formulae and water are the significant

Lead is among the most recycled non-ferrous metals and its secondary production has therefore greatly declining lead prices. Its physical and chemical properties are applied in the manufacturing, construction industries. It is easily shaped and is malleable and ductile. There are eight broad categories of use: (no longer allowed in the EU), rolled and extruded products, alloys, pigments and compounds, cable ammunition.

Effects of Mercury on the environment

Mercury is a toxic substance which has no known function in human biochemistry or physiology and in living organisms. Inorganic mercury poisoning is associated with tremors, gingivitis and/or minor together with spontaneous abortion and congenital malformation.

Monomethylmercury causes damage to the brain and the central nervous system, while foetal and given rise to abortion, congenital malformation and development changes in young children.

In what form is emitted Mercury?

Mercury is a global pollutant with complex and unusual chemical and physical properties. The major is the degassing of the Earth's crust, emissions from volcanoes and evaporation from natural bodies

World-wide mining of the metal leads to indirect discharges into the atmosphere. The usage of mercury industrial processes and in various products (e.g. batteries, lamps and thermometers). It is also widely amalgam for fillings and by the pharmaceutical industry. Concern over mercury in the environment toxic forms in which mercury can occur.

Mercury is mostly present in the atmosphere in a relatively unreactive form as a gaseous element. The lifetime (of the order of 1 year) of its gaseous form means the emission, transport and deposition of

Natural biological processes can cause methylated forms of mercury to form which bioaccumulate or concentrate in living organisms, especially fish. These forms of mercury: monomethylmercury and dimethylmercury are toxic, causing neurotoxicological disorders. The main pathway for mercury to humans is through the inhalation.

The main sources of mercury emissions in the UK are from the manufacture of chlorine in mercury cell production, coal combustion and crematoria. UK emissions of mercury are uncertain and it is estimated 13 to 36 tonnes per year (DERA). Emissions are estimated to have declined by around 75% between 1990 and 2000 due to improved controls on mercury cells and their replacement, and the fall in coal use.

Whilst there has been a decline in the level of European emissions of mercury, emissions from outside the EU are increasing – increasing the level of ambient concentrations in the continent.

Handheld XRF No Isotopes

Metals in Soil, Paint, Wipes, etc. No Radioactive Materials!
www.Innov-Xsys.com

Heavy Metal Chelation

Edta treatment with self-diagnosis Safe, affordable
www.detoxamin.com

Ads by Gooooogle

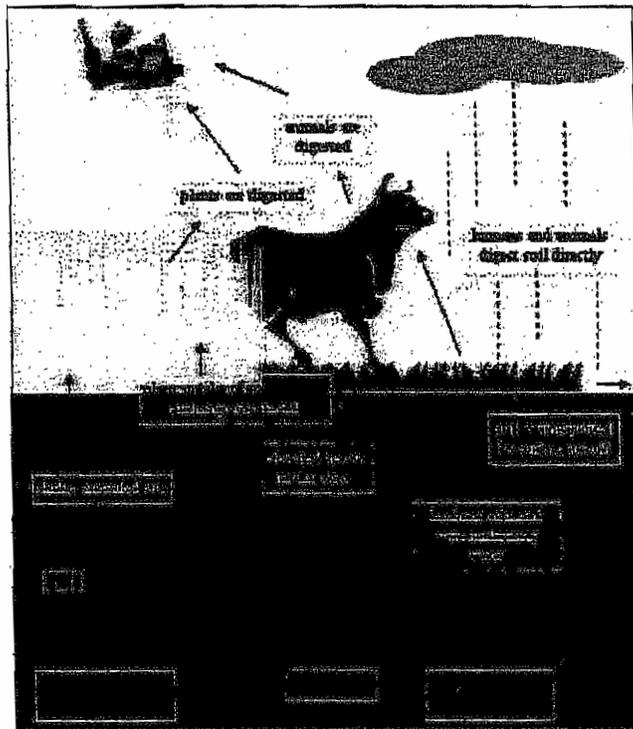
effects of Nickel on the environment

Small amounts of Nickel are needed by the human body to produce red blood cells, however, in excess become mildly toxic. Short-term overexposure to nickel is not known to cause any health problems, can cause decreased body weight, heart and liver damage, and skin irritation. The EPA does not cur levels in drinking water. Nickel can accumulate in aquatic life, but its presence is not magnified alone.

Effects of Selenium on the environment

Selenium is needed by humans and other animals in small amounts, but in larger amounts can cause system, fatigue, and irritability. Selenium accumulates in living tissue, causing high selenium content organisms, and causing greater health problems in human over a lifetime of overexposure. These health and fingernail loss, damage to kidney and liver tissue, damage to circulatory tissue, and more severe system.

Heavy Metals adsorption process:



In the picture we can observe the way that follows the heavy metals from the first step of the pollution to the human body by means of the food.

The most important disasters with heavy metals:

1932

Minamata
Sewage containing mercury is released by Chisso's chemicals works into Minimata Bay in Japan. The mercury accumulates in sea creatures, leading eventually to mercury poisoning in the population.
1952
Minamata Syndrome
In 1952, the first incidents of mercury poisoning appear in the population of Minimata Bay in Japan, caused by consumption of fish polluted with mercury, bringing over 500 fatalities. Since then, Japan has had the strictest environmental laws in the industrialised world.
1986-11-01
Sandoz
Water used to extinguish a major fire carries c. 30 t fungicide containing mercury into the Upper Rhine. Fish are killed over a stretch of 100 km. The shock drives many FEA projects forwards. See also "Pollution of the Rhine at Basel / Sandoz".
1998-04
Spanish nature reserve contaminated after environmental disaster
Toxic chemicals in water from a burst dam belonging to a mine contaminate the Coto de Donana nature reserve in southern Spain. C. 5 million m ³ of mud containing sulphur, lead, copper, zinc and cadmium flow down the Rio Guadimar. Experts estimate that Europe's largest bird sanctuary, as well as Spain's agriculture and fisheries, will suffer permanent damage from the pollution.

Suggested reading for Heavy Metals

Heavy Metal Analysis Test

Hair Analysis Reveals Toxic Metals Full
Equipped Med. Lab Order Today
www.gracefulearth.com

ID Heavy Metals In Soil

Real-time, In-Situ Characterization No
sampling, no waiting for results
www.austinai.com

Analytical Testing L

RTI Laboratories, Livoni
& Metallurgical Testing
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MSDS Number: A7441 * * * * * Effective Date: 11/12/03 * * * * * Supersedes: 02/23/01



Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08855



24 Hour Emergency Telephone: 908-852-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC, and National Response Center emergency numbers should be used only in the event of chemical emergencies involving spills, leaks, releases or fires involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-882-2537) for assistance.

ARSENIC, 1,000 UG/ML OR 10,000 UG/ML

1. Product Identification

Synonyms: None
CAS No.: Not applicable to mixtures.
Molecular Weight: Not applicable to mixtures.
Chemical Formula: Not applicable to mixtures.
Product Codes: 5704, 5718, 6442

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Arsenic	7440-38-2	0.1 - 1%	Yes
Nitric Acid	7697-37-2	< 4%	Yes
Water	7732-18-5	> 95%	No

3. Hazards Identification

Emergency Overview

DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. AFFECTS LIVER, KIDNEYS, LUNGS AND TEETH. CANCER HAZARD. CONTAINS INORGANIC ARSENIC WHICH CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.

J.T. Baker SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 4 - Extreme (Cancer Causing)

Flammability Rating: 0 - None

Reactivity Rating: 1 - Slight

Contact Rating: 3 - Severe (Corrosive)

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

Storage Color Code: White (Corrosive)

Potential Health Effects

Nitric acid is extremely hazardous; it is corrosive, reactive, an oxidizer, and a poison. The health effects from exposure to diluted forms of this chemical are not well documented. They are expected to be less severe than those for concentrated forms which are referenced in the descriptions below.

Inhalation:

Corrosive! Inhalation of vapors can cause breathing difficulties and lead to pneumonia and pulmonary edema, which may be fatal. Other symptoms may include coughing, choking, and irritation of the nose, throat, and respiratory tract. Arsenic may cause inflammation of the mucous membranes with cough and foamy sputum, restlessness, dyspnea, cyanosis, and rales. Symptoms like those from ingestion exposure may follow. May cause pulmonary edema.

Ingestion:

Corrosive! Swallowing nitric acid can cause immediate pain and burns of the mouth, throat, esophagus and gastrointestinal tract. Arsenic is highly toxic! May cause burning in esophagus, vomiting, and bloody diarrhea. Symptoms of cold and clammy skin, low blood pressure, weakness, headache, cramps, convulsions, and coma may follow. May cause damage to liver and kidneys. A suspected fetal toxin. Death may occur from circulatory failure. Estimated lethal dose 120 milligrams.

Skin Contact:

Corrosive! Can cause redness, pain, and severe skin burns. Concentrated solutions cause deep ulcers and stain skin a yellow or yellow-brown color.

Eye Contact:

Corrosive! Vapors are irritating and may cause damage to the eyes. Contact may cause severe burns and permanent eye damage.

Chronic Exposure:

Long-term exposure to concentrated vapors may cause erosion of teeth and lung damage. Long-term exposures seldom occur due to the corrosive properties of the acid. Arsenic on repeated or prolonged skin contact may cause bronzing of the skin, edema, dermatitis, and lesions. Repeated or prolonged inhalation of dust may cause damage to the nasal septum.

Chronic exposure from inhalation or ingestion may cause hair and weight loss, a garlic odor

to the breath and perspiration, excessive salivation and perspiration, central nervous system damage, hepatitis, gastrointestinal disturbances, cardiovascular damage, and kidney and liver damage. Arsenic compounds are known human carcinogens and may be teratogenic based on effects in laboratory animals.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders, eye disease, or cardiopulmonary diseases may be more susceptible to the effects of this substance.

4. First Aid Measures

Immediate first aid treatment reduces the health effects of this substance. First aid procedures given apply to concentrated solutions. Exposures to dilute solutions may not require these extensive first aid procedures.

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion:

If swallowed, give large quantities of water to drink and get medical attention immediately. Never give anything by mouth to an unconscious person.

Skin Contact:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately. Contaminated work clothes should be laundered by individuals who have been informed of the hazards of exposure to this substance.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Note to Physician:

If emesis is unsuccessful after two doses of Ipecac, consider gastric lavage. Monitor urine arsenic level. Alkalinization of urine may help prevent disposition of red cell breakdown products in renal tubular cells. If acute exposure is significant, maintain high urine output and monitor volume status, preferably with central venous pressure line. Abdominal X-rays should be done routinely for all ingestions. Chelation therapy with BAL, followed by n-penicillamine is recommended, but specific dosing guidelines are not clearly established.

5. Fire Fighting Measures

Fire:

Not combustible, but concentrated material is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition.

Explosion:

Concentrated material reacts explosively with combustible organic or readily oxidizable materials such as: alcohols, turpentine, charcoal, organic refuse, metal powder, hydrogen sulfide, etc. Reacts with most metals to release hydrogen gas which can form explosive

mixtures with air.

Fire Extinguishing Media:

If involved in a fire, use water spray.

Special Information:

Increases the flammability of combustible, organic and readily oxidizable materials. In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker NEUTRASORB® or TEAM® 'Low Na+' acid neutralizers are recommended for spills of this product.

7. Handling and Storage

Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Protect from physical damage. Keep out of direct sunlight and away from heat, water, and incompatible materials. Do not wash out container and use it for other purposes. When diluting, the acid should always be added slowly to water and in small amounts. Never use hot water and never add water to the acid. Water added to acid can cause uncontrolled boiling and splashing. Wear special protective equipment (Sec. 8) for maintenance break-in or where exposures may exceed established exposure levels. Wash hands, face, forearms and neck when exiting restricted areas. Shower, dispose of outer clothing, change to clean garments at the end of the day. Avoid cross-contamination of street clothes. Wash hands before eating and do not eat, drink, or smoke in workplace. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

For Nitric Acid:

OSHA Permissible Exposure Limit (PEL):

2 ppm (TWA)

ACGIH Threshold Limit Value (TLV):

2 ppm (TWA); 4 ppm (STEL)

For Inorganic Arsenic compounds (as As):

- OSHA Permissible Exposure Limit (PEL):

10 ug/m³ (TWA), 5 ug/m³ (Action Level), cancer hazard.

- ACGIH Threshold Limit Value (TLV):

0.01 mg/m³ (TWA), A1, confirmed human carcinogen.**Ventilation System:**

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus. Canister-type respirators using sorbents are ineffective.

Skin Protection:

Rubber or neoprene gloves and additional protection including impervious boots, apron, or coveralls, as needed in areas of unusual exposure to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Other Control Measures:

Any area where inorganic arsenic is stored, handled, used, etc., must be established as a 'Regulated Area' with controlled access, limited to authorized persons. Containers of inorganic arsenic and Regulated Areas must be labeled to show a CANCER SUSPECT AGENT is present. Eating, drinking, and smoking should not be permitted in areas where solids or liquids containing arsenic or lead compounds are handled, processed, or stored. See OSHA substance-specific standard for more information on personal protective equipment, engineering and work practice controls, medical surveillance, record keeping, and reporting requirements. (arsenic: 29 CFR 1910.1018; lead: 29 CFR 1910.1025).

9. Physical and Chemical Properties

Appearance:

Clear, colorless liquid.

Odor:

Odorless.

Solubility:

Infinitely soluble.

Specific Gravity:

No information found.

pH:

No information found.

% Volatiles by volume @ 21C (70F):

> 99

Boiling Point:

No information found.

Melting Point:

No information found.

Vapor Density (Air=1):

No information found.

Vapor Pressure (mm Hg):

No information found.

Evaporation Rate (BuAc=1):

No information found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage. Containers may burst when heated.

Hazardous Decomposition Products:

When heated to decomposition, emits toxic nitrogen oxides fumes and hydrogen nitrate. Emits toxic fumes of arsenic when heated to decomposition.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

A dangerously powerful oxidizing agent, concentrated nitric acid is incompatible with most substances, especially strong bases, metallic powders, carbides, hydrogen sulfide, turpentine, and combustible organics.

Conditions to Avoid:

Heat, incompatibles.

11. Toxicological Information

Toxicological Data:

For arsenic: oral rat LD50: 763 mg/kg. Investigated as a tumorigen, mutagen, reproductive effector. For Nitric Acid: Investigated as a mutagen and reproductive effector.

Carcinogenicity:

For arsenic and inorganic arsenic compounds:

Regulated by OSHA as a carcinogen.

EPA / IRIS classification: Group A - Known human carcinogen.

Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Arsenic (7440-38-2)	Yes	No	1
Nitric Acid (7697-37-2)	No	No	None
Water (7732-18-5)	No	No	None

12. Ecological Information

Environmental Fate:

No information found.

Environmental Toxicity:

No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
(NITRIC ACID)

Hazard Class: 8**UN/NA:** UN3264**Packing Group:** III**Information reported for product/size:** 500ML**International (Water, I.M.O.)**

Proper Shipping Name: CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
(NITRIC ACID)

Hazard Class: 8**UN/NA:** UN3264**Packing Group:** III**Information reported for product/size:** 500ML**International (Air, I.C.A.O.)**

Proper Shipping Name: CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
(NITRIC ACID)

Hazard Class: 8**UN/NA:** UN3264**Packing Group:** III**Information reported for product/size:** 500ML

15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----				
Ingredient	TSCA	EC	Japan	Australia
Arsenic (7440-38-2)	Yes	Yes	No	Yes
Nitric Acid (7697-37-2)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

-----\Chemical Inventory Status - Part 2\-----				
Ingredient	Korea	--Canada--		
		DSL	NDSL	Phil.
Arsenic (7440-38-2)	Yes	Yes	No	Yes
Nitric Acid (7697-37-2)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

-----\Federal, State & International Regulations - Part 1\-----				
Ingredient	-SARA 302-		-----SARA 313-----	
	RQ	TPQ	List	Chemical Catg.
Arsenic (7440-38-2)	No	No	Yes	Arsenic comp
Nitric Acid (7697-37-2)	1000	1000	Yes	No
Water (7732-18-5)	No	No	No	No

-----\Federal, State & International Regulations - Part 2\-----			
Ingredient	CERCLA	-RCRA-	-TSCA-
		261.33	8 (d)
Arsenic (7440-38-2)	1	No	No
Nitric Acid (7697-37-2)	1000	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
 SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
 Reactivity: No (Mixture / Liquid)

WARNING:

THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

Australian Hazchem Code: None allocated.

Poison Schedule: S6

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 3 Flammability: 0 Reactivity: 0

Label Hazard Warning:

DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL

BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. AFFECTS LIVER, KIDNEYS, LUNGS AND TEETH. CANCER HAZARD. CONTAINS INORGANIC ARSENIC WHICH CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.

Label Precautions:

- Do not get in eyes, on skin, or on clothing.
- Do not breathe vapor or mist.
- Use only with adequate ventilation.
- Wash thoroughly after handling.
- Keep container closed.

Label First Aid:

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If swallowed, give large amounts of water to drink. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases get medical attention immediately.

Product Use:

Laboratory Reagent.

Revision Information:

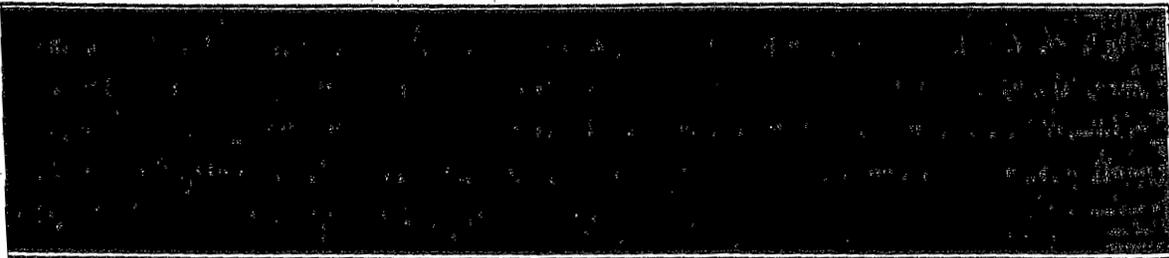
No Changes.

Disclaimer:

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Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

This fact sheet answers the most frequently asked health questions (FAQs) about mercury. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.



What is mercury?

(Pronounced mĕr'kyŭ-rĕ)

Mercury is a naturally occurring metal which has several forms. The metallic mercury is a shiny, silver-white, odorless liquid. If heated, it is a colorless, odorless gas.

Mercury combines with other elements, such as chlorine, sulfur, or oxygen, to form inorganic mercury compounds or "salts," which are usually white powders or crystals. Mercury also combines with carbon to make organic mercury compounds. The most common one, methylmercury, is produced mainly by microscopic organisms in the water and soil. More mercury in the environment can increase the amounts of methylmercury that these small organisms make.

Metallic mercury is used to produce chlorine gas and caustic soda, and is also used in thermometers, dental fillings, and batteries. Mercury salts are sometimes used in skin lightening creams and as antiseptic creams and ointments.

What happens to mercury when it enters the environment?

- Inorganic mercury (metallic mercury and inorganic mercury compounds) enters the air from mining ore deposits, burning coal and waste, and from manufacturing plants.
- It enters the water or soil from natural deposits, disposal of waste, and volcanic activity.

- Methylmercury may be formed in water and soil by small organisms called bacteria.
- Methylmercury builds up in the tissues of fish. Larger and older fish tend to have the highest levels of mercury.

How might I be exposed to mercury?

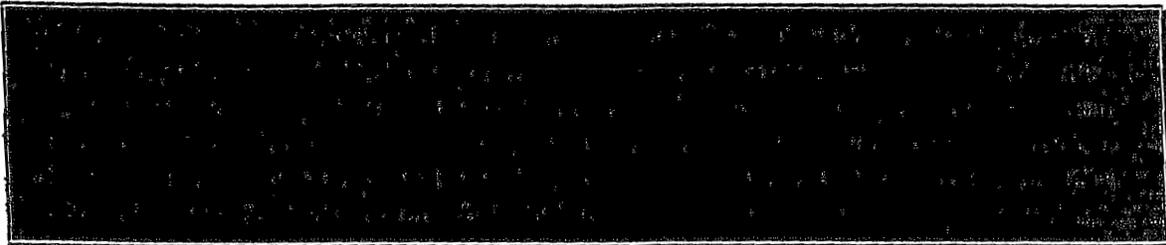
- Eating fish or shellfish contaminated with methylmercury.
- Breathing vapors in air from spills, incinerators, and industries that burn mercury-containing fuels.
- Release of mercury from dental work and medical treatments.
- Breathing contaminated workplace air or skin contact during use in the workplace (dental, health services, chemical, and other industries that use mercury).
- Practicing rituals that include mercury.

How can mercury affect my health?

The nervous system is very sensitive to all forms of mercury. Methylmercury and metallic mercury vapors are more harmful than other forms, because more mercury in these forms reaches the brain. Exposure to high levels of metallic, inorganic, or organic mercury can permanently damage the brain, kidneys, and developing fetus. Effects on brain functioning may result in irritability, shyness, tremors, changes in vision or hearing, and memory problems.

Short-term exposure to high levels of metallic mercury vapors may cause effects including lung damage, nausea,

This fact sheet answers the most frequently asked health questions (FAQs) about lead. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.



What is lead?

(Pronounced lēd)

Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. Lead can be found in all parts of our environment. Much of it comes from human activities including burning fossil fuels, mining, and manufacturing.

Lead has many different uses. It is used in the production of batteries, ammunition, metal products (solder and pipes), and devices to shield X-rays.

Because of health concerns, lead from gasoline, paints and ceramic products, caulking, and pipe solder has been dramatically reduced in recent years.

What happens to lead when it enters the environment?

- Lead itself does not break down, but lead compounds are changed by sunlight, air, and water.
- When lead is released to the air, it may travel long distances before settling to the ground.
- Once lead falls onto soil, it usually sticks to soil particles.
- Movement of lead from soil into groundwater will depend on the type of lead compound and the characteristics of the soil.
- Much of the lead in inner-city soils comes from old houses painted with lead-based paint.

How might I be exposed to lead?

- Eating food or drinking water that contains lead.
- Spending time in areas where lead-based paints have been used and are deteriorating.
- Working in a job where lead is used.
- Using health-care products or folk remedies that contain lead.
- Engaging in certain hobbies in which lead is used (for example, stained glass).

How can lead affect my health?

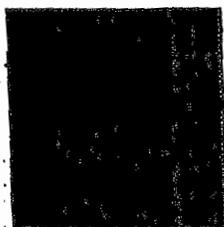
Lead can affect almost every organ and system in your body. The most sensitive is the central nervous system, particularly in children. Lead also damages kidneys and the reproductive system. The effects are the same whether it is breathed or swallowed.

At high levels, lead may decrease reaction time, cause weakness in fingers, wrists, or ankles, and possibly affect the memory. Lead may cause anemia, a disorder of the blood. It can also damage the male reproductive system. The connection between these effects and exposure to low levels of lead is uncertain.

How likely is lead to cause cancer?

The Department of Health and Human Services has determined that lead acetate and lead phosphate may reasonably

Safety (MSDS) data for beryllium



General

Synonyms: glucinium
Molecular formula: Be
CAS No: 7440-41-7
EINECS No: 231-150-7
EU No: 004-001-00-7

Physical data

Appearance: silvery solid or grey foil
Melting point: 1278 C
Boiling point: 2970 C
Vapour density:
Vapour pressure:
Density (g cm^{-3}): 1.85
Flash point:
Explosion limits:
Autoignition temperature:
Water solubility: insoluble

Stability

Stable. Incompatible with acids, bases, oxidizing agents, halogen

pH:

No information found.

% Volatiles by volume @ 21C (70F):

0

Boiling Point:

340C (644F)

Melting Point:

217C (423F)

Vapor Density (Air=1):

6.15

Vapor Pressure (mm Hg):

1 @ 145C (293F) (sublimes)

Evaporation Rate (BuAc=1):

No information found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage. Darkens on exposure to light.

Hazardous Decomposition Products:

Carbon dioxide and carbon monoxide may form when heated to decomposition.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Fluorine, chromic acid, oxidizing agents.

Conditions to Avoid:

No information found.

11. Toxicological Information

Oral mouse LD: > 17,000 mg/kg. Irritation skin, Draize mouse: 118 ug mild.

Investigated as a tumorigen and mutagen. IARC 3.

-----\Cancer Lists\-----

Ingredient	---NTP Carcinogen---		IARC Categ
	Known	Anticipated	
Anthracene (120-12-7)	No	No	3

12. Ecological Information

Safety (MSDS) data for zinc

Click here for data on zinc in student-friendly format, from the HSci project

General

Synonyms: zinc dust, zinc powder, blue powder, granular zinc, zinc foil, LS 2, LS 6, merrillite, zinc metal

Molecular formula: Zn

CAS No: 7440-66-6

EINECS No: 231-175-3

EC number: 030-001-00-1

Physical data

Appearance: silver or blueish-white foil or powder

Melting point: 420 C

Boiling point: 908 C

Vapour density:

Vapour pressure:

Density (g cm^{-3}): 7.14

Flash point:

Explosion limits:

Autoignition temperature:

Water solubility:

Stability

Stable. Incompatible with amines, cadmium, sulfur, chlorinated solvents, strong acids, strong bases. Air and moisture sensitive.
Powder or dust is very flammable.

Abbreviations used in Toxicity data

The table below gives the main abbreviations which will be found in the toxicity data for chemicals listed on these (and many other) web pages.

asn	Aspergillus nidulans
ast	Ascites tumor
bcs	Bacillus subtilis
bfa	body fluid assay
bmr	bone marrow
brd	bird (domestic or lab)
bwd	wild bird species
chd	child
ckn	chicken
CL	ceiling concentration
clr	Chlamydomonas reinhardi
ctl	cattle
cyt	cytogenetic analysis
D	day
dck	duck
dlt	cominant lethal test
dmg	Drosophila melanogaster
dnd	DNA damage
dni	DNA inhibition
dnr	nNA repair
dns	unscheduled DNA synthesis
dom	domestic animal (goat, sheep)
dpo	Drcsophila pseudo-obscura
emb	embryo
esc	Escherichia cold
eug	Euglena gracilis

itt	intratesticular
iu	international unit
iut	intrauterine
ivg	intravaginal
ivn	intravenous
kdy	kidney
kg	kilogram
kfp	<i>Klebsiella pneumoniae</i>
L	liter
LC50	lethal concentration 50 percent kill
LCLo	lowest published lethal concentration
LD50	lethal dose 50 percent kill
LDlo	lowest published lethal dose
leu	leukocyte
Liq	liquid
lng	lung
lvr	liver
lym	lymphocyte
M	minute
m ³	cubic meter
mam	mammal (species unspecified)
man	man
ug	microgram
umol	micromole
mg	milligram
mky	monkey
mL	milliliter
MLD	mild irritation effects
mma	microsomal mutagenicity assay
mno	mutation in microorganisms
mmol	millimole
mmr	mammary gland
mnt	micronucleus test
MOD	moderate irritation effects

ppt	parts per trillion (v/v)
preg	pregnant
qal	quail
rat	rat
rbt	rabbit
rec	rectal
rns	rinsed with water
S	second
sal	salmon
sat	Salmonella typhimurium
sce	sister chromatic exchange
scu	subcutaneous
SEV	severe irritation effects
skn	administration onto skin
sln	sex chromosome loss and nondisjunction
slt	specific locus test
slw	silkworm
smc	Saccharomyces cerevisiae
spm	sperm morphology
spr	sperm
sql	squirrel
sm	Serratia marcescens
ssp	Schizosaccharomyces pombe
STEL	short term exposure limit
TC	toxic concentration (other than lowest concentration)
TCLo	lowest published toxic concentration
TD	toxic dose (other than lowest toxic dose)
TDLo	lowest published toxic dose
tes	testis
TLV	Threshold Limit Value
tod	toad
trk	turkey
trn	heritable translocation test
TWA	time weighted average

Risk Phrases

Chemical data sheets available in many countries now contain codes for certain "risk phrases", shown as R23, R45 etc. These risk phrase codes have the following meanings:

- R1 Explosive when dry.
- R2 Risk of explosion by shock, friction, fire or other source of ignition.
- R3 Extreme risk of explosion by shock, friction, fire or other sources of ignition.
- R4 Forms very sensitive explosive metallic compounds.
- R5 Heating may cause an explosion.
- R6 Explosive with or without contact with air.
- R7 May cause fire.
- R8 Contact with combustible material may cause fire.
- R9 Explosive when mixed with combustible material.
- R10 Flammable.
- R11 Highly flammable.
- R12 Extremely flammable.
- R13 Extremely flammable liquefied gas
- R14 Reacts violently with water.
- R15 Contact with water liberates extremely flammable gases.
- R16 Explosive when mixed with oxidizing substances.
- R17 Spontaneously flammable in air.
- R18 In use, may form inflammable/explosive vapour-air mixture.
- R19 May form explosive peroxides.
- R20 Harmful by inhalation.
- R21 Harmful in contact with skin.
- R22 Harmful if swallowed.
- R23 Toxic by inhalation.
- R24 Toxic in contact with skin.
- R25 Toxic if swallowed.

- R61 May cause harm to the unborn child.
 - R62 Risk of impaired fertility.
 - R63 Possible risk of harm to the unborn child.
 - R64 May cause harm to breastfed babies.
 - R65 Harmful: may cause lung damage if swallowed.
 - R66 Repeated exposure may cause skin dryness or cracking.
 - R67 Vapours may cause drowsiness and dizziness.
 - R68 Possible risk of irreversible effects.
-

It is current safety policy at Oxford University that a written COSHH assessment **must** be provided when a substance to be used has been assigned any of the risk phrases R42, R43, R45, R46, R48, R49, R60 or R61. Other hazards may also dictate the preparation of a suitable COSHH assessment.

[Return to [Physical & Theoretical Chemistry Lab. Safety home page.](#)]

This information was last updated on October 28, 2003. We have tried to make it as accurate and useful as possible, but can take no responsibility for its use, misuse, or accuracy. We have not verified this information, and cannot guarantee that it is up-to-date.

- Class 8 Corrosive substances
- Class 9 Miscellaneous dangerous substances

See also Packing Group.

For further details on the transport of dangerous goods, see the OECD Directorate web site.

Return to the Safety Glossary.

Return to the Safety home page of the Physical and Theoretical Chemistry Laboratory, Oxford University.

- S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- S27 Take off immediately all contaminated clothing.
- S28 After contact with skin, wash immediately with plenty of soap-suds.
- S29 Do not empty into drains.
- S30 Never add water to this product.
- S33 Take precautionary measures against static discharges.
- S35 This material and its container must be disposed of in a safe way.
- S36 Wear suitable protective clothing.
- S37 Wear suitable gloves.
- S38 In case of insufficient ventilation, wear suitable respiratory equipment.
- S39 Wear eye / face protection.
- S40 To clean the floor and all objects contaminated by this material, use (there follows suitable cleaning material).
- S41 In case of fire and / or explosion do not breathe fumes.
- S42 During fumigation / spraying wear suitable respiratory equipment.
- S43 In case of fire use ... (there follows the type of fire-fighting equipment to be used.)
- S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label whenever possible.)
- S46 If swallowed, seek medical advice immediately and show this container or label.
- S47 Keep at temperature not exceeding...
- S48 To be kept wet with (there follows a material name).
- S49 Keep only in the original container.
- S50 Do not mix with ...
- S51 Use only in well ventilated areas.
- S52 Not recommended for interior use on large surface areas

MSDS**Material Safety Data Sheet**

From: Mallinckrodt Baker, Inc.
 220 Reed School Lane
 Philadelphia, NJ 08885

M Mallinckrodt
CHEMICALS



24 Hour Emergency Telephone: 800-424-2124
 DANGEROUS: 1-800-424-2124

National Response in Canada
 CHEMTRIX: 604-424-2124

Outside U.S. and Canada
 Chemtrec: 703-424-2124

NOTE: CHEMTRIX, CHEMTRIX and National Response Center emergency responses to be used only in the event of chemical emergency involving a spill, leak, fire, explosion or accidental injury to humans.

All non-emergency requests should be directed to Customer Service (1-800-522-2537) for assistance.

COPPER METAL

MSDS Number: C5170 — *Effective Date: 05/17/01*

1. Product Identification

Synonyms: C.I. 77400; Arwood Copper
 CAS No.: 7440-50-8
 Molecular Weight: 63.546
 Chemical Formula: Cu
 Product Codes:
 J.T. Baker: 1714, 1720, 1732, 1736
 Mallinckrodt: 1733, 4649

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Copper	7440-50-8	90 - 100%	Yes

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS THE LIVER AND KIDNEYS. CHRONIC EXPOSURE MAY CAUSE TISSUE DAMAGE.

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:

Not considered to be a fire hazard since the bulk solid does not burn, but very finely divided particles (ultra-fine powder) may burn in air.

Explosion:

Not considered to be an explosion hazard. Reactions with incompatibles may pose an explosion hazard. Liquid copper explodes on contact with water. High concentrations of finely divided copper particles in the air may present an explosion hazard.

Fire Extinguishing Media:

Use any means suitable for extinguishing surrounding fire.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Avoid exposure to air and moisture. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

Copper Dust and Mists, as Cu:

- OSHA Permissible Exposure Limit (PEL) -
1 mg/m³ (TWA)
- ACGIH Threshold Limit Value (TLV) -

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage. Copper becomes dull when exposed to air, on exposure to moist air it gradually converts to the carbonate. On long standing, a white, highly explosive peroxide deposit may form.

Hazardous Decomposition Products:

No information found.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Copper is incompatible with oxidizers, alkalis, acetylene, chlorine plus oxygen difluoride, phosphorus, nitric acid, potassium peroxide, 1-bromo-2-propyne, sulfur plus chlorates. Reacts violently with ammonium nitrate, bromates, iodates, chlorates, ethylene oxide, hydrozoic acid, potassium oxide, dimethyl sulfoxide plus trichloroacetic acid, hydrogen peroxide, sodium peroxide, sodium azide, sulfonic acid, hydrogen sulfide plus air, and lead azide. A potentially explosive reaction occurs with acetylenic compounds. Copper ignites on contact with chlorine, fluorine (above 121C), chlorine trifluoride, and hydrazinum nitrate (above 70C). An incandescent reaction occurs with potassium dioxide.

Conditions to Avoid:

Incompatibles and prolonged exposure to air and moisture.

11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure. Investigated as a tumorigen and a reproductive effector.

-----\Cancer Lists\-----

Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Copper (7440-50-8)	No	No	None

12. Ecological Information

Environmental Fate:

No information found.

Environmental Toxicity:

No information found.

13. Disposal Considerations

or use of this information to any person or for use in any situation.

Section 1 - Product and Company Identification
CHROMIUM

Product Identification: CHROMIUM

Date of MSDS: 11/01/1993 **Technical Review Date:** 11/10/1995

FSC: 6810 **NEIN:** LIIN: 00N066370

Submitter: N EN

Status Code: C

MFN: 01

Article: N

Kit Part: N

Manufacturer's Information

Manufacturer's Name: HIGH-PURITY STANDARDS

Post Office Box: 30188

Manufacturer's Address1:

Manufacturer's Address2: CHARLESTON, SC 29417

Manufacturer's Country: US

General Information Telephone: 803-556-3411

Emergency Telephone: 803-556-3411

Emergency Telephone: 803-556-3411

MSDS Preparer's Name: N/P

Proprietary: N

Reviewed: N

Published: Y

CAGE: 0YZE5

Special Project Code: N

Contractor Information

Contractor's Name: HIGH-PURITY STANDARDS INC

Post Office Box: 30180

Contractor's Address1: 2040 SAVAGE RD

Contractor's Address2: CHARLESTON, SC 29417

Contractor's Telephone: 803-556-3411

Contractor's CAGE: 0YZE5

Section 2 - Composition/Information on Ingredients
CHROMIUM

METALS, HYDROXIDES, CARBONATES, CYANIDES.

Hazardous Decomposition Products:

NO, NO*2.

Hazardous Polymerization Indicator: NO

Conditions to Avoid Polymerization:

NOT RELEVANT

Section 11 - Toxicological Information
CHROMIUM

Toxicological Information:

N/P

Section 12 - Ecological Information
CHROMIUM

Ecological Information:

N/P

Section 13 - Disposal Considerations
CHROMIUM

Waste Disposal Methods:

FOLLOW FEDERAL, STATE AND LOCAL REGULATIONS FOR ACID WASTE.

Section 14 - MSDS Transport Information
CHROMIUM

Transport Information:

N/P

Section 15 - Regulatory Information
CHROMIUM

SARA Title III Information:

N/P

Federal Regulatory Information:

N/P

State Regulatory Information:

N/P

Section 16 - Other Information
CHROMIUM

Other Information:

N/P

HAZCOM Label Information

Product Identification: CHROMIUM

CAGE: 0YZE5

Assigned Individual: N

Company Name: HIGH-PURITY STANDARDS INC

Company PO Box: 30180

Company Street Address1: 2040 SAVAGE RD

Company Street Address2: CHARLESTON, SC 29417 US

Health Emergency Telephone: 803-556-3411

Label Required Indicator: Y

Date Label Reviewed: 11/10/1995

Status Code: C

Manufacturer's Label Number:

Date of Label: 11/10/1995

Year Procured: N/K

Organization Code: G

Chronic Hazard Indicator: N

Eye Protection Indicator: YES

Skin Protection Indicator: YES

Respiratory Protection Indicator: YES

Signal Word: CAUTION

Health Hazard: Slight

Contact Hazard: Slight

Fire Hazard: None

Reactivity Hazard: None

8/9/2002 9:23:55 AM

APPENDIX E

Proposed Development Plans



Board of Standards and Appeals

40 Rector Street, 9th Floor • New York, NY 10006-1705 • Tel. (212) 788-8500 • Fax (212) 788-8769
Website @ www.nyc.gov/bsa

MEENAKSHI SRINIVASAN

Chair/Commissioner

March 21, 2012

John Gallagher, R.A.
Brooklyn Borough Commissioner
NYC Department of Buildings
Municipal Building, 8th floor
Brooklyn, N.Y. 11201

Re: BSA Cal. No 134-10-BZ
107 Union Street, Brooklyn

Dear Borough Commissioner Gallagher:

Under the above referenced calendar number, the Board granted a variance permitting the construction of a new two family residential building in an M1-1 district, contrary to use, floor area, height and setback.(ZR §42-10, §43-12, §43-43).

Neil Weisbard, a representative of the owner, has requested that the Board determine that specific minor modifications are in substantial compliance with the Board's previous approvals. Specifically, Mr. Weisbard, in a letter dated March 15, 2012, explains that due to high water table the cellar will be eliminated. As a result, the relocation of mechanical equipment and reconfiguration of interior partitions, stairs, closets and windows is necessary. Mr. Weisbard represents that the alterations will have no effect on the bulk and use of the building.

The changes are illustrated on the revised plans, labeled A-001, A-100, A-101, A-102, A-200, A-300 stamped "March 21, 2012".

The Board has reviewed the request and has determined that the aforementioned changes are in substantial compliance with the Board's prior grant. Therefore, the Board has no objection to the proposed changes, on condition that the Department of Buildings shall ensure compliance with all applicable provisions of the Zoning Resolution, Building Code, or any other relevant law. To the extent that the proposed changes trigger any new non-compliance, then the Board's determination herein will have no effect.

Sincerely,

Meenakshi Srinivasan
Chair/Commissioner

c: Jeff Mulligan
Becca Kelly
Neil Weisbard

134-10-BZ

CEQR #11-BSA-009K

APPLICANT – Stuart Beckerman, for Passiv House Xperimental LLC, owner.

SUBJECT – Application July 30, 2010 – Variance (§72-21) to allow a residential building, contrary to floor area (§43-12), height (§43-43), and use (§42-10) regulations. M1-1 zoning district.

PREMISES AFFECTED – 107 Union Street, north side of Union Street, between Van Brunt and Columbia Streets, Block 335, Lot 42, Borough of Brooklyn.

COMMUNITY BOARD #6BK

APPEARANCES –

For Applicant: Neil Weisbard.

ACTION OF THE BOARD – Application granted on condition.

THE VOTE TO GRANT –

Affirmative: Chair Srinivasan, Vice Chair Collins, Commissioner Ottley-Brown, Commissioner Hinkson and Commissioner Montanez5

Negative:.....0

THE RESOLUTION –

WHEREAS, the decision of the Brooklyn Borough Commissioner, dated July 26, 2010, acting on Department of Buildings Application No. 310153473, reads in pertinent part:

“Proposed (2) family dwelling (UG 2) in an M1-1 zoning district is contrary to Section 42-10 of the NYC ZR and must be referred to the BSA
Proposed FA is contrary to Section 43-12 of the NYC ZR and must be referred to the BSA
Proposed FAR is contrary to Section 43-12 of the NYC ZR and must be referred to the BSA
Proposed Front Wall Height is contrary to Section 43-43 of the NYC ZR and must be referred to the BSA
Proposed Initial Setback Distance is contrary to Section 43-43 of the NYC ZR and must be referred to the BSA
Proposed Sky Exposure Plane is contrary to Section 43-43 of the ZR and must be referred to the BSA;” and

WHEREAS, this is an application under ZR § 72-21, to permit, on a site within an M1-1 zoning district, a four-story residential building with two dwelling units and one on-site parking space, contrary to ZR §§ 42-10, 43-12 and 43-43; and

WHEREAS, a public hearing was held on this application on October 26, 2010 after due notice by publication in the *City Record*, with continued hearings on December 7, 2010, January 11, 2011 and February 8, 2011, and then to decision on May 3, 2011; and

WHEREAS, the premises and surrounding area had site and neighborhood examinations by Chair Srinivasan, Commissioner Hinkson, Commissioner Montanez, and Commissioner Ottley-Brown; and

WHEREAS, Community Board 6, Brooklyn, recommends approval of this application, subject to the

following conditions: (1) the width of the curb cut be reduced to 12 feet; (2) the applicant consider modifying the design of the building façade to make it more harmonious with the surrounding neighborhood; and (3) the applicant reconsider the use of window louvers for the building; and

WHEREAS, the site is located on the north side of Union Street, between Van Brunt Street and Columbia Street, within an M1-1 zoning district; and

WHEREAS, the site has a width of 23 feet, a depth of 100 feet, and a lot area of 2,300 sq. ft.; and

WHEREAS, the site is currently vacant; and

WHEREAS, the applicant proposes to construct a four-story two-family residential building with a floor area of 4,574 sq. ft. (the maximum permitted floor area is 2,286 sq. ft.), an FAR of 2.0 (the maximum permitted FAR is 1.0), a total height of 45’-6”, a front wall height of 37’-0” (the maximum permitted front wall height is 30’-0”), an initial front setback of 15’-0” (a minimum initial front setback distance of 20’-0” is required), encroachment into the sky exposure plane, and one on-site parking space; and

WHEREAS, the applicant initially proposed to construct a four-story residential building with a total height of 52’-4” and two parking spaces; and

WHEREAS, in response to concerns raised by the Board, the applicant reduced the total height of the building by approximately seven feet, and eliminated one of the on-site parking spaces; and

WHEREAS, because residential use is not permitted in the subject M1-1 zoning district, and because relief from bulk requirements of the M1-1 district is necessary, the applicant requests the subject variance; and

WHEREAS, the applicant represents that the following is a unique physical condition which creates unnecessary hardship in developing the site in conformance with applicable regulations: the site is a vacant lot with a narrow width and no opportunity for assemblage with adjoining lots; and

WHEREAS, the applicant represents that the subject zoning lot is a vacant pre-existing lot with a width of 23’-0”, which cannot feasibly accommodate a modern conforming use; and

WHEREAS, the applicant states that the narrow lot width would result in inefficient, narrow floor plates that would severely limit potential manufacturing or commercial uses on the site; and

WHEREAS, the applicant states that there are only two other lots in the surrounding area with widths of less than 25 feet which are occupied by buildings containing a conforming use; and

WHEREAS, the applicant represents that there are so few conforming uses on narrow lots because the limited width of such lots does not provide sufficient

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CEQR #11-BSA-009K

space for a loading dock or floor plates which are necessary for manufacturing or commercial uses; and

WHEREAS, as further evidence that the subject lot is not conducive to development of a conforming manufacturing or commercial building, the applicant submitted letters from real estate brokers reflecting that the owner has attempted to market the site for a conforming use since November 2008 but has received no offers; and

WHEREAS, the applicant represents that the subject site is also unique because it is the only vacant lot in the surrounding area with no opportunity for assemblage with adjoining zoning lots; and

WHEREAS, the applicant states that all of the lots immediately adjacent to the subject site are improved with existing buildings and under separate ownership; and

WHEREAS, the applicant submitted a 400-ft. radius diagram reflecting that of the 13 vacant lots less than 25 feet in width in the surrounding area, the subject site is the only vacant lot which does not adjoin another vacant lot, and therefore has no opportunity to merge with an adjoining lot to create a larger zoning lot that is more viable for conforming uses; and

WHEREAS, the Board finds that the narrow width of the vacant lot is a unique physical condition which creates unnecessary hardship and practical difficulty in developing the site in conformance with the applicable zoning regulations; and

WHEREAS, the applicant submitted a feasibility study which analyzed: (1) an as-of-right industrial building; (2) an as-of-right commercial office building; (3) a four-story, two-family residential building with a 2.0 FAR, a rear yard with a depth of 43 feet, and no parking spaces; (4) a three-story, two-family residential building with a 1.99 FAR, a rear yard with a depth of 30 feet, and no parking spaces; (5) a three-story, two-family residential building with a 1.99 FAR, a rear yard with a depth of 30 feet, and one parking space in a garage; and (6) the proposed four-story residential building with a 2.0 FAR, a rear yard with a depth of 43 feet, and one parking space in a garage; and

WHEREAS, the study concluded that only the proposed residential building would realize a reasonable return; and

WHEREAS, based upon its review of the feasibility study, the Board has determined that because of the subject lot's unique physical condition, there is no reasonable possibility that development in strict conformance with applicable use requirements will provide a reasonable return; and

WHEREAS, the applicant represents that the proposed building will not alter the essential character of the neighborhood, will not substantially impair the appropriate use or development of adjacent property, and will not be detrimental to the public welfare; and

WHEREAS, the applicant states that the

immediate area is a mix of residential, commercial, and manufacturing/industrial uses; and

WHEREAS, the applicant notes that the area immediately to the east of the site is located in a C2-4 (R6A) zoning district, and the areas one block to the south and southeast of the site are located in R6B zoning districts; and

WHEREAS, the applicant submitted a 400-ft. radius diagram which reflects that the adjacent buildings to the east, south and north of the site all contain residential uses; and

WHEREAS, the applicant states that the proposed building complies with all bulk regulations of the adjacent R6A and R6B zoning districts, except for lot coverage; and

WHEREAS, the applicant further states that the total height of the building was reduced by approximately seven feet, and the proposed building is contextual with the surrounding area; and

WHEREAS, specifically, the applicant submitted a site line drawing which reflects that (1) since it is setback, only a small portion of the fourth floor of the proposed building will be visible from the street, (2) the base wall of the proposed building will align with the street wall of the adjacent building to the east, and (3) the street wall of the proposed building will be lower than the majority of the base walls of the buildings on the south side of Union Street, and the small portion of the fourth floor parapet which is visible from the street will appear lower than the majority of the base walls of the buildings on the south side of Union Street; and

WHEREAS, in response to the Community Board's request, the applicant agreed to reduce the width of the existing curb cut on the site from 22 feet to 12 feet; and

WHEREAS, the applicant notes that the proposed residential use is consistent with the character of the area, which includes residential buildings adjacent to the site, across the street, and elsewhere on the subject block; and

WHEREAS, accordingly, the Board finds that this action will not alter the essential character of the surrounding neighborhood nor impair the use or development of adjacent properties, nor will it be detrimental to the public welfare; and

WHEREAS, the Board finds that the hardship herein was not created by the owner or a predecessor in title, but is rather a function of the site's historic lot dimensions; and

WHEREAS, as noted above, during the course of the hearing process, the applicant revised the plans to reduce the total height from 52'-4" to 45'-6" and eliminated one of the garage parking spaces from its proposal, in response to concerns raised by the Board; and

WHEREAS, accordingly, the Board finds that this

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CEQR #11-BSA-009K

proposal is the minimum necessary to afford the owner relief; and

WHEREAS, the Board has determined that the evidence in the record supports the findings required to be made under ZR § 72-21; and

WHEREAS, the project is classified as an Unlisted Action pursuant to 6 NYCRR, Part 617; and

WHEREAS, the Board has conducted an environmental review of the proposed action and has documented relevant information about the project in the Final Environmental Assessment Statement (EAS) CEQR No. 11-BSA-009K dated May 2, 2011; and

WHEREAS, the EAS documents that the project as proposed would not have significant adverse impacts on Land Use, Zoning, and Public Policy; Socioeconomic Conditions; Community Facilities and Services; Open Space; Shadows; Historic Resources; Urban Design and Visual Resources; Neighborhood Character; Natural Resources; Waterfront Revitalization Program; Infrastructure; Hazardous Materials; Solid Waste and Sanitation Services; Energy; Traffic and Parking; Transit and Pedestrians; Air Quality; Noise; and Public Health; and

WHEREAS, the New York City Department of Environmental Protection's (DEP) Bureau of Environmental Planning and Analysis has reviewed the project for potential hazardous materials and air quality impacts; and

WHEREAS, DEP accepts the March 2011 Remedial Action Plan and the Construction Health and Safety Plan; and

WHEREAS, DEP requested that a Remedial Closure Report be submitted for its review and approval upon completion of the proposed project; and

WHEREAS, a site survey and permits search was conducted for the active industrial/manufacturing facilities for the area within a 400-ft. radius of the proposed project; and

WHEREAS, one active industrial facility (auto body shop) was identified; and

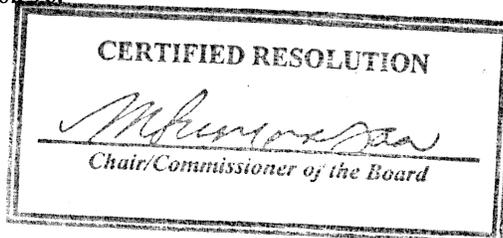
WHEREAS, based on the air quality screening analysis conducted for the auto body shop, DEP determined that significant impacts from industrial/manufacturing uses on the proposed project are not anticipated; and

WHEREAS, no other significant effects upon the environment that would require an Environmental Impact Statement are foreseeable; and

WHEREAS, the Board has determined that the proposed action will not have a significant adverse impact on the environment.

A true copy of resolution adopted by the Board of Standards and Appeals, May 3, 2011.
Printed in Bulletin Nos. 17-19, Vol. 96.

Copies Sent
To Applicant
Fire Com'r.
Borough Com'r.



Therefore it is Resolved that the Board of Standards and Appeals issues a Negative Declaration, with conditions as stipulated below, prepared in accordance with Article 8 of the New York State Environmental Conservation Law and 6 NYCRR Part 617, the Rules of Procedure for City Environmental Quality Review and Executive Order No. 91 of 1977, as amended, and makes each and every one of the required findings under ZR § 72-21, and grants a variance to permit, on a site within an M1-1 zoning district, a four-story residential building with two dwelling units and one on-site parking space, contrary to ZR §§ 42-10, 43-12 and 43-43; *on condition* that any and all work shall substantially conform to drawings as they apply to the objections above noted, filed with this application marked "Received December 21, 2010" – six (6) sheets; and *on further condition*:

THAT the following are the bulk parameters of the building: a floor area of 4,574 sq. ft. (2.0 FAR); a total height of 45'-6"; a maximum front wall height of 37'-0"; and one parking space, as indicated on the BSA-approved plans;

THAT prior to the issuance of any building permit that would result in grading, excavation, foundation, alteration, building or other permit respecting the subject site which permits soil disturbance for the proposed project, the applicant or successor shall obtain from DEP a Notice to Proceed;

THAT prior to the issuance by DOB of a temporary or permanent Certificate of Occupancy, the applicant or successor shall obtain from DEP a Notice of Satisfaction;

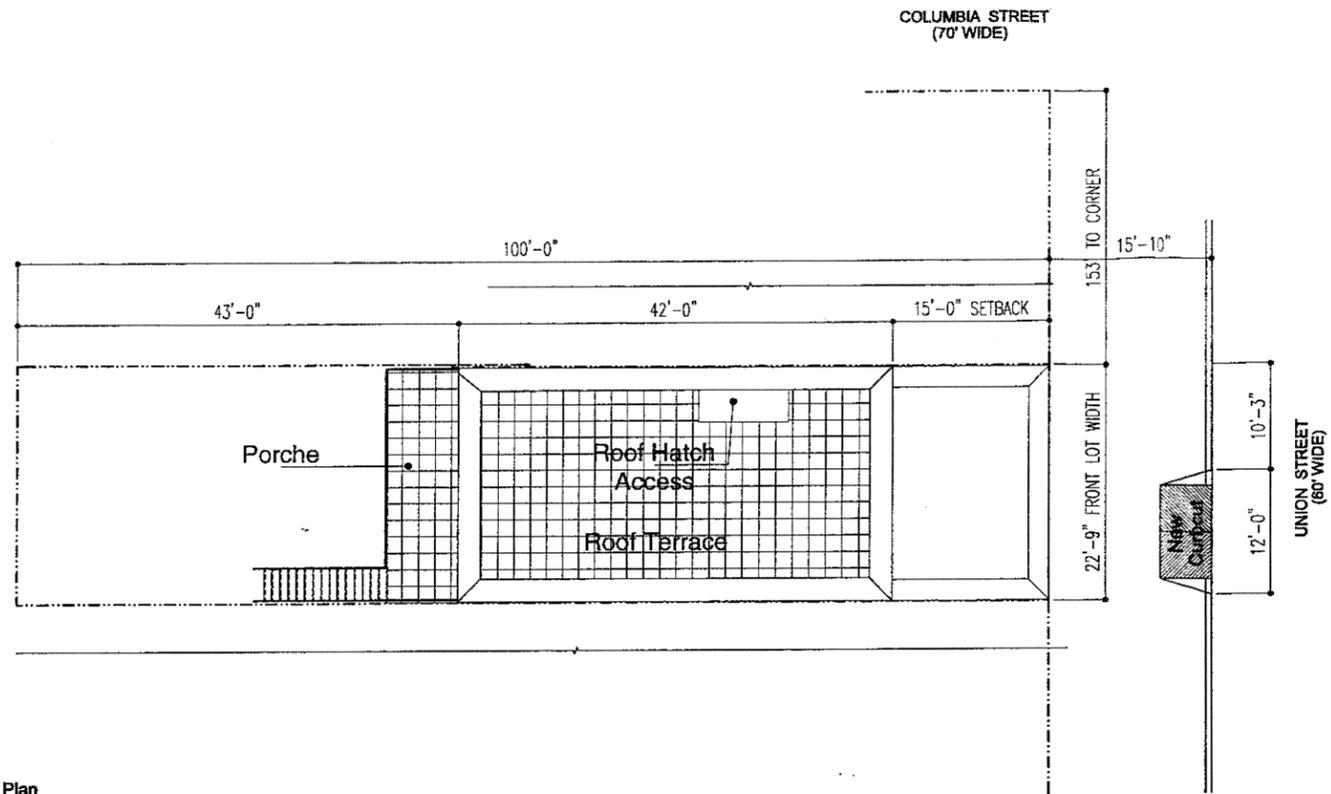
THAT substantial construction shall be completed in accordance with ZR § 72-23;

THAT this approval is limited to the relief granted by the Board in response to specifically cited and filed DOB/other jurisdiction objection(s);

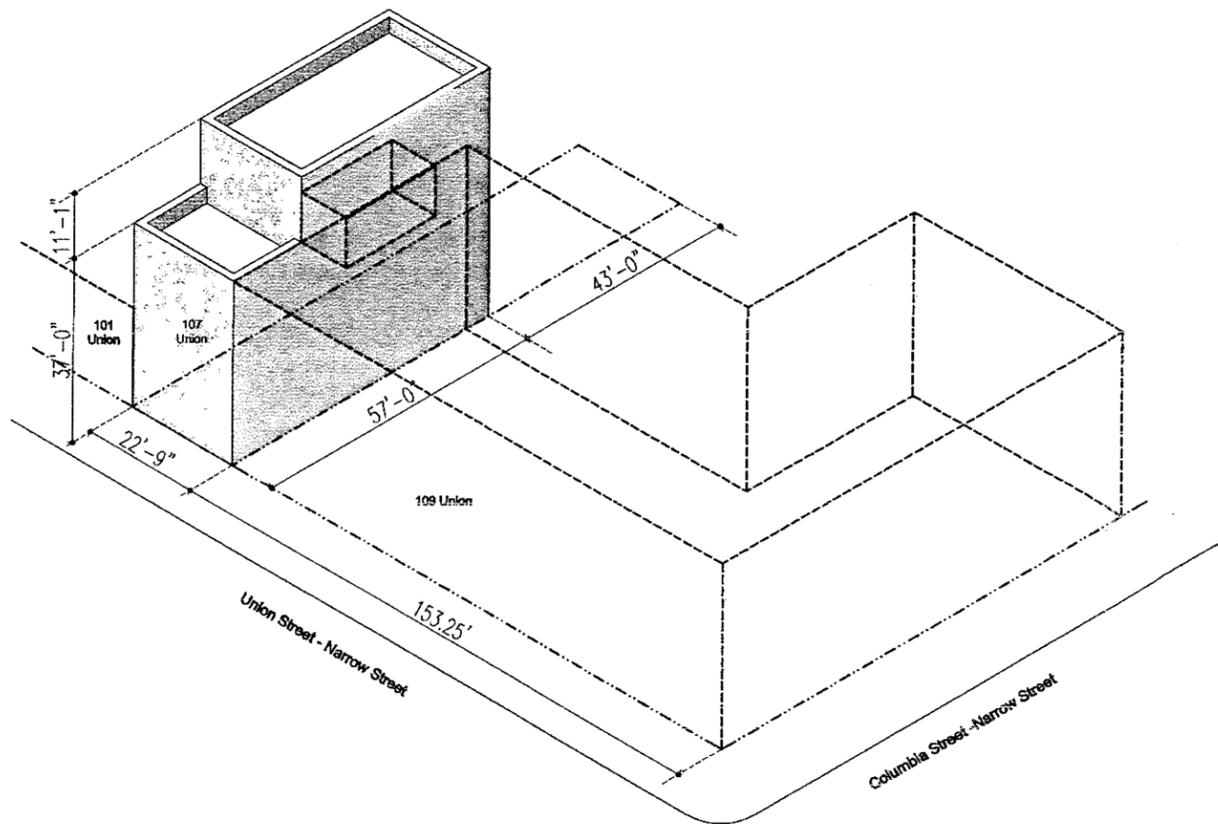
THAT the approved plans shall be considered approved only for the portions related to the specific relief granted; and

THAT the Department of Buildings must ensure compliance with all other applicable provisions of the Zoning Resolution, the Administrative Code, and any other relevant laws under its jurisdiction irrespective of plan(s)/configuration(s) not related to the relief granted.

Adopted by the Board of Standards and Appeals, May 3, 2011.



1 Proposed Site Plan
1/8" = 1'-0"



2 Isometric View
1/16" = 1'-0"

Proposed Floor Areas				
FLOOR	USE	GROSS AREA	DEDUCTIONS	Residential Floor Area
Cellar	Mechanical, Storage, Accessory uses	575.50	575.50	0.00
First	Residential	1,287.00	17.75	1,269.25
Second	Residential	1,287.00	17.75	1,269.25
Third	Residential	1,122.00	17.75	1,104.25
Fourth	Residential	948.50	17.75	930.75
TOTAL		5,220.00	646.50	4,573.50

**APPROVED PLANS
BOARD OF STANDARDS AND APPEALS**

The approval of these plans is limited solely to the relief granted by the BSA. All plans are subject to Department of Buildings review for compliance with all other applicable laws rules and regulations.

Refer to the Certified Resolution language for the scope and specific description of the BSA approval.

Gateliers Architecture
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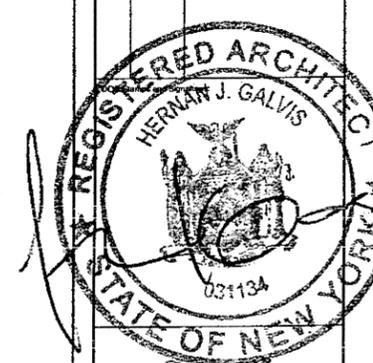
ARCHITECT OF RECORD:
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 131 Union St, Brooklyn, NY 11231
 T: 718.875.4599

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OWNER:
 Passive House XPerimental LLC.
 131 Union St, Brooklyn, NY 11231
 T: 718.875.4599



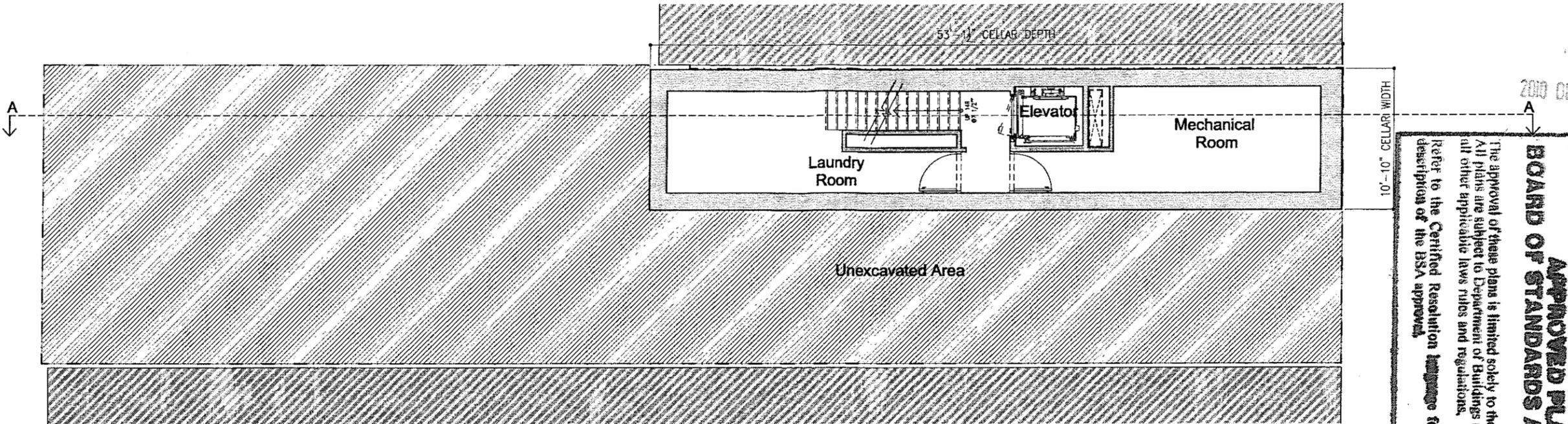
Project:
 107 Union Street, Brooklyn NY
 11231
 Alternative 2- Proposed BSA
 Approved Drawings

Title:
 Site Plan, Zoning Analysis

DATE:	12-16-2010
PROJECT No.:	08-03
DRAWN BY:	OG
CHECK BY:	HG
DWG No.:	A-001.00
CADD FILE No.:	1 of 6

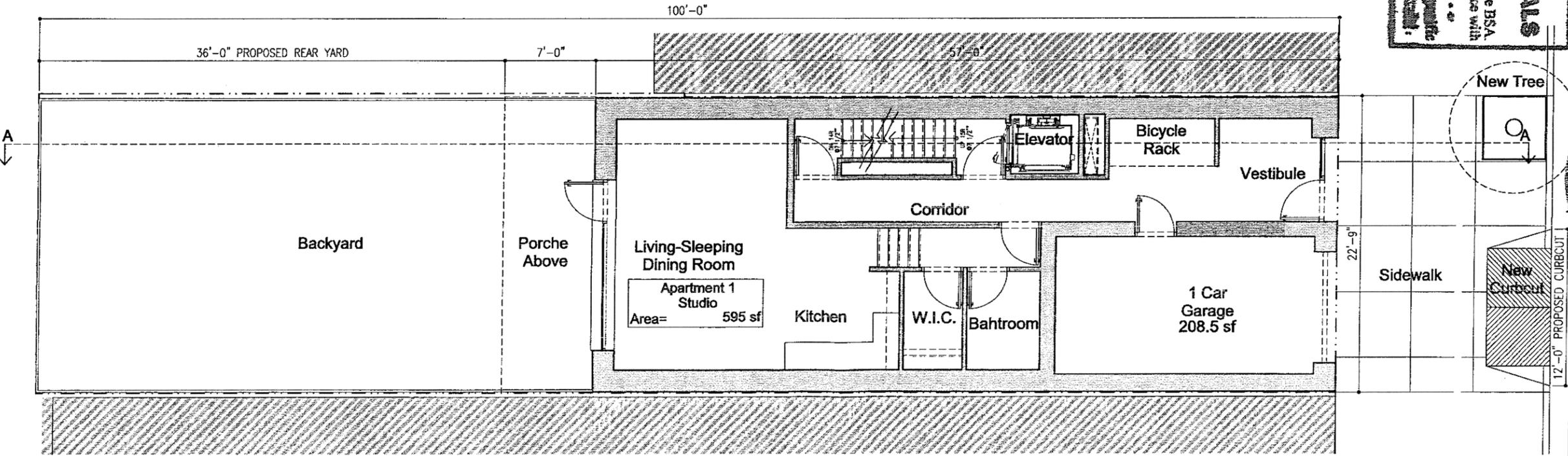
134-10-BZ

Revision No.	Date	Remarks



**APPROVED PLANS
 BOARD OF STANDARDS AND APPEALS**
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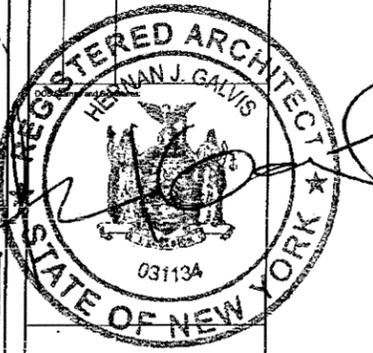
1 Cellar
 1/4" = 1'-0"



2 First Floor
 1/4" = 1'-0"

Total Gross Area: 5,220 sf;
 Total Zoning Area: 4,573.5 sf

"All partitions and exits shall be as approved by DOB."



Project:
 107 Union Street, Brooklyn NY
 11231
 Alternative 2- Proposed BSA
 Approved Drawings

Title:
 Proposed Cellar, First Floor

DATE: 12-16-2010
PROJECT No: 08-03
DRAWN BY: OG
CHK BY: HG
DWG No: A-100_00
CADD FILE No: 2 of 6

Design Team

G ateliers Architecture

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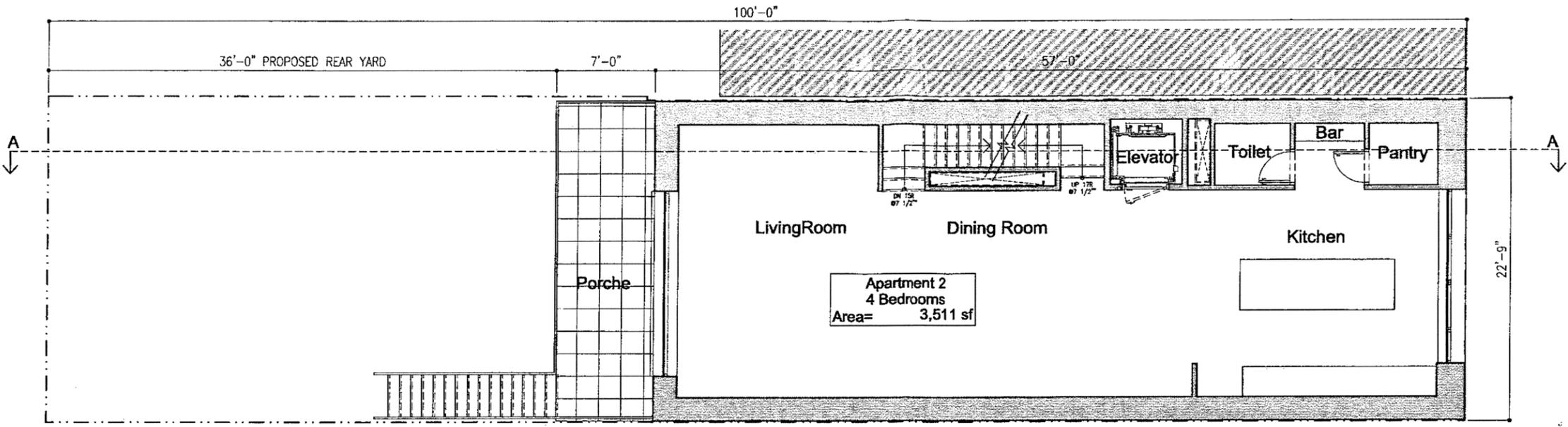
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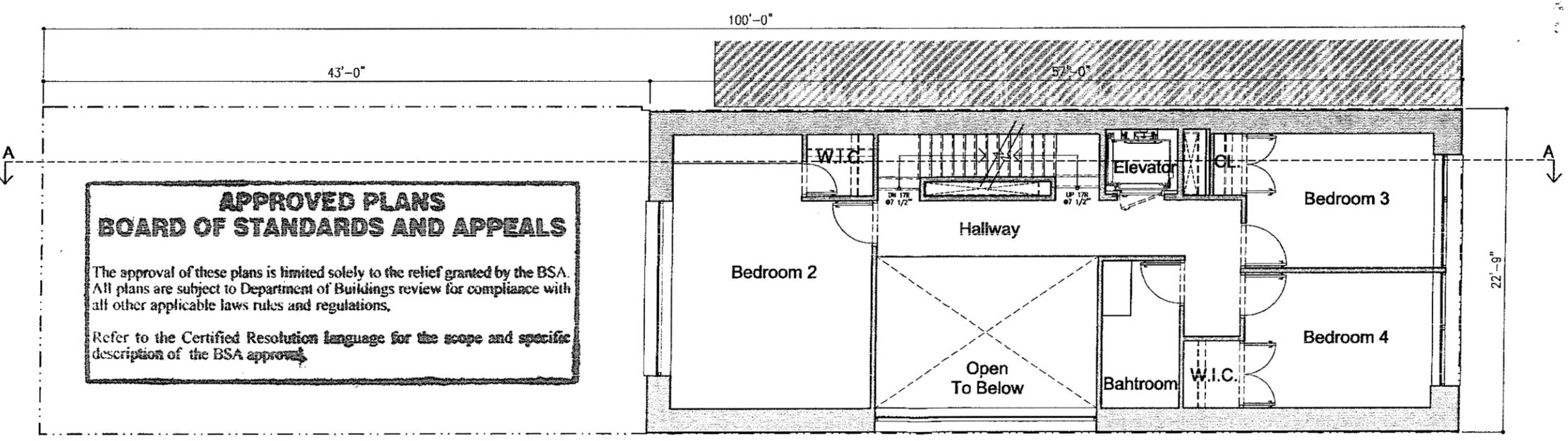
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2010 DEC 21



1 Second Floor
1/4" = 1'-0"

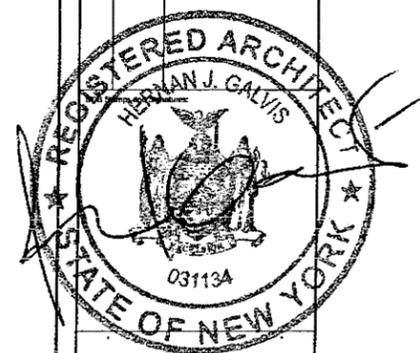


2 3rd Floor
1/4" = 1'-0"

**APPROVED PLANS
BOARD OF STANDARDS AND APPEALS**

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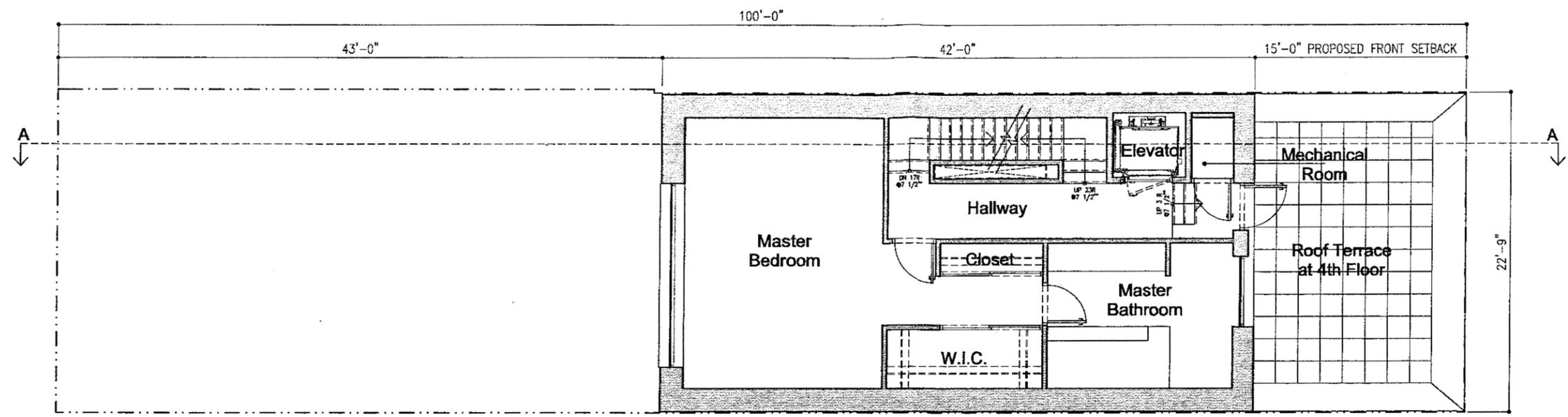


Project:
107 Union Street, Brooklyn NY
11231
Alternative 2- Proposed BSA
Approved Drawings

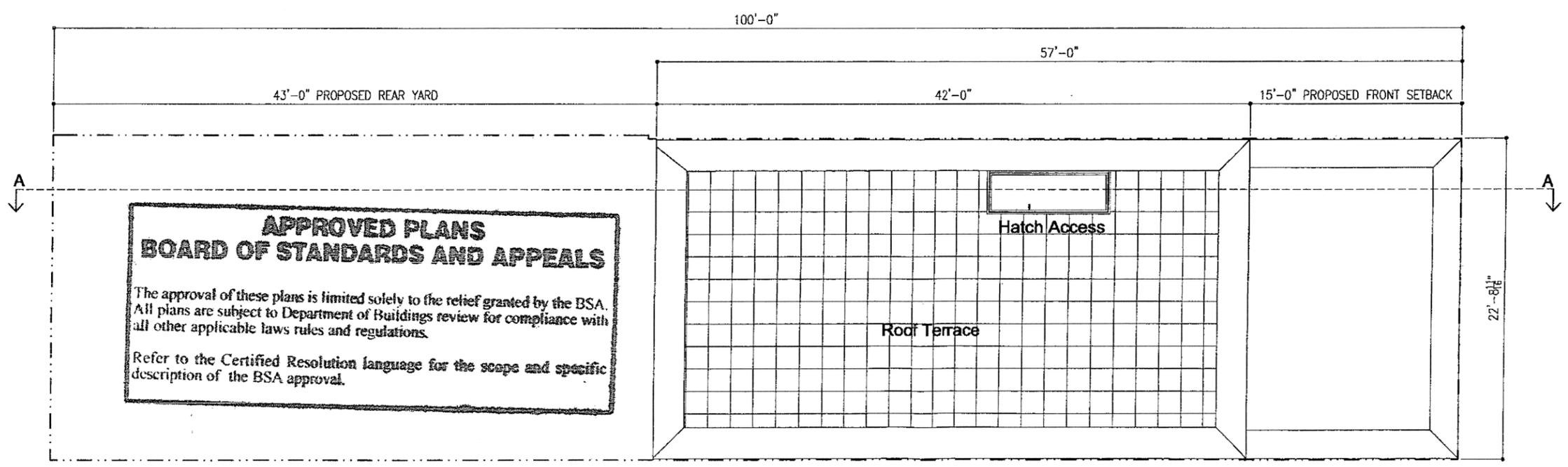
File:
Proposed 2nd & 3rd Floor Plans

DATE	12-16-2010
PROJECT NO.	08-03
DRAWN BY	OG
CHEK BY	HG
DWG NO.	A-101_00
DWG FILE NO.	3 of 6

"All partitions and exits shall be as approved by DOB."



1 4th Floor
1/4" = 1'-0"



2 Roof Terrace
1/4" = 1'-0"

**APPROVED PLANS
BOARD OF STANDARDS AND APPEALS**

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"All partitions and exits shall be as approved by DOB."

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Revision No.	Date	Remarks



Project:
107 Union Street, Brooklyn NY
11231
Alternative 2- Proposed BSA
Approved Drawings

Title:
Proposed 4th Floor & Roof Plans

DATE: 12-16-2010
PROJECT No: DB-03
DRAWN BY: OG
CHEK BY: HG
DWG No: A-102.00
DADO FILE No: 4 of 6

2010 DEC 21

Design Team:

G
ateliers
Architecture

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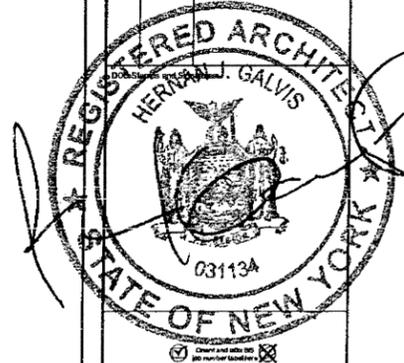
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Revision No.	Date	Remarks



Project:
107 Union Street, Brooklyn NY
11231
Alternative 2- Proposed BSA
Approved Drawings

Title:
Proposed Longitudinal Section
A-A

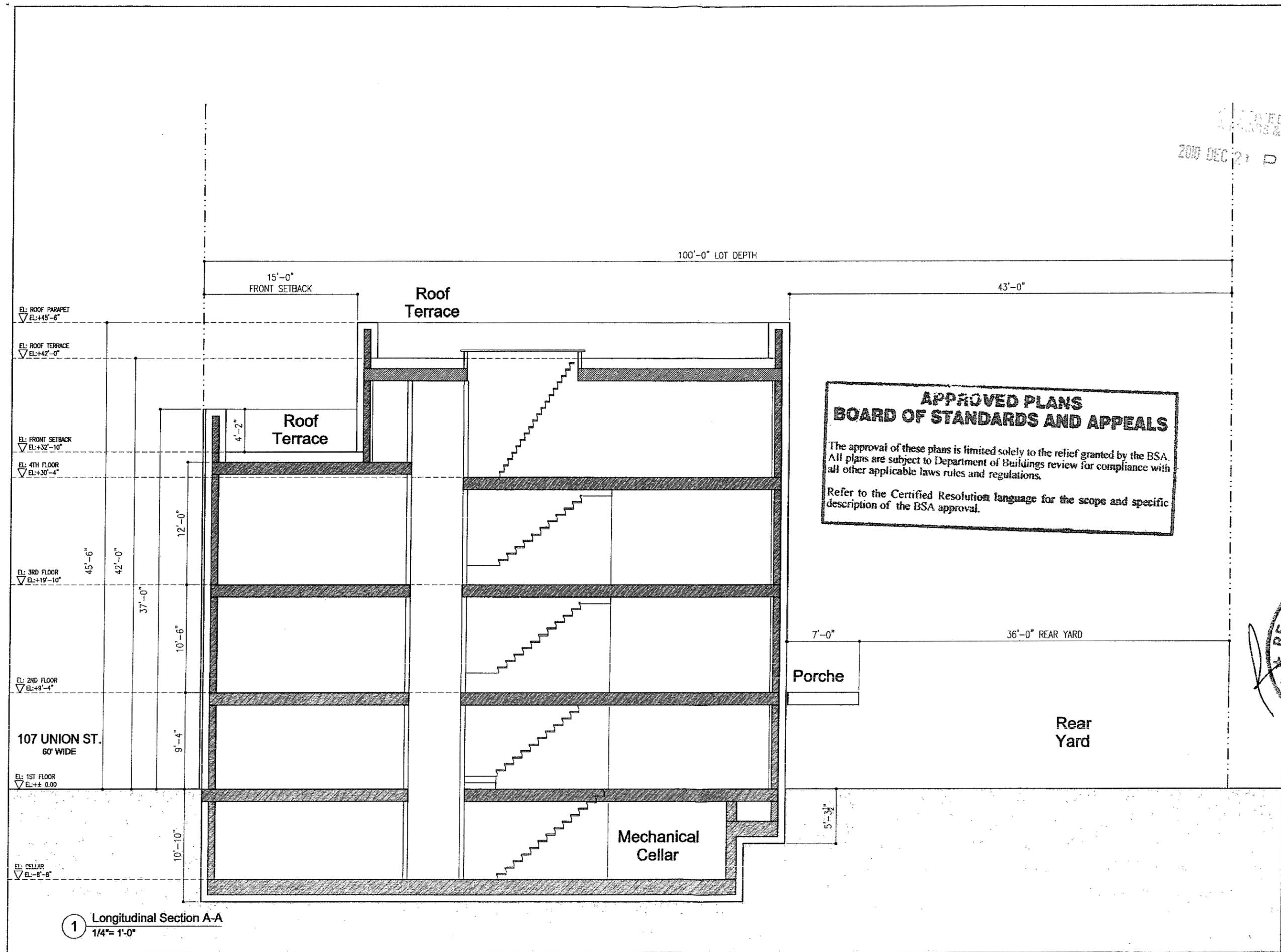
DATE: 12-16-2010
PROJECT No: 08-03
DRAWN BY: OG
CHEK BY: HC
DWG No: A-200
CADD FILE No: ---

APPROVED
2010 DEC 21 P 3

APPROVED PLANS
BOARD OF STANDARDS AND APPEALS

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1 Longitudinal Section A-A
1/4" = 1'-0"

**APPROVED PLANS
BOARD OF STANDARDS AND APPEALS**

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2010 DEC 2

EL: ROOF PARAPET
▽ EL: +45'-6"

EL: ROOF TERRACE
▽ EL: +42'-0"

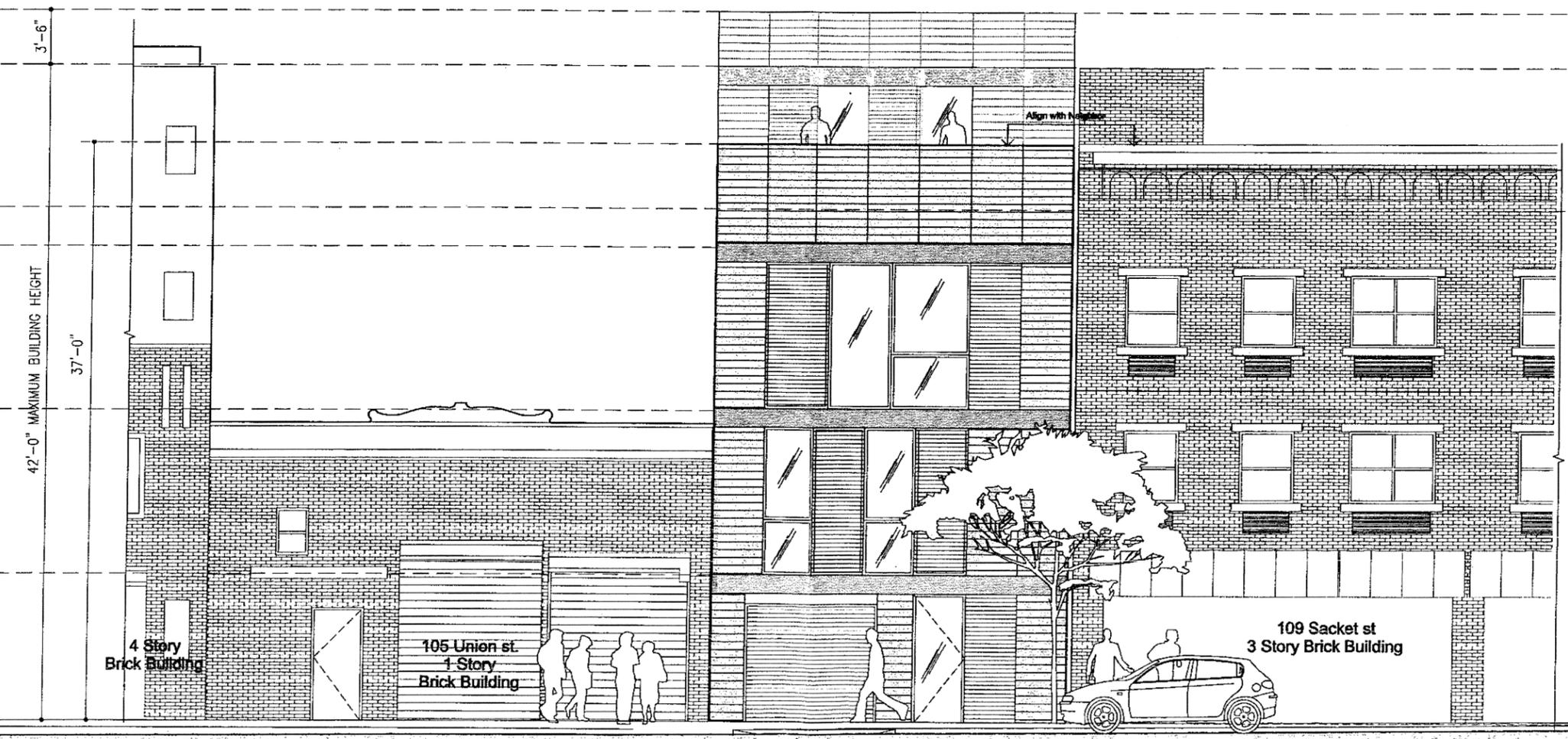
EL: FRONT SETBACK
▽ EL: +32'-10"

EL: 4TH FLOOR
▽ EL: +30'-4"

EL: 3RD FLOOR
▽ EL: +19'-10"

EL: 2ND FLOOR
▽ EL: +9'-4"

EL: 1ST FLOOR
▽ EL: ± 0.00



G ateliers
Architecture

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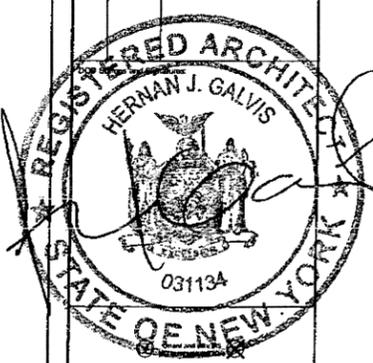
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Revision No.	Date	Remarks

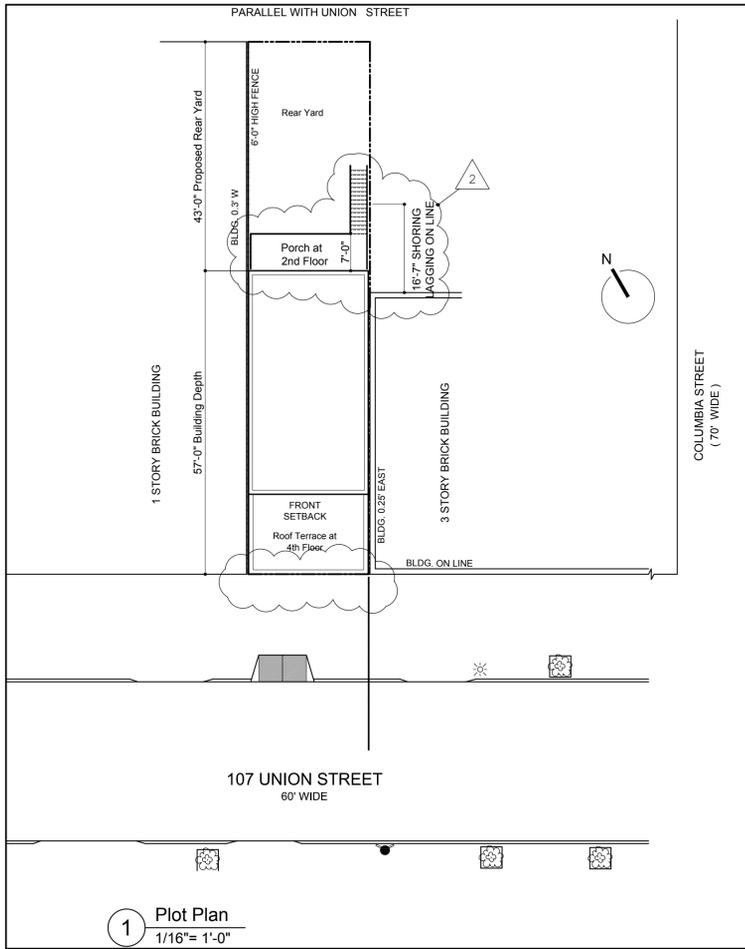


Project:
107 Union Street, Brooklyn NY
11231
Alternative 2- Proposed BSA
Approved Drawings

Title:
Proposed Front elevation

SEAL & SIGNATURE: _____ DATE: 12-16-2010
PROJECT No: 09-03
DRAWN BY: OG
CHK BY: HG
DWG No: A300_00
GADO FILE No: _____ of 6

1 Front Elevation- Union Street
1/4" = 1'-0"



1 Plot Plan
1/16" = 1'-0"

NOTE: NO UNDERPINNING PROPOSED/REQUIRED UNDER THIS APPLICATION

FLOOR LIVE LOAD CRITERIA:

R-2 MULTIFAMILY STRUCTURE		R-3 SINGLE AND TWO FAMILY STRUCTURE	
OCCUPANCY OR USE	UNIFORM (PSF)	OCCUPANCY OR USE	UNIFORM (PSF)
BALCONIES (EXTERIOR)	100	BALCONIES (EXTERIOR)	60 f
DECKS	VARIES a	DECKS	VARIES a
PUBLIC CORRIDORS/LOBBY	100	CORRIDORS	40
EQUIPMENT/MECHANICAL ROOMS	75 b	EQUIPMENT/MECHANICAL	75
GARAGES (PASSENGER)	40 c	GARAGES (PASSENGER)	40 c
RESIDENTIAL/PRV. CORRIDORS	40	RESIDENTIAL	40
ROOFS (FLAT) (SPECIAL PURPOSE)	120 d	ROOFS (FLAT) (SPECIAL PURPOSE)	100 d
STAIRS AND EXITS	100 e	STAIRS AND EXITS	40
STORAGE (LIGHT)	125	STORAGE (LIGHT)	125
YARDS AND TERRACES (PED)	100	YARDS AND TERRACES (PED)	100

- a. Same as Occupancy Served, and in compliance with BC-1604.8.3
- b. Elevator Machine Room grating 300lbs on Area of 4 Sq Inches.
- c. AtL 3,000lbs on area of 4.5 Sq Inches for storage of Vehicles accommodating up to 9 Pias.
- d. In compliance with Section 1607.11. See Roof Live Load Criteria below.
- e. Minimum Concentrated Load on stair treads (on area of 4 Sq Inches) iss 300lbs.
- f. Not to Exceed 100 Sq Ft.

ROOF LIVE LOAD CRITERIA:

- 1. SPECIAL PURPOSE ROOFS:
PROMENADE PURPOSE AND ROOF GARDENS: 120PSF LIVE LOAD
- 2. AWNINGS AND CANOPIES: 5PSF LIVE LOAD

ROOF SNOW LOAD CRITERIA:

- 1. GROUND SNOW LOAD: 25PSF

WIND DESIGN DATA/CRITERIA:

- 1. BASIC WIND SPEED: 20 PSF

EARTHQUAKE DESIGN DATA/CRITERIA:

- 1. SEISMIC IMPORTANCE FACTOR: B

FLOOD LOAD CRITERIA:

STRUCTURE IS LOCATED OUTSIDE ANY AREAS OF SPECIAL FLOOD HAZARD.

SPECIAL LOAD CRITERIA:

NO SPECIAL LOADING CONDITIONS ARE APPLICABLE OR PROPOSED TO/IN THIS STRUCTURE

PROPOSED BUILDING CHARACTERISTICS

PRIMARY STRUCTURAL SYSTEM: REINFORCED MASONRY
STRUCTURAL OCCUPANCY CATEGORY: II
SEISMIC DESIGN CATEGORY: B
OCCUPANCY CLASSIFICATION: RESIDENTIAL (R-3)
CONSTRUCTION CLASSIFICATION II-A

BUILDING DEPARTMENT NOTES:

1. PROPOSED SCOPE OF WORK IS LIMITED INSTALLATION OF NEW FOUNDATION AND STRUCTURAL SYSTEMS AND SUPPORT OF EXCAVATION IN CONJUNCTION WITH NEW BUILDING FILED UNDER DOC 01 OF THIS APPLICATION.
2. THIS APPLICATION TO BE EXAMINED UNDER 2008 CODE.
3. CONTRACTOR SHALL OBTAIN ALL PERMITS FROM THE D.O.B. PRIOR TO START OF WORK.
4. APARTMENT UNITS ARE NOT BEING COMBINED.
5. ALL MATERIALS TO COMPLY WITH NYC DEPARTMENT OF BUILDINGS FLAME SPREAD RATINGS.
6. THE G.C. IS TO COMPLY WITH ALL TERMS, CONDITIONS, RULES AND REGULATIONS COVENANTS, AND CODES GOVERNING THIS PROJECT.

GENERAL NOTES:

1. ALL MATERIALS AND CONSTRUCTION METHODS SHALL BE IN COMPLIANCE WITH THE REGULATIONS OF THE BUILDING CODE OF THE CITY OF NEW YORK, 2008 EDITION WITH LATEST AMENDMENTS.
2. NO WORK SHALL COMMENCE WITHOUT THE ISSUANCE OF THE REQUIRED PERMITS BY THE COMMISSIONER.
3. THE CONTRACTOR SHALL COMPLY WITH THE PROVISIONS OF CHAPTER 33 REGARDING SAFEGUARDS DURING CONSTRUCTION.
4. ALL NOTES, DIMENSIONS, DETAILS AND JOB CONDITIONS ARE TO BE VERIFIED IN THE FIELD PRIOR TO THE COMMENCEMENT OF WORK. ANY DISCREPANCIES SHALL BE IMMEDIATELY PRESENTED TO THE ENGINEER FOR SUBSEQUENT DIRECTION.
5. DRAWINGS SHALL NOT BE SCALED, DIMENSIONS ARE TO BE USED ONLY.
6. NO FOUNDATION OR EARTHWORK PERMIT SHALL BE ISSUED UNLESS AND UNTIL AT LEAST FIVE DAYS PRIOR WRITTEN NOTICE OF THE PERMIT APPLICATION SHALL HAVE BEEN GIVEN BY THE APPLICANT TO THE OWNERS OF ALL ADJOINING LOTS, BUILDINGS AND SERVICE FACILITIES WHICH MAY BE AFFECTED BY THE PROPOSED FOUNDATION WORK OR EARTHWORK OPERATIONS.
7. ALL FOUNDATION AND EARTHWORK OPERATIONS SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTERS 18 AND 19 OF THE CODE AND ALL LOTS, BUILDINGS AND SERVICE FACILITIES ADJOINING THE FOUNDATION AND EARTHWORK AREAS SHALL BE PROTECTED AND SUPPORTED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 33 OF THE NYC BC.

NOTE:

IT SHALL BE UNLAWFUL TO PLACE OR CAUSE OR PERMIT TO BE PLACED ON ANY FLOOR OR ROOF OF A BUILDING, STRUCTURE OR PORTION THEREOF, A LOAD GREATER THAN IT IS PERMITTED BY THE DESIGN LOADS AS INDICATED.

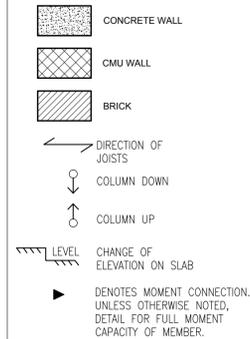
LEGEND:

Structural Legend & Symbols

ABBREVIATIONS

U.O.N.	UNLESS OTHERWISE NOTED
V.I.F.	VERIFY IN FIELD
T.O.	TOP OF
F.O.	FACE OF
E.W.	EACH WAY
E.F.	EACH FACE
T&B	TOP AND BOTTOM
CLR	CLEAR COVER FOR REINFORCING BARS
C.J.	CONSTRUCTION JOINT
E.J.	EXPANSION JOINT
LLV	LONG LEG VERTICAL
CP	COMPLETE PENETRATION
BP	BEARING PLATE. SEE TYPICAL DETAIL AND SCHEDULE.
MC	MOMENT CONNECTION

NOTE: ITEMS SHOWN ON LEGEND ARE NOT NECESSARILY INCLUDED IN SCOPE OF WORK. CONTRACTOR SHALL USE DRAWINGS TO DEFINE SCOPE OF WORK



EXCAVATION NOTES:

1. THE PERIMETER OF THE GENERAL EXCAVATION SHALL BE RETAINED BY A SOIL RETENTION SYSTEM (WHERE APPLICABLE). THE INSTALLATION, MAINTENANCE AND REMOVAL (WHERE REQUIRED) SHALL BE THE COMPLETE AND SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL PROVIDE ALL MEASURES AND PRECAUTIONS NECESSARY TO PREVENT DAMAGE AND MINIMIZE SETTLEMENT OF EXISTING OR NEW CONSTRUCTION INSIDE AND OUTSIDE THE PROJECT LIMITS. ANY DAMAGE TO NEW OR EXISTING CONSTRUCTION INSIDE OR OUTSIDE OF THE PROJECT LIMITS, CAUSED BY CONSTRUCTION TECHNIQUES OR MOVEMENTS OF THE SOIL RETENTION SYSTEM, IS THE RESPONSIBILITY OF THE CONTRACTOR. THE DESIGN OF THE SOIL RETENTION SYSTEM WILL BE PROVIDED BY THE OWNER. THE CONTRACTOR WILL ASSIST THE OWNER IN THE APPROVAL PROCESS FOR THE RETENTION SYSTEM IF SO REQUIRED. THE CONTRACTOR SHALL PROVIDE ALL CONTROLLED INSPECTIONS REQUIRED BY THE STATE BUILDING CODE RELATING TO THE RETENTION SYSTEM.
2. THE CONTRACTOR SHALL COORDINATE ALL ELEMENTS OF THE SOIL RETENTION SYSTEM WITH ALL ELEMENTS OF THE PERMANENT BUILDING.
3. PRIOR TO ANY EXCAVATION OR INSTALLATION OF ELEMENTS OF THE SOIL RETENTION SYSTEM, THE CONTRACTOR SHALL ESTABLISH SURVEY POINTS AROUND THE PERIMETER OF THE AREA TO BE EXCAVATED AND OTHER POINTS UP TO 200 FEET BEYOND THE PERIMETER. THESE POINTS SHALL BE SURVEYED FOR VERTICAL AND HORIZONTAL MOVEMENT AT FREQUENT INTERVALS DURING ACTUAL EXCAVATION AND CONTINUING DURING EACH SUBSEQUENT PHASE OF THE WORK AND SUBMITTED TO THE ARCHITECT FOR INFORMATION.
4. ALL EXCAVATION SHALL BE BASED ON ENGINEERED DRAWINGS PREPARED BY THE CONTRACTOR INCLUDING PLANS AND SECTIONS OF EXCAVATION SEQUENCES. THE EXCAVATION SEQUENCES SHALL BE CONTROLLED TO MATCH THE REQUIREMENTS OF THE DESIGN OF THE SOIL RETENTION SYSTEM AND TO PERMIT MONITORING OF WALL AND GROUND MOVEMENTS.
5. THE GENERAL EXCAVATION ACROSS THE SITE SHALL NOT EXTEND DEEPER THAN THE SLAB-ON-GRADE SUBGRADE ELEVATION. THE EXCAVATIONS FOR FOOTINGS, GRADE BEAMS, PILE CAPS, MATS, PITS, SLABS, ETC. SHALL BE EXCAVATED ON AN INDIVIDUAL, LOCALIZED BASIS DOWN FROM THE SLAB-ON-GRADE SUBGRADE LEVEL.
6. ALL EXCAVATION BELOW THE SLAB LEVEL REQUIRED FOR PITS SHALL BE RETAINED BY LOCALIZED SOIL RETENTION SYSTEMS AS MAY BE NECESSARY BASED ON A DESIGN USING APPROPRIATED EARTH AND HYDRAULIC PRESSURES AND OTHER CONSTRUCTION LOADINGS.
7. THE CONTRACTOR SHALL PROVIDE POSITIVE PROTECTION (MAT/SHEET COVERINGS) FOR ALL EXCAVATION SLOPES TO PROTECT SLOPES FROM INSTABILITY AND DEGRADATION DUE TO RAIN, WIND OR SNOW/ICE.
8. THE CONTRACTOR SHALL PROVIDE SURFACE DRAINAGE CHANNELS AND SUMPS AND SLUMP PUMPS TO PROTECT ALL EXCAVATIONS FROM FLOODING. FLOODING OF ANY EXCAVATION AFTER APPROVAL OF THE SUBGRADE WILL BE CAUSE FOR COMPLETE REPREPARATION AND APPROVAL OF THE SUBGRADE.
9. PROVIDE A DRAINAGE PANEL AGAINST THE OUTSIDE FACE OF THE FOUNDATION WALL AT LOCATIONS INDICATED ON THE ARCHITECTURAL DRAWINGS.
10. THE OWNER'S SOIL TESTING LABORATORY SHALL REVIEW AND MONITOR THE EXCAVATION, DEWATERING AND SOIL RETENTION SYSTEMS. THE CONTRACTOR SHALL PROVIDE, INSTALL AND SURVEY: (A) VERTICAL AND HORIZONTAL MOVEMENTS OF THE TOP OF THE SOIL RETENTION SYSTEM; AND (B) BENCH MARKS ADJACENT TO AND AWAY FROM THE SITE PERIMETER FOR VERTICAL AND HORIZONTAL MOVEMENTS.
11. SEE PLUMBING AND ELECTRICAL DRAWINGS FOR UNDERFLOOR UTILITY AND GROUNDING REQUIREMENTS, AND ARCHITECTURAL DRAWINGS FOR ALL WATERPROOFING AND DAMPROOFING DETAILS.

FOUNDATION NOTES:

1. CONCRETE FOR FOOTINGS, PIERS, AND SLABS ON GRADE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS UNLESS OTHERWISE NOTED ON DRAWINGS.
2. ALL REINFORCEMENT SHALL CONFORM TO ASTM A615 GRADE 60, WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185.
3. BEFORE ANY FOOTING IS PLACED, THE CONTRACTOR SHALL ESTABLISH BY SURVEY THE EXACT LOCATION OF ALL UNDERGROUND UTILITIES, TRENCHES AND PIPING TO REMAIN IN THE FINISHED WORK. THESE LOCATIONS SHALL BE SUBMITTED TO DRAWINGS TO THE ARCHITECT FOR REVIEW. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF ALL EXISTING CONSTRUCTION AND SHALL REPAIR ANY DAMAGE TO THE SATISFACTION OF THE OWNER AT NO EXTRA COST TO THE OWNER.
4. THE ELEVATIONS OF THE FOOTINGS ARE BASED ON THE BORINGS WHICH CONSTITUTE THE BEST POSSIBLE INFORMATION AVAILABLE. ACTUAL SITE CONDITIONS MAY NECESSITATE DEVIATIONS FROM THESE ELEVATIONS. ANY DEVIATIONS FROM THE ELEVATIONS SHALL BE NOTED ON DRAWINGS AND SUBMITTED TO THE ARCHITECT FOR HIS APPROVAL PRIOR TO CONSTRUCTION.
5. DOWELS FROM FOOTINGS INTO PIERS AND GRADE BEAMS SHALL BE SIZE AND NUMBER AS VERTICAL REINF. IN PIERS, BUTTRESSES AND WALLS, AND SHALL BE EXTENDED 30 BAR DIAMETER IF NOT OTHERWISE SHOWN.
6. PROVIDE #5 @12" DOWELS EACH FACE TO THE FULL EXTENT OF CONTACT BETWEEN GRADE BEAMS, OR FOOTINGS AND EXTEND 30 BAR DIAMETER INTO FOOTINGS AND GRADE BEAMS OR WALL, IF NOT OTHERWISE SHOWN.
7. DROP BOTTOM OF GRADE BEAMS TO TOP OF FOOTINGS, TO OBTAIN FULL EXTENT OF CONTACT, IF NOT OTHERWISE NOTED.
8. CENTERLINES OF FOOTINGS, AND CENTERLINES OF PIERS, COLUMNS, AND BEAMS SHALL BE THE SAME UNLESS OTHERWISE NOTED.
9. ALL REINFORCEMENT SHALL BE SECURELY HELD IN PLACE WHILE PLACING CONCRETE. IF REQUIRED, ADDITIONAL BARS OF STIRRUPS SHALL BE PROVIDED BY THE CONTRACTOR TO FURNISH SUPPORT FOR ALL BARS.
10. ALL REINFORCING BARS SHALL BE LAPPED AS PER EMBEDMENT AND SPICE LENGTH SCHEDULE ON THE DRAWINGS. LAP GRADE BEAM TOP REINFORCEMENT AT CENTER OF SPAN. LAP GRADE BEAM BOTTOM REINFORCEMENT AT SUPPORT. TERMINATE CONTINUOUS BARS AT DISCONTINUOUS ENDS WITH STANDARD HOOKS.
11. MINIMUM CONCRETE COVER FOR REINFORCING STEEL SHALL BE 1" FOR SLABS AND WALLS. ALL CONCRETE EXPOSED TO WEATHER OR EARTH FILL SHALL HAVE MINIMUM CONCRETE COVER OF 2" FOR BARS LARGER THAN #5, 1" FOR #5 BARS OR SMALLER AND 3" FOR ALL CONCRETE PLACES AGAINST EARTH. ALL CONCRETE PLACED AGAINST PERMANENT SHEETING SHALL HAVE MINIMUM CONCRETE COVER IF 4".
12. ALL EXPOSED CONCRETE SHALL HAVE AN AIR ENTRAINING AGENT.
13. CONTRACTOR SHALL SUBMIT DRAWINGS SHOWING INTENDED PLACEMENT SEQUENCE AND LOCATION OF CONSTRUCTION JOINTS TO THE ARCHITECT FOR APPROVAL. FDN. WALL CONSTRUCTION JOINTS SHALL BE LOCATED SO AS TO PROVIDE A 60'-0" MAXIMUM LENGTH OF CONCRETE PLACEMENT.
14. VERTICAL CONSTRUCTION JOINTS IN FDN. WALLS SHALL BE USED ONLY WHEN UNAVOIDABLE AND SHALL BE LOCATED AT LEAST 8'-0" FROM ANY COLUMN LINE AND AT CENTER LINES BETWEEN SUPPORTS FOR GRADE BEAMS.
15. NO HORIZONTAL CONSTRUCTION JOINT WILL BE PERMITTED IN WALLS AND SLABS UNLESS SPECIFICALLY SHOWN ON STRUCTURAL DRAWINGS.
16. NO BACK FILLING SHALL BE DONE AGAINST UNBRACED FDN. WALLS UNTIL CONCRETE HAS ATTAINED AT LEAST 75% OF ITS 28 DAY STRENGTH, AND WALLS SUSTAIN NO MORE THAN 3'-0" OF EARTH PRESSURE. PROVIDE BRACING AT TOP OF WALLS (OR PROVIDE FLOOR FRAMING) FOR WALLS SUSTAINING MORE THAN 3'-0" OF BACKFILL.
17. CONTRACTOR SHALL VERIFY DIMENSIONS AND LOCATIONS OF ALL OPENINGS, PIPE SLEEVES, CURBS, ETC. AS REQUIRED BY OTHER TRADES BEFORE CONCRETE IS PLACED.
18. PIPES OR CONDUITS PLACED IN SLAB ON GRADE SHALL NOT BE SPACED CLOSER 3 X DIAMETER IN CENTER PIPES AND CONDUITS PLACES IN SLAB ON GRADE SHALL NOT HAVE AN OUTSIDE DIAMETER LARGER THAN 1/3 OF SLAB THICKNESS. ALUMINUM CONDUITS SHALL NOT BE PLACED IN CONCRETE. NO CONDUITS SHALL BE PLACED IN SLAB WITHIN 2" OF COLUMN FACE.
19. ALL CONCRETE DESIGN IS ULTIMATE STRENGTH DESIGN BASED ON ACI 318 "BUILDING CODE REQUIREMENTS REINFORCED CONCRETE", LATEST EDITION.
20. PROVIDE 4" MINIMUM DRAINAGE FILL CONCRETE SLAB ON GROUND.
21. CONTRACTOR SHALL USE RIGID TEMPLATE TO INSTALL ANCHOR BOLTS.
22. CONTRACTOR SHALL BE RESPONSIBLE TO ADEQUATELY PROTECT ALL EXCAVATION SLOPES.
23. IN NO CASE SHALL BULLDOZERS OR OTHER HEAVY EQUIPMENT BE PERMITTED CLOSER THAN 8'-0" FROM ANY FDN. WALL. IF IT IS NECESSARY TO OPERATE SUCH EQUIPMENT CLOSER THAN 8'-0" TO THE WALL, THE CONTRACTOR SHALL BE THE SOLE RESPONSIBLE PARTY AND AT HIS OWN EXPENSE SHALL PROVIDE ADEQUATE SUPPORTS OR BRACE THE WALL TO WITHSTAND THE ADDITIONAL LOADS SUPERIMPOSED FROM SUCH EQUIPMENT.
24. FOR LOCATION OF FLOOR DRAINS, CURBS, CONCRETE PADS AND FLOOR DEPRESSIONS SEE ARCHITECTURAL AND MECHANICAL DRAWINGS.
25. AKK TOP REINF. IN SLAB AT PARKING OR CAR AREAS SHALL HAVE MINIMUM CLEAR COVER OF 1" INCHES.
26. ALL CONCRETE SHALL HAVE AN AIR ENTRAINMENT AGENT.
27. PROVIDE WATERSTOPS AT ALL CONSTRUCTION JOINTS IN BASEMENT WALLS AND CONCRETE SLAB ON GROUND.

ADDITIONAL FOUNDATION NOTES:

1. ALL FOUNDATION WORK SHALL CONFORM TO THE REQUIREMENTS OF CHAPTER 18 OF THE CODE.
2. THE BOTTOM SURFACE OF ANY FOOTING SHALL BE CARRIED DOWN AT LEAST FOUR FEET BELOW THE LOWEST LEVEL OF THE ADJOINING GROUND OR PAVEMENT SURFACE THAT IS EXPOSED TO FROST.
3. NO FOUNDATION SHALL BE PLACED ON FROZEN SOIL. NO FOUNDATION SHALL BE PLACED IN FREEZING WEATHER UNLESS PROVISION IS MADE TO MAINTAIN THE UNDERLYING SOIL FREE OF FROST.
4. NO FOUNDATION SHALL BE LAID ON SOIL THAT HAS BEEN DISTURBED BY SEEPAGE UNLESS REMEDIAL MEASURES, AS DIRECTED BY THE ENGINEER ARE TAKEN.
5. ALL FOOTINGS SHALL BEAR DIRECTLY ON UNDISTURBED OR SATISFACTORILY COMPACTED SOIL HAVING A MINIMUM SAFE CAPACITY AS INDICATED ON THE CONTRACT DRAWINGS, 3.5 TON PER SQUARE FOOT.
6. THE SOIL MATERIAL DIRECTLY UNDERLYING FOOTINGS, FOUNDATION PIERS AND FOUNDATION WALLS SHALL BE INSPECTED BY AN ARCHITECT/ENGINEER AFTER EXCAVATION AND IMMEDIATELY PRIOR TO FOOTING CONSTRUCTION IN CONFORMANCE WITH SPECIAL INSPECTION BC 1704.7.1, BC 109.3.1

EARTH BRACING NOTES:

1. THE LOCATION OF ALL UNDERGROUND UTILITIES SHALL BE VERIFIED IN THE FIELD. ALL UTILITIES AND UNDERGROUND STRUCTURES SHALL BE MARKED PRIOR TO EXCAVATIONS. THE CONTRACTOR IS TO USE CAUTION WHEN WORKING NEAR OR UNDER OVERHEAD UTILITIES.
2. CONTRACTOR SHALL ADHERE TO ALL APPLICABLE CONSTRUCTION SAFETY STANDARDS AS PUBLISHED IN THE CODE OF FEDERAL REGULATION PART 1926, OSHA STANDARDS.
3. THE EARTH BRACING SYSTEM SHOWN IS SUGGESTED. SEE SUPPORT OF EXCAVATION NOTE ON 5-011 BELOW
4. DESIGN OF THE EARTH BRACING SYSTEM SHALL CONSIDER A SURCHARGE LIVE LOAD OF 100 PSF ON THE EARTH-SIDE OF THE SYSTEM.
5. IF APPLICABLE STRUCTURAL STEEL SHAPES, PLATES, AND ANGLES SHALL BE ASTM A36. BOLTS SHALL BE ASTM A307.
6. ALL WELDS, WHERE USED, SHALL BE IN ACCORDANCE WITH AWS D1.1. ELECTRODES SHALL BE E70XX.
6. EARTH BRACING SYSTEMS SHALL BE FULLY ASSEMBLED BEFORE CONCRETE PLACEMENT.
9. TIMBER STRUTS SHALL BE 6X6 MINIMUM UNDERESSED WITH A MINIMUM ALLOWABLE COMPRESSIVE STRESS PARALLEL TO THE GRAIN OF 800 PSI. TIMBER SHALL BE IN GOOD SERVICEABLE CONDITION AND SHALL BE PRESSURE TREATED.

STRUCTURAL MASONRY:

1. ALL MATERIALS AND CONSTRUCTION METHODS REGARDING REINFORCED AND UN-REINFORCED MASONRY SHALL COMPLY WITH CHAPTER 21 OF THE CODE AND IN CONFORMANCE WITH SPECIAL INSP. BC 1704.5.
2. THE QUALITY OF ALL MASONRY UNITS SHALL CONFORM TO THE STANDARD AND GRADE SHOWN IN TABLE 10-1.1 MATERIAL STANDARDS; F'm = 2,000 PSI MORTAR SHALL CONFORM TO TABLE RS 10-1.2 TYPES OF MORTAR PERMITTED.
3. PROVIDE MINIMUM #6 VERTICAL AND HORIZONTAL REINFORCEMENT AT THE FOLLOWING LOCATIONS:
 - a. TOP OF WALLS.
 - b. AT WALL ENDS.
 - c. 24" EITHER SIDE OF A WINDOW.
 - d. AT THE TOP AND BOTTOM OF ALL OPENINGS.
 - e. MAXIMUM HORIZONTAL SPACING FOR VERTICAL REINFORCEMENT SHALL BE 10'-0".
4. MINIMUM HORIZONTAL REINFORCEMENT SHALL BE 0.0007 THE CROSS-SECTION AREA OF THE WALL SPACED AT 16" ON CENTER.
5. ANCHORS SHALL BE EMBEDDED IN REINFORCED BOND OR REINFORCED VERTICAL CELLS.
6. ROOF CONSTRUCTION SHALL BE SECURELY ANCHORED TO LOAD BEARING MASONRY WALLS WITH A MIN. 1/2" DIAMETER BOLT SPACED AT 8'-0" ON CENTER WITH 1/4" DIAMETER BOLTS EMBEDDED 16".
7. FLOOR JOISTS SHALL BE SECURED AT 6'-0" ON CENTER WITH 1/4" DIAMETER BOLTS EMBEDDED 16".
8. MASONRY ABOVE OPENINGS SHALL BE SUPPORTED BY BUTTRESSED ARCHES OR BY LINTELS THAT BEAR ON THE WALL FOR AT LEAST 4".
9. TEMPORARY BRACING SHALL BE USED WHENEVER NECESSARY TO TAKE CARE OF ANY LOADS TO WHICH THE WALLS MAY BE SUBJECTED TO DURING ERECTION. SUCH BRACING SHALL REMAIN IN PLACE AS LONG AS MAY BE REQUIRED FOR SAFETY.
10. ALL CEMENTITIOUS MATERIALS, AGGREGATES, AND WATER SHALL BE MIXED FOR A MINIMUM OF 5 MINS IN A MECHANICAL BATCH MIXER. SLUM SHALL NOT EXCEED 11". ALL MORTAR AND GROUT SHALL BE USED WITHIN 2-1/2 HOURS OF INITIAL MIXING AND NO MORTAR OR GROUT SHALL BE USED AFTER IT HAS BEGUN TO SET.
11. MASONRY UNITS SHALL NOT BE WETTED BEFORE LAYING. NO FROZEN MATERIAL OR MATERIALS CONTAINING ICE MAY BE USED.
12. THE FACING AND BACKING OF MASONRY WALLS SHALL BE BONDED WITH CORROSION-RESISTANT 3/16" DIA. STEEL TIES EMBEDDED IN HORIZONTAL JOISTS WITH SPACING NOT TO EXCEED TWO SQUARE FEET OF WALL AREA.
13. VERTICAL CELLS TO BE FILLED WITH GROUT SHALL BE ALIGNED TO PROVIDE A CONTINUOUS UNSTRUCTURED OPENING OF THE DIMENSIONS SHOWN ON THE PLANS.
14. HOLLOW UNITS SHALL BE LAID WITH FULL MORTAR COVERAGE ON HORIZONTAL AND VERTICAL FACE SHEETS EXCEPT THAT WEBS SHALL ALSO BE BEDDED WHERE THEY ARE ADJACENT TO CELLS TO BE REINFORCED AND/OR FILLED WITH GROUT.
15. ALL CUTTING AND FITTING OF MASONRY, INCLUDING THAT REQUIRED TO ACCOMMODATE THE WORK OF OTHER TRADES, SHALL BE DONE WITH MASONRY SAWS.
16. REINFORCING BARS FOR REINFORCED MASONRY SHALL CONFORM TO ASTM A615-60.
17. GROUT FOR FILLING REINFORCED OR NON-REINFORCED CELLS SHALL BE LAYED AND PLACED BY ACCEPTABLE PRACTICE PROCEDURES.
18. GROUT FOR FILLING REINFORCED OR NON-REINFORCED CELLS SHALL BE PLACED IN MAXIMUM FOUR (4) FOOT LIFTS AND CONSOLIDATED IN PLACE BY VIBRATION OR OTHER METHODS WHICH INSURE COMPLETE FILLING OF THE CELLS. ALL CELLS CONTAINING REINFORCING BARS AND/OR ANCHOR BOLTS SHALL BE FULLY GROUTED.
19. POINTS OF BEARING SHALL BE ON TWO (2) COURSES OF HOLLOW MASONRY GROUTED SOLID. CHASES SHALL BE BUILT INTO WALLS, NOT CUT IN. CHASES SHALL BE PLUMB AND SHALL BE A MINIMUM OF ONE (1) MASONRY COURSE FROM JAW OF WALL OPENINGS. NO CHASES OTHER THAN THOSE SHOWN ON THE DRAWINGS SHALL BE CONSTRUCTED WITHOUT PRIOR REVIEW OF THE ENGINEER.
20. PROVIDE ADEQUATE TEMPORARY BRACING AS REQUIRED DURING CONSTRUCTION TO WITHSTAND LATERAL LOADS AND THE PRESSURES OF FLUID GROUT.
21. CONCRETE MASONRY SHALL BE PROTECTED FROM ABSORBING MOISTURE AND WATER WHILE AT THE PLANT, DURING SHIPMENT AND AT THE SITE DURING CONSTRUCTION.
22. ANCHORS, WALL PLUGS, ACCESSORIES AND OTHER ITEMS TO BE BUILT IN SHALL BE INSTALLED AS THE MASONRY WORK PROGRESSES. SEE ARCHITECTURAL DRAWINGS FOR ADDITIONAL DETAILS.
23. MASONRY WALLS SHALL BE ANCHORED TO THE FLOOR SLAB OR CURB WITH #5 DOWELS AT 24 INCHES ON CENTER. THESE BARS SHALL BE HOOKED AND EMBEDDED INTO THE CONCRETE AND EXTEND AT LEAST 1'-6" INTO THE MASONRY AND GROUTED SOLID, UNLESS OTHERWISE SHOWN.
24. POINTS OF BEARING SHALL BE ON A MINIMUM OF TWO (2) COURSES OF HOLLOW MASONRY GROUTED SOLID.
25. WALLS WHICH TERMINATE BELOW FLOOR DECKS SHALL BE ANCHORED LATERALLY WITH L4x4x1/4 ANGLES SPACED AT 4 FEET ON CENTER EACH SIDE OF THE WALL U.O.N.
26. PROVIDE LOOSE LINTELS FOR OPENINGS IN BRICK FACADE AS FOLLOWS U.O.N.:
 - 0'-0" < OPENINGS < 4'-0" L4x3.5x5/16
 - 4'-0" < OPENINGS < 7'-0" L6x3.5x7/8
27. AUTOCLAVED AERATED CONCRETE TO BE USED AT MASONRY WALL BOTTOM COURSE AND ELSEWHERE AS NOTED ON THE DESIGN DOCUMENTS. AAC BLOCK TO BE 8" X 8" X 24" SOLID AAC-6 BY HEBEL-HELLA AAC TEXAS, INC. TECHNICAL SHEET V09-319EN, WITH A MINIMUM COMPRESSIVE STRENGTH OF 870-1100 PSI. SET ON A MORTAR (CEMENT-SAND) BASE FOR LEVELING 1" MIN. AND IF APPLICABLE, ADHERED WITH HEBEL THIN BED MORTAR JOINT PER MANUFACTURER'S RECOMMENDATIONS.

UNDERPINNING & SHORING NOTE:

1. NO UNDERPINNING IS REQUIRED OR PROPOSED UNDER THIS APPLICATION
2. SHORING IS PROPOSED UNDER THIS APPLICATION AS SHOWN ON THESE CONSTRUCTION DOCUMENTS.
3. TEMPORARY SOIL, CONSTRUCTION MATERIAL OR EQUIPMENT SHALL NOT BE PLACED CLOSER TO THE EDGE OF EXCAVATION THAN A DISTANCE EQUAL TO 1.5 TIMES THE DEPTH OF THE EXCAVATION, UNLESS OTHERWISE NOTED FOR ADJOINING PARKING AREA SLABS.

EARTHQUAKE DESIGN COMPLIANCE NOTE:

1. PLANS AND DETAILS COMPLY WITH NYC BC CHAPTER 16 SECTIONS 1613 & 1623
2. PROPOSED 1" SEISMIC GAP/BUILDING SEPARATION IS IN COMPLIANCE WITH BCSECTION 1614, TPN 2/96.

CONTROLLED INSPECTIONS PROVIDED BY OWNER:

OWNER WILL ENGAGE AND PAY FOR THE SERVICES OF A PROFESSIONAL ENGINEER TO PROVIDE CONTROLLED INSPECTIONS (SPECIAL INSPECTION ITEMS AND PROGRESS INSPECTION ITEMS) SERVICES FOR THE ITEMS LISTED BELOW IN ACCORDANCE WITH NYC BUILDING CODE.

CONTROLLED INSPECTIONS

(TR-1): Technical Report
Statement of Responsibility

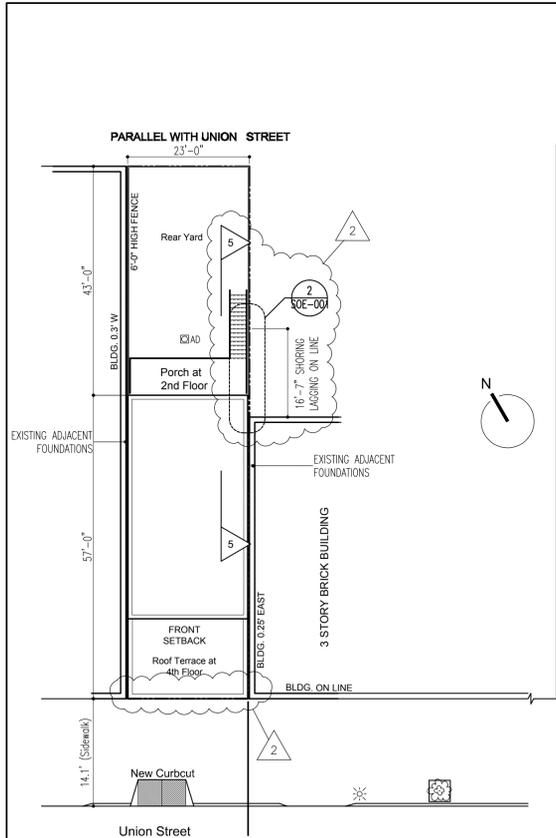
Y	N	Special Inspection Items	Code/ Section
		Flood Zone Compliance	BC G105
		Fire Alarm Test	BC 907, BC 1704.13
		Photoluminescent Exit Path Markings	BC 1026.11
		Emergency Power Systems (Generators)	BC 1704.13, BC 2702
		Structural Steel-Welding	BC 1704.3.1
		Structural Steel-Erection & Bolting	BC 1704.3.2, BC 1704.3.3
		Structural Cold-Formed Steel	BC 1704.3.4
		Concrete-Cast-In-Place	BC 1704.4
		Concrete - Precast	BC1704.4
		Concrete - Prestressed	BC 1704.4
		Masonry	BC 1704.5
		Wood - Off-Site fabrication of Structural Elements	BC 1704.6
		Wood - Installation of High- Load Diaphragms	BC 1704.6.1
		Wood - Installation of Metal-Plate Connected Trusses	BC 1704.6.3
		Wood - Installation of Prefabricated Joists	BC 1704.6.4
		Soils - Site Preparation	BC 1704.7.1
		Soils - Fill placement & In-Place Density	BC 1704.7.2, BC 1704.7.3
		Soils - Investigations (Borings/Tests/Pits)	BC 1704.7.4
		Pier Foundations & Drilled Pier Installation	BC 1704.8
		Pier Foundations	BC 1704.9
		Underpinning	BC 1704.9.1
		Wall Panels, Curtain Walls and Veneers	BC 1704.10
		Sprayed Fire-Resistant Materials	BC 1704.11
		Exterior Insulation Finish Systems (EIFS)	BC 1704.12
		Alternative Materials- OTCR Buildings Bulletin #	BC 1704.13
		Smoke Control Systems	BC 1704.14
		Mechanical Systems	BC 1704.15
		Fuel-Oil Storage and Fuel- Oil Piping Systems	BC 1704.16
		High- Pressure Steam Piping (Welding)	BC 1704.17
		Fuel-Gas Piping (Welding)	BC 1704.18
		Structural Safety Stability	BC 1704.19
		Mechanical Demolition	BC 1704.19, BC 3306.6
		Excavation- Sheeting, Shoring, and Bracing	BC 1704.19, BC3306.4.1
		Soil Percolation Test- Drywall	BC 1704.20.1
		Soil Percolation Test- Septic	BC 1704.20.1
		Site Storm Drainage Disposal and Detention System Installation	BC 1704.20
		Septic System Installation	BC 1704.20
		Sprinkler Systems	BC 1704.21
		Standpipe Systems	BC 1704.22
		Heating Systems	BC 1704.23
		Chimneys	BC 1704.24
		Firestop, Draftstop, an Fireblock systems	BC 1704.25
		Aluminum Window	BC1704.26
		Seismic Isolation Systems	BC 1707.8
		Concrete Test Cylinders	BC 1905.6
		Concrete Design Mix	BC 1905.3

Progress Inspections

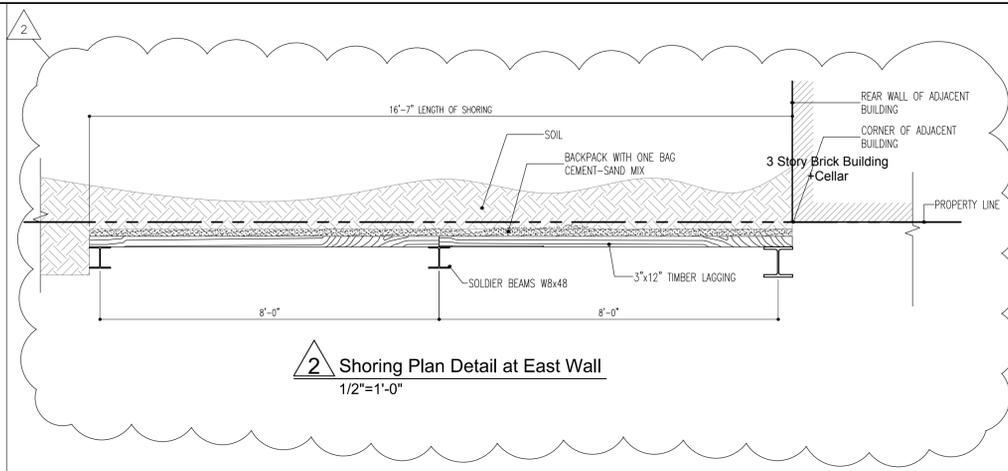
Y	N	Code/ Section
		28-116.2.1, BC 109.2
		BC 109.3.1
		BC 109.3.3
		BC 109.3.5
		BC 109.3.4
		28-116.2.2
		28-16.2.4.2 and BC 109.5.
		Directive 14 of 1975, and 1 RCNY §101-10

SAFETY DURING EXECUTION OF WORK

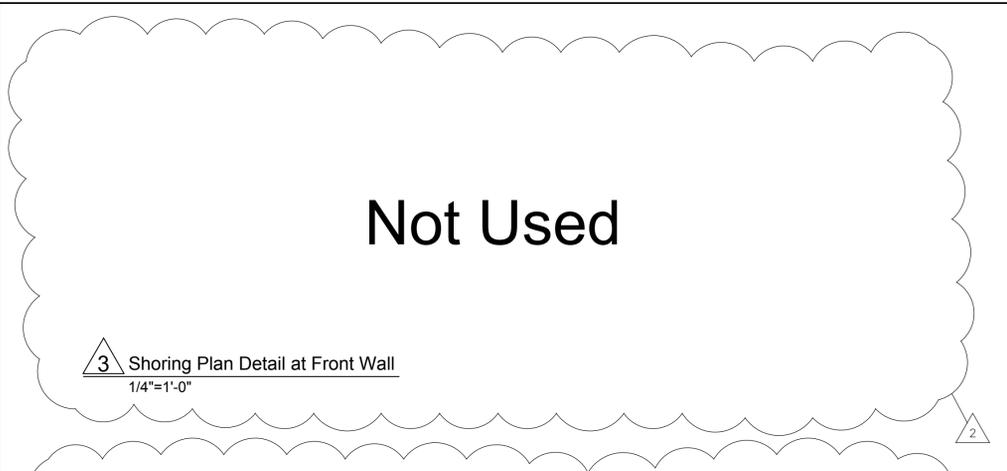
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CONDITIONS OF PUBLIC AND WORKER SAFETY DURING EXECUTION OF THE WORK. THIS SHALL INCLUDE COMPLIANCE WITH CHAPTER 33 OF



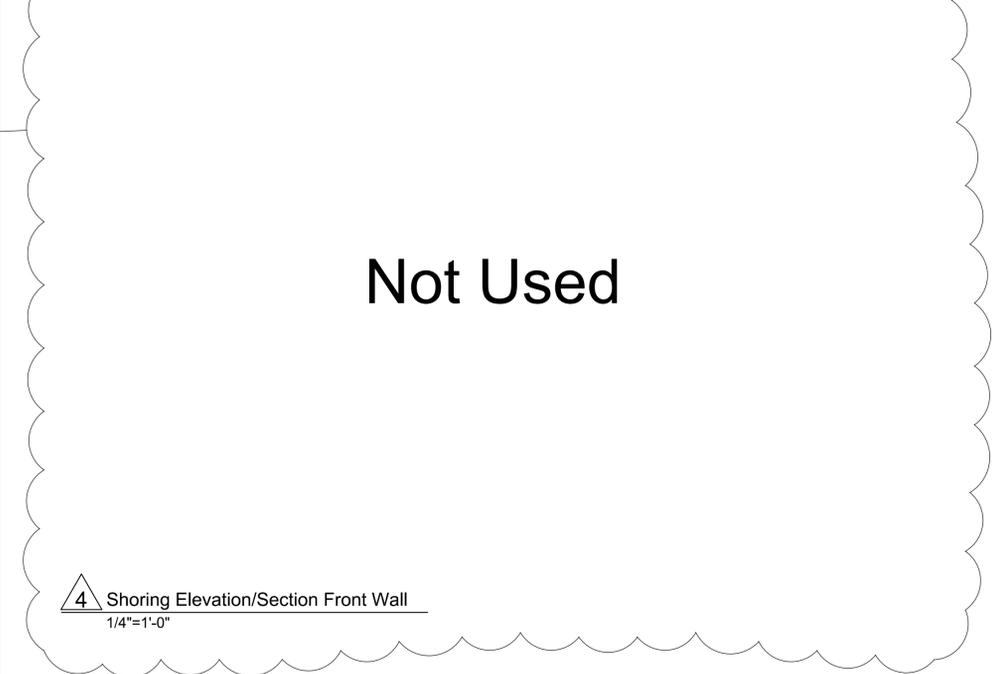
1 Plot Plan
1/16"= 1'-0"



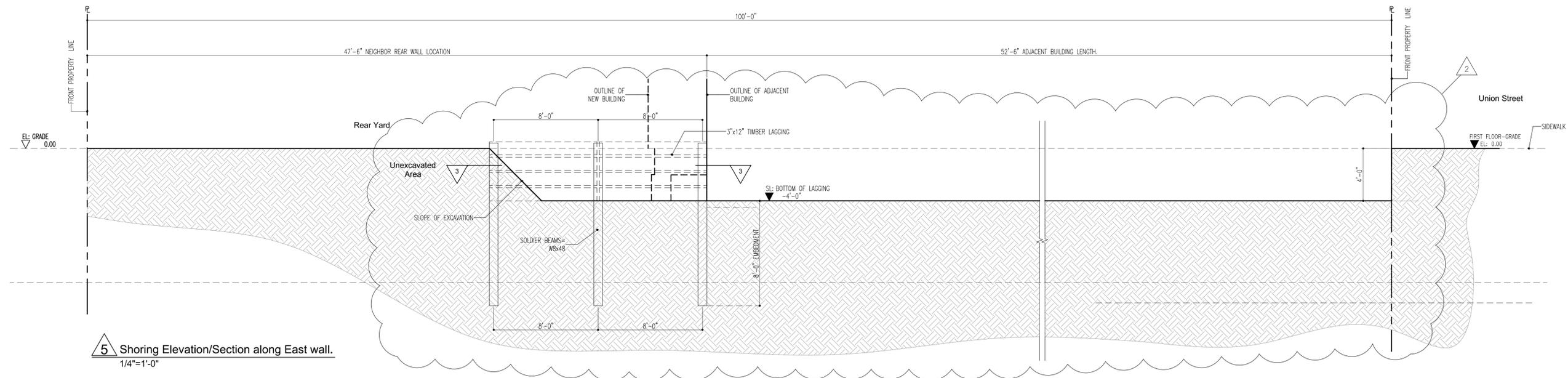
2 Shoring Plan Detail at East Wall
1/2"=1'-0"



3 Shoring Plan Detail at Front Wall
1/4"=1'-0"



4 Shoring Elevation/Section Front Wall
1/4"=1'-0"



5 Shoring Elevation/Section along East wall.
1/4"=1'-0"

ARCHITECT OF RECORD:
Fractal
 ARCHITECTURE PLLC.
 Herman J. Galvis R.A. NYS 031134
 131 Union st, Brooklyn, NY 11231
 T: 718.875.4599

Design Team:
Gateliers
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 Drawing scales as indicated are for reference only and are not intended to accurately depict actual or designed conditions. Written dimensions shall govern.

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CIVIL ENGINEER:
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 TSF ENGINEERING, P.C.
 200 Park Ave. South NY, NY
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OWNER:
 Passiv House Xperimental LLC 131 Union st,
 Brooklyn, NY 11231
 T: 718.875.4599

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 Contractor to notify the architect of any discrepancy between field conditions and the drawings.

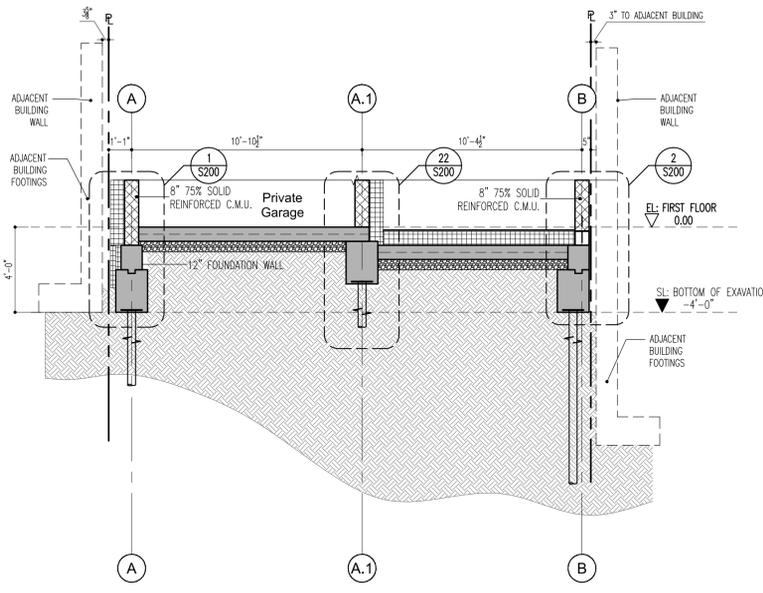
Revision No.	Date	Remarks
1	1/26/2012	ENGINEERING COORDINATION
2	04/03/2012	DESIGN UPDATE

DOB Stamps and Signatures:

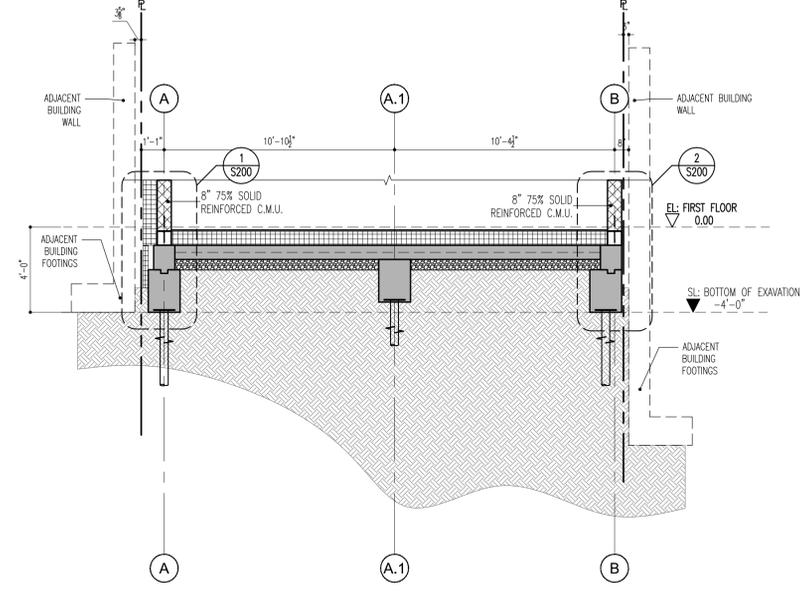
Project:
**Proposed Building at
 107 Union st
 Brooklyn, NY 11231
 Block: 335, Lot: 42**

Title:
Support of Excavation

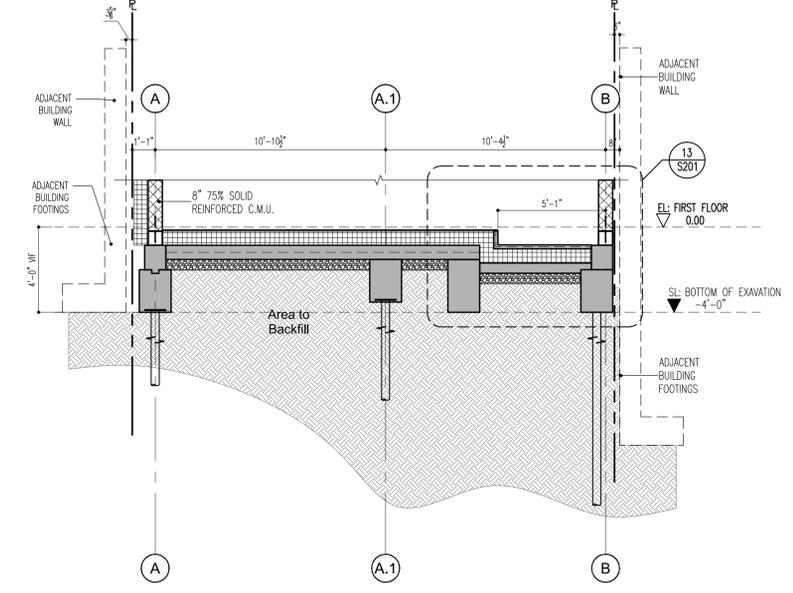
SEAL & SIGNATURE	DATE: Sept 28-2011
	PROJECT No: 10-02
	DRAWN BY: OG
	CHK BY: HG
	DWG No: SOE-001.02
	CADD FILE No: 3 of 12



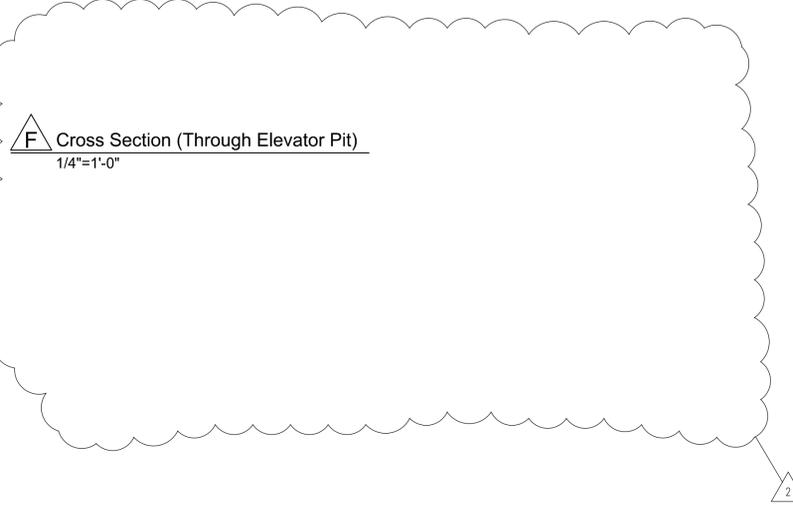
C Cross Section
1/4"=1'-0"



D Cross Section
1/4"=1'-0"



E Cross Section (Through Elevator Pit)
1/4"=1'-0"



F Cross Section (Through Elevator Pit)
1/4"=1'-0"

Drawing scales as indicated are for reference only and are not intended to accurately depict actual or designed conditions. Written dimensions shall govern. Contractor to notify the architect of any discrepancy between field conditions and the drawings.

Revision No.	Date	Remarks
1	1/26/2012	ENGINEERING COORDINATION
2	04/03/2012	DESIGN UPDATE

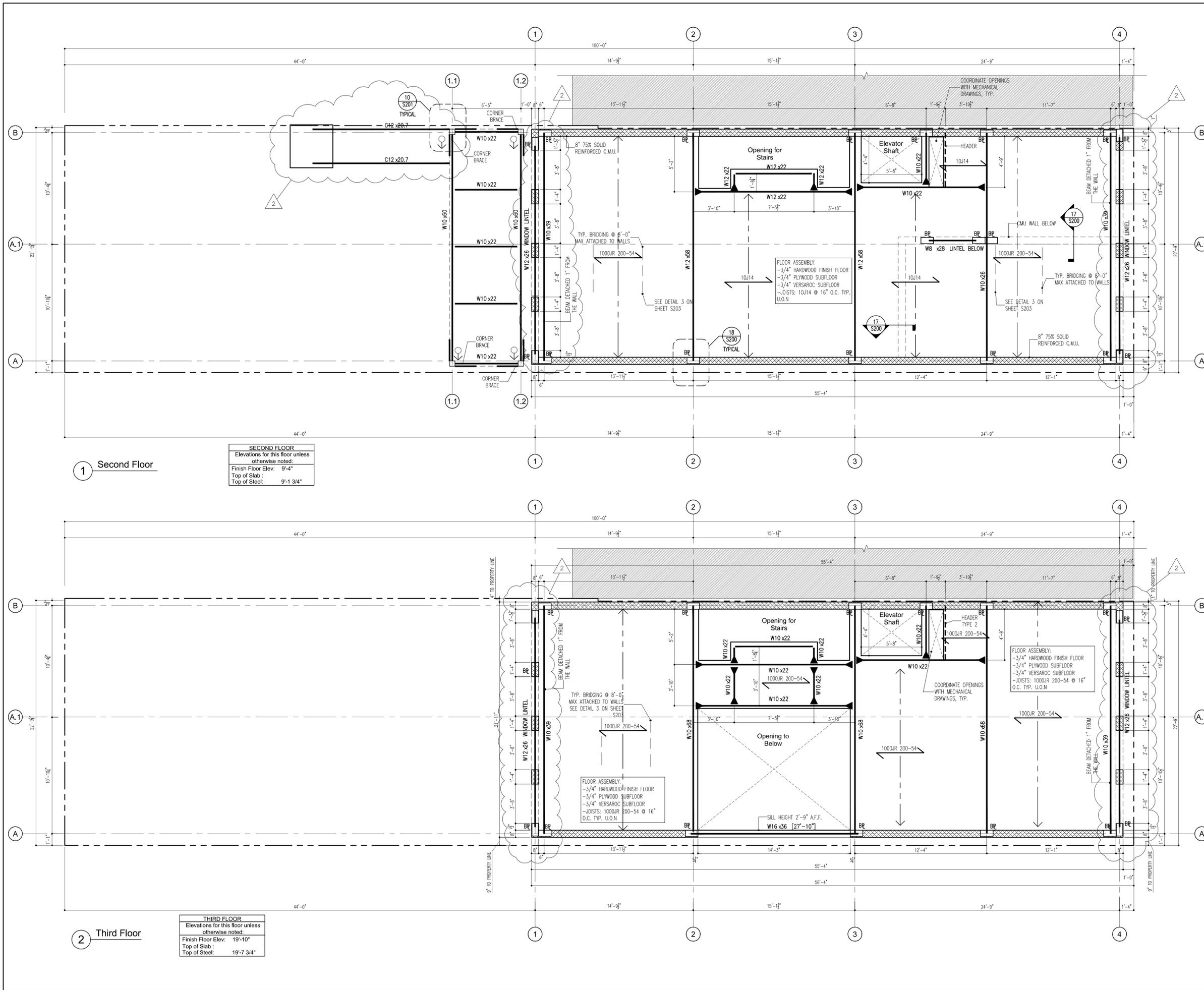
DOB Stamps and Signatures:

Orient and affix BIS job number label here

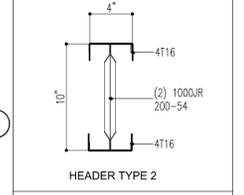
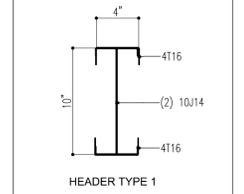
Project:
 Proposed Building at
 107 Union St
 Brooklyn, NY 11231
 Block: 335, Lot: 42

Title:
 Foundation Details

SEAL & SIGNATURE	DATE: Sept 28-2011
	PROJECT No: 10-02
	DRAWN BY: OG
	CHK BY: HG
	DWG No: F-002_02
CADD FILE No:	5 of 12



- LEGEND:**
- CMU WALL
 - SPECIAL ELEVATION FOR CONCRETE SLAB
 - CONCRETE SLAB/FOOTING
 - CONCRETE FOUNDATION WALL
 - Insulation/ Foam Glass Blocks
 - DIRECTION OF DECK
 - COLUMN DOWN
 - COLUMN UP
 - CHANGE OF ELEVATION ON SLAB
 - BEAM INDICATOR
 - HELICAL PILE
 - TYPICAL HEADER
 - BEARING PLATE: 14"x7"x 1 1/2" Typ.
 - STAINLESS STEEL REBAR
 - CONTINUOUS FOAM GLASS BLOCK COURSE
 - CMU WALL
 - INDICATES POCKET IN FOUNDATION WALL TO ACCOMMODATE BEAM OR BOX HEADER
 - INDICATES HEAVY GAUGE STEEL BEARING WALL
 - MOMENT CONNECTIONS



- GENERAL NOTES:**
- COORDINATE CORE-DRILL PERFORATIONS ON CONCRETE SLAB AT MECHANICAL ROOMS, CHASE WALLS, VENTILATION SHAFTS, and PLUMBING, ETC. WHERE APPLICABLE.
 - FOR METAL STUD CONSTRUCTION DETAILS, SEE SHEETS S-202, S-203 AND S-205.
 - COORDINATE WINDOW LINTEL LOCATIONS AND ROUGH OPENINGS WITH ARCHITECTURAL FLOOR PLANS AND BUILDING ELEVATIONS.

1 Second Floor

SECOND FLOOR
Elevations for this floor unless otherwise noted:
Finish Floor Elev: 9'-4"
Top of Slab : 9'-1 3/4"
Top of Steel: 9'-1 3/4"

2 Third Floor

THIRD FLOOR
Elevations for this floor unless otherwise noted:
Finish Floor Elev: 19'-10"
Top of Slab : 19'-7 3/4"
Top of Steel: 19'-7 3/4"

ARCHITECT OF RECORD:
Fractal ARCHITECTURE PLLC.
Hernan J. Galvis R.A. NYS 031134
131 Union St, Brooklyn, NY 11231
T: 718.875.4599

Design Team:
Gateliers
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MECHANICAL ENGINEER:
TSF ENGINEERING, P.C.
200 Park Ave. South NY, NY
T: 212.253.7303, F: 212.253.6512

OWNER:
Passiv House Xperimental LLC 131 Union St,
Brooklyn, NY 11231
T: 718.875.4599

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Contractor to notify the architect of any discrepancy between field conditions and the drawings.

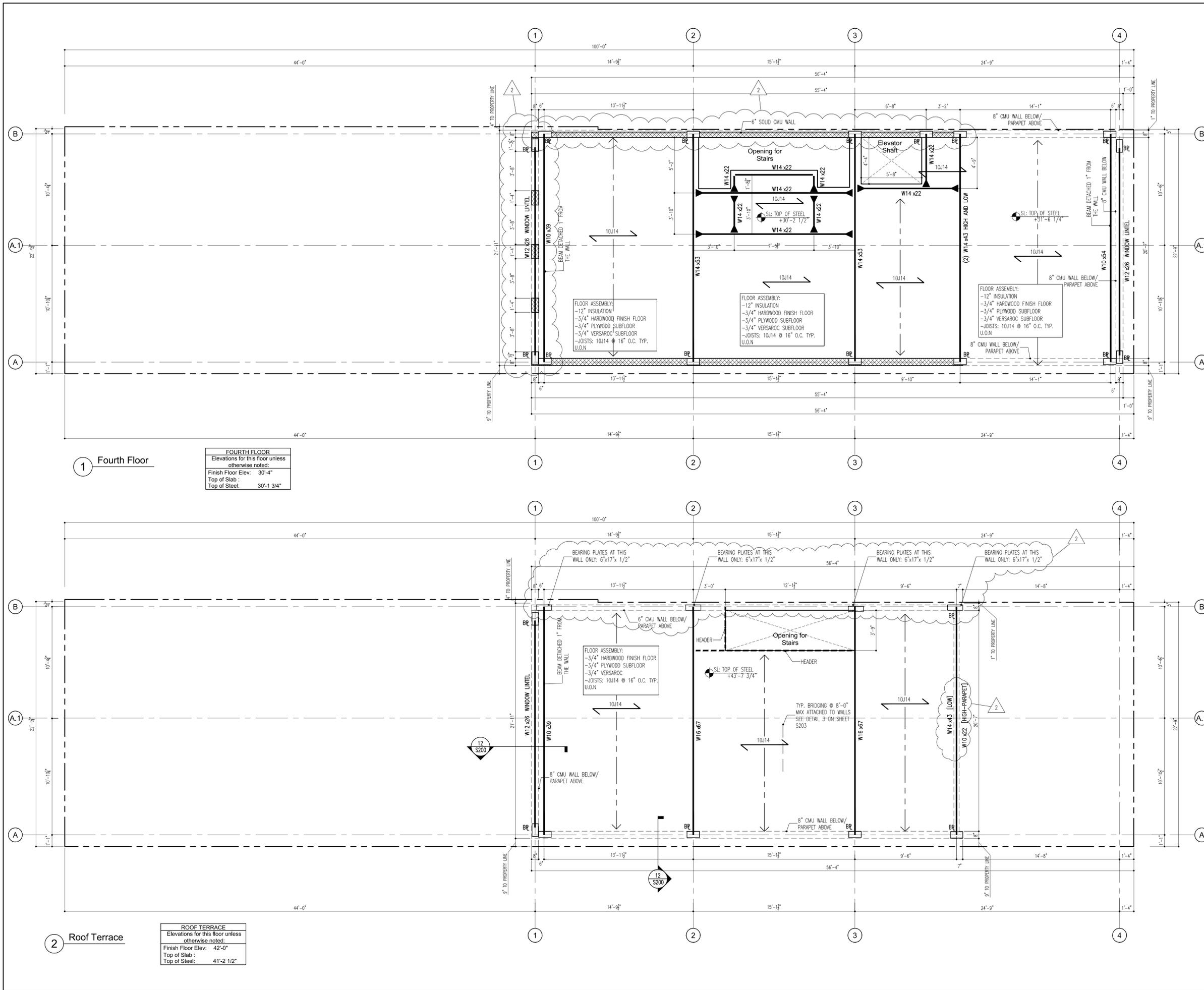
Revision No.	Date	Remarks
1	1/26/2012	ENGINEERING COORDINATION
2	04/03/2012	DESIGN UPDATE

DOB Stamps and Signatures:

Project:
**Proposed Building at
107 Union St
Brooklyn, NY 11231
Block: 335, Lot: 42**

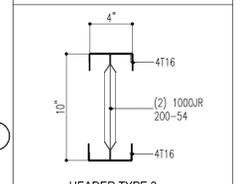
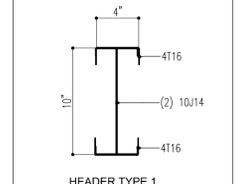
Title:
Second and Third Framing Plans

SEAL & SIGNATURE	DATE: Sept 28-2011
	PROJECT No: 10-02
	DRAWN BY: OG
	CHK BY: HG
	DWG No: S-101_02
	CADD FILE No: 7 of 12



LEGEND:

- CMU WALL
- SPECIAL ELEVATION FOR CONCRETE SLAB
- CONCRETE SLAB/FOOTING
- CONCRETE FOUNDATION WALL
- Insulation/ Foam Glass Blocks
- DIRECTION OF DECK
- COLUMN DOWN
- COLUMN UP
- CHANGE OF ELEVATION ON SLAB
- SHAPE TYPE DEPTH WEIGHT
- W8 x15 [0'-5"] BEAM INDICATOR
- TOP OF STEEL
- HELICAL PILE
- TYPICAL HEADER
- BEARING PLATE: 14"x7"x 1 1/2" Typ.
- STAINLESS STEEL REBAR
- CONTINUOUS FOAM GLASS BLOCK COURSE
- CMU WALL
- INDICATES POCKET IN FOUNDATION WALL TO ACCOMMODATE BEAM OR BOX HEADER
- INDICATES HEAVY GAUGE STEEL BEARING WALL
- MOMENT CONNECTIONS



GENERAL NOTES:

- COORDINATE CORE-DRILL PERFORATIONS ON CONCRETE SLAB AT MECHANICAL ROOMS, CHASE WALLS, VENTILATION SHAFTS, and PLUMBING, ETC. WHERE APPLICABLE.
- FOR METAL STUD CONSTRUCTION DETAILS, SEE SHEETS S-202, S-203 AND S-205.
- COORDINATE WINDOW LINTEL LOCATIONS AND ROUGH OPENINGS WITH ARCHITECTURAL FLOOR PLANS AND BUILDING ELEVATIONS.

FOURTH FLOOR
Elevations for this floor unless otherwise noted:
Finish Floor Elev: 30'-4"
Top of Slab : 30'-1 3/4"
Top of Steel: 30'-1 3/4"

ROOF TERRACE
Elevations for this floor unless otherwise noted:
Finish Floor Elev: 42'-0"
Top of Slab : 41'-2 1/2"
Top of Steel: 41'-2 1/2"

ARCHITECT OF RECORD:
Fractal ARCHITECTURE PLLC.
Herman J. Galvis R.A. NYS 031134
131 Union St, Brooklyn, NY 11231
T: 718.875.4599

Design Team:
Gateliers
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T: 718.875.4599

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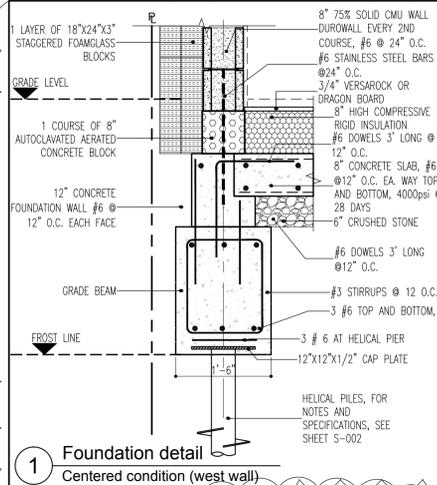
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2	04/03/2012	DESIGN UPDATE

DOB Stamps and Signatures:

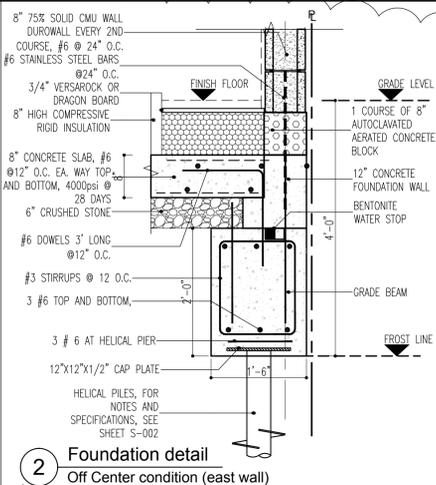
Project:
Proposed Building at 107 Union St Brooklyn, NY 11231 Block: 335, Lot: 42

Title:
Third and Roof Framing Plans

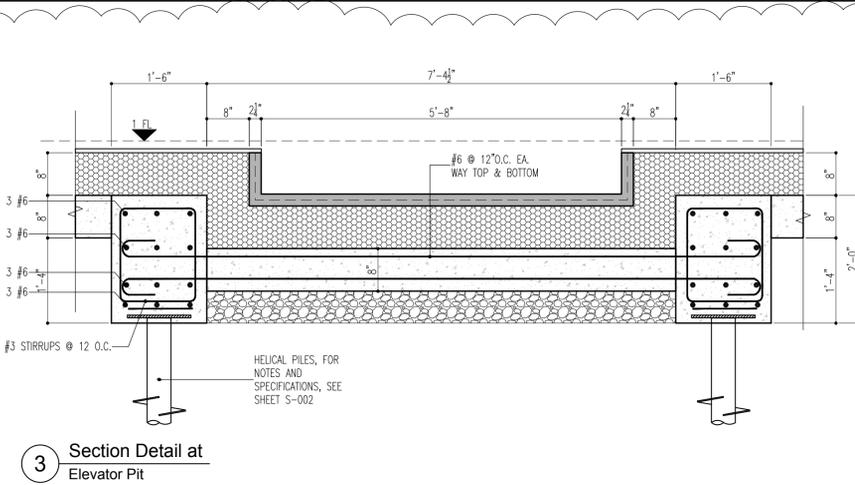
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	DRAWN BY: OG
	CHK BY: HG
	DWG No: S-102_02
	CADD FILE No: 8 of 12



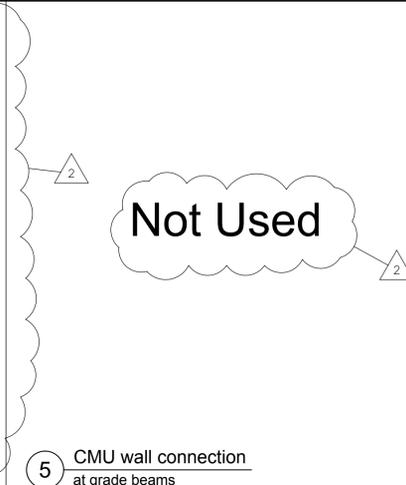
1 Foundation detail Centered condition (west wall)



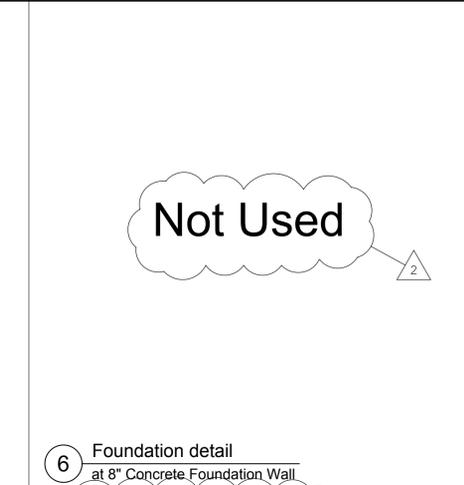
2 Foundation detail Off Center condition (east wall)



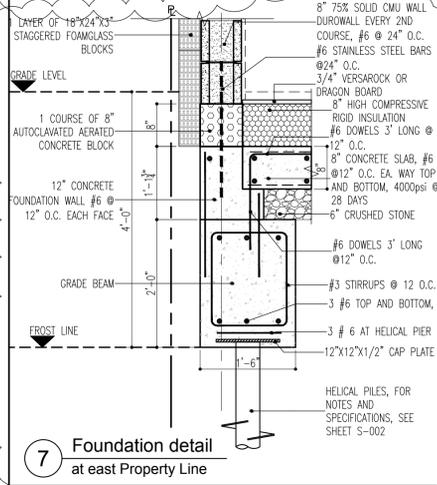
3 Section Detail at Elevator Pit



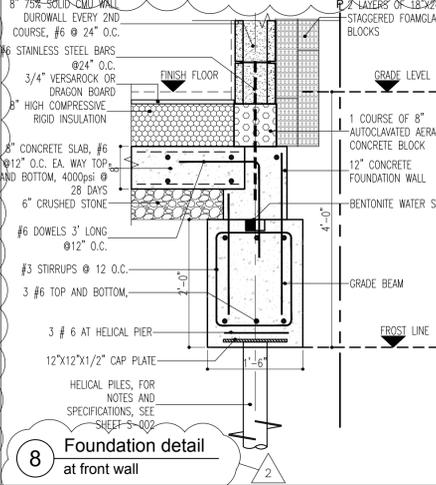
5 CMU wall connection at grade beams



6 Foundation detail at 8\"/>



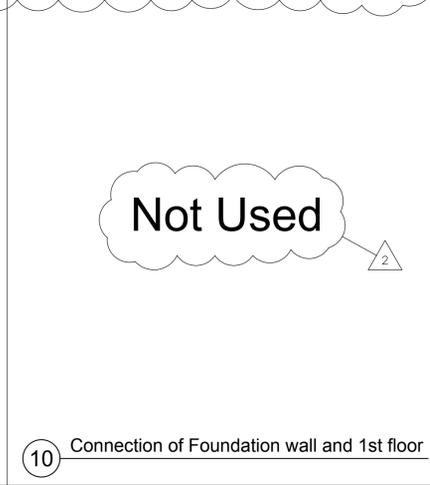
7 Foundation detail at east Property Line



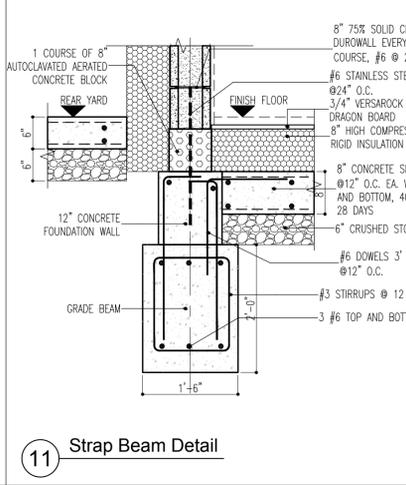
8 Foundation detail at front wall



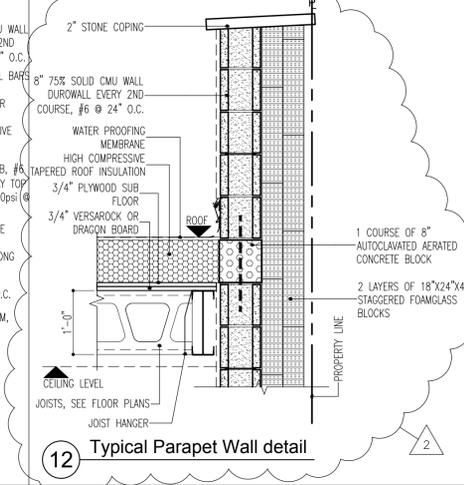
9 Connection of Foundation wall and 1st floor at front wall



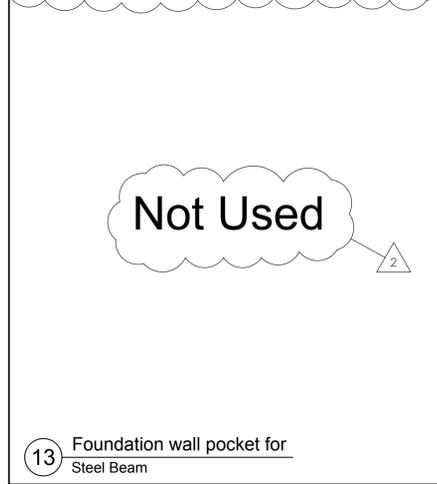
10 Connection of Foundation wall and 1st floor



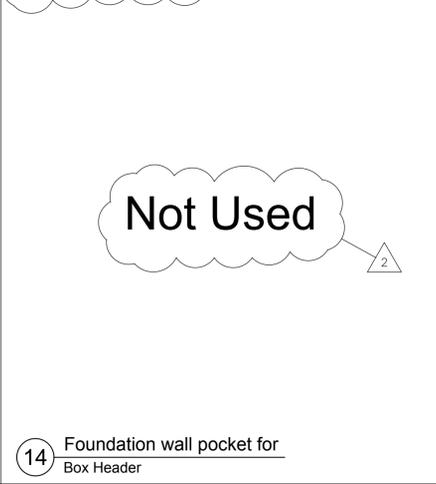
11 Strap Beam Detail



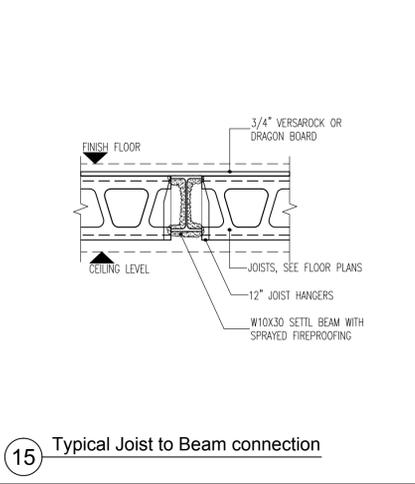
12 Typical Parapet Wall detail



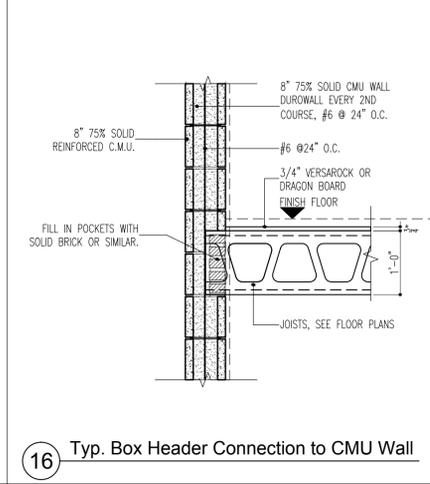
13 Foundation wall pocket for Steel Beam



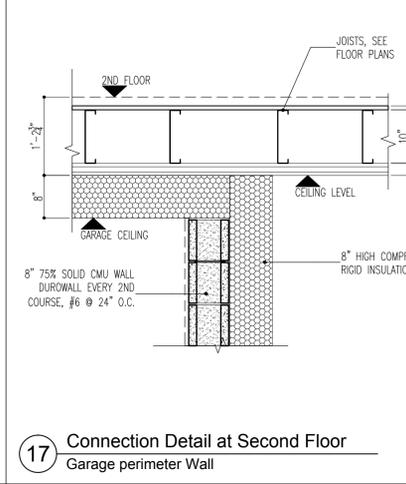
14 Foundation wall pocket for Box Header



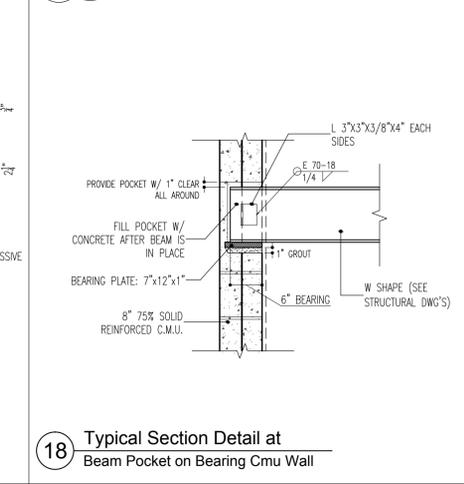
15 Typical Joist to Beam connection



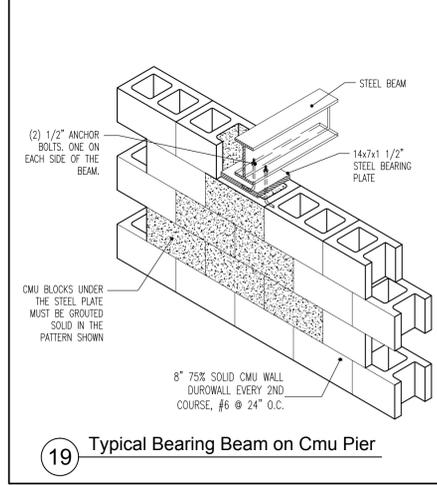
16 Typ. Box Header Connection to CMU Wall



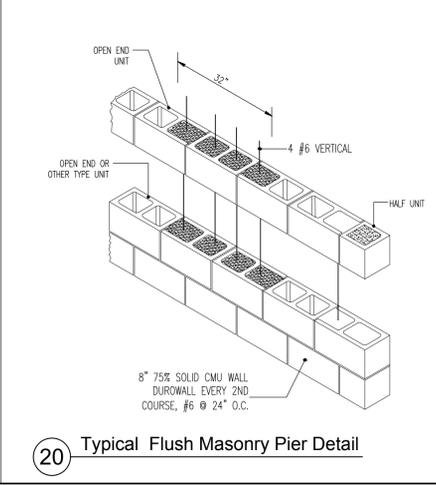
17 Connection Detail at Second Floor Garage perimeter Wall



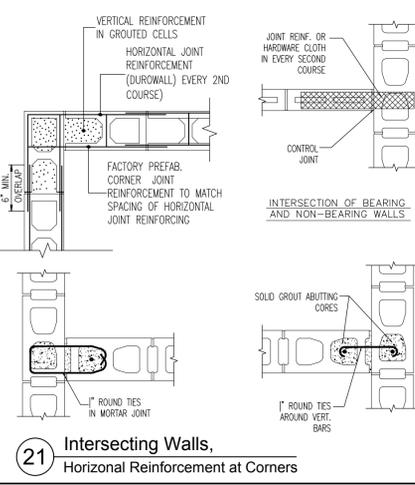
18 Typical Section Detail at Beam Pocket on Bearing Cmu Wall



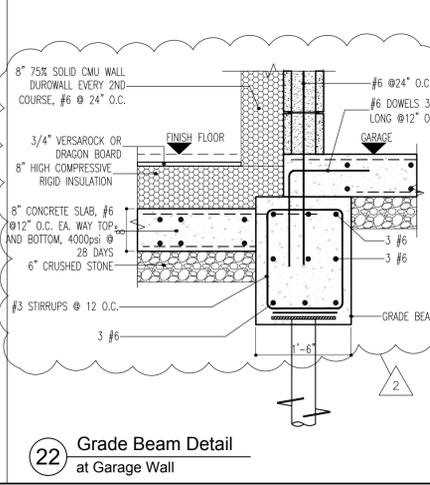
19 Typical Bearing Beam on Cmu Pier



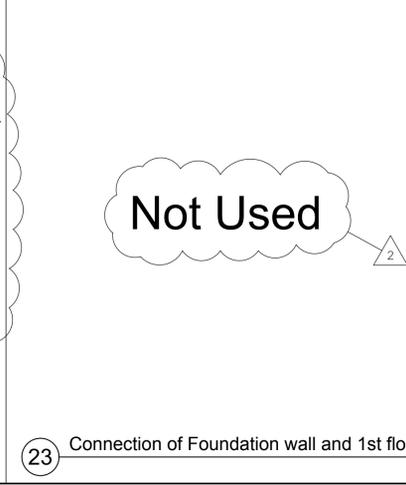
20 Typical Flush Masonry Pier Detail



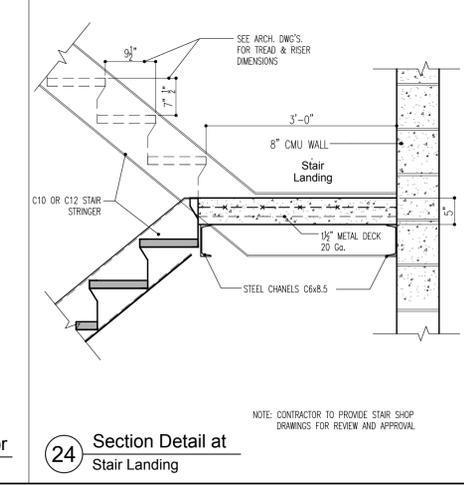
21 Intersecting Walls, Horizontal Reinforcement at Corners



22 Grade Beam Detail at Garage Wall



23 Connection of Foundation wall and 1st floor



24 Section Detail at Stair Landing

Not Used

ARCHITECT OF RECORD:
Fractal
 ARCHITECTURE PLLC.
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Design Team:
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Revision No.	Date	Remarks
1	1/26/2012	ENGINEERING COORDINATION
2	04/03/2012	DESIGN UPDATE

DOB Stamps and Signatures:

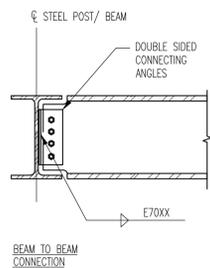
Project:
Proposed Building at
107 Union St
Brooklyn, NY 11231
Block: 335, Lot: 42

Title:
Structural Details sheet 1

SEAL & SIGNATURE	DATE: Sept 28-2011
	PROJECT No: 10-02
	DRAWN BY: OG
	CHK BY: HG
	DWG No: S-200 .02
	CADD FILE No: 9 of 12

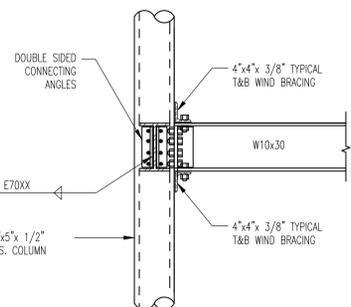
NOTE: CONTRACTOR TO PROVIDE STAIR SHOP DRAWINGS FOR REVIEW AND APPROVAL

MOMENT CONNECTION TYPICAL FOR ALL

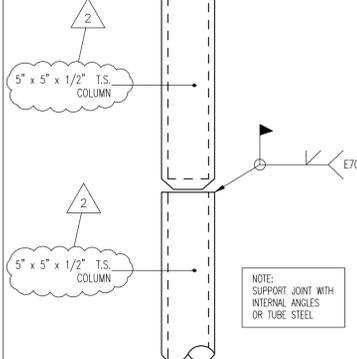


1 BEAM TO BEAM CONNECTION
Typical Throughout

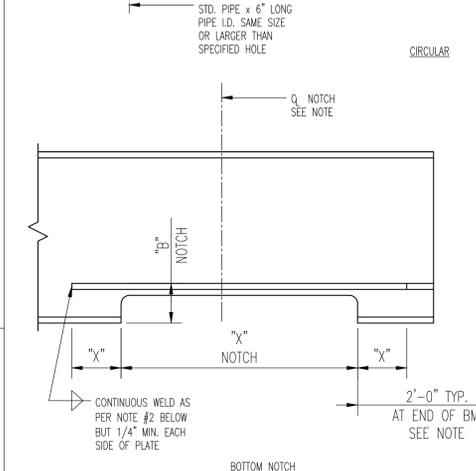
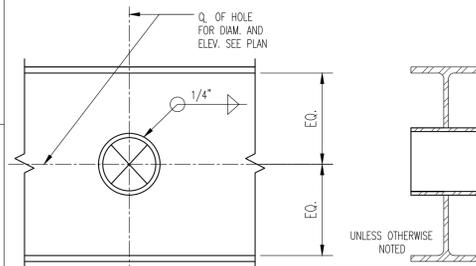
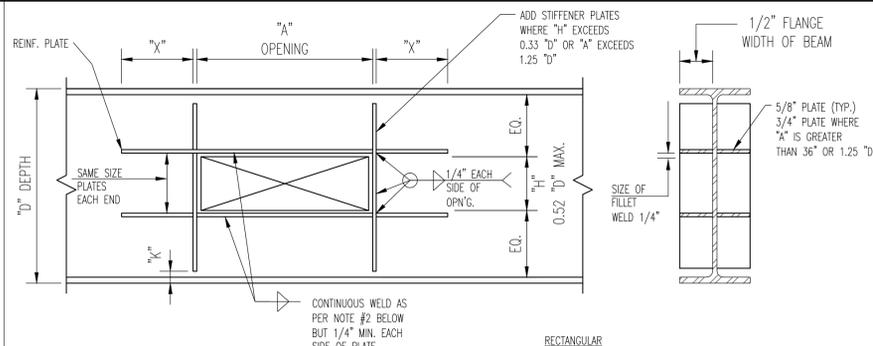
MOMENT CONNECTION TYPICAL FOR ALL



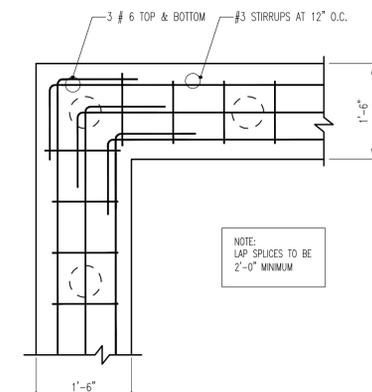
2 BEAM TO T.S. COLUMN CONNECTION
Typical Throughout



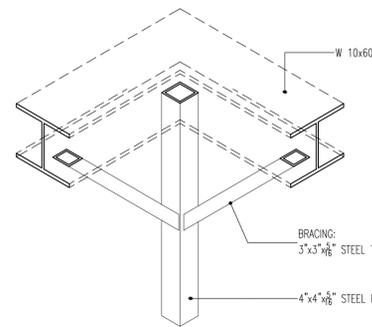
3 T.S. COLUMN SPLICE DETAIL
Typical Throughout



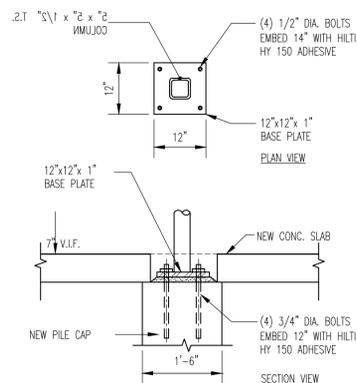
8 STEEL BEAM PENETRATION DETAILS
Coordinate with other Trades



9 TYPICAL PILE CAP DETAIL
Corner Detail



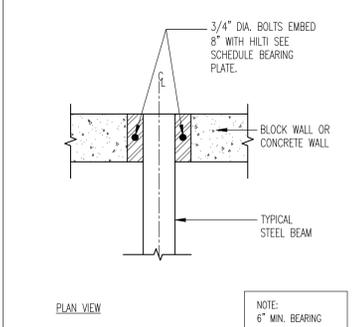
10 Typical Bracing Detail
at Porch Posts



4 BASE PLATE / ANCHOR BOLT CONN.
For T.S. Columns

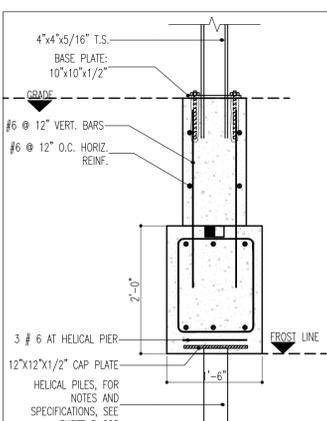
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5 BEARING PLATE / ANCHOR BOLT CONN.
For Beam to Masonry Wall Connections



6 BEARING PLATE / ANCHOR BOLT CONN.
For Beam to Masonry Wall Connections

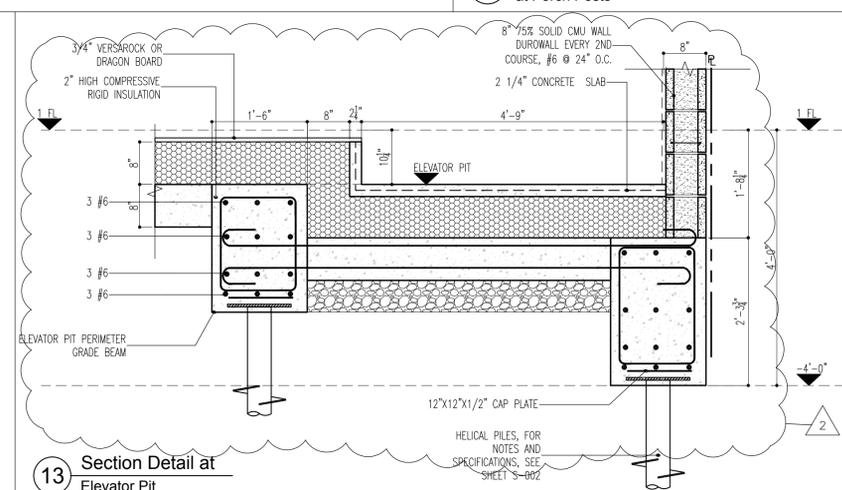
Not Used



11 Foundation Detail at
Porch Steel Posts

Not Used

12 Slab Edge Condition @
Parapets



13 Section Detail at
Elevator Pit

7 Step Footing Detail
Grade Beam Change of Level

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Revision No.	Date	Remarks
01	01/26/2012	ENGINEERING COORDINATION
02	04/03/2012	DESIGN UPDATE

DOB Stamps and Signatures:

Orient and affix bills job number label here

Project:
Proposed Building at
107 Union St
Brooklyn, NY 11231
Block: 335, Lot: 42

Title:
Structural Details sheet 2

SEAL & SIGNATURE	DATE: Sept 28-2011
	PROJECT No: 10-02
	DRAWN BY: OG
	CHK BY: HG
	DWG No: S-201_02
	CADD FILE No: 10 of 12

APPENDIX F

Previous Environmental Investigations and Reports

PHASE I ENVIRONMENTAL SITE ASSESSMENT

for the property located at:

107 Union Street
Brooklyn, New York 11231

prepared for:

Builders Bank
1001 Franklin Avenue
Suite 210
Garden City, New York 11530

prepared by:


Cashin Associates, P.C.

Engineering • Planning • Construction Management

1200 Veterans Memorial Highway, Hauppauge, New York 11788 - (631) 348-7600
601 Brickell Key Drive, Suite 606, Miami, Florida 33131 - (305) 579-2006

JULY 22, 2011

PHASE I ENVIRONMENTAL SITE ASSESSMENT

FOR THE PROPERTY LOCATED AT:

**107 UNION STREET
NEW YORK, NEW YORK 11231**

PREPARED FOR:

**BUILDERS BANK
1001 FRANKLIN AVENUE
SUITE 210
GARDEN CITY, NEW YORK 11530**

PREPARED BY:

**CASHIN ASSOCIATES, P.C.
1200 VETERANS MEMORIAL HIGHWAY
HAUPPAUGE, NEW YORK 11788**

11003.016

JULY 22, 2011

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 - 1.2.2 Site Reconnaissance**
 - 1.2.3 Interviews with Owners, Occupants and Other Knowledgeable Individuals**
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 - 1.2.6 Evaluation and Report Preparation**
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 - 1.2.9 Reliance**
 - 1.2.10 Conflict Certification**

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**PHASE I ENVIRONMENTAL SITE ASSESSMENT
FOR THE PROPERTY LOCATED AT:**

**107 UNION STREET
BROOKLYN, NEW YORK 11231**

EXECUTIVE SUMMARY

This report outlines the findings of a Phase I Environmental Site Assessment conducted by Cashin Associates, P.C. (CA) for the subject property located at 107 Union Street, Brooklyn, New York. The approximately 2,300 square foot subject parcel (Block 335, Lot 42) is currently vacant, cleared of surface structures.

The findings of CA's Phase I ESA, including a site history information review, site inspection, and regulatory agency database review, are summarized here and presented in more detail in the body of the report. The field inspection was conducted on July 15, 2011 by Brian Duggan, an Environmental Scientist from CA. Site and site access was facilitated by the owner's representative, Mr. Hernan Galvis of Passiv House Xperimental, LLC.

The subject property known as 107 Union Street is currently vacant and unpaved, with emergent vegetation around the perimeter security fencing, and containing parked vehicles. According to CA's historical research, the subject property was originally developed sometime before the late 1800s, as either agricultural land or as a residential property.

The site was developed several times for commercial/industrial purposes since at least 1886. Structures were constructed and demolished, and the property was also vacant land for at least two periods of time, including the present. Recent subsurface investigations identified that the

subsurface soils, and possibly the groundwater, had been impacted by trace levels of volatile organic compounds, pesticides and metals, typical for Urban Land having a long-term history of commercial and industrial uses. The studies show that these impacts occur mostly within the upper few feet on the site, and that the concentrations detected slightly exceed or are at levels that are below various regulatory guidelines.

The owner has developed a site specific Remedial Action Plan and construction Health and Safety Plan to address proper safe work practices and soils handling and disposal procedures during the site construction. These plans have been reviewed and approved by the NYCDEP, permitting the construction work to proceed. The site is to be rezoned and developed with a four-story two-family apartment building containing a small cellar and garage. The Remedial Action Plan specifies the construction to include the installation of a soil vapor barrier membrane, and capping any unpaved areas with two feet of clean fill as a solution to the conditions present on site. Once the owner has completed the site redevelopment, it is required to develop and provide a Remediation Closure Report to the NYCDEP for final review and approval in order to use the site for its intended purposes, a two-family residential dwelling. It is recommended that the owner provide copies of any future environmental reports and/or correspondence completed as part of the site development. The owner should also provide a copy of the approved Remediation Closure Report once all site development work is completed.

CA's review of NYC property and environmental records showed no indications for any adverse environmental impacts to the site, or environmental liens encumbering the property interests. CA's review of prior environmental reports found that these earlier environmental studies adequately characterized recognized environmental conditions associated with the subject property.

The subject property is not listed in any of the readily available environmental regulatory databases reviewed by CA. While nearby properties in the surrounding area appeared in some of the databases, CA found no evidence in the reports that any of these listed properties have directly contributed to the known environmental conditions on the subject property.

Therefore, it is CA's Environmental Professional's opinion that there are no other recognized environmental conditions and business environmental risks associated with the subject property.

**PHASE I ENVIRONMENTAL SITE ASSESSMENT
FOR THE PROPERTY LOCATED AT:**

**107 UNION STREET
BROOKLYN, NEW YORK 11231**

1.0 INTRODUCTION & METHODOLOGY

1.1 Purpose of the Phase I Environmental Site Assessment

This report outlines the findings of a Phase I Environmental Site Assessment conducted by Cashin Associates, P.C. (CA) for the subject property located at 107 Union Street, Brooklyn, N.Y.

This report has been prepared in accordance with the recommended guidelines as presented in American Society for Testing and Materials (ASTM) E 1527-05, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, as directed by our client (Builders Bank). The goal of this assessment is to identify recognized environmental conditions on the site, as defined by ASTM E 1527-05. The term “recognized environmental conditions” means the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property.

CA has performed this Phase I Environmental Site Assessment of the subject property in compliance with the scope and limitations of ASTM Practice E 1527-05. The purpose of this report is to provide Builders Bank, as the Users of this report under the ASTM Practice, with Phase I ESA findings, conclusions and recommendations to support its business practices regarding the property. Any exceptions to, or deletions from, this practice are described in Sections 1.2.7 and 1.2.8 of this report.

1.2 Methodology

The methodology of this assessment consists of four basic components, as recommended in ASTM E 1527-05, Section 7 Phase I Environmental Site Assessment, plus the completion of several additional tasks provided by CA, as part of the evaluation of "Business Environmental Risk", as defined under ASTM. This methodology is summarized below.

1.2.1 Records Review

A search of available records is performed to obtain and review information that will help to identify recognized environmental conditions in connection with the property. Records are reviewed for the site itself as well as for the area around the site within a minimum search distance recommended by ASTM E 1527-05, Section 8 Records Review. This records review includes

standard Federal and State environmental record sources such as the Federal National Priorities List (NPL), Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) lists, Resource Conservation and Recovery Act (RCRA) lists, and the Emergency Response Notification System listing. State environmental record source listings include State-equivalent NPL listings, State-equivalent CERCLIS listings, State landfill or solid waste disposal site lists, State registered underground storage tank (UST) listing, State leaking underground storage tank (LUST) lists, and additional State or local environmental record sources.

ASTM E 1527-05 requires that the User of this report provide the environmental professional with documentation of any environmental liens filed against the property so that this information can be included. By mutual agreement between the User and the environmental professional, research involving environmental liens placed upon the subject property may be transferred to the environmental professional; however, any prior User knowledge of in-place environmental liens must be shared with the environmental professional, for inclusion herein.

As requested by the User (Builders Bank), as part of this assessment, CA researched public records to obtain information on any environmental liens associated with the subject property. The reviewed information is discussed in Section 2.7 of this report, and copies of the reviewed documents are

provided in Appendix X. CA did not provide comment on the perceived value of the real property as part of this assessment.

Additional evaluations of current or historical recognized environmental conditions may include a review of records obtained through the following sources:

- The current United States Geologic Survey (USGS) 7.5-Minute Topographic Map and other physical setting maps.
- Historical use maps, such as Sanborn Fire Insurance maps, if available.
- Historical Aerial Photographs.
- Other historical land use records.
- Local municipal building department records.
- Other municipal agency records.

1.2.2 Site Reconnaissance

A site visit is performed to visually and physically observe the site and any associated structures, facilities, or materials on the site, to obtain information on the likelihood of identifying recognized environmental conditions, as recommended by ASTM E 1527-05, Section 9 Site Reconnaissance. A general reconnaissance of surrounding properties is also performed to

determine the potential of off-site conditions to affect the subject site. A list of references utilized for this assessment is provided in Section 7.

The site visit conducted for this property was performed by an Environmental Scientist (also qualifying as an “Environmental Professional” as defined under ASTM E 1527-05). The site visit includes inspection for potential recognized environmental concerns including: presence of hazardous substances and petroleum products (collectively defined as “hazardous materials”); storage tanks; drums and other containers for hazardous materials; PCB-containing equipment; drains; sumps; stained soil and pavement; stressed vegetation; solid waste; liquid wastes; and on-site septic systems. The site visit was also conducted to obtain field information on general site geologic conditions, topography, utility supplies, and nature/condition of any on-site structures, facilities and equipment.

1.2.3 Interviews with Owners, Occupants and Other Knowledgeable Individuals

Interviews are typically conducted to obtain information relating to current and former site uses, site history, and possible environmental conditions associated with the site. In general, individuals interviewed as part of this work include: property representatives; key site personnel; occupants/tenants; and lender officers, as needed. A list of contacts made for this assessment is

provided in Section 7. A completed Environmental Questionnaire (by the owner) is provided in Appendix VI.

1.2.4 User Supplied Information

In order for a prospective purchaser to claim CERCLA landowner liability protections, under section 101 (35)(B) of CERCLA, as amended by the Small Business Liability Relief and Brownfields Revitalization Act, such persons and businesses are required to conduct all appropriate inquiries prior to or on the date of obtaining ownership of the property. The USEPA, in its Final Rule, Standards and Practices for All Appropriate Inquiries, established federal standards and practices for conducting all appropriate inquiries, found in 40 CFR Part 312. Under § 312.11 (a), ASTM E 1527-05 is identified as an industry standard which may be used to comply with all appropriate inquiries.

The performance standards required for all appropriate inquiries include inquiries by an Environmental Professional, and additional inquiries by persons seeking to establish one of the CERCLA liability protections. Under § 312.22, additional inquiries by persons seeking to establish one of the CERCLA liability protections, if not otherwise provided to the Environmental Professional, includes in substance: an evaluation of environmental cleanup liens against the subject property; consideration of specialized knowledge or experience of the person seeking to claim liability

protection; evaluation of the relationship of the purchase price to fair market value of the subject property, if the property was not contaminated; or other commonly known or reasonably ascertainable information about the property. If such information is not provided to the Environmental Professional, the all appropriate inquiry report prepared by the Environmental Professional must include a determination as to whether the lack of this information affects his or her ability to identify conditions of releases or threatened releases under the Final Rule, and discuss this condition as a significant Data Gap (See Section 5 of this report).

1.2.5 Business Environmental Risk Investigations

Although not within the scope of ASTM E 1527-05 for recognized environmental concerns, the environmental assessment prepared by CA includes an evaluation of several additional environmental issues to provide an evaluation of Business Environmental Risk, as identified under the ASTM practice as warranted for consideration by parties to a commercial real estate transaction. This evaluation is not intended to provide a thorough or comprehensive analysis of the respective conditions, but instead provide a preliminary indication of the potential for conditions of concern. These additional tasks include:

- A preliminary visual inspection of the site and any building interiors to determine if *friable* asbestos-containing building materials (ACM) may be present. If appropriate, samples of suspected ACM are collected for laboratory analysis. The inspection performed as part of this assessment does not constitute a full asbestos survey.
- A preliminary inspection for major sources of electromagnetic fields (e.g. high tension wires, electrical sub-stations, etc.) in the vicinity.
- Determination of the potential for existence of radon in soil at the subject site.
- A preliminary visual inspection of painted surfaces to determine if lead-based paint (LBP) may be present. If appropriate, samples of suspected lead-based paint are collected for laboratory analysis. The inspection performed as part of this assessment does not constitute a full lead survey.
- Review of area maps to determine if wetlands, flood plains, and other environmentally sensitive areas are present on the site.

1.2.6 Evaluation and Report Preparation

The information obtained under the above tasks is evaluated to assess recognized environmental conditions and business environmental risk conditions associated with the subject site. This report includes opinions rendered regarding the presence of these conditions, and represents the end product of this analysis. This report includes a summary of findings and conclusions. Recommendations, including Phase II work, are provided as appropriate in the Cover Letter of this report, as specified by the User. Documentation including references, test results, maps and other important materials are presented as appendices.

1.2.7 Exceptions to ASTM E 1527-05

This report complies with the recommendations of ASTM E 1527-05, with no exceptions.

1.2.8 Assessment Limitations

As specified in ASTM E 1527-05, an environmental site assessment cannot wholly eliminate uncertainty regarding the potential for recognized environmental conditions in connection with a property. Performance of the assessment is intended to reduce, but not eliminate, uncertainty regarding the

potential for recognized environmental conditions in connection with the property, within reasonable limits of time and cost. The Phase I Environmental Site Assessment is a visual, non-intrusive assessment where investigation includes review of records, interviews with site personnel and inspection of visible conditions. The conclusions of the assessment are based upon readily accessible and visible areas. No conclusions are provided on items hidden behind construction or completely underground and without visible evidence.

1.2.9 Reliance

The User, Builders Bank, may rely upon this report. This information also may be used by any actual or prospective purchaser, transferee, assignee, or servicer of the Loan, any actual or prospective investor, including agent or advisor in any securities evidencing a beneficial interest in or backed by the Loan, any rating agency rating any such securities, any indenture trustee, and any institutional provider(s) of any liquidity facility or credit support for such financing. In addition, this report or a reference to this report may be included or quoted in any offering circular, registration statement, or prospectus in connection with a securitization or transaction involving the Loan and/or such securities. This report has no other purpose and should not be relied upon by any other person or entity. Anyone wanting information about the condition

or characteristics of the site or operation should consult an appropriate professional.

1.2.10 Conflict Certification

Cashin Associates, P.C. has no present or contemplated future ownership interest or financial interest in the real estate that is the subject of this Environmental Assessment Report; and Cashin Associates, P.C. has no personal interest with respect to the subject matter of the Environmental Assessment Report or the parties involved and Cashin Associates, P.C. has no relationship with the property or the owners thereof which would prevent an independent analysis of the environmental or other conditions of the property.

2.0 SITE DESCRIPTION AND HISTORY

The following site description is based upon a field inspection that was conducted on July 15, 2011 by CA's Environmental Scientist. This description is also based on CA's review of the applicable USGS 7.5-Minute Topographical Map (Jersey City, NJ-NY Quadrangle) and other physical setting sources including soil type maps, geological reports and road maps. CA reviewed readily available property historical information obtained from a commercial vendor including historical Sanborn Fire Insurance Maps and historical city telephone directories. Property information relating to historical and existing property conditions, including any readily available and accessible information relating to property liens were reviewed through municipal property records obtained from agency websites.

2.1 Site Location and Description

The subject property is located on the north side of Union Street, between Columbia Van Brunt Street to the west and Columbia Street to the east. The approximately 2,300 square foot subject parcel (Block 335, Lot 42) is currently vacant, cleared of surface structures. The site is located in the Columbia Waterfront District of the Red Hook neighborhood of the Borough of Brooklyn (Kings County), New York City. Site location maps and a site sketch are provided in Appendix I.

2.2 Present Use(s) of the Site

The subject property is currently vacant and cleared of surface structures, and is zoned in an M-1 (manufacturing) district. The site is unpaved, and overgrown with vegetation, and also contains loose lumber, six vehicles, and a trailer.

CA reviewed environmental reports and correspondence provided by the owner which detail earlier investigations that identified trace levels of hazardous materials within the subsurface soils and groundwater, due to past uses and or surrounding area land uses. The environmental regulatory agency reviewing these investigations has approved the owner's Remedial Action Plan and Construction Health and Safety Plan to be implemented during the planned site redevelopment activities. Once site redevelopment is completed, the owner will complete and submit a certified Remedial Closure Report indicating that all remedial requirements have been satisfied for the future planned uses of the site for residential occupancy. Section 2.8 contains additional details relating to the environmental conditions identified and addressed in the environmental reports and correspondence provided by the owner.

According to interviews conducted with the owner's representative, Mr. Hernan Galvis of Passiv House Xperimental, LLC, the subject property is planned to be rezoned and redeveloped with a four-story residential apartment building, possessing a cellar. Based on this information, it is possible that much of the existing fill materials may be excavated and removed from the subject parcel.

2.3 Surrounding Land Use

The subject property is located in a heavily developed urban area, known as the Columbia Waterfront District of the Red Hook neighborhood of the Borough of Brooklyn (Kings County), New York City. Site location maps and a site sketch are provided in Appendix I. The neighborhood consists of mixed residential, commercial and industrial development. Land uses immediately adjacent to the site consist of:

- a. **Three-story residential apartment buildings and commercial buildings to the north;**
- b. **A parking lot and multi-story apartment buildings with retail storefronts to the southeast, and commercial/industrial properties to the southwest along Union Street;**
- c. **A three-story apartment building with commercial/retail storefronts to the east; and**
- d. **A two-story commercial building adjacent to the east (former auto repair shop), a motorcycle repair shop, NYC FDNY facility and a NYC Department of Sanitation facility further west along Union Street.**

This section of the Red Hook neighborhood is in transition from industrial, commercial and manufacturing operations (concentrated to the west along the waterfront) to lighter commercial, retail and residential properties. The surrounding Red Hook neighborhood includes: the Port of New York Terminal along the East River approximately one-quarter of a mile to the northwest, and the Atlantic Basin and Terminals along Buttermilk Channel approximately one-quarter of a mile to the west and southwest; the Brooklyn Battery Tunnel entrance and the Gowanus Expressway approximately one-quarter of a mile to the south/southwest, and the Brooklyn Queens Expressway approximately one-eighth of a mile to the east.

2.4 Topography and Geological Setting

A review of the applicable USGS 7.5-Minute Topographical Map (Jersey City, NJ-NY Quadrangle) revealed that the subject site is located at an approximate elevation of 10 feet above Mean Sea Level (MSL), in an area that slopes moderately down to the west toward Buttermilk Channel and Upper New York Harbor. The subject property itself is relatively level. A copy of the topographic map showing the subject property is included in Appendix I.

The geology of the subject area, as part of Brooklyn, is expected to consist of layers of urban fill, derived from local glacial and Cretaceous age sediments, consisting of gravel, sand and clay, which overlie Precambrian-age metamorphic bedrock. Soils in heavily developed urban areas, such as the subject area, are typically classified as

Urban Land, defined as containing imported fill materials having been placed and reworked by human activities, with more than 90% of the land covered by structures and pavement.

As stated below, the site was developed several times for commercial/industrial purposes since at least 1886. Structures were constructed and demolished, and the property was also vacant land for at least two periods of time, including the present. Recent subsurface investigations identified that the subsurface soils, and possibly the groundwater has been impacted by trace levels of volatile organic compounds, pesticides and metals, typical for Urban Land having a long-term history of commercial and industrial uses. The studies show that these impacts occur mostly within the upper few feet on the site, and that the concentrations detected slightly exceed or are levels that are below various regulatory guidelines. Section 2.8 contains additional details relating to these conditions.

The regional water table is expected to vary in elevation based upon local precipitation rates and subsurface geologic and urban development conditions. Information provided by the owner includes subsurface testing results which indicate that the local groundwater table is at least seven feet below the ground surface. The direction of groundwater flow in the immediate area of the subject property cannot be confirmed without more detailed site specific measurements; however, it is estimated to generally follow the topographical gradient to the west toward the Red Hook waterfront. The underlying groundwater aquifers in this area are considered unfit for

public use due to salt water intrusion and pollution. The City of New York provides potable water drawn from reservoirs located to the north of the city.

2.5 Site History

History of the site was determined based on interviews with the owner's representative, Mr. Hernan Galvis of Passiv House Xperimental, LLC, and a review of available property and building documents. Mr. Galvis stated that the subject parcel was once contained a live poultry market and slaughterhouse. He stated that the building was destroyed by fire approximately four to five years ago, and the owner demolished the former building in 2007. He also stated that the former building contained no cellar, and was constructed as a "slab on grade" one-story structure.

CA reviewed commercially available property information obtained from Environmental Data Resources, Inc. (EDR) which included historical Sanborn Fire Insurance Maps and historical city telephone directories. Sanborn Fire Insurance Maps were available for certain years during the period from 1886 through 2007. Historical city telephone directories were available for certain years during the period from 1940 through 2005. Historical aerial photographs were not obtained due to the availability of other historical information sources. CA's experience with readily available historical aerial photographs for urban properties, such as Brooklyn, is that the information typically obtained does not materially supplement the other readily

available historical information available from commercial and municipal agency sources.

CA also reviewed subject property information available on NYC agency websites, including the Department of Buildings and the Department of Finance.

A chronological summary of the site history for the subject property, and adjoining properties based on EDR's commercially available historical property information found is provided below:

YEAR	SOURCE	DESCRIPTION / USE
1886	Sanborn Map	The subject property is shown to contain one or possibly two small sheds, possibly associated with a small structure, other sheds, and what is labeled as "Wood Pile" to the west. It is possible that the subject property was part of a larger industrial property at the time depicted on this map. A "Wallpaper Factory" site is located further west along Union Street, with more factories further south along Van Brunt Street. Properties adjacent to the east are shown as multistory dwellings identified as "tenements" containing storefronts. The portion of the neighborhood depicted in the map shows the surrounding neighborhood to consist mostly of multi-story dwellings. Storefronts are concentrated along Union Street and along Columbia Street. Factories most likely part of the waterfront industrial area are located further to the west.
1904	Sanborn Map	The comparison of this map and the 1886 map shows that the subject property was apparently cleared of structures, and depicted as vacant by 1904. The industrial property to the west has been redeveloped with a small theater building and stable adjacent to the subject property. The multistory residential dwellings to the south and east along Union Street are shown in the 1904 map to contain storefronts. No other significant changes are shown for the surrounding neighborhood.
1915	Sanborn Map	The subject property is shown to have been improved with a narrow one-story building, with a shed at the rear. The Wallpaper Factory is identified on this map as "not running." No other significant changes were found in the comparison of this map and the 1904 map for the surrounding neighborhood.

YEAR	SOURCE	DESCRIPTION / USE
1938	Sanborn Map	The comparison of this map and the 1915 map shows that the subject property was apparently cleared of structures, and redeveloped with a one-story commercial building, identified as containing a "Poultry Market." No other significant changes were found in the comparison of this map and the 1910 map for the subject property and surrounding neighborhood.
1940, 1945	City Directories	The subject property is listed as "Elite Live Poultry Shop" and "Skloot, Harry, L Live Poultry."
1949	City Directories	The subject property is listed as "Adler, Lawrence, Elite Live Poultry Shop" and "Skloot, Harry, L Live Poultry."
1950	Sanborn Map	The comparison of this map and the 1938 map shows no significant changes for the subject property during this period. The property adjacent to the west has apparently been redeveloped as a machine shop and a neighboring auto repair shop. The former wall paper factory further west is now shown on the 1950 map as developed as a large one-story auto repair facility, with "filling stations" shown along Van Brunt Street. No other significant changes were found in the comparison of this map and the 1938 map for the surrounding neighborhood.
1960	City Directories	The subject property is listed as "Elite Live Poultry Shop" and "Gueirrieri Bros Live Poultry."
1969	Sanborn Map	No significant changes are shown for the subject property, and surrounding properties.
1970	City Directories	The subject property is listed as "Lees Live Poultry," and "Phillips, Jean."
1973	City Directories	The subject property is listed as "Lees Live Poultry."
1977	Sanborn Map	No significant changes are shown for the subject property. The property adjacent to the west is now identified on this map as containing an automobile repair facility. The factories formerly located further to the west appear to have been either demolished or changed over to storage/warehouse facilities. No other significant changes were found in the comparison of this map and the 1969 map for the subject property and surrounding neighborhood.
1979, 1980, 1981	Sanborn Maps	No significant changes are shown for the subject property, and surrounding properties.
1982	Sanborn Maps	No significant changes are shown for the subject property. The buildings located on the properties adjacent to the east are shown to have been cleared sometime between 1981 and 1982. No other significant changes were identified for the surrounding neighborhood.
1986, 1987, 1988, 1991, 1992, 1993, 1995, 1996, 2001	Sanborn Maps	No significant changes are shown for the subject property, and surrounding properties.
2002	Sanborn Map	The comparison of this map and the 2001 map shows that the properties adjacent to the east have been redeveloped with the three-story residential apartment building with commercial/retail spaces that essentially exist today. No significant changes are shown for the subject property, and surrounding properties.
1997, 2005	City Directories	"Lees Live Poultry Market" and "Lees Live Poultry"

YEAR	SOURCE	DESCRIPTION / USE
2003, 2004, 2005, 2006, 2007	Sanborn Maps	No significant changes are shown for the subject property, and surrounding properties.

Since this part of Brooklyn has been occupied since Pre-Colonial times, it is most likely that the subject property was originally developed sometime before the late 1800s, as either agricultural land or as a residential property. According to CA's research, the subject property was developed several times for commercial/industrial purposes since at least 1886. Structures were constructed and demolished, and the property was also vacant land for at least two periods of time, including the present. The subject parcel apparently once contained a live poultry market and slaughterhouse from about 1938 through about 2004. The poultry market building was reportedly destroyed by fire approximately four to seven years ago, and the current owner demolished the building in 2007. The former building reportedly contained no cellar, and was constructed as a "slab on grade" one-story structure.

Given the long-term use of the subject property for commercial/industrial purposes, and the general character of the neighborhood as a commercial/industrial waterfront, it is possible that some of these businesses on the subject site and the businesses adjacent to the site generated or handled unknown quantities of hazardous materials. These activities have contributed to the environmental impacts further discussed in Section 2.8, Previous Reports.

Section 3.0 contains additional regulatory information regarding the subject property and properties in the surrounding area. Copies of the historical Fire Insurance Maps and city directories have been included in Appendix V.

2.6 Municipal Records Review

CA researched the New York City Department of Buildings (NYCDOB) website (<http://a810-bisweb.nyc.gov/bisweb/bsqpm01.jsp> accessed on July 18, 2011) and Department of Finance website (<http://www.nyc.gov/html/dof/html/jump/acris.shtml> accessed on July 19, 2011) in order to review any available records associated with the subject property. Useful information obtained from these sources was used by CA throughout this report. CA's review of these records showed:

- i) A copy of an application pending for Zoning Approval, reportedly filed on May 24, 2011 by Hernan Galvis, RA, from Fractal Architecture, PLLC, identifies the new building as a four story, two-family with cellar residential apartment building, with accessory parking. It was also reported in the application that the site is not located in a designated wetland; there are no restrictive covenants; and the site is not listed as a NYC "Little E" Hazardous Materials site. However, the application reports the open NYC Department of Environmental Protection (NYCDEP) case file 11DEPTECH010K, which is further discussed in Section 2.8.

- ii) **The Building Classification is listed as “V1-Vacant Land.”**

- iii) **There are no Open Violations with the NYCDEP’s Environmental Control Board.**

CA has submitted a Freedom of Information request form to the NYCDEP and the New York State Department of Environmental Conservation (NYSDEC) requesting an opportunity to review any readily available records regarding the historical uses and any environmentally significant information for the subject property. To date, CA has not received a reply from this Department. Any responses containing useful and pertinent information regarding the current or past conditions of the site will be forwarded as an addendum to this report. It should be noted that Section 2.8 contains copies of correspondence from the NYCDEP about the findings and response actions to be completed, based on environmental conditions on the subject site. A copy of the Freedom of Information request form has been included in Appendix VIII.

2.7 Environmental Lien Information

As requested by the User as part of this assessment, CA researched available public records to obtain information on any environmental liens associated with the subject property. CA reviewed information from the NYC Department of Finance website (<http://www.nyc.gov/html/dof/html/jump/acris.shtml> accessed on July 19, 2011) in order to review any available records associated with the subject property.

CA found deed transfer records for the following dates: April 20, 2010; April 17, 2010; May 11, 2004; December 7, 1977; June 24, 1968; November 13, 1967; and October 30, 1967. There were no readily available records for earlier dates from 1967 back through the time of the first development of the subject property.

The property records also show the release of an Estate Tax Lien in 1967; the establishing of a restrictive covenant (for parking from another property) in 2007, and later canceling of this restrictive covenant in 2008. The building information also included copies of mortgage documents from 1977, which identifies the site operations as "Lee's Poultry Market" at that time.

CA found no information reported, or otherwise known to be readily available and accessible indicating any environmental liens or other encumbrances on the subject property, based on the documents reviewed from the City's website. It should also be noted that the current owner's responses to the questionnaire reported no such environmental liens or encumbrances (see Appendix VI).

2.8 Previous Reports

The owner provided CA with a copy of an earlier Phase I Environmental Site Assessment report, and a copy of the results for certain geotechnical investigations completed for the subject property and Associated Parcel. Copies of these reports are

included in Appendix IX. CA's findings of the review of these documents are presented below.

Phase I Environmental Site Assessment, Cobble Gardens; 107 Union Street, Brooklyn, N.Y. 11231; Block 335, Lot 42; Dated June 28, 2010; Prepared by: Galli Engineering, P.C. (Melville, N.Y.).

This report by Galli Engineering, P.C. (Galli) was developed based on a site inspection reportedly completed on June 18, 2010. The report states that the site conditions were similar to the conditions observed during CA's July 15th 2011 site inspection. The site was reported to be vacant and unpaved, used for parking vehicles a small trailer. It was also reported that construction materials were stored on the site (characterized as construction debris). Galli stated that the results for their site inspection found no recognized environmental conditions relating to the subject site, or associated with the surrounding properties.

The historical review conducted by Galli as part of their Phase I ESA report included a review of historical Sanborn Fire Insurance maps and municipal site records. Galli's review indicated that the subject property contained a structure on the 1986 Sanborn Map, which was apparently removed by 1904; developed with a one-story commercial building by 1915; and later identified as a poultry market. Galli also states that the property was once a poultry slaughterhouse, which burned down in 2007 (and in another section of the report, 2004).

Galli's review of the environmental regulatory database information found no listings for the subject property and surrounding properties. The general neighborhood includes many listed sites associated with the handling, generating, treating, storing and disposing of hazardous wastes and materials, which is typical for the conditions found in this heavily developed section of Brooklyn. Galli reported that it was unable to determine whether or not the conditions identified for the property located in the surrounding neighborhood were affecting environmental conditions on the subject property.

Galli reported that its investigation found no evidence for the use and storage of heating oil in tanks on the subject property. It also stated that the site is not located within any jurisdictional wetlands.

Based on the results of its investigation Galli concluded that there were no recognized environmental conditions associated with the subject property. It did recommend that the construction materials be removed from the site.

September 16, 2010 NYC Department of Environmental Protection, Bureau of Environmental Planning and Analysis letter to the NYC Board of Standards and Appeals.

- i) It was reported that the letter was based on its review of the owner's environmental reports including an Environmental Assessment Statement dated July 8, 2010 by AECOM and a Phase I Environmental Site Assessment dated June 28, 2010 by Galli. This review is in response to the application for

development of the site by Passive House Xperimental, LLC, at the request by the NYC Board of Standards and Appeals (BSA), the agency responsible for approving the rezoning and redevelopment of the property. It was acknowledged that the applicant plans on developing the site for a four-story, two-family residential apartment building, currently located in a M1-1 District.

- ii) Its findings of the review revealed that onsite and surrounding neighborhood was developed for commercial, industrial, and residential purposes. The NYCDEP noted that the Phase I ESA report identified two automobile repair facilities, two drycleaners, and four manufactured gas plant facilities. It was also noted that there were 10 spill sites, 16 leaking tank sites, and six underground storage sites, all within a one half mile radius of the subject site. The NYCDEP concluded that past on site and/or neighboring site activities have impacted on site soils and groundwater.
- iii) The NYCDEP recommended that BSA direct the applicant (owner) perform an assessment to characterize surface soils, subsurface soils, and groundwater conditions prior to the start of the site development.

Phase II Environmental Subsurface Investigation at 107 Union Street, Brooklyn, N.Y. Regulatory Tracking Nos. 11BSA009K/11DEPTECH010K (Dated February 2011); for Passiv House Xperimental, LLC by EEA, Inc. (Garden City, N.Y.).

The copy of the soils investigation report by EEA, Inc. (EEA) reported that its Phase II Environmental Site Assessment was based on site sampling completed in January 2011. The investigation included advancing two soil borings to depths of approximately 12 feet below grade for each borehole. Two soils samples were collected from each boring. The study also included the installation of a temporary groundwater monitoring well, to collect a water sample for analysis. EEA reported that the upper six feet of the site included "urban fill," meaning, soils and cinders, as well as brick and concrete fragments. The lower sections investigated was described as consisting of natural soils.

The four soil samples were collected and analyzed for volatile organic compounds, semi-volatile organic compounds, pesticides, PCBs, and certain metals; to be evaluated according to the NYS Department of Environmental Conservation (NYSDEC) Unrestricted Use Brownfield Cleanup Objectives. The results of the sampling showed impacts primarily within two feet of the surface by semi-volatile organic compounds, pesticides, and metals (such as copper, lead, selenium, zinc, and mercury). These compounds were identified at concentrations that slightly exceeded the NYSDEC Unrestricted Use Criteria, and according to EEA are typical of Urban Fill materials throughout the NYC Metropolitan Area.

The EEA report indicated that the local groundwater table was encountered at a depth of approximately six feet below the surface. One groundwater sample, collected from the temporary groundwater well, was analyzed for volatile organic compounds, semi-volatile organic compounds, pesticides, PCBs, and certain metals; to be evaluated according to the NYSDEC Technical Operational Guidance Series (TOGS) groundwater quality standards.

No compounds were detected in the filtered the groundwater sample (evaluating the water for any dissolved contaminants); however, the unfiltered sample showed concentration levels for semi-volatile organic compounds, pesticides, and metals slightly above the NYSDEC criteria. This was determined to be due to suspended soil particles in the groundwater sample.

The EEA report concluded that the concentrations found in the soils were typical for Urban Fill in the NYC Metropolitan Area. It was also concluded that there no additional investigations were necessary to characterize subsurface soils and groundwater conditions. It was recommended that any site development work should include the development and execution of safe work practices and soils disposal operations according to a Remedial Action Plan and Construction Health and Safety Plan.

February 17, 2011 NYC Department of Environmental Protection, Bureau of Environmental Planning and Analysis letter to the NYC Board of Standards and Appeals.

This letter reported the NYCDEP's site survey and evaluation of potential air pollution impacts to the property which is planned to be redeveloped as a four-story residential property. The NYCDEP evaluated permit information from a nearby automobile body repair shop, and found that air emissions from this facility should not significantly affect air quality at the subject property.

March 7, 2011 NYC Department of Environmental Protection, Bureau of Environmental Planning and Analysis letter to the NYC Board of Standards and Appeals.

The NYCDEP reported that it completed its review of the EEA Phase II report, and provided the following recommended directives to the applicants:

- i) The applicant should develop and submit to the NYCDEP for approval a site-specific Remedial Action Plan (RAP) and Construction Health and Safety Plan (HASP). The RAP should delineate procedures for handling and disposal of all excavated soils according to regulatory agency and disposal site facility requirements. The HASP should address safe work practices with respect to worker protections against significant exposures to the contaminants found.
- ii) Any dewatering and disposal of pumped water into the NYC municipal sewer system should be permitted and controlled by the NYCDEP Sewer Discharge Permit procedures.
- iii) The site redevelopment should include the installation of a proper soil vapor barrier. The NYCDEC must review and approve vapor barrier samples and materials installation specifications prior to the start of construction.
- iv) Any site surfaces not capped with pavement are to be covered and landscaped maintaining a minimum of two feet of clean fill/topsoil as a barrier. All imported fill must be tested for the same compounds evaluated in the Phase II ESA investigation,

with the results to be reviewed and approved by the NYCDEP prior to the delivery to the site.

Remedial Action Plan for 107 Union Street, Brooklyn, N.Y.; Regulatory Tracking Nos. 11BSA009K/11DEPTECH010K (Dated March 2011); for Passiv House Xperimental, LLC; by EEA, Inc. (Garden City, N.Y.).

CA reviewed a copy of the RAP developed by EEA, and provided by the owner. CA's review found that the RAP substantially complies with the applicable NYSDEC and NYCDEP regulatory requirements, and appropriately addresses the site-specific environmental conditions. The procedures follow those outlined in the March 7, 2011 NYCDP letter to the BSA, with the exception that procedures were included for addressing underground petroleum storage tanks in the event that these were encountered during site construction activities. The RAP also stated that any unpaved portions of the site will be first excavated below the two-foot depth horizon, prior to installing the required site fill.

Remedial Action Plan for 107 Union Street, Brooklyn, N.Y.; Regulatory Tracking Nos. 11BSA009K/11DEPTECH010K (Dated March 2011); for Passiv House Xperimental, LLC; by EEA, Inc. (Garden City, N.Y.).

CA reviewed a copy of the HASP developed by EEA, and provided by the owner. CA's review found that the HASP substantially complies with the applicable NYSDEC and NYCDEP regulatory requirements, and appropriately addresses the site-specific environmental conditions.

**April 6, 2011 NYC Department of Environmental Protection, Bureau of Environmental
Planning and Analysis letter to the NYC Board of Standards and Appeals.**

3.0 FINDINGS OF RECORDS REVIEW

A review of readily available and accessible Federal, State and local environmental regulatory agency records pertaining to potential recognized environmental conditions was performed based on a commercial database search acquired for the subject site and surrounding area, provided by Environmental Data Resources, Inc. The search distances comply with those recommended by ASTM E 1527-05. A brief description of the database review is provided below, and an abridged copy of the search output is given in Appendix IV.

3.1 Federal Records Search

3.1.1 National Priorities List (NPL) or Superfund

The subject property is not listed as a Federal Superfund site. No such sites were identified within a one-mile radius of the subject property.

The NPL Report, also known as the Superfund List, is a USEPA listing of uncontrolled or abandoned hazardous waste sites. This list is primarily based upon a score which the site receives from the USEPA's hazardous ranking system. These sites are targeted for possible long-term remedial action under the Superfund Act.

3.1.2 Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)

The subject property does not appear in the CERCLIS database. No such sites were identified within a one-half mile radius of the subject property.

CERCLIS is a list of potential hazardous waste sites that the USEPA is investigating for hazardous substance releases. Each site is given a hazardous ranking score which determines its standing on the NPL and priorities for cleanup. The higher the score, the greater the threat to the environment, and the more rapidly the site will be addressed by the USEPA.

3.1.3 Resource Conservation and Recovery Act (RCRA) Hazardous Waste Treatment, Storage, and Disposal (TSD) Sites

The subject property does not appear on this USEPA RCRA list. There are no sites located within a one-half mile radius of the subject property.

RCRA facilities are permitted by the USEPA to generate hazardous waste and dispose of the waste legally. These facilities generally abide by USEPA regulations for storage, handling and disposal of hazardous materials.

3.1.4 RCRA Hazardous Waste Generators and Transporters

The subject property is not listed as a RCRA Hazardous Waste Generator or Transporter site. There are two sites identified within a one-quarter mile radius of the subject property.

The closest site is identified as Randex Cleaners at 534 Henry Street, located approximately 800 feet to the southeast. The site is identified as a “Conditionally Exempt Small Quantity Generator,” having no violations.

RCRA facilities are permitted by the USEPA to generate hazardous waste and dispose of the waste legally. These facilities generally abide by USEPA regulations for storage, handling and disposal of hazardous materials.

3.1.5 Emergency Response Notification System (ERNS)

The subject property is not listed in the Federal database of spills compiled by the Emergency Response Notification System.

3.1.6 Toxic Release Inventory Sites (TRIS)

The subject property is not a listed Toxic Release Inventory Site.

Toxic release sites are manufacturing facilities that are required, pursuant to Section 313 of the Federal Emergency Planning and Community Right-To-Know Act, to report releases of any listed toxic chemical into the air, water, or onto the land.

3.1.7 CORRACTS (Corrective Action Report)

The subject property is not listed as a CORRACTS site.

This database represents a list of RCRA hazardous waste generator, treatment, transporter and disposal facilities that have been identified by the USEPA for corrective action.

3.2 State and Local Records Search

3.2.1 NYSDEC Inactive Hazardous Waste Disposal Sites (State Superfund)

The subject property does not appear on the State Superfund list. There is one site identified within a one mile radius of the subject property.

The K-Metropolitan Manufactured Gas Facility is located at the intersection of 12th Street and Nevins street, approximately one-mile to the southeast of the subject property. This site has a long history for the generation of coal

tar and natural gas during the earlier part of the 20th Century. These operations have significantly affected subsurface soils, the local groundwater system, the Gowanus Canal environment, and the New York Harbor. Contaminants include many hazardous organic compounds and metals. Remedial investigations are reportedly underway to determine the nature and extent of the contamination. However, due to the fact that the subject property is sufficiently removed from this site, and may be cross-gradient with respect to the estimated groundwater flow direction, it is most likely that the conditions on this site have not significantly affected the subject property.

The list of NYSDEC Inactive Hazardous Waste Disposal Sites contains summary information pertaining to those facilities that are deemed hazardous by the New York State Department of Environmental Conservation (NYSDEC).

3.2.2 NYSDEC Solid Waste Facilities

The subject property is not on the NYSDEC Solid Waste Facilities list. There is one site listed within a one-half radius of the subject property. The East Coast Tank Lining Corp. at 700 Hicks Street is located approximately one-half of a mile to the southwest of the subject property. The site is listed as an inactive solid waste transfer station, with little additional information.

Due to the fact that the subject property is sufficiently removed from this site, and may be down-gradient with respect to the estimated groundwater flow direction, it is most likely that the conditions on this site have not significantly affected the subject property.

3.2.3 NYSDEC Registered UST/AST Sites

The subject property is not listed as a NYSDEC registered UST/AST site. There are 14 such sites identified within a one-quarter mile radius of the subject property.

The NYC Department of Sanitation facility, known as District 6A, located to the west on Union Street near Van Brunt Street. This site is listed for more than four tanks for fuels and heating oil. The capacities for these tanks is not reported in this database. The site is also listed with a history of spills associated with these tanks and facility operations, resulting in a groundwater monitoring program. However, given the fact that this facility is located sufficiently removed, down slope, and down-gradient with respect to the groundwater flow direction, it is unlikely that conditions on this site have affected or contributed to the conditions associated with the subject property.

One of the other closest listed sites is located at 129 DeGraw Street approximately 1,000 feet to the northeast of the subject property. This site is listed for an undisclosed storage of petroleum or chemicals in a tank. No further details are provided for this location. There are no indications in the record that the conditions on this site have significantly affected the subject property.

The fact that a facility is listed as a petroleum bulk storage site does not mean that it is an unsafe facility or that fuel spills will occur, but does indicate that there is a potential for spillage because there is a significant quantity of fuel stored on the site.

3.2.4 Area Spills (NYS Toxic Spills, Leaking Underground Storage Tanks, Etc.)

The subject property does not appear on either the State Leaking Tanks List or the State Spills List. There are 18 State Spill sites identified within one-eighth mile of the subject property, and 29 State Leaking Tanks sites identified within one-half mile of the subject property.

One of the closest listed spill sites is reported for 106 Union Street, across the street from the subject property. This site is listed for an incident associated with a suspected leaking fuel oil tank discharging from into the

building cellar. This incident was first reported on January 7, 1993. There is no other information relating to the response actions taken for this incident; however, the file is identified as "closed" as of the same date.

The spill lists include relatively small incidents, such as equipment or human errors, tank overfills, and poor housekeeping. In general, the spill list records sites that were reported to the NYSDEC and are classified as "active", "cleaned up", or "unspecified". The ultimate goal of the NYSDEC is to resolve all reported spill sites to a classification of "cleaned up" after investigation, monitoring or remediation activities. CA found no evidence in the reports that any of the listed spill events in the surrounding area have directly contributed to the conditions at the subject property (see Section 2.8).

3.2.5 NYS Permitted Air Discharge Facilities (AIRS)

The subject property/facility is not identified as a source of permitted air pollutant discharges.

The EPA maintains a database containing information regarding each air emission facility and the type of air pollutant being emitted. Compliance information is also provided for each pollutant as well as the facility itself.

3.2.6 NYSDOH Radon Results

Based on CA's experience in conducting Phase I Environmental Site Assessments throughout the region, and our knowledge of the area's hydrogeology, radon is not generally present or expected to be found at elevated levels in Brooklyn. This is corroborated by a Statewide testing program recently conducted (October 2010) by the New York State Department of Health (NYSDOH) Bureau of Environmental Radiation. In Kings County (Brooklyn), the basements of 404 homes were tested by charcoal screening for the presence of radon gas. The average quantity of radon present in these houses was 1.92 picocuries per liter (pCi/L). The USEPA has set 4.0 pCi/L as the acceptable level for homes. Based on this standard, the average quantity of radon gas is below the USEPA action level.

A copy of the NYSDOH study results is provided in Appendix III of this report.

4.0 INFORMATION FROM SITE RECONNAISSANCE AND INTERVIEWS

4.1 On-Site Inspection of Hazardous Material Usage

The subject property is currently vacant land, cleared of all structures. CA observed no signs of hazardous material storage, handling or disposal on the grounds of the subject property. There were no signs of any leaks or spills of hazardous materials on the grounds of the subject property.

4.2 On-Site Storage Tanks

The subject property is currently vacant land, cleared of all structures. CA observed no signs of storage tanks, including associated piping systems such vent and fill lines, on the grounds of the subject property during the site inspection.

4.3 On-Site PCB's

The subject property is currently vacant land, cleared of all structures. CA observed no signs of PCB-containing electrical equipment on the grounds of the subject property.

4.4 Asbestos-Containing Material (ACM) in the Building

The subject property is currently vacant land, cleared of all structures. CA observed no signs of asbestos-containing building materials on the grounds of the subject property.

4.5 Lead-Based Paint (LBP) & Lead Materials

The subject property is currently vacant land, cleared of all structures. CA observed no signs of building materials which may contain lead-based paint on the grounds of the subject property.

4.6 Solid Waste Handling

The subject property is currently vacant land, cleared of all structures. There are reportedly no solid wastes generated or stored at the site.

4.7 Electromagnetic Fields

There were no sources of EMFs (e.g. high tension wires, electrical substations, etc.) observed in the vicinity of the site.

Although there are currently no regulations concerning the proximity of residential structures to major sources of electromagnetic fields (EMFs) such as overhead high tension wires, high levels of EMFs are an unresolved public health issue. Some recent studies have linked the presence of elevated EMFs to increased risk of certain cancers and other illnesses. Although studies are ongoing and no definitive conclusions have been reached, the existing evidence indicates that a potential health risk may exist for individuals who are exposed to these fields. In any case, the general perception of a risk associated with major sources of EMFs can reduce the marketability and value of real estate.

4.8 Pits, Ponds, or Lagoons

No pits, ponds, or lagoons were observed on or adjacent to the subject property.

4.9 Storage Drums

The subject property is currently vacant land, cleared of all structures. CA found no evidence for the storage of drums on the subject property during the site inspection.

4.10 Stained Soils or Pavement

The subject property is currently vacant land, cleared of all structures. CA observed no signs of hazardous material storage, handling or disposal on the grounds of the

subject property. There were no signs of any staining observed, which may be indicative of leaks or spills of hazardous materials on the grounds of the subject property.

4.11 Stormwater and Sanitary Systems

No on-site sanitary waste disposal/treatment systems were observed or reported to CA. Stormwater most likely infiltrates through the site fill materials to the local groundwater table.

4.12 Floor Drains and Sumps

The subject property is currently vacant land, cleared of all structures. CA observed no signs of collection or drainage systems observed on the grounds of the subject property.

4.13 Water Supply

The subject property is currently vacant land, cleared of all structures. According to interviews conducted with the owner's representative, Mr. Hernan Galvis of Passiv House Xperimental, LLC, the subject property is planned to be rezoned and redeveloped with a four-story residential apartment building, possessing a small cellar. Based on this information, it is most likely that the building will be connected

to the New York City municipal water supply system. No groundwater supply or monitoring wells were observed at the site.

4.14 Stressed Vegetation

The subject property is currently vacant land, cleared of all structures, and containing emergent vegetation. However, CA did not observe any areas of stressed vegetation on the subject property during the site inspection.

4.15 Evidence of Mold

The subject property is currently vacant land, cleared of all structures. There is no conditions observed to be present on the site that would result in significant mold growth.

4.16 Wetlands and Floodplains

There are no designated wetlands located on or immediately adjacent to the subject property. According to CA's review of Federal Emergency Management Agency (FEMA) information provided by EDR, the subject property is not located within a designated 100- or 500-year flood hazard area.

5.0 DATA GAPS

According to ASTM E 1527-05, a *Data Gap* is defined as an inability to obtain information during the Phase I ESA process, as required under this standard, despite a good faith effort by the Environmental Professional to obtain this information. As required under the ASTM standard, Section 12.7, the Environmental Professional must include in the ESA report a discussion identifying significant Data Gaps which prevent the Environmental Professional from identifying recognized environmental conditions associated with the subject property.

If Data Gaps identified during the all appropriate inquiry prevent the Environmental Professional's ability to render an opinion as to whether recognized environmental concerns associated with the subject property, then such Data Gaps are considered significant, according to the ASTM E 1527-05, Section 12.7. The Environmental Professional must identify significant Data Gaps in the report, identify the sources consulted to address the Data Gap, and comment on the significance of the Data Gap in affecting the opinion as to whether recognized environmental conditions are associated with the subject property. The Environmental Professional may then provide recommendations to the User of the report for further actions which may be necessary to address these significant Data Gaps.

However, a Data Gap itself is not inherently significant. If the Environmental Professional is able to render an opinion as to whether or not recognized environmental conditions are associated with the subject property, based on the professional's experience and other

information collected during an all appropriate inquiry even where Data Gaps exist, then such Data Gaps are not considered significant and do not need to be discussed in the report. CA has performed this Phase I Environmental Site Assessment of the subject property in compliance with the scope and limitations of ASTM Practice E 1527-05, as an all appropriate inquiry under the Final Rule. The findings of this Phase I ESA are based on: an inspection of the subject property and adjacent properties; interviews with knowledgeable parties representing the current property owner; review of available reports and records relating to earlier environmental investigations; review of available historical records; and a review of available environmental regulatory agency records.

6.0 FINDINGS AND CONCLUSIONS

Cashin Associates, P.C. has performed a Phase I Environmental Site Assessment, in conformance with the scope and limitations of ASTM Practice E 1527-05. Any exceptions to, or deletions from, these practices are described in Sections 1.2.7 and 1.2.8 of this report. Any pertinent information provided to CA from local municipality FOIL requests will be provided to the client upon receipt.

This report outlines the findings of a Phase I Environmental Site Assessment conducted by Cashin Associates, P.C. (CA) for the subject property located at 107 Union Street, Brooklyn, New York. The approximately 2,300 square foot subject parcel (Block 335, Lot 42) is currently vacant, cleared of surface structures.

The findings of CA's Phase I ESA, including a site history information review, site inspection, and regulatory agency database review, are summarized here and presented in more detail in the body of the report. The field inspection was conducted on July 15, 2011 by Brian Duggan, an Environmental Scientist from CA. Site and site access was facilitated by the owner's representative, Mr. Hernan Galvis of Passiv House Xperimental, LLC.

The subject property known as 107 Union Street is currently vacant and unpaved, with emergent vegetation around the perimeter security fencing, and containing parked vehicles. According to CA's historical research, the subject property was originally developed sometime before the late 1800s, as either agricultural land or as a residential property.

The site was developed several times for commercial/industrial purposes since at least 1886. Structures were constructed and demolished, and the property was also vacant land for at least two periods of time, including the present. Recent subsurface investigations identified that the subsurface soils, and possibly the groundwater, had been impacted by trace levels of volatile organic compounds, pesticides and metals, typical for Urban Land having a long-term history of commercial and industrial uses. The studies show that these impacts occur mostly within the upper few feet on the site, and that the concentrations detected slightly exceed or are at levels that are below various regulatory guidelines.

The owner has developed a site specific Remedial Action Plan and construction Health and Safety Plan to address proper safe work practices and soils handling and disposal procedures during the site construction. These plans have been reviewed and approved by the NYCDEP, permitting the construction work to proceed. The site is to be rezoned and developed with a four-story two-family apartment building containing a small cellar and garage. The Remedial Action Plan specifies the construction to include the installation of a soil vapor barrier membrane, and capping any unpaved areas with two feet of clean fill as a solution to the conditions present on site. Once the owner has completed the site redevelopment, it is required to develop and provide a Remediation Closure Report to the NYCDEP for final review and approval in order to use the site for its intended purposes, a two-family residential dwelling. It is recommended that the owner provide copies of any future environmental reports and/or correspondence completed as part of the site development. The owner should

also provide a copy of the approved Remediation Closure Report once all site development work is completed.

CA's review of NYC property and environmental records showed no indications for any adverse environmental impacts to the site, or environmental liens encumbering the property interests. CA's review of prior environmental reports found that these earlier environmental studies adequately characterized recognized environmental conditions associated with the subject property.

The subject property is not listed in any of the readily available environmental regulatory databases reviewed by CA. While nearby properties in the surrounding area appeared in some of the databases, CA found no evidence in the reports that any of these listed properties have directly contributed to the known environmental conditions on the subject property.

Therefore, it is CA's Environmental Professional's opinion that there are no other recognized environmental conditions and business environmental risks associated with the subject property.

SECTION 7
REFERENCES AND CONTACTS

REFERENCES AND CONTACTS

Mr. Hernan Galvis of Passiv House Xperimental, LLC, Owner's Representative, Personal Communication, July 2011.

Construction Health and Safety Plan for 107 Union Street, Brooklyn, N.Y.; Regulatory Tracking Nos. 11BSA009K/11DEPTECH010K (Dated March 2011); for Passiv House Xperimental, LLC; by EEA, Inc. (Garden City, N.Y.).

**New York City Department of Buildings (NYCDOB) website
<http://a810-bisweb.nyc.gov/bisweb/bsqpm01.jsp> accessed on July 18, 2011**

**New York City Department of Finance website
<http://www.nyc.gov/html/dof/html/jump/acris.shtml> accessed on July 19, 2011**

New York City Department of Environmental Protection (NYCDEP), Freedom of Information Request from CA, July 2011.

Phase II Environmental Subsurface Investigation at 107 Union Street, Brooklyn, N.Y. Regulatory Tracking Nos. 11BSA009K/11DEPTECH010K (Dated February 2011); for Passiv House Xperimental, LLC by EEA, Inc. (Garden City, N.Y.).

Remedial Action Plan for 107 Union Street, Brooklyn, N.Y.; Regulatory Tracking Nos. 11BSA009K/11DEPTECH010K (Dated March 2011); for Passiv House Xperimental, LLC; by EEA, Inc. (Garden City, N.Y.).

September 16, 2010 NYC Department of Environmental Protection, Bureau of Environmental Planning and Analysis letter to the NYC Board of Standards and Appeals.

February 17, 2011 NYC Department of Environmental Protection, Bureau of Environmental Planning and Analysis letter to the NYC Board of Standards and Appeals.

March 7, 2011 NYC Department of Environmental Protection, Bureau of Environmental Planning and Analysis letter to the NYC Board of Standards and Appeals.

April 6, 2011 NYC Department of Environmental Protection, Bureau of Environmental Planning and Analysis letter to the NYC Board of Standards and Appeals.

New York State Department of Environmental Conservation, November 2010. Inactive Hazardous Waste Disposal Sites in New York State, Albany, New York.

New York State Department of Environmental Conservation, November 2010. Petroleum Bulk Storage Facilities, Albany, New York.

New York State Department of Environmental Conservation, August 2010. Spills Information Database, Albany, New York.

New York State Department of Health, October 2010. Measured Basement Screening Radon Levels, Albany, New York.

Phase I Environmental Site Assessment, 107 Union Street, Brooklyn, N.Y. 11231; Dated June 18, 2010; Prepared by: Galli Engineering, P.C. (Melville).

United States Environmental Protection Agency, November 2010. Resource Conservation and Recovery Act (RCRA) Information, Washington, D.C.

United States Environmental Protection Agency, November 2010. Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), Washington, D.C.

United States Environmental Protection Agency, November 2010. Corrective Action Report (CORRACTS), Washington, D.C.

United States Environmental Protection Agency, January 2011. Emergency Response Notification System (ERNS), Washington, D.C.

United States Environmental Protection Agency, October 2010. National Priority List (NPL), Washington, D.C.

Federal Emergency Management Agency (FEMA), Flood Zone Data.

United States Fish & Wildlife Service, National Wetlands Inventory (NWI).

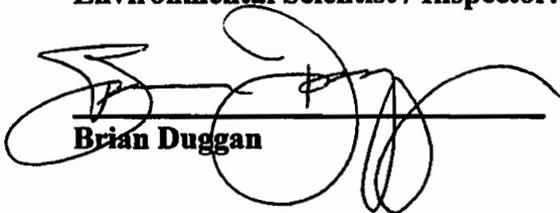
**SECTION 8
SIGNATURE PAGE**

**PHASE I ENVIRONMENTAL SITE ASSESSMENT
FOR THE PROPERTY LOCATED AT:**

**107 UNION STREET
BROOKLYN, NEW YORK 11231**

CASHIN ASSOCIATES, P.C. REFERENCE NO. 11003.016

Environmental Scientist / Inspector:



Brian Duggan

Date: 07/22/11

**Inspection
Date: 07/15/11**

Director of Environmental Programs:



Gregory T. Greene

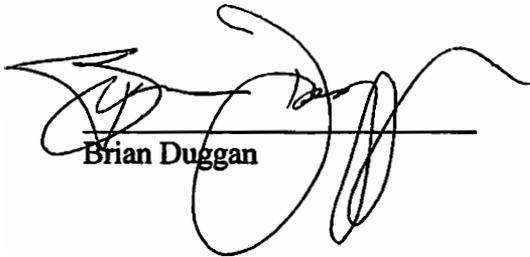
Date: 07/22/11

SECTION 9
QUALIFICATIONS INFORMATION

QUALIFICATIONS

Environmental Professional's Statement

I, Brian Duggan, declare that, to the best of my professional knowledge and belief, I meet the definition of *Environmental Professional* as defined in §312 of 40 CFR 312. I have the specific qualifications based on education, training and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312, for the purposes identified.



Brian Duggan



CASHIN ASSOCIATES, P.C.

GREGORY T. GREENE

Director of Environmental Programs

EDUCATION/REGISTRATION

B.A., Geological and Geophysical Sciences, Princeton University, 1975

M.S., Marine Environmental Sciences, SUNY at Stony Brook, 1978

Certified Environmental Specialist, Environmental Assessment Association

PROFESSIONAL AFFILIATIONS

National Groundwater Association

National Association of Environmental Professionals

National Shellfisheries Association

American Society of Safety Engineers

Sigma Xi Scientific Society

EXPERIENCE

As Director of Environmental Programs at Cashin Associates, Mr. Greene serves as project director for major environmental planning, site assessment projects and hazardous material management programs. He has directed the preparation of numerous site assessments, environmental impact statements, planning studies, field investigations, master plans and technical studies for governmental agencies and authorities on the local, state and federal levels, as well as CA's banking and insurance company clients.

Mr. Greene has technical expertise in issues relating to site remediation, resource protection, hazardous materials management, groundwater and surface water management, and State/Federal environmental review requirements.

Recent environmental projects completed under Mr. Greene's direction included:

- Environmental assessments of commercial, residential and industrial sites for banks, lending institutions and other corporate clients, including asbestos and lead investigation and abatement, throughout the eastern United States and Puerto Rico.
- Assistance to the Valley Stream School District on issues relating to groundwater contamination, school safety, exposure to potential contaminants from off-site sources.
- Development/implementation of health/safety, emergency response and hazardous materials management plans for the Town of Oyster Bay.
- Environmental review and risk assessment for a major pesticide management and vector control program for Suffolk County, including environmental and human health risk assessment.
- Environmental studies for re-use and enhancement of a former industrial property as a harborfront park for the Village of Port Jefferson, NY.
- Environmental studies relating to solid waste recycling and energy recovery for the Solid Waste Management Authority of Puerto Rico.
- Evaluation and assessment of property and other collateral on behalf of CA's banking, real estate investment, and insurance company clients.
- Feasibility study including safety inspections, groundwater investigation and water supply report for redevelopment of Camp Hero, a decommissioned army base for the NYS Office of Parks, Recreation & Historic Preservation.

- Flood Hazard Mitigation and Emergency Response Plan, for the Town of Brookhaven, NY.
- Health and safety investigation and regulatory compliance reviews for a major bank client, involving branches and corporate offices.
- Human health and environmental risk assessment for the Peconic River, Suffolk County, NY.
- Implementation of fuel storage tank testing and remediation programs for the Towns of Oyster Bay, Babylon and Islip, including several hundred underground tanks, and associated groundwater investigations.
- Phase I environmental site assessments for numerous properties under consideration by Suffolk County for open space and groundwater recharge area acquisition.
- Phase II investigations and follow-up remedial activities at industrial and commercial sites with environmental issues for banking and real estate investment firms.
- Preparation of a draft solid waste management plan and comprehensive recycling analysis for the Town of Oyster Bay, NY.
- Environmental risk assessment for the Carmans River, For Suffolk County Department of Health Services.
- Supervision of investigation and remediation of leaking underground storage tank sites in New York and New Jersey for various banking and corporate clients.
- Supervision of lead paint abatement programs performed under FREDDIE MAC requirements for buildings in New York and New Jersey.
- Supervision of site remediation and monitoring for a leaking underground gasoline tank for the Village of Amityville, NY.
- Development and implementation of a groundwater remediation program for an underground hydrocarbon spill at Montauk Downs State Park, for NYS Department of Parks, Recreation and Historic Preservation.
- Groundwater and soil monitoring and development of a remediation program at a former brick manufacturing facility at Bristol Bay State Park, for the Palisades Interstate Park Commission.
- PCB remediation at the Brooklyn Air Station for the U.S. Coast Guard.

Mr. Greene was also employed for four years at a national environmental consulting firm where he was involved in the preparation of environmental impact studies for the U.S. EPA. He acquired extensive experience in project planning, field work, data analysis, EIS preparation and expert testimony in this position. He served as project manager for a major EIS on the proposed remediation of PCB-contaminated sediments from the Hudson River, and for an assessment of impacts of sewerage on marine resources of the Great South Bay, NY. He prepared EIS's for regional wastewater disposal systems on Long Island, upstate New York, New Jersey, and Puerto Rico.

BRIAN DUGGAN, LEED AP BD+C
Environmental Scientist

Education

J.D. / Touro Law Center/2005

M.S. / Geology / State University of New York at Stony Brook/1996

B.A. / Geology / State University of New York at Buffalo/1982

Licenses / Certification

LEED Accredited Professional, NY

Admitted to Practice Law, NY, NJ

OSHA (HAZWOPER)

OSHA (Supervisor)

Memberships

New York State Bar Association, Member

Suffolk County Bar Association, Member

United States Green Building Council, Member

Overview

Mr. Duggan has 25 years of experience in environmental consulting, Phase I and II environmental site assessments, SEQR and CEQR compliance, worker health and safety practices, engineering, and construction management. He has experience with field supervision of projects, as well as the preparation of technical contract specifications, construction & environmental permit applications, remediation plans, and regulatory agency compliance reports. His work experience also includes project management of construction site hazard and workplace hazard assessments, occupational exposure risk assessments, and worker exposure monitoring. He has served as a project manager on many environmental investigations and site clean-up projects, and served as the on-site health and safety officer during the construction of several major landfill closure projects, as well as for other heavy construction projects.

Mr. Duggan serves at the firm as a senior environmental scientist and project manager for CA's environmental programs. Responsibilities include Phase I and II site assessments in accordance with ASTM standards, construction contract development, preparation of environmental impact statements, SEQR compliance, project health and safety plans and other technical requirements, and reviewing compliance with contract requirements as part of CA's construction management team. He provides technical support to the firm's engineering and design services, including services involving indoor air quality, hazardous materials management, environmental remediation, and regulatory compliance programs.

He has served as project manager for a Health and Safety Compliance Program and Workplace Violence Protection Program for the Town of Oyster Bay, involving over 1,200 employees at 25 different facilities. His responsibilities have included management and coordination of health and safety inspections, interviews, training, and interface with the Town's Department of Human Resources. He was primary author of a Workplace Violence Prevention Inventory Report for the Town, prepared in accordance with the New York State Workplace Violence Protection Act of 2006. He also assisted with the preparation of a similar Workplace Violence Inventory Report for the Town of Southampton.

Mr. Duggan also assists the firm's technical staff during the due diligence phase of a project when Project Labor Agreement (PLA) services are provided. Mr. Duggan provides technical litigation support and expert testimony for



several of CA's forensic engineering projects. He draws upon his technical and legal support experience at other companies, providing technical discovery review support for construction litigation services, and providing technical review of construction documents and property loss claims. He also serves as project manager for health and safety compliance for the Valley Stream Public School District 30, which includes analysis of issue relating to indoor air quality, teacher and student safety, groundwater contamination and facility monitoring.

Mr. Duggan is a licensed attorney, admitted to practice in New York and, as general counsel for the firm, regularly reviews and negotiates company contracts with private and public clients. He provides regulatory compliance reviews and environmental assessments as part of his services at CA. He is also responsible for drafting subconsultant agreements for the various company projects. He manages and coordinates the submission of CA's general conditions contract requirements on behalf of the company's principals, ensuring the proper insurance requirements and regulatory compliance affidavits are in place. Mr. Duggan coordinates and provides the appropriate corporate filing documents for CA's corporate presence in the several states where the company provides its professional engineering services. He is also serves as an internal legal advisor with regard to Project Labor Agreement services offered by the firm.

His previous experience includes:

Solo practitioner of a general and family law practice. Solo practice as an environmental consultant. (2006-2007)

John E. Osborn, P.C., New York, NY

Mr. Duggan served as a technical professional / environmental scientist at this law firm. He provided technical review and analysis of construction project records in support of the firm's defense of claims in litigation for public school clients. He provided technical project oversight in support of the firm's role as environmental counsel for environmental response actions, as part of a large hotel redevelopment project in Manhattan. He served as a teaching assistant to the firm's principal for graduate-level courses at the Brooklyn Polytechnic Institute and Pratt Institute. (2004-2006)

AIG Technical Services, Inc. / Pollution Insurance Products Group, New York, NY

Mr. Duggan served as a home office supervisor and environmental claims adjuster, reviewing insureds' notices of claims and technical reports for environmental investigations and cleanup costs. His duties included the determination of reasonable and necessary response actions applicable to coverage under the indemnity agreements. He was also responsible for reviewing and monitoring the legal defense of actions against insureds as part of AIG's defense obligations under its policies. (2002-2004)

Prior to first joining CA in 1997, Mr. Duggan served as an Industrial Hygienist and Project Geologist for several environmental consulting firms. His industrial hygiene experience includes worker exposure monitoring for hazardous chemicals and project monitoring and project management during asbestos abatement programs, health and safety monitoring during landfill capping operations, and indoor air quality investigations. As a Project Geologist, he performed site investigations, soils and groundwater testing, and project management of environmental response actions on commercial and industrial properties.

Other prior assignments included:

- Project management of various building renovation projects involving the characterization of hazardous material conditions and health and safety monitoring during the removal of hazardous wastes for public utilities, public transportation authorities, and a number of federal, state, and city agencies (New York State, New York City, Washington, D.C., Maryland, and others).

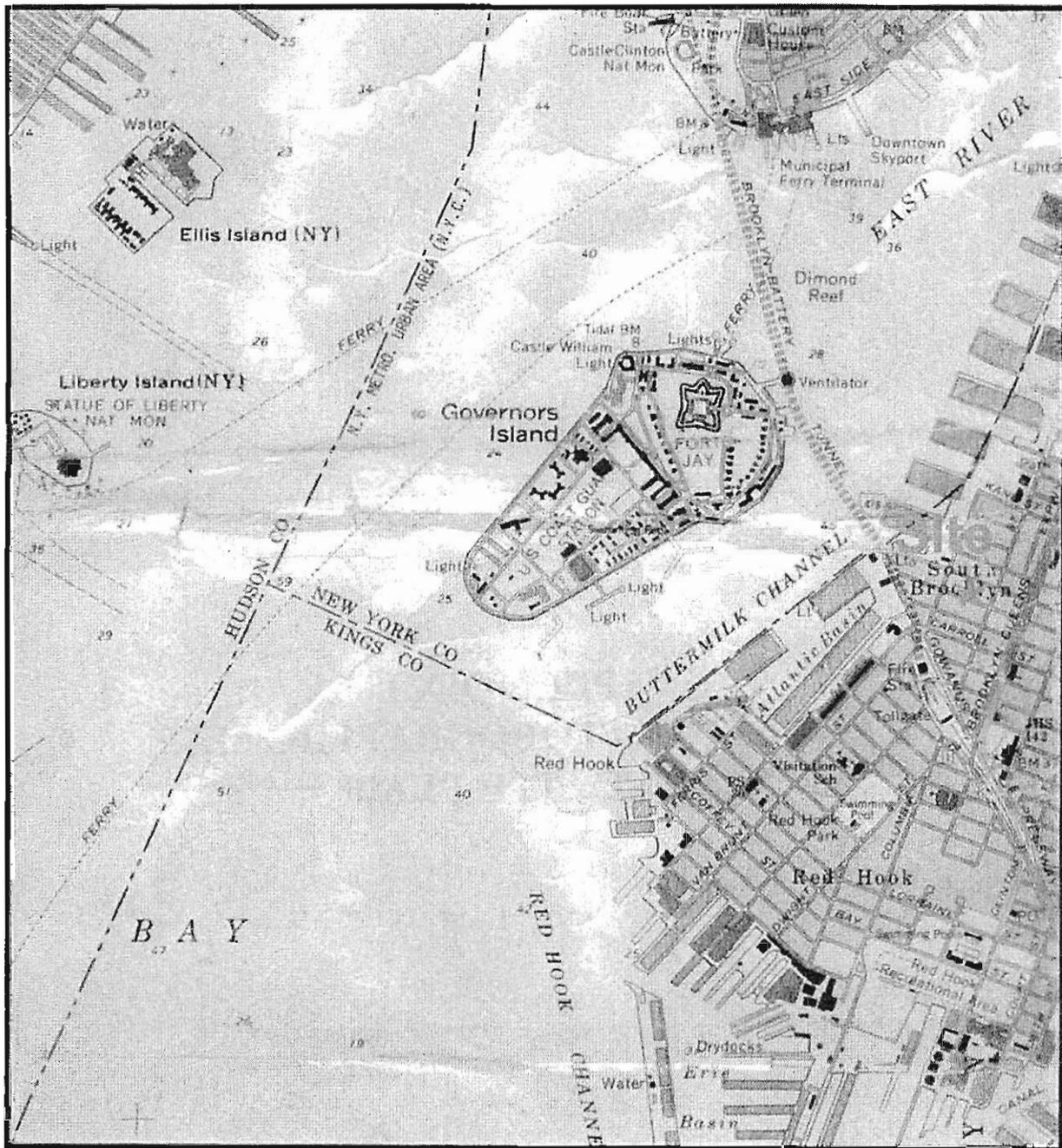


Cashin Associates, P.C.

- Project management for investigation, assessment and remediation of hazardous waste sites, petroleum contaminated soils and contaminated groundwater.
- Indoor air quality studies, including worker and occupancy exposure assessment studies, and the development of health and safety plans.
- Project management of building inspections for asbestos in institutional, commercial and industrial facilities.
- Geological investigations during groundwater well placement and soil boring activities.

APPENDICES

**APPENDIX I
LOCATION/TOPOGRAPHIC MAP
AND SITE PLAN**

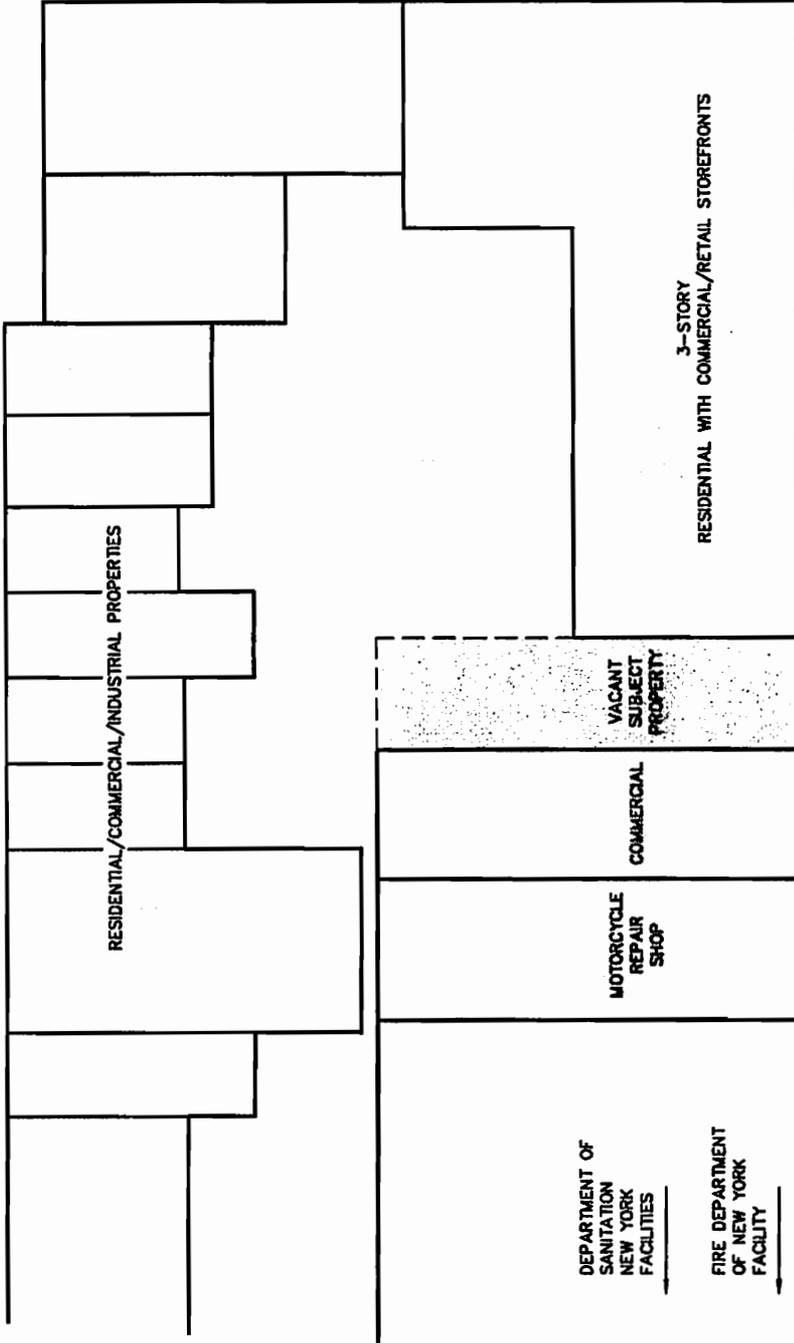


*New York State
Department of Transportation
Jersey City Quadrangle
New Jersey - New York
7.5 Minute Series
1975
Second Edition
Scale 1:24000*

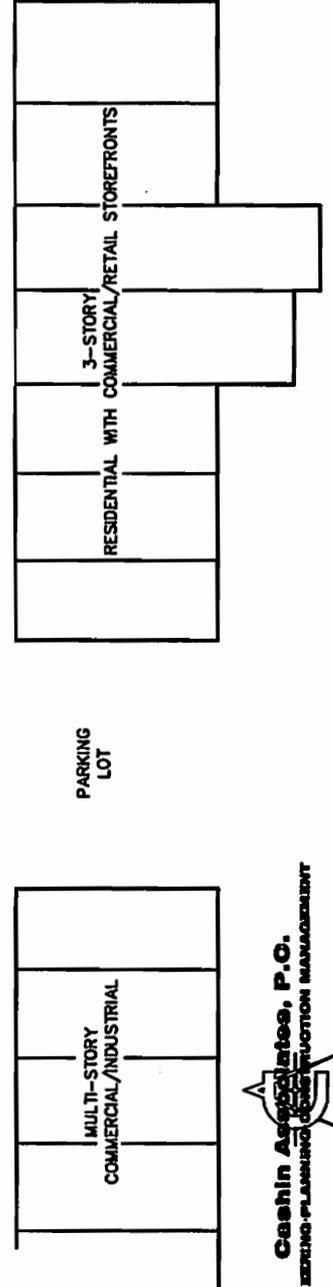


NOT TO SCALE

COLUMBIA STREET



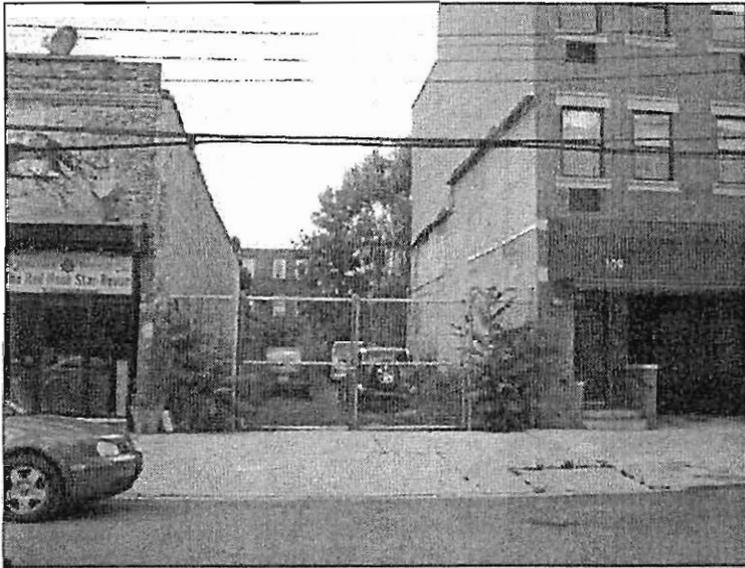
UNION STREET



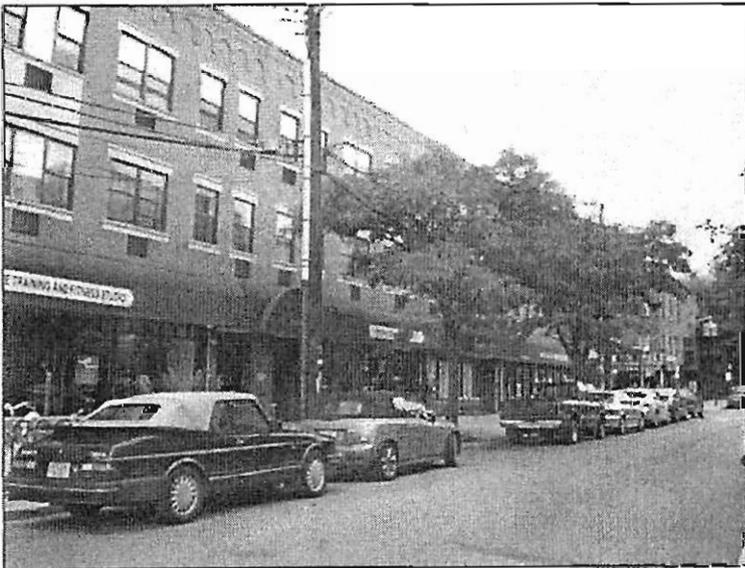
SITE SKETCH

107 Union Street
Brooklyn, New York

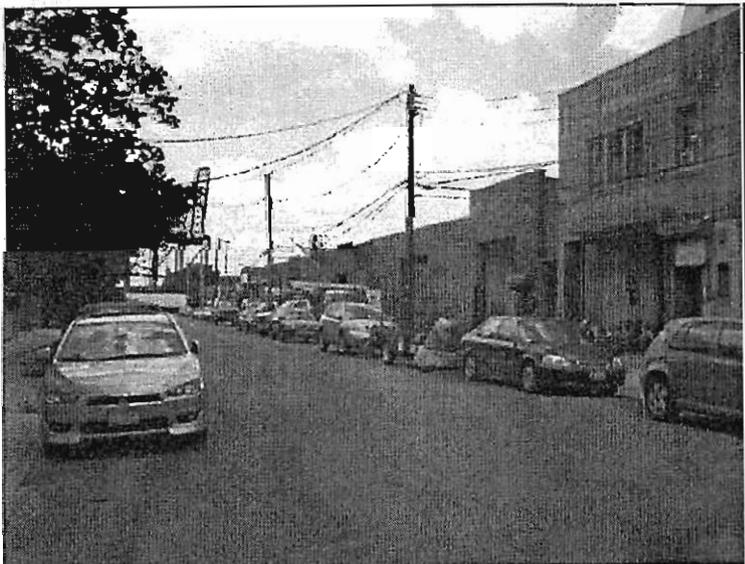
APPENDIX II
SITE PHOTOGRAPHS



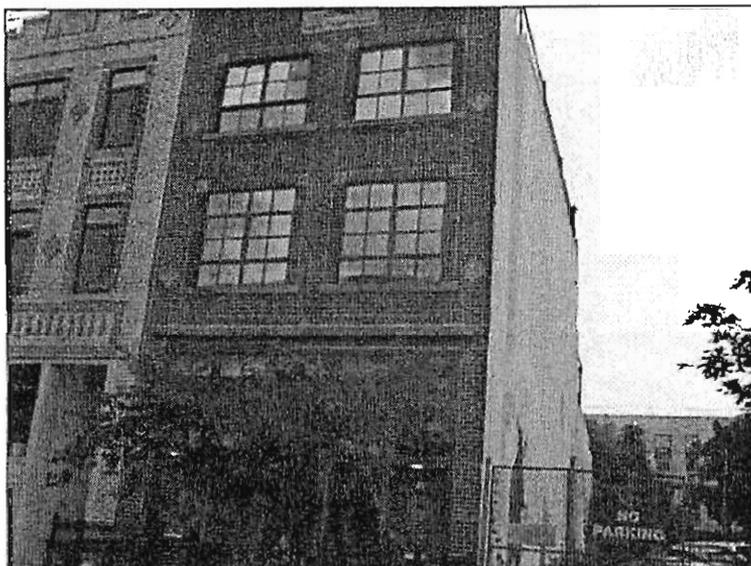
Photograph #1 - View of the subject property located at 107 Union Street, Brooklyn, New York.



Photograph #2 - View of easterly adjoining properties.



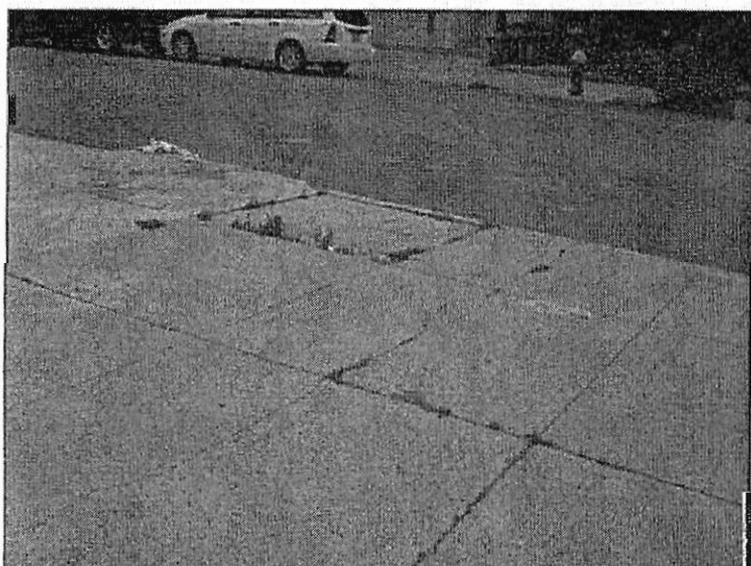
Photograph #3 - View of the westerly adjoining properties.



Photograph #4 - View of properties to the south across Union Street.



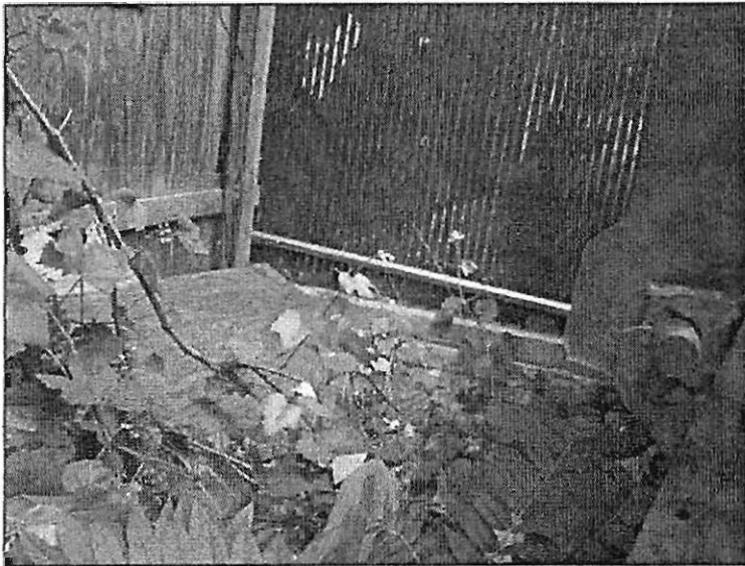
Photograph #5 - View of the vacant property used for parking owner vehicles.



Photograph #6 - View of the sidewalk area in front of the subject property.



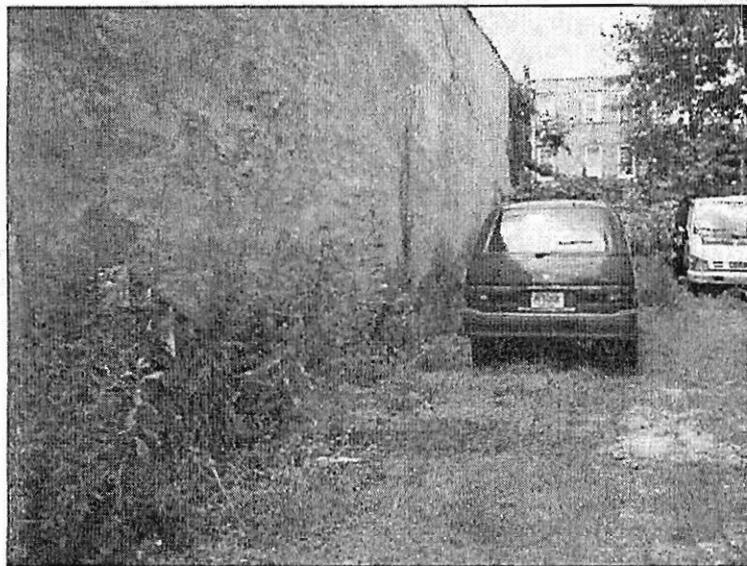
Photograph #7 - View along the east side of the site.



Photograph #8 - View of piled lumber in the northeast corner of the site.



Photograph #9 - View to the south.



Photograph #10 - View to the north
along the east side of the site.

**PHASE II ENVIRONMENTAL
SUBSURFACE INVESTIGATION**



**107 UNION STREET
BROOKLYN, NEW YORK**

**Project No. 10742
Regulatory Tracking Nos. 11BSA009K/11DEPTECH010K**

Prepared for:

**PASSIV HOUSE XPERIMENTAL LLC
131 UNION STREET
BROOKLYN, NEW YORK 11231**

FEBRUARY 2011

Prepared by:

EEA Inc.

*55 Hilton Avenue, Garden City, New York 11510
Environmental Consultants To Industry And Government Since 1979
www.eeaconsultants.com*

**PHASE II ENVIRONMENTAL SUBSURFACE INVESTIGATION
PROPERTY LOCATED AT
107 UNION STREET
BROOKLYN, NEW YORK
BLOCK 335, LOT 42
11DEPTECH010K, 11BSA009K**

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 Table 8: Water Analytical Results: Metals

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 B. Chain-of-Custody Record
 C. Laboratory Analytical Report
 D. Soil Boring Log Reports
 E. NYCDEP Approval Letter

**PHASE II ENVIRONMENTAL SUBSURFACE INVESTIGATION
PROPERTY LOCATED AT
107 UNION STREET
BROOKLYN, NEW YORK
BLOCK 335, LOT 42
11DEPTECH010K, 11BSA009K**

Executive Summary

EEA, Inc. performed a Phase II Environmental Subsurface Investigation at the property located at 107 Union Street in Brooklyn, New York.

The subject property encompasses approximately 2,300 square feet and is occupied by a dirt, gravel and weed covered vacant lot. The proposed project development would facilitate construction of a 4,600 square foot, two-family, four-story residential building with a ground floor studio apartment. The construction of this structure would also include the installation of sub-grade cellar beneath the proposed building, which means, soils would be excavated to a depth of approximately 10'10" below the current grade. The location of the subject property is shown on **Figure 1**.

All subsurface investigation work was performed in accordance with the New York City Department of Environmental Protection (NYCDEP) approved EEA's Investigation Work Plan (IWP) and Health and Safety Plan (HASP); furthermore, approval was granted and stated in NYCDEP's letter dated January 6, 2010 (see **Appendix E**).

Soil Quality Conditions

A total of two (2) soil borings, with sampling designations B-1, B-2, were advanced at the subject property. Two (2) soil samples from each soil borings were collected and submitted for laboratory analysis. Furthermore, a total of four (4) soil samples were collected as part of this investigation. The soil sample collection locations are presented in **Figure 1**. The laboratory soil analytical results are summarized and presented on **Tables 1, 2, 3, and 4**.

Soil on the grounds of the subject property consisted of urban fill material (i.e., fine silty tan sand with some asphalt and brick) to a depth of approximately six (6) feet below grade. Soil below the six (6) foot depth predominantly consisted of a tan silty fine sand. Field inspection, via visual, olfactory and PID screening methods, did not identify the presence of significant contamination in soils on the subject property. The laboratory analytical results did not detect any VOCs and PCBs in any of the soil samples at concentrations exceeding the New York State Department of Conservation (NYSDEC) Unrestricted Use Brownfield Cleanup Objectives (USCOs).

Heavy metals, such as copper, lead, selenium, zinc, and mercury were detected in 0 to 2 foot soil samples (B-1 and B-2) at concentrations exceeding their respective NYSDEC Unrestricted Use Brownfield soil cleanup guidelines. No metals were detected in deeper soil

samples at concentrations exceeding NYSDEC Unrestricted Use Brownfield soil cleanup guidelines. The metals detected in the 0-2 foot samples are typical of “Urban Fill Soil” quality conditions.

Semi-Volatile Organic Compounds (SVOCs), such as Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, and Chrysene, were detected in 0 to 2 foot soil samples at concentrations exceeding their respective NYSDEC Unrestricted Use Brownfield soil cleanup guidelines. No SVOCs were detected in deeper soil samples at concentrations exceeding NYSDEC Unrestricted Use Brownfield soil cleanup guidelines. The SVOCs detected in the 0-2 foot samples are typical of “Urban Fill Soil” quality conditions.

Pesticides, such as 4,4'-DDT and 4,4'-DDE, were detected in 0 to 2 foot soil samples at concentrations exceeding their respective NYSDEC Unrestricted Use Brownfield soil cleanup guidelines. No pesticides were detected in deeper soil samples at concentrations exceeding NYSDEC Unrestricted Use Brownfield soil cleanup. The presence of the pesticides detected in the 0-2 foot samples is likely due to the presence of “Urban Fill Soil” on the grounds of the subject property.

Property Ground Water

There were no field observations of potential groundwater contamination in the groundwater collected from B-1W. Groundwater was encountered at approximately 7 feet below surface grade in both soil borings. Laboratory analysis of the groundwater sample did not detect any VOCs, SVOCs, Pesticides, and PCBs at concentration exceeding the NYSDEC Technical and Operational Guidance Series (TOGS) groundwater quality standards. The laboratory analytical results of the above mentioned parameters are summarized and presented in **Tables 5, 6, and 7**.

Several TAL metals (i.e., arsenic, barium, beryllium, chromium, lead, manganese, nickel, selenium, and iron) were detected in unfiltered groundwater samples at concentrations exceeding their respective NYSDEC TOGS 1.1.1 GQS. However, no metals were detected at levels exceeding TOGS guidelines in the filtered groundwater sample. These metal exceedences in the unfiltered sample are likely the result of dissolved soil particles present in groundwater. Furthermore, the groundwater on site is not considered an aquifer and is not used for drinking or any other water supply uses. The laboratory analytical results of metal concentrations in groundwater are summarized and presented in **Table 8**.

Conclusions and Recommendations

Based on field observations, the chemical concentrations of SVOCs, metals and pesticides in the soils, and metals in groundwater, beneath the subject property indicate the presence of “Urban Fill Soil” to a depth of approximately six feet below grade. “Urban Fill Soils” are common and typical of industrial/commercial properties found throughout the metropolitan area. The soil below six (6) feet was observed to be native, glacial fluvial deposits of outwash silty sand with trace fine gravel.

The levels of SVOCs, metals and pesticides are background for this area of New York City; therefore, no recommendations for additional investigation are being made for this property at this time. The concentrations of chemical parameters identified in the soil are typical of industrial/commercial “Urban Fill” properties in the New York metropolitan area. If these soils [0 to 6 feet below surface grade] are excavated and removed from the property as part of the redevelopment then these soils will have to be handled and disposed in accordance with NYSDEC solid waste (Part 360) guidelines. The NYCDEP may require a Remedial Action Plan (RAP) and Construction Health and Safety Plan (CHASP) to be developed and approved by NYCDEP prior to any site excavation activities.

The NYSDEC has developed the “guidelines” in order for DEC case managers to determine potential cleanup recommendations at various sites throughout the state. The NYSDEC considers each site on a case-by-case basis in consideration of the history and district of property usage and its location to sensitive human, wildlife and environmental interests. Industrial and commercial properties are treated differently than residential or environmentally sensitive areas.

EEA recommends submitting this report to NYCDEP for their review and comment.

I. INTRODUCTION

EEA, Inc. performed a Phase II Environmental Subsurface Investigation at the property located at 107 Union Street in Brooklyn, New York.

The subject property encompasses approximately 2,300 square feet and is occupied by a dirt, gravel and weed covered vacant lot. The proposed project development would facilitate construction of a 4,600 square foot, two-family, four-story residential building with a ground floor studio apartment. The construction of this structure would also include the installation of sub-grade cellar beneath the proposed building, which means, soils would be excavated to a depth of approximately 10'10" below the current grade. The location of the subject property is shown on **Figure 1**.

All subsurface investigation work was performed in accordance with the New York City Department of Environmental Protection (NYCDEP) approved EEA's Investigation Work Plan (IWP) and Health and Safety Plan (HASP); furthermore, approval was granted and stated in NYCDEP's letter dated January 6, 2010 (see **Appendix E**).

EEA initiated and completed field activities on January 21, 2011. This report summarizes the work performed, the results of the investigation, and associated recommendations.

II. SCOPE OF WORK PERFORMED

Two (2) soil borings (B-1, B-2) were advanced on-site using a Geoprobe LT 54 drill rig. A total of four (4) soil samples were collected as part of this investigation. Two (2) soil samples from each soil borings were collected and submitted for laboratory analysis. Samples were field screened for volatile organic vapors using a photo ionization detector (PID). The soil sample collection locations are presented in **Figure 1**.

EEA collected one (1) 0 to 2 foot and one (1) 10 to 12 foot soil sample from borings B-1 and B-2. It should be noted that borings were advanced below the level of the proposed foundation for the planned building, which is approximately 10'10" below surface grade. The samples were directed toward those areas likely to have accumulated the highest contaminant levels as observed during sampling. Soil samples at all depths were screened using a photo ionization detector (PID).

At each soil boring location, two (2) soil samples were collected and analyzed for VOCs using EPA Method 8260, SVOCs using EPA Method 8270BN, Pesticides and PCBs using EPA Method 8081/8082 and TAL Metals.

A groundwater sample, B-1W, was obtained from boring location B-1, using a temporary PVC screen monitoring well with the Geoprobe drill rig. Furthermore, to obtain this sample, an inertial pump consisting of a stainless steel check valve and ball, was utilized. The inertial pump was fitted with dedicated polyethylene tubing, which allowed the groundwater to be brought up

to the ground surface for collection. Each groundwater sample was placed into two (2) pre-cleaned forty milliliter vials, two (2) one-liter amber and two (2) plastic jars for metal analysis. These samples were submitted to the State certified laboratory for analysis. The groundwater samples were collected and analyzed for VOCs using EPA Method 8260, SVOCs using EPA Method 8270BN, Pesticides and PCBs using EPA Method 8081/8082 and TAL Metals. The groundwater sample collection locations are presented in **Figure 1**.

a. Health and Safety Plan

EEA used NYCDEP approved site-specific Health and Safety Plan for performing this Phase II Environmental Subsurface Investigations. The HASP assigns responsibilities, establishes personal protection standards, recommends operating procedures, and provides for contingencies that may arise during performance of the assessment at the site. The protocols in the HASP apply to all personnel involved in the work activities including EEA, all outside subcontractors, client, or regulatory agencies present during the performance of the work. In addition, the following safety equipment is maintained on-site for responding to potential emergency situations: portable eyewash, ABC fire extinguisher, and first aid kit. Telephone numbers of emergency response units in the area are also posted where all those working at the site can easily see them. All personnel working at the site will also be required to receive training in respirator fitting, emergency procedures, equipment decontamination and specific task procedures. All personnel involved with the collection of soil or water will have successfully completed the 40-hour OSHA Hazardous Materials Training Program.

b. Subsurface Utility Location, Permits and Bonding

EEA notified the DigNet of New York City and Long Island under the New York State Regulation Code 753 prior to initiating the work to identify the location of underground utilities in the vicinity of the proposed boring locations. Any permits for soil boring were obtained from the local agencies. In addition, any license and permit bonding required was secured for the work.

III. RESULTS OF LABORATORY ANALYSES

York Analytical Laboratories, Inc. (NYSDOH Certification No. 10854) prepared the results of the soil samples. **Tables 1 through 4** present a summary of the soil sampling results and a comparison to New York State Department of Environmental Conservation 6 NYCRR Part 375-6.8(a) Brownfield unrestricted use soil cleanup objectives (USCOs). **Tables 5 through 8** present a summary of the groundwater sampling results and a comparison to NYSDEC TOGS 1.1.1 Groundwater Quality Standards (GQS). The chain-of-custody records, as well as the analytical laboratory data sheets, are presented in the Appendix to this report.

IV. FINDINGS

Property Soil Quality

Field inspection, via visual, olfactory and PID screening methods, did not identify the presence of significant contamination in soils on the subject property. The laboratory analytical results did not detect any VOCs, and PCBs in any of the soil samples at concentrations exceeding the New York State Department of Conservation (NYSDEC) Unrestricted Use Brownfield Cleanup Objectives (USCOs).

Heavy metals, such as copper, lead, selenium, zinc, and mercury were detected in 0 to 2 foot soil samples (B-1, B-2) at concentrations exceeding their respective NYSDEC Unrestricted Use Brownfield soil cleanup guidelines. No metals were detected in deeper soil samples at concentrations exceeding NYSDEC Unrestricted Use Brownfield soil cleanup guidelines. These metals are typical of “Urban Fill Soil” quality conditions.

Semi-Volatile Organic Compounds (SVOCs), such as Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, and Chrysene, were detected in 0 to 2 foot soil samples (B-1, B-2) at concentrations exceeding their respective NYSDEC Unrestricted Use Brownfield soil cleanup guidelines. No SVOCs were detected in deeper soil samples at concentrations exceeding NYSDEC Unrestricted Use Brownfield soil cleanup guidelines. These SVOCs are typical of “Urban Fill Soil” quality conditions.

Pesticides, such as 4,4'-DDT and 4,4'-DDE, were detected in 0 to 2 foot soil samples (B-1, B-2) at concentrations exceeding their respective NYSDEC Unrestricted Use Brownfield soil cleanup guidelines. No pesticides were detected in deeper soil samples at concentrations exceeding NYSDEC Unrestricted Use Brownfield soil cleanup. The presence of these pesticides is likely due to the presence of “Urban Fill Soil” on the grounds of the subject property.

Property Groundwater Quality

Groundwater was encountered at approximately 7 feet below surface grade in both soil borings. There were no field observations of potential groundwater contamination in the groundwater collected from B-1W. Laboratory analysis of groundwater samples did not detect any VOCs, SVOCs, Pesticides, and PCBs at concentration exceeding the NYSDEC Technical and Operational Guidance Series (TOGS) groundwater quality standards. The laboratory analytical results of the above mentioned parameters are summarized and presented in **Tables 5, 6, and 7**.

Several TAL metals (i.e., arsenic, barium, beryllium, chromium, lead, manganese, nickel, selenium, and iron) were detected in the unfiltered groundwater sample at concentrations exceeding their respective NYSDEC TOGS 1.1.1 GQS. However, no metals were detected at levels exceeding TOGS guidelines in the filtered groundwater sample. These metal exceedences in the unfiltered sample are likely the result of dissolved soil particles present in groundwater. Furthermore, the groundwater on site is not considered an aquifer and is not used for drinking or

any other water supply uses. The laboratory analytical results of metal concentrations in groundwater are summarized and presented in **Table 8**.

Conclusions

Based on field observations, the chemical concentrations of SVOCs, metals and pesticides in the soils, and metals in groundwater, beneath the subject property indicate the presence of “Urban Fill Soil” to a depth of approximately six feet below grade. “Urban Fill Soils” are common and typical of industrial/commercial properties found throughout the metropolitan area. The soil below six (6) feet was observed to be native, glacial fluvial deposits of outwash silty sand with trace fine gravel.

The levels of SVOCs, metals and pesticides are background for this area of New York City.

The NYSDEC has developed the “guidelines” in order for DEC case managers to determine potential cleanup recommendations at various sites throughout the state. The NYSDEC considers each site on a case-by-case basis in consideration of the history and district of property usage and its location to sensitive human, wildlife and environmental interests. Industrial and commercial properties are treated differently than residential or environmentally sensitive areas.

V. RECOMMENDATIONS

No recommendations for additional investigation are being made for this property at this time. The concentrations of chemical parameters identified in the soil are typical of industrial/commercial “Urban Fill” properties in the New York metropolitan area. If these soils [0 to 6 feet below surface grade] are excavated and removed from the property as part of the redevelopment then these soils will have to be handled and disposed in accordance with NYSDEC solid waste (Part 360) guidelines. The NYCDEP may require a Remedial Action Plan (RAP) and Construction Health and Safety Plan (CHASP) to be developed and approved by NYCDEP prior to any site excavation activities.

EEA recommends submitting this report to NYCDEP for their review and comments.

VI. SAMPLING METHODOLOGY

a. Soil and Groundwater Sampling

Soil and groundwater samples were obtained by a Geoprobe drill rig. The soil and groundwater samples were collected and placed in laboratory pre-cleaned sample jars. The sample jars were then placed in a cooler and chilled to a temperature of 4 degrees C.

b. Quality Assurance and Quality Control QA/QC Plan

EEA implements a QA/QC Plan to ensure sample integrity and avoid contamination and/or cross-contamination of samples. All sampling equipment is cleaned before each sample is collected. The following procedures are followed in the decontamination process:

Step 1: Steam clean equipment.

Step 2: Scrub with a bristle brush using a non-phosphate detergent (such as Alconox).

Step 3: Rinse with hot tap water.

Step 4: Rinse twice with deionized water.

Step 5: Air dry.

Step 6 Nitric Acid (5%) solution rinse (if sampling for metals)

Step 7: Rinse twice with deionized water.

Step 8: Air dry.

VII. QUALIFICATIONS

EEA, Inc. is an environmental consulting firm that has undertaken environmental pollution investigations, development feasibility studies, and environmental site assessment studies since 1979. These site evaluation studies have been prepared for major lenders, public corporations, businesses, developers and governmental agencies. Approximately 4,000 parcels have been evaluated in the metropolitan New York-New Jersey area during the past twenty years, ranging from Phase I Environmental Site Assessments to comprehensive subsurface hazardous material investigations and testing programs. EEA also prepares bid specifications for remedial cleanup actions and supervises site cleanup.

EEA's principals and senior managers for the hazardous waste investigations each have over 20 years experience in environmental consulting, with established credentials in the field.

Individual qualifications of EEA personnel, including specific credentials of persons involved in the preparation of this report can be provided upon request.

VIII. DISCLAIMER

This report is for use by Passiv House Xperimental LLC and is only to be used as a guide in determining the potential for contamination by toxic or hazardous materials on the subject property at the time of the site visit. This Phase II Environmental Subsurface Investigation was undertaken in accordance with generally accepted protocols, including ASTM Standards Related to the Phase II Environmental Site Assessment Process. This Phase II Investigation is based principally on the review of historic and regulatory records (made available within a reasonable time period), relating to past occupants and usage of the subject property, as well as activities at nearby sites, and upon a visual assessment of the subject property, and makes no determinations with respect to portions of the subject property and its structures which were not inspected. Our professional services have been performed using that degree of care and skill ordinarily exercised under similar circumstances by reputable qualified professionals practicing in this or

similar situations. The interpretation of the field data is based on good judgment and experience. However, no matter how qualified the professional or detailed the investigation, subsurface conditions cannot always be predicted beyond the points of actual sampling and testing. No other warranty, expressed or implied, is made to the professional advice included in this report.

Any and all liability on the part of EEA, Inc. shall be limited solely to EEA's professional liability insurance (errors and omissions coverage of one million dollars). EEA, Inc. shall have no liability for any other damages, whether consequential, compensatory, punitive, or special, arising out of, incidental to, or as a result of, this assessment. EEA, Inc. assumes no liability for the use of this report by any person or entity other than the institution and/or entities or persons for whom it has been prepared.

IX. REFERENCES

1. *NYSDEC Bureau of Spill Prevention & Response Sampling Guidelines and Protocols, March 1991.*
2. *DER-10 Technical Guidance for Site Investigation and Remediation, Date Issued May 3, 2010.*
3. *Principals of Groundwater Engineering, William C. Walton, Lewis Publishers, Inc., 1991.*
4. *NYSDEC Brownfield Cleanup Program, Soil Cleanup Objectives, 6 NYCRR Part 375-6.8, 12/14/2006.*
5. *NYCDEP approved EEA's Investigation Work Plan and Health and Safety Plan dated December 2010.*

FIGURES



Legend
 ● B-1 – soil sample location
 ● B-1GW – groundwater sample location
 [Red Outline] - Property Boundary

EEA, Inc.
 55 Hilton Avenue
 Garden City, New York
 (516) 746-4400

Property Located at:
 107 Union Street
 Brooklyn, New York
 Figure 1: Site Plan

TABLES

Table 1
Soil Samples Volatile Organic Analytical Results
107 Union Street, Brooklyn, New York

Sample Identification	S-1	S-2	S-3	S-4	NYSDEC Brownfield's Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives
Boring Number	B-1 0'-2'	B-1 10'-12'	B-2 0'-2'	B-2 10'-12'	
Sample Date	1/21/2011	1/21/2011	1/21/2011	1/21/2011	
Sample Matrix	Soil	Soil	Soil	Soil	
Units	ug/kg	ug/kg	ug/kg	ug/kg	
Volatile Organic Compounds (ug/kg) - EPA Method 8260					
1,1,1,2-Tetrachloroethane	<12	<12	<12	<12	NS
1,1,1-Trichloroethane	<12	<12	<12	<12	680
1,1,2,2-Tetrachloroethane	<12	<12	<12	<12	NS
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon)	<12	<12	<12	<12	NS
1,1,2-Trichloroethane	<12	<12	<12	<12	NS
1,1-Dichloroethane	<12	<12	<12	<12	270
1,1-Dichloroethylene	<12	<12	<12	<12	330
1,1-Dichloropropylene	<12	<12	<12	<12	NS
1,2,3-Trichlorobenzene	<23	<23	<24	<24	NS
1,2,3-Trichloropropane	<12	<12	<12	<12	NS
1,2,4-Trichlorobenzene	<23	<23	<24	<24	NS
1,2,4-Trimethylbenzene	6.9	<12	<12	<12	NS
1,2-Dibromo-3-chloropropane	<23	<23	<24	<24	NS
1,2-Dibromoethane	<12	<12	<12	<12	NS
1,2-Dichlorobenzene	<12	<12	<12	<12	1,100
1,2-Dichloroethane	<12	<12	<12	<12	20
1,2-Dichloropropane	<12	<12	<12	<12	NS
1,3,5-Trimethylbenzene	3.3	<12	<12	<12	NS
1,3-Dichlorobenzene	<12	<12	<12	<12	2,400
1,3-Dichloropropane	<12	<12	<12	<12	NS
1,4-Dichlorobenzene	<12	<12	<12	<12	1,800
2,2-Dichloropropane	<12	<12	<12	<12	NS
2-Chlorotoluene	<12	<12	<12	<12	NS
4-Chlorotoluene	<12	<12	<12	<12	NS
Benzene	<12	<12	<12	<12	60
Bromobenzene	<12	<12	<12	<12	NS
Bromochloromethane	<12	<12	<12	<12	NS
Bromodichloromethane	<12	<12	<12	<12	NS
Bromoform	<12	<12	<12	<12	NS
Bromomethane	<12	<12	<12	<12	NS
Carbon tetrachloride	<12	<12	<12	<12	760
Chlorobenzene	<12	<12	<12	<12	1,100
Chloroethane	<12	<12	<12	<12	NS
Chloroform	<12	<12	<12	<12	370
Chloromethane	<12	<12	<12	<12	NS
cis-1,2-Dichloroethylene	<12	<12	<12	<12	250
cis-1,3-Dichloropropylene	<12	<12	<12	<12	NS
Dibromochloromethane	<12	<12	<12	<12	NS
Dibromomethane	<12	<12	<12	<12	NS
Dichlorodifluoromethane	<12	<12	<12	<12	NS
Ethyl Benzene	4.9	<12	<12	<12	1,000
Hexachlorobutadiene	<12	<12	<12	<12	NS
Isopropylbenzene	<12	<12	<12	<12	NS
Methyl tert-butyl ether (MTBE)	<12	<12	<12	<12	930
Methylene chloride	31	19	21	20	50
Naphthalene	11	<23	<24	<24	12,000
n-Butylbenzene	<12	<12	<12	<12	12,000
n-Propylbenzene	<12	<12	<12	<12	3,900
o-Xylene	4.2	<12	<12	<12	NS
p- & m- Xylenes	14	<23	<24	<24	260
p-Isopropyltoluene	<12	<12	<12	<12	NS
sec-Butylbenzene	<12	<12	<12	<12	11,000
Styrene	<12	<12	<12	<12	NS
tert-Butylbenzene	<12	<12	<12	<12	5,900
Tetrachloroethylene	<12	<12	<12	<12	1,300
Toluene	2.9	<12	2.0	<12	700
trans-1,2-Dichloroethylene	<12	<12	<12	<12	190
trans-1,3-Dichloropropylene	<12	<12	<12	<12	NS
Trichloroethylene	<12	<12	<12	<12	470
Trichlorofluoromethane	<12	<12	<12	<12	NS
Vinyl Chloride	<12	<12	<12	<12	20
Xylenes, Total	18	<35	<36	<35	260

NS : No Standard

ug/kg...micrograms per kilogram

Bold values indicate concentrations exceeding laboratory method detection limits.

Table 2
Soil Samples Semi-Volatile Organic Analytical Results
107 Union Street, Brooklyn, New York

Sample Identification	S-1	S-2	S-3	S-4	NYSDEC Brownfield's Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives
Boring Number	B-1 0'-2'	B-1 10'-12'	B-2 0'-2'	B-2 10'-12'	
Sample Date	1/21/2011	1/21/2011	1/21/2011	1/21/2011	
Sample Matrix	Soil	Soil	Soil	Soil	
Units	ug/kg	ug/kg	ug/kg	ug/kg	
Semi-Volatile Organic Compounds (ug/kg) - EPA Method 8270					
Acenaphthene	859	<196	342	<196	20,000
Acenaphthylene	113	<196	215	<196	100,000
Aniline	<192	<196	<202	<196	NG
Anthracene	1210	73.2	777	58.9	100,000
Benzo(a)anthracene	2300	130	2650	162	1,000
Benzo(a)pyrene	1860	92.0	2340	141	1,000
Benzo(b)fluoranthene	2380	107	2480	124	1,000
Benzo(g,h,i)perylene	215	<196	268	<196	100,000
Benzo(k)fluoranthene	2070	<196	2210	151	800
Benzyl butyl phthalate	<192	<196	<202	<196	NG
4-Bromophenyl phenyl ether	<192	<196	<202	<196	NG
4-Chloro-3-methylphenol	<192	<196	<202	<196	NG
4-Chloroaniline	<192	<196	<202	<196	NG
Bis(2-chloroethoxy)methane	<192	<196	<202	<196	NG
Bis(2-chloroethyl)ether	<192	<196	<202	<196	NG
Bis(2-chloroisopropyl)ether	<192	<196	<202	<196	NG
Bis(2-ethylhexyl)phthalate	<192	<196	<202	78.9	NG
2-Chloronaphthalene	<192	<196	<202	<196	NG
4-Chlorophenyl phenyl ether	<192	<196	<202	<196	NG
Chrysene	2110	122	2510	156	1,000
Dibenzo(a,h)anthracene	121	<196	<202	<196	330
Dibenzofuran	<192	<196	<202	<196	7,000
Di-n-butyl phthalate	<192	<196	<202	<196	NG
1,2-Dichlorobenzene	<192	<196	<202	<196	NG
1,4-Dichlorobenzene	<192	<196	<202	<196	NG
1,3-Dichlorobenzene	<192	<196	<202	<196	NG
3,3'-Dichlorobenzidine	<192	<196	<202	<196	NG
Diethyl phthalate	<192	<196	<202	<196	NG
Dimethyl phthalate	<192	<196	<202	<196	NG
2,6-Dinitrotoluene	<192	<196	<202	<196	NG
2,4-Dinitrotoluene	<192	<196	<202	<196	NG
Di-n-octyl phthalate	<192	<196	<202	<196	NG
Fluoranthene	3300	287	2390	273	100,000
Fluorene	769	<196	370	<196	30,000
Hexachlorobenzene	<192	<196	<202	<196	NG
Hexachlorobutadiene	<192	<196	<202	<196	NG
Hexachlorocyclopentadiene	<192	<196	<202	<196	NG
Hexachloroethane	<192	<196	<202	<196	NG
Indeno(1,2,3-cd)pyrene	286	<196	339	<196	500
Isophorone	<192	<196	<202	<196	NG
2-Methylnaphthalene	148	<196	74.3	<196	NG
Naphthalene	281	<196	65.8	<196	12,000
3-Nitroaniline	<192	<196	<202	<196	NG
4-Nitroaniline	<192	<196	<202	<196	NG
Nitrobenzene	<192	<196	<202	<196	NG
N-nitroso-di-n-propylamine	<192	<196	<202	<196	NG
N-Nitrosodimethylamine	<192	<196	<202	<196	NG
N-Nitrosodiphenylamine	<192	<196	<202	<196	NG
Phenanthrene	3010	293	2540	200	100,000
Pyrene	3120	257	3600	277	100,000
Pyridine	<192	<196	<202	<196	NG
1,2,4-Trichlorobenzene	<192	<196	<202	<196	NG

NS : No Standard

ug/kg...micrograms per kilogram

Shaded values represents concentration exceeding NYSDEC TAGM 4046 soil cleanup guidelines

Table 3
Soil Samples Pesticides and PCBs Analytical Results
107 Union Street, Brooklyn, New York

Sample Identification	S-1	S-2	S-3	S-4	NYSDEC Brownfield's Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives
Boring Number	B-1 0'-2'	B-1 10'-12'	B-2 0'-2'	B-2 10'-12'	
Sample Date	1/21/2011	1/21/2011	1/21/2011	1/21/2011	
Sample Matrix	Soil	Soil	Soil	Soil	
Pesticides - EPA Method 8081 (ug/kg)					
Toxaphene	<380	<388	<400	<389	NS
Methoxychlor	<19.0	<19.4	<20.0	<19.4	NS
Heptachlor epoxide	<3.80	<3.88	<4.00	<3.89	NS
Heptachlor	<3.80	<3.88	<4.00	<3.89	42
gamma-BHC (Lindane)	<3.80	<3.88	<4.00	<3.89	NS
Endrin ketone	<3.80	<3.88	<4.00	<3.89	NS
Endrin aldehyde	<3.80	<3.88	<4.00	<3.89	NS
Endrin	<3.80	<3.88	<4.00	<3.89	14
Endosulfan sulfate	<3.80	<3.88	<4.00	<3.89	2,400
Endosulfan II	<3.80	<3.88	<4.00	<3.89	2,400
Endosulfan I	<3.80	<3.88	<4.00	<3.89	2,400
Dieldrin	<3.80	<3.88	<4.00	<3.89	5
delta-BHC	<3.80	<3.88	<4.00	<3.89	40
Chlordane, total	<15.2	<15.5	51.3	<15.6	NS
beta-BHC	<3.80	<3.88	<4.00	<3.89	36
alpha-BHC	<3.80	<3.88	<4.00	<3.89	20
Aldrin	<3.80	<3.88	<4.00	<3.89	5
4,4'-DDT	31.6	<3.88	25.6	<3.89	3.3
4,4'-DDE	6.61	<3.88	8.89	<3.89	3.3
4,4'-DDD	<3.80	<3.88	<4.00	<3.89	3.3
PCBs - EPA Method 8082 (mg/kg)					
Aroclor 1260	<19.6	<20.0	<20.6	<20.0	100
Aroclor 1254	<19.6	<20.0	<20.6	<20.0	100
Aroclor 1248	<19.6	<20.0	<20.6	<20.0	100
Aroclor 1242	<19.6	<20.0	<20.6	<20.0	100
Aroclor 1232	<19.6	<20.0	<20.6	<20.0	100
Aroclor 1221	<19.6	<20.0	<20.6	<20.0	100
Aroclor 1016	<19.6	<20.0	<20.6	<20.0	100

NS : No Standard

ug/kg...micrograms per kilogram mg/kg...milligram per kilogram

Bold values indicate concentrations exceeding laboratory method detection limits.

Table 4
Soil Samples Inorganic Analytical Results
107 Union Street, Brooklyn, New York

Sample Identification	S-1	S-2	S-3	S-4	NYSDEC Brownfield's Part 375- 6.8(a) Unrestricted Use Soil Cleanup Objectives
Boring Number	B-1 0'-2'	B-1 10'-12'	B-2 0'-2'	B-2 10'-12'	
Sample Date	1/21/2011	1/21/2011	1/21/2011	1/21/2011	
Sample Matrix	Soil	Soil	Soil	Soil	
Units	mg/kg	mg/kg	mg/kg	mg/kg	
Metals (TAL) (mg/kg)					
Aluminum	3800	4420	2650	4150	NS
Antimony	1.08	<0.352	1.52	<0.353	NS
Arsenic	8.84	3.21	9.69	4.19	13
Barium	191	39.9	130	22.1	350
Beryllium	<0.115	<0.117	<0.121	<0.118	7.2
Cadmium	<0.575	<0.587	<0.605	<0.589	2.5
Calcium	15200	689	22600	538	NS
Chromium	10.4	7.05	7.15	6.78	30
Cobalt	4.95	4.82	2.92	4.96	NS
Copper	55.8	9.32	41.6	6.13	50
Iron	11500	11600	13600	11200	NS
Lead	483	6.29	342	4.94	63
Magnesium	2090	1560	1250	1100	NS
Manganese	197	140	108	114	1600
Nickel	12.5	6.50	4.52	6.82	30
Potassium	800	562	540	489	NS
Selenium	4.12	2.93	4.19	2.86	3.9
Silver	<0.575	<0.587	<0.605	<0.589	2
Sodium	329	196	335	206	NS
Thallium	<0.575	<0.587	<0.605	<0.589	NS
Vanadium	13.8	9.54	7.54	12.0	NS
Zinc	207	25.2	203	24.4	109
Mercury	1.23	<0.117	0.460	<0.118	0.18

NS : No Standard

m/kg...miligram per kilogram

Shaded values represents concentration exceeding NYSDEC TAGM 4046 soil cleanup guidelines.

APPENDICES

APPENDIX A
PHOTOGRAPHS

PHOTOGRAPHS
107 Union Street, Brooklyn, NY



Fig1. View of boring B-1 being installed at 107 Union Street, Brooklyn, NY.



Fig2. View of groundwater sample taken from boring B-1.



Fig 3. Close-up view of soil obtained from the 10'-12' section of soil boring B-1.



Fig 4. View of soil boring B-2 being installed in middle of property lot.



Fig 5. Close-up view of soil obtained from the 0'-2' section of soil boring B-2.

APPENDIX B

CHAIN OF CUSTODY

Field Chain-of-Custody Record

NOTE: York's Std. Terms & Conditions are listed on the back side of this document. This document serves as your written authorization to York to proceed with the analyses requested and your signature binds you to York's Std. Terms & Conditions unless superseded by written contract.

York Project No. 11A0547

Client Information Company: <u>EEA Inc.</u> Address: <u>55 Hilton Ave</u> <u>Garden City NY</u> Phone No. <u>516-946-4400</u> Contact Person: <u>Sean Martin</u> <u>Smartgreen Consultants</u> E-Mail Address: _____		Report To: Company: <u>SAME</u> Address: _____ Phone No. _____ Attention: _____ E-Mail Address: _____		Invoice To: Company: <u>SAME</u> Address: _____ Phone No. _____ Attention: <u>Nancy</u> E-Mail Address: <u>JAKE</u>		Client Project ID <u>10742</u> Purchase Order No. _____		Turn-Around Time 24 hr _____ 48 hr _____ 72 hr _____ 5 Day _____ Standard <input checked="" type="checkbox"/>		Report Type/Deliverables Summary Results Only _____ RCP Package _____ ASP A Pkg _____ ASP B Pkg _____ ASP A Pkg _____ ASP B Pkg _____ EDD _____ OTHER <u>PDF + XCEL</u>	
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Volatilities	Semi-Volat.	Metals	Misc. Org.	Full Lists	Miscellaneous Parameters	Special Instructions
8260 full	8270 or 625	RCKR8	TPH GRO	PH Poll.	Color	Field Filtered <input type="checkbox"/> Lab to Filter <input type="checkbox"/>
624	STARS	PP13	TPH DRO	TCL DRO	Phenols	
STARS	SPL Per TCLP	8081 Pest	CT ETPH	TAL MeqCN	Cyanide-T	
BTEX	Benzene	815 Herb	NY 310-13	Full TCLP	Tox Nitrogen	
MTBE	Nassau Co.	CT RCP	TPH 418.1	Full App. IX	Ammonia-N	
TCL list	Suffolk Co.	App. IX	Air TO14A	Pat. 360-Routine	Chloride	
TAGM	CT RCP	Site Spec.	Air TO15	Pat. 360-Specific	Phosphate	
CT RCP	TCL list	SPL Per TCLP	Air STARS	Pat. 360-Trace	BOOD5	
Arom.	TICs	TCLP Herb	Hg, Pb, As, Cd	TOX	BOOD28	
Halog.	524.2	Chloride	Cr, Ni, Ba, Fe	BTU/b.	COD	
App. IX	502.2	608 Pest	Sa, Ti, Sb, Cu	Aguaic. Tox.	Oil & Grease	
8021B list	5035	TCLP BNA	Methane	NYCDE-Sewer	F.O.G.	
		TCLP BNA	Na, Mn, As, etc.	NYCDE-Cover	pH	
			Helium	TAGM	TDS	
					TPH-IR	

Sample Identification	Date Sampled	Sample Matrix	Choose Analyses Needed from the Menu Above and Enter Below	Container Description(s)
B-1 0'-2'	01/21/11	S	8260 Full 8081/8082 TAL	2 jars
B-1 10'-12'	01/21/11	S	BN only 8081/8082 TAL	2 amber 200ml 2 jars
B-1 G-W	01/21/11	GW	TAL (filtered + unfiltered)	2 jars
B-2 0'-2'	01/21/11	S	↓	↓
B-2 10'-12'	01/21/11	S	↓	↓

Comments
 "E" designated site - pricing applies
 All soils analyzed for: 8260 Full, BIN only, 8081/8082, and TAL metals (filtered/unfiltered for water sample).
 Samples Relinquished By: Sean Martin Date/Time: 01/21/11
 Samples Received By: Appleton Date/Time: 1/21/11 12:10
 Samples Relinquished By: _____ Date/Time: _____
 Samples Received in LAB by: _____ Date/Time: _____
 Temperature on Receipt: 38 °C

APPENDIX C

LABORATORY REPORTS

YORK

ANALYTICAL LABORATORIES, INC.

Technical Report

prepared for:

EEA, Inc
55 Hilton Ave
Garden City NY, 11530
Attention: Sean Martin

Report Date: 01/31/2011
Client Project ID: 10742
York Project (SDG) No.: 11A0547

CT License No. PH-0723

New Jersey License No. CT-005



New York License No. 10854

PA Reg. 68-04440

Report Date: 01/31/2011
Client Project ID: 10742
York Project (SDG) No.: 11A0547

EEA, Inc
55 Hilton Ave
Garden City NY, 11530
Attention: Sean Martin

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on January 21, 2011 and listed below. The project was identified as your project: **10742**.

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables.

All samples were received in proper condition meeting the customary acceptance requirements for environmental samples except those indicated under the Notes section of this report.

All analyses met the method and laboratory standard operating procedure requirements except as indicated by any data flags, the meaning of which are explained in the attachment to this report, and case narrative if applicable.

The results of the analyses, which are all reported on dry weight basis (soils) unless otherwise noted, are detailed in the following pages.

Please contact Client Services at 203.325.1371 with any questions regarding this report.

<u>York Sample ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Date Collected</u>	<u>Date Received</u>
11A0547-01	B-1 0-2'	Soil	01/21/2011	01/21/2011
11A0547-02	B-1 10-12'	Soil	01/21/2011	01/21/2011
11A0547-03	B-2 0-2'	Soil	01/21/2011	01/21/2011
11A0547-04	B-2 10-12'	Water	01/21/2011	01/21/2011
11A0547-05	B-1 GW	Water	01/21/2011	01/21/2011

General Notes for York Project (SDG) No.: 11A0547

1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All samples were received in proper condition for analysis with proper documentation, unless otherwise noted.
6. All analyses conducted met method or Laboratory SOP requirements. See the Qualifiers and/or Narrative sections for further information.
7. It is noted that no analyses reported herein were subcontracted to another laboratory, unless noted in the report.
8. This report reflects results that relate only to the samples submitted on the attached chain-of-custody form(s) received by York.

Approved By:



Robert Q. Bradley
Managing Director

Date: 01/31/2011



Sample Information

Client Sample ID: B-1 0-2'

York Sample ID: 11A0547-01

<u>York Project (SDG) No.</u> 11A0547	<u>Client Project ID</u> 10742	<u>Matrix</u> Soil	<u>Collection Date/Time</u> January 21, 2011 12:00 am	<u>Date Received</u> 01/21/2011
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Volatil Organics, 8260 List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 5035B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	1,1,1,2-Tetrachloroethane	ND		ug/kg dry	1.3	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
71-55-6	1,1,1-Trichloroethane	ND		ug/kg dry	2.4	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/kg dry	1.4	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND		ug/kg dry	1.5	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
79-00-5	1,1,2-Trichloroethane	ND		ug/kg dry	1.5	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
75-34-3	1,1-Dichloroethane	ND		ug/kg dry	1.7	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
75-35-4	1,1-Dichloroethylene	ND		ug/kg dry	3.3	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
563-58-6	1,1-Dichloropropylene	ND		ug/kg dry	1.1	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
87-61-6	1,2,3-Trichlorobenzene	ND		ug/kg dry	0.92	23	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
96-18-4	1,2,3-Trichloropropane	ND		ug/kg dry	2.8	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	1.2	23	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
95-63-6	1,2,4-Trimethylbenzene	6.9	J	ug/kg dry	1.3	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
96-12-8	1,2-Dibromo-3-chloropropane	ND		ug/kg dry	3.3	23	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
106-93-4	1,2-Dibromoethane	ND		ug/kg dry	1.7	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
95-50-1	1,2-Dichlorobenzene	ND		ug/kg dry	1.5	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
107-06-2	1,2-Dichloroethane	ND		ug/kg dry	1.6	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
78-87-5	1,2-Dichloropropane	ND		ug/kg dry	0.55	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
108-67-8	1,3,5-Trimethylbenzene	3.3	J	ug/kg dry	0.92	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
541-73-1	1,3-Dichlorobenzene	ND		ug/kg dry	1.2	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
142-28-9	1,3-Dichloropropane	ND		ug/kg dry	1.7	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
106-46-7	1,4-Dichlorobenzene	ND		ug/kg dry	1.7	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
594-20-7	2,2-Dichloropropane	ND		ug/kg dry	2.4	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
95-49-8	2-Chlorotoluene	ND		ug/kg dry	1.2	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
106-43-4	4-Chlorotoluene	ND		ug/kg dry	1.2	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
71-43-2	Benzene	ND		ug/kg dry	1.2	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
108-86-1	Bromobenzene	ND		ug/kg dry	1.5	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
74-97-5	Bromochloromethane	ND		ug/kg dry	3.2	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
75-27-4	Bromodichloromethane	ND		ug/kg dry	1.5	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
75-25-2	Bromoform	ND		ug/kg dry	1.4	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
74-83-9	Bromomethane	ND		ug/kg dry	3.1	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
56-23-5	Carbon tetrachloride	ND		ug/kg dry	2.6	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
108-90-7	Chlorobenzene	ND		ug/kg dry	0.87	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
75-00-3	Chloroethane	ND		ug/kg dry	1.9	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
67-66-3	Chloroform	ND		ug/kg dry	0.89	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS

Sample Information

Client Sample ID: B-1 0-2'

York Sample ID: 11A0547-01

York Project (SDG) No.
11A0547

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10742

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January 21, 2011 12:00 am

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01/21/2011

Volatile Organics, 8260 List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 5035B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
74-87-3	Chloromethane	ND		ug/kg dry	2.2	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
156-59-2	cis-1,2-Dichloroethylene	ND		ug/kg dry	2.4	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/kg dry	0.87	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
124-48-1	Dibromochloromethane	ND		ug/kg dry	1.7	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
74-95-3	Dibromomethane	ND		ug/kg dry	3.3	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
75-71-8	Dichlorodifluoromethane	ND		ug/kg dry	2.1	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
100-41-4	Ethyl Benzene	4.9	J	ug/kg dry	0.87	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	1.1	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
98-82-8	Isopropylbenzene	ND		ug/kg dry	0.97	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/kg dry	0.94	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
75-09-2	Methylene chloride	31	B	ug/kg dry	2.6	23	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
91-20-3	Naphthalene	11	J	ug/kg dry	1.2	23	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
104-51-8	n-Butylbenzene	ND		ug/kg dry	0.80	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
103-65-1	n-Propylbenzene	ND		ug/kg dry	1.4	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
95-47-6	o-Xylene	4.2	J	ug/kg dry	1.2	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
1330-20-7P/M	p- & m- Xylenes	14	J	ug/kg dry	1.4	23	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
99-87-6	p-Isopropyltoluene	ND		ug/kg dry	0.62	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
135-98-8	sec-Butylbenzene	ND		ug/kg dry	1.3	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
100-42-5	Styrene	ND		ug/kg dry	1.1	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
98-06-6	tert-Butylbenzene	ND		ug/kg dry	1.1	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
127-18-4	Tetrachloroethylene	ND		ug/kg dry	1.3	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
108-88-3	Toluene	2.9	J	ug/kg dry	0.57	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
156-60-5	trans-1,2-Dichloroethylene	ND		ug/kg dry	1.6	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/kg dry	1.7	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
79-01-6	Trichloroethylene	ND		ug/kg dry	1.4	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
75-69-4	Trichlorofluoromethane	ND		ug/kg dry	2.3	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
75-01-4	Vinyl Chloride	ND		ug/kg dry	2.4	12	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS
1330-20-7	Xylenes, Total	18	J	ug/kg dry	2.6	35	2	EPA SW846-8260B	01/24/2011 14:49	01/25/2011 15:56	SS

Sample Information

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York Sample ID: 11A0547-01

York Project (SDG) No.
11A0547

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01/21/2011

Semi-Volatiles, 8270 Base/Neutrals

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	105	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
95-50-1	1,2-Dichlorobenzene	ND		ug/kg dry	83.9	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
541-73-1	1,3-Dichlorobenzene	ND		ug/kg dry	91.3	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
106-46-7	1,4-Dichlorobenzene	ND		ug/kg dry	65.8	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
121-14-2	2,4-Dinitrotoluene	ND		ug/kg dry	83.9	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
606-20-2	2,6-Dinitrotoluene	ND		ug/kg dry	91.3	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
91-58-7	2-Chloronaphthalene	ND		ug/kg dry	58.5	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
91-57-6	2-Methylnaphthalene	148	J	ug/kg dry	66.8	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
91-94-1	3,3'-Dichlorobenzidine	ND		ug/kg dry	48.3	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
99-09-2	3-Nitroaniline	ND		ug/kg dry	69.5	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
101-55-3	4-Bromophenyl phenyl ether	ND		ug/kg dry	80.0	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
59-50-7	4-Chloro-3-methylphenol	ND		ug/kg dry	20.7	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
106-47-8	4-Chloroaniline	ND		ug/kg dry	75.7	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
7005-72-3	4-Chlorophenyl phenyl ether	ND		ug/kg dry	55.3	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
100-02-7	4-Nitroaniline	ND		ug/kg dry	63.7	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
83-32-9	Acenaphthene	859		ug/kg dry	111	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
208-96-8	Acenaphthylene	113	J	ug/kg dry	53.7	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
62-53-3	Aniline	ND		ug/kg dry	69.0	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
120-12-7	Anthracene	1210		ug/kg dry	47.5	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
56-55-3	Benzo(a)anthracene	2300		ug/kg dry	74.2	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
50-32-8	Benzo(a)pyrene	1860		ug/kg dry	50.0	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
205-99-2	Benzo(b)fluoranthene	2380		ug/kg dry	73.0	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
191-24-2	Benzo(g,h,i)perylene	215		ug/kg dry	57.6	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
207-08-9	Benzo(k)fluoranthene	2070		ug/kg dry	74.2	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
85-68-7	Benzyl butyl phthalate	ND		ug/kg dry	80.0	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
111-91-1	Bis(2-chloroethoxy)methane	ND		ug/kg dry	70.7	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
111-44-4	Bis(2-chloroethyl)ether	ND		ug/kg dry	65.1	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
108-60-1	Bis(2-chloroisopropyl)ether	ND		ug/kg dry	71.2	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
117-81-7	Bis(2-ethylhexyl)phthalate	ND		ug/kg dry	64.2	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
218-01-9	Chrysene	2110		ug/kg dry	77.3	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
53-70-3	Dibenzo(a,h)anthracene	121	J	ug/kg dry	48.5	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
132-64-9	Dibenzofuran	ND		ug/kg dry	61.9	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
84-66-2	Diethyl phthalate	ND		ug/kg dry	101	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
131-11-3	Dimethyl phthalate	ND		ug/kg dry	55.3	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
84-74-2	Di-n-butyl phthalate	ND		ug/kg dry	57.3	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD

Sample Information

Client Sample ID: B-1 0-2'

York Sample ID: 11A0547-01

York Project (SDG) No.
11A0547

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10742

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January 21, 2011 12:00 am

Date Received
01/21/2011

Semi-Volatiles, 8270 Base/Neutrals

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
117-84-0	Di-n-octyl phthalate	ND		ug/kg dry	86.3	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
206-44-0	Fluoranthene	3300		ug/kg dry	111	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
86-73-7	Fluorene	769		ug/kg dry	53.7	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
118-74-1	Hexachlorobenzene	ND		ug/kg dry	31.2	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	76.7	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
77-47-4	Hexachlorocyclopentadiene	ND		ug/kg dry	143	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
67-72-1	Hexachloroethane	ND		ug/kg dry	69.0	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
193-39-5	Indeno(1,2,3-cd)pyrene	286		ug/kg dry	70.7	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
78-59-1	Isophorone	ND		ug/kg dry	71.2	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
91-20-3	Naphthalene	281		ug/kg dry	57.3	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
98-95-3	Nitrobenzene	ND		ug/kg dry	86.3	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
62-75-9	N-Nitrosodimethylamine	ND		ug/kg dry	69.4	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
621-64-7	N-nitroso-di-n-propylamine	ND		ug/kg dry	50.0	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
86-30-6	N-Nitrosodiphenylamine	ND		ug/kg dry	111	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
85-01-8	Phenanthrene	3010		ug/kg dry	70.7	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
129-00-0	Pyrene	3120		ug/kg dry	68.8	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD
110-86-1	Pyridine	ND		ug/kg dry	74.9	192	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:09	TD

Pesticides/PCBs, EPA TCL List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
72-54-8	4,4'-DDD	ND		ug/kg dry	1.69	3.80	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 12:58	JW
72-55-9	4,4'-DDE	6.61		ug/kg dry	2.17	3.80	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 12:58	JW
50-29-3	4,4'-DDT	31.6		ug/kg dry	1.70	3.80	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 12:58	JW
309-00-2	Aldrin	ND		ug/kg dry	2.43	3.80	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 12:58	JW
319-84-6	alpha-BHC	ND		ug/kg dry	2.86	3.80	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 12:58	JW
12674-11-2	Aroclor 1016	ND		ug/kg dry	9.09	19.6	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
11104-28-2	Aroclor 1221	ND		ug/kg dry	9.09	19.6	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
11141-16-5	Aroclor 1232	ND		ug/kg dry	9.09	19.6	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
53469-21-9	Aroclor 1242	ND		ug/kg dry	9.09	19.6	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
12672-29-6	Aroclor 1248	ND		ug/kg dry	9.09	19.6	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
11097-69-1	Aroclor 1254	ND		ug/kg dry	7.82	19.6	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
11096-82-5	Aroclor 1260	ND		ug/kg dry	7.82	19.6	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
319-85-7	beta-BHC	ND		ug/kg dry	2.39	3.80	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 12:58	JW
57-74-9	Chlordane, total	ND		ug/kg dry	15.2	15.2	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 12:58	JW
319-86-8	delta-BHC	ND		ug/kg dry	2.07	3.80	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 12:58	JW

Sample Information

Client Sample ID: B-1 0-2'

York Sample ID: 11A0547-01

York Project (SDG) No.
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Client Project ID
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Pesticides/PCBs, EPA TCL List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
60-57-1	Dieldrin	ND		ug/kg dry	2.24	3.80	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 12:58	JW
959-98-8	Endosulfan I	ND		ug/kg dry	1.84	3.80	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 12:58	JW
33213-65-9	Endosulfan II	ND		ug/kg dry	2.32	3.80	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 12:58	JW
1031-07-8	Endosulfan sulfate	ND		ug/kg dry	1.94	3.80	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 12:58	JW
72-20-8	Endrin	ND		ug/kg dry	2.30	3.80	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 12:58	JW
7421-93-4	Endrin aldehyde	ND		ug/kg dry	2.55	3.80	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 12:58	JW
53494-70-5	Endrin ketone	ND		ug/kg dry	1.67	3.80	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 12:58	JW
58-89-9	gamma-BHC (Lindane)	ND		ug/kg dry	2.63	3.80	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 12:58	JW
76-44-8	Heptachlor	ND		ug/kg dry	3.03	3.80	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 12:58	JW
1024-57-3	Heptachlor epoxide	ND		ug/kg dry	1.67	3.80	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 12:58	JW
72-43-5	Methoxychlor	ND		ug/kg dry	9.79	19.0	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 12:58	JW
1336-36-3	Total PCBs	ND		ug/kg dry	7.82	19.6	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
8001-35-2	Toxaphene	ND		ug/kg dry		380	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 12:58	JW

Metals, Target Analyte

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA SW 846-3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7429-90-5	Aluminum	3800		mg/kg dry	1.45	2.30	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:39	MW
7440-36-0	Antimony	1.08		mg/kg dry	0.161	0.345	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:39	MW
7440-38-2	Arsenic	8.84		mg/kg dry	0.219	0.575	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:39	MW
7440-39-3	Barium	191		mg/kg dry	0.276	0.575	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:39	MW
7440-41-7	Beryllium	ND		mg/kg dry	0.009	0.115	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:39	MW
7440-43-9	Cadmium	ND		mg/kg dry	0.150	0.575	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:39	MW
7440-70-2	Calcium	15200		mg/kg dry	0.050	2.30	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:39	MW
7440-47-3	Chromium	10.4		mg/kg dry	0.092	0.575	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:39	MW
7440-48-4	Cobalt	4.95		mg/kg dry	0.092	0.575	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:39	MW
7440-50-8	Copper	55.8		mg/kg dry	0.161	0.575	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:39	MW
7439-89-6	Iron	11500		mg/kg dry	0.633	1.15	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:39	MW
7439-92-1	Lead	483		mg/kg dry	0.115	0.345	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:39	MW
7439-95-4	Magnesium	2090		mg/kg dry	0.943	2.30	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:39	MW
7439-96-5	Manganese	197		mg/kg dry	0.092	1.15	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:39	MW
7440-02-0	Nickel	12.5		mg/kg dry	0.081	0.575	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:39	MW
7440-09-7	Potassium	800		mg/kg dry	3.13	11.5	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:39	MW
7782-49-2	Selenium	4.12		mg/kg dry	0.243	0.575	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:39	MW
7440-22-4	Silver	ND		mg/kg dry	0.104	0.575	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:39	MW
7440-23-5	Sodium	329		mg/kg dry	7.73	11.5	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:39	MW

Sample Information

Client Sample ID: B-1 0-2'

York Sample ID: 11A0547-01

<u>York Project (SDG) No.</u> 11A0547	<u>Client Project ID</u> 10742	<u>Matrix</u> Soil	<u>Collection Date/Time</u> January 21, 2011 12:00 am	<u>Date Received</u> 01/21/2011
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Metals, Target Analyte

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA SW 846-3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7440-28-0	Thallium	ND		mg/kg dry	0.219	0.575	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:39	MW
7440-62-2	Vanadium	13.8		mg/kg dry	0.092	0.575	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:39	MW
7440-66-6	Zinc	207		mg/kg dry	0.081	0.575	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:39	MW

Mercury by 7470/7471

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA SW846-7471

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-97-6	Mercury	1.23		mg/kg dry	0.112	0.115	1	EPA SW846-7471	01/24/2011 15:10	01/24/2011 15:10	AA

Total Solids

Log-in Notes:

Sample Notes:

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	86.9		%	0.100	0.100	1	SM 2540G	01/24/2011 16:29	01/24/2011 16:29	MZ

Sample Information

Client Sample ID: B-1 10-12'

York Sample ID: 11A0547-02

<u>York Project (SDG) No.</u> 11A0547	<u>Client Project ID</u> 10742	<u>Matrix</u> Soil	<u>Collection Date/Time</u> January 21, 2011 12:00 am	<u>Date Received</u> 01/21/2011
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Volatile Organics, 8260 List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 5035B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	1,1,1,2-Tetrachloroethane	ND		ug/kg dry	1.4	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
71-55-6	1,1,1-Trichloroethane	ND		ug/kg dry	2.4	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/kg dry	1.4	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND		ug/kg dry	1.5	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
79-00-5	1,1,2-Trichloroethane	ND		ug/kg dry	1.5	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
75-34-3	1,1-Dichloroethane	ND		ug/kg dry	1.8	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
75-35-4	1,1-Dichloroethylene	ND		ug/kg dry	3.4	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
563-58-6	1,1-Dichloropropylene	ND		ug/kg dry	1.1	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
87-61-6	1,2,3-Trichlorobenzene	ND		ug/kg dry	0.94	23	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
96-18-4	1,2,3-Trichloropropane	ND		ug/kg dry	2.9	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	1.2	23	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
95-63-6	1,2,4-Trimethylbenzene	ND		ug/kg dry	1.3	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
96-12-8	1,2-Dibromo-3-chloropropane	ND		ug/kg dry	3.3	23	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
106-93-4	1,2-Dibromoethane	ND		ug/kg dry	1.7	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS

Sample Information

Client Sample ID: B-1 10-12'

York Sample ID: 11A0547-02

York Project (SDG) No.
11A0547

Client Project ID
10742

Matrix
Soil

Collection Date/Time
January 21, 2011 12:00 am

Date Received
01/21/2011

Volatile Organics, 8260 List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 5035B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
95-50-1	1,2-Dichlorobenzene	ND		ug/kg dry	1.5	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
107-06-2	1,2-Dichloroethane	ND		ug/kg dry	1.6	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
78-87-5	1,2-Dichloropropane	ND		ug/kg dry	0.56	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
108-67-8	1,3,5-Trimethylbenzene	ND		ug/kg dry	0.94	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
541-73-1	1,3-Dichlorobenzene	ND		ug/kg dry	1.2	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
142-28-9	1,3-Dichloropropane	ND		ug/kg dry	1.8	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
106-46-7	1,4-Dichlorobenzene	ND		ug/kg dry	1.7	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
594-20-7	2,2-Dichloropropane	ND		ug/kg dry	2.4	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
95-49-8	2-Chlorotoluene	ND		ug/kg dry	1.2	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
106-43-4	4-Chlorotoluene	ND		ug/kg dry	1.2	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
71-43-2	Benzene	ND		ug/kg dry	1.2	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
108-86-1	Bromobenzene	ND		ug/kg dry	1.5	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
74-97-5	Bromochloromethane	ND		ug/kg dry	3.2	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
75-27-4	Bromodichloromethane	ND		ug/kg dry	1.6	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
75-25-2	Bromoform	ND		ug/kg dry	1.5	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
74-83-9	Bromomethane	ND		ug/kg dry	3.1	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
56-23-5	Carbon tetrachloride	ND		ug/kg dry	2.6	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
108-90-7	Chlorobenzene	ND		ug/kg dry	0.89	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
75-00-3	Chloroethane	ND		ug/kg dry	1.9	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
67-66-3	Chloroform	ND		ug/kg dry	0.91	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
74-87-3	Chloromethane	ND		ug/kg dry	2.3	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
156-59-2	cis-1,2-Dichloroethylene	ND		ug/kg dry	2.4	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/kg dry	0.89	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
124-48-1	Dibromochloromethane	ND		ug/kg dry	1.7	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
74-95-3	Dibromomethane	ND		ug/kg dry	3.4	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
75-71-8	Dichlorodifluoromethane	ND		ug/kg dry	2.1	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
100-41-4	Ethyl Benzene	ND		ug/kg dry	0.89	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	1.1	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
98-82-8	Isopropylbenzene	ND		ug/kg dry	0.99	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/kg dry	0.96	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
75-09-2	Methylene chloride	19	J, B	ug/kg dry	2.7	23	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
91-20-3	Naphthalene	ND		ug/kg dry	1.3	23	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
104-51-8	n-Butylbenzene	ND		ug/kg dry	0.81	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
103-65-1	n-Propylbenzene	ND		ug/kg dry	1.5	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
95-47-6	o-Xylene	ND		ug/kg dry	1.3	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS

Sample Information

Client Sample ID: B-1 10-12'

York Sample ID: 11A0547-02

York Project (SDG) No.
11A0547

Client Project ID
10742

Matrix
Soil

Collection Date/Time
January 21, 2011 12:00 am

Date Received
01/21/2011

Volatile Organics, 8260 List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 5035B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
1330-20-7P/M	p- & m- Xylenes	ND		ug/kg dry	1.4	23	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
99-87-6	p-Isopropyltoluene	ND		ug/kg dry	0.63	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
135-98-8	sec-Butylbenzene	ND		ug/kg dry	1.3	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
100-42-5	Styrene	ND		ug/kg dry	1.1	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
98-06-6	tert-Butylbenzene	ND		ug/kg dry	1.2	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
127-18-4	Tetrachloroethylene	ND		ug/kg dry	1.3	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
108-88-3	Toluene	ND		ug/kg dry	0.58	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
156-60-5	trans-1,2-Dichloroethylene	ND		ug/kg dry	1.6	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/kg dry	1.7	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
79-01-6	Trichloroethylene	ND		ug/kg dry	1.4	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
75-69-4	Trichlorofluoromethane	ND		ug/kg dry	2.3	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
75-01-4	Vinyl Chloride	ND		ug/kg dry	2.5	12	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS
1330-20-7	Xylenes, Total	ND		ug/kg dry	2.7	35	2	EPA SW846-8260B	01/24/2011 17:46	01/24/2011 17:46	SS

Semi-Volatiles, 8270 Base/Neutrals

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	107	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
95-50-1	1,2-Dichlorobenzene	ND		ug/kg dry	85.7	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
541-73-1	1,3-Dichlorobenzene	ND		ug/kg dry	93.2	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
106-46-7	1,4-Dichlorobenzene	ND		ug/kg dry	67.1	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
121-14-2	2,4-Dinitrotoluene	ND		ug/kg dry	85.7	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
606-20-2	2,6-Dinitrotoluene	ND		ug/kg dry	93.2	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
91-58-7	2-Chloronaphthalene	ND		ug/kg dry	59.8	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
91-57-6	2-Methylnaphthalene	ND		ug/kg dry	68.2	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
91-94-1	3,3'-Dichlorobenzidine	ND		ug/kg dry	49.3	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
99-09-2	3-Nitroaniline	ND		ug/kg dry	71.0	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
101-55-3	4-Bromophenyl phenyl ether	ND		ug/kg dry	81.6	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
59-50-7	4-Chloro-3-methylphenol	ND		ug/kg dry	21.1	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
106-47-8	4-Chloroaniline	ND		ug/kg dry	77.3	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
7005-72-3	4-Chlorophenyl phenyl ether	ND		ug/kg dry	56.4	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
100-02-7	4-Nitroaniline	ND		ug/kg dry	65.0	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
83-32-9	Acenaphthene	ND		ug/kg dry	113	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
208-96-8	Acenaphthylene	ND		ug/kg dry	54.8	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
62-53-3	Aniline	ND		ug/kg dry	70.4	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD

Sample Information

Client Sample ID: B-1 10-12'

York Sample ID: 11A0547-02

<u>York Project (SDG) No.</u> 11A0547	<u>Client Project ID</u> 10742	<u>Matrix</u> Soil	<u>Collection Date/Time</u> January 21, 2011 12:00 am	<u>Date Received</u> 01/21/2011
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Semi-Volatiles, 8270 Base/Neutrals

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
120-12-7	Anthracene	73.2	J	ug/kg dry	48.5	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
56-55-3	Benzo(a)anthracene	130	J	ug/kg dry	75.7	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
50-32-8	Benzo(a)pyrene	92.0	J	ug/kg dry	51.0	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
205-99-2	Benzo(b)fluoranthene	107	J	ug/kg dry	74.5	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
191-24-2	Benzo(g,h,i)perylene	ND		ug/kg dry	58.8	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
207-08-9	Benzo(k)fluoranthene	ND		ug/kg dry	75.8	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
85-68-7	Benzyl butyl phthalate	ND		ug/kg dry	81.7	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
111-91-1	Bis(2-chloroethoxy)methane	ND		ug/kg dry	72.2	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
111-44-4	Bis(2-chloroethyl)ether	ND		ug/kg dry	66.5	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
108-60-1	Bis(2-chloroisopropyl)ether	ND		ug/kg dry	72.7	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
117-81-7	Bis(2-ethylhexyl)phthalate	ND		ug/kg dry	65.5	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
218-01-9	Chrysene	122	J	ug/kg dry	78.9	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
53-70-3	Dibenzo(a,h)anthracene	ND		ug/kg dry	49.5	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
132-64-9	Dibenzofuran	ND		ug/kg dry	63.2	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
84-66-2	Diethyl phthalate	ND		ug/kg dry	103	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
131-11-3	Dimethyl phthalate	ND		ug/kg dry	56.4	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
84-74-2	Di-n-butyl phthalate	ND		ug/kg dry	58.5	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
117-84-0	Di-n-octyl phthalate	ND		ug/kg dry	88.1	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
206-44-0	Fluoranthene	287		ug/kg dry	113	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
86-73-7	Fluorene	ND		ug/kg dry	54.8	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
118-74-1	Hexachlorobenzene	ND		ug/kg dry	31.9	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	78.3	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
77-47-4	Hexachlorocyclopentadiene	ND		ug/kg dry	146	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
67-72-1	Hexachloroethane	ND		ug/kg dry	70.4	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
193-39-5	Indeno(1,2,3-cd)pyrene	ND		ug/kg dry	72.2	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
78-59-1	Isophorone	ND		ug/kg dry	72.7	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
91-20-3	Naphthalene	ND		ug/kg dry	58.5	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
98-95-3	Nitrobenzene	ND		ug/kg dry	88.1	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
62-75-9	N-Nitrosodimethylamine	ND		ug/kg dry	70.8	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
621-64-7	N-nitroso-di-n-propylamine	ND		ug/kg dry	51.1	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
86-30-6	N-Nitrosodiphenylamine	ND		ug/kg dry	113	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
85-01-8	Phenanthrene	293		ug/kg dry	72.2	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
129-00-0	Pyrene	257		ug/kg dry	70.2	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD
110-86-1	Pyridine	ND		ug/kg dry	76.4	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 05:40	TD

Sample Information

Client Sample ID: B-1 10-12'

York Sample ID: 11A0547-02

York Project (SDG) No.
11A0547

Client Project ID
10742

Matrix
Soil

Collection Date/Time
January 21, 2011 12:00 am

Date Received
01/21/2011

Pesticides/PCBs, EPA TCL List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
72-54-8	4,4'-DDD	ND		ug/kg dry	1.73	3.88	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:13	JW
72-55-9	4,4'-DDE	ND		ug/kg dry	2.22	3.88	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:13	JW
50-29-3	4,4'-DDT	ND		ug/kg dry	1.74	3.88	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:13	JW
309-00-2	Aldrin	ND		ug/kg dry	2.48	3.88	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:13	JW
319-84-6	alpha-BHC	ND		ug/kg dry	2.92	3.88	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:13	JW
12674-11-2	Aroclor 1016	ND		ug/kg dry	9.28	20.0	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
11104-28-2	Aroclor 1221	ND		ug/kg dry	9.28	20.0	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
11141-16-5	Aroclor 1232	ND		ug/kg dry	9.28	20.0	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
53469-21-9	Aroclor 1242	ND		ug/kg dry	9.28	20.0	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
12672-29-6	Aroclor 1248	ND		ug/kg dry	9.28	20.0	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
11097-69-1	Aroclor 1254	ND		ug/kg dry	7.99	20.0	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
11096-82-5	Aroclor 1260	ND		ug/kg dry	7.99	20.0	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
319-85-7	beta-BHC	ND		ug/kg dry	2.44	3.88	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:13	JW
57-74-9	Chlordane, total	ND		ug/kg dry	15.5	15.5	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:13	JW
319-86-8	delta-BHC	ND		ug/kg dry	2.11	3.88	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:13	JW
60-57-1	Dieldrin	ND		ug/kg dry	2.29	3.88	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:13	JW
959-98-8	Endosulfan I	ND		ug/kg dry	1.88	3.88	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:13	JW
33213-65-9	Endosulfan II	ND		ug/kg dry	2.37	3.88	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:13	JW
1031-07-8	Endosulfan sulfate	ND		ug/kg dry	1.98	3.88	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:13	JW
72-20-8	Endrin	ND		ug/kg dry	2.35	3.88	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:13	JW
7421-93-4	Endrin aldehyde	ND		ug/kg dry	2.61	3.88	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:13	JW
53494-70-5	Endrin ketone	ND		ug/kg dry	1.70	3.88	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:13	JW
58-89-9	gamma-BHC (Lindane)	ND		ug/kg dry	2.69	3.88	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:13	JW
76-44-8	Heptachlor	ND		ug/kg dry	3.09	3.88	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:13	JW
1024-57-3	Heptachlor epoxide	ND		ug/kg dry	1.70	3.88	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:13	JW
72-43-5	Methoxychlor	ND		ug/kg dry	9.99	19.4	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:13	JW
1336-36-3	Total PCBs	ND		ug/kg dry	7.99	20.0	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
8001-35-2	Toxaphene	ND		ug/kg dry		388	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:13	JW

Sample Information

Client Sample ID: B-1 10-12'

York Sample ID: 11A0547-02

York Project (SDG) No.
11A0547

Client Project ID
10742

Matrix
Soil

Collection Date/Time
January 21, 2011 12:00 am

Date Received
01/21/2011

Metals, Target Analyte

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA SW 846-3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7429-90-5	Aluminum	4420		mg/kg dry	1.48	2.35	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:43	MW
7440-36-0	Antimony	ND		mg/kg dry	0.164	0.352	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:43	MW
7440-38-2	Arsenic	3.21		mg/kg dry	0.223	0.587	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:43	MW
7440-39-3	Barium	39.9		mg/kg dry	0.282	0.587	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:43	MW
7440-41-7	Beryllium	ND		mg/kg dry	0.009	0.117	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:43	MW
7440-43-9	Cadmium	ND		mg/kg dry	0.153	0.587	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:43	MW
7440-70-2	Calcium	689		mg/kg dry	0.051	2.35	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:43	MW
7440-47-3	Chromium	7.05		mg/kg dry	0.094	0.587	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:43	MW
7440-48-4	Cobalt	4.82		mg/kg dry	0.094	0.587	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:43	MW
7440-50-8	Copper	9.32		mg/kg dry	0.164	0.587	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:43	MW
7439-89-6	Iron	11600		mg/kg dry	0.646	1.17	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:43	MW
7439-92-1	Lead	6.29		mg/kg dry	0.117	0.352	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:43	MW
7439-95-4	Magnesium	1560		mg/kg dry	0.963	2.35	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:43	MW
7439-96-5	Manganese	140		mg/kg dry	0.094	1.17	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:43	MW
7440-02-0	Nickel	6.50		mg/kg dry	0.082	0.587	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:43	MW
7440-09-7	Potassium	562		mg/kg dry	3.19	11.7	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:43	MW
7782-49-2	Selenium	2.93		mg/kg dry	0.248	0.587	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:43	MW
7440-22-4	Silver	ND		mg/kg dry	0.106	0.587	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:43	MW
7440-23-5	Sodium	196		mg/kg dry	7.89	11.7	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:43	MW
7440-28-0	Thallium	ND		mg/kg dry	0.223	0.587	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:43	MW
7440-62-2	Vanadium	9.54		mg/kg dry	0.094	0.587	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:43	MW
7440-66-6	Zinc	25.2		mg/kg dry	0.082	0.587	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:43	MW

Mercury by 7470/7471

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA SW846-7471

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-97-6	Mercury	ND		mg/kg dry	0.114	0.117	1	EPA SW846-7471	01/24/2011 15:10	01/24/2011 15:10	AA

Sample Information

Client Sample ID: B-1 10-12'

York Sample ID: 11A0547-02

<u>York Project (SDG) No.</u> 11A0547	<u>Client Project ID</u> 10742	<u>Matrix</u> Soil	<u>Collection Date/Time</u> January 21, 2011 12:00 am	<u>Date Received</u> 01/21/2011
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Total Solids

Log-in Notes:

Sample Notes:

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	85.2		%	0.100	0.100	1	SM 2540G	01/24/2011 16:29	01/24/2011 16:29	MZ

Sample Information

Client Sample ID: B-2 0-2'

York Sample ID: 11A0547-03

<u>York Project (SDG) No.</u> 11A0547	<u>Client Project ID</u> 10742	<u>Matrix</u> Soil	<u>Collection Date/Time</u> January 21, 2011 12:00 am	<u>Date Received</u> 01/21/2011
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Volatile Organics, 8260 List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 5035B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	1,1,1,2-Tetrachloroethane	ND		ug/kg dry	1.4	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
71-55-6	1,1,1-Trichloroethane	ND		ug/kg dry	2.5	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/kg dry	1.5	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND		ug/kg dry	1.6	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
79-00-5	1,1,2-Trichloroethane	ND		ug/kg dry	1.6	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
75-34-3	1,1-Dichloroethane	ND		ug/kg dry	1.8	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
75-35-4	1,1-Dichloroethylene	ND		ug/kg dry	3.5	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
563-58-6	1,1-Dichloropropylene	ND		ug/kg dry	1.1	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
87-61-6	1,2,3-Trichlorobenzene	ND		ug/kg dry	0.97	24	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
96-18-4	1,2,3-Trichloropropane	ND		ug/kg dry	3.0	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	1.3	24	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
95-63-6	1,2,4-Trimethylbenzene	ND		ug/kg dry	1.4	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
96-12-8	1,2-Dibromo-3-chloropropane	ND		ug/kg dry	3.5	24	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
106-93-4	1,2-Dibromoethane	ND		ug/kg dry	1.8	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
95-50-1	1,2-Dichlorobenzene	ND		ug/kg dry	1.5	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
107-06-2	1,2-Dichloroethane	ND		ug/kg dry	1.7	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
78-87-5	1,2-Dichloropropane	ND		ug/kg dry	0.58	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
108-67-8	1,3,5-Trimethylbenzene	ND		ug/kg dry	0.97	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
541-73-1	1,3-Dichlorobenzene	ND		ug/kg dry	1.2	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
142-28-9	1,3-Dichloropropane	ND		ug/kg dry	1.8	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
106-46-7	1,4-Dichlorobenzene	ND		ug/kg dry	1.8	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
594-20-7	2,2-Dichloropropane	ND		ug/kg dry	2.5	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
95-49-8	2-Chlorotoluene	ND		ug/kg dry	1.3	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
106-43-4	4-Chlorotoluene	ND		ug/kg dry	1.3	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS

Sample Information

Client Sample ID: B-2 0-2'

York Sample ID: 11A0547-03

York Project (SDG) No.
11A0547

Client Project ID
10742

Matrix
Soil

Collection Date/Time
January 21, 2011 12:00 am

Date Received
01/21/2011

Volatile Organics, 8260 List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 5035B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
71-43-2	Benzene	ND		ug/kg dry	1.3	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
108-86-1	Bromobenzene	ND		ug/kg dry	1.6	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
74-97-5	Bromochloromethane	ND		ug/kg dry	3.3	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
75-27-4	Bromodichloromethane	ND		ug/kg dry	1.6	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
75-25-2	Bromoform	ND		ug/kg dry	1.5	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
74-83-9	Bromomethane	ND		ug/kg dry	3.2	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
56-23-5	Carbon tetrachloride	ND		ug/kg dry	2.7	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
108-90-7	Chlorobenzene	ND		ug/kg dry	0.92	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
75-00-3	Chloroethane	ND		ug/kg dry	2.0	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
67-66-3	Chloroform	ND		ug/kg dry	0.94	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
74-87-3	Chloromethane	ND		ug/kg dry	2.3	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
156-59-2	cis-1,2-Dichloroethylene	ND		ug/kg dry	2.5	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/kg dry	0.92	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
124-48-1	Dibromochloromethane	ND		ug/kg dry	1.8	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
74-95-3	Dibromomethane	ND		ug/kg dry	3.5	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
75-71-8	Dichlorodifluoromethane	ND		ug/kg dry	2.2	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
100-41-4	Ethyl Benzene	ND		ug/kg dry	0.92	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	1.1	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
98-82-8	Isopropylbenzene	ND		ug/kg dry	1.0	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/kg dry	0.99	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
75-09-2	Methylene chloride	21	J, B	ug/kg dry	2.8	24	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
91-20-3	Naphthalene	ND		ug/kg dry	1.3	24	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
104-51-8	n-Butylbenzene	ND		ug/kg dry	0.84	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
103-65-1	n-Propylbenzene	ND		ug/kg dry	1.5	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
95-47-6	o-Xylene	ND		ug/kg dry	1.3	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
1330-20-7P/M	p- & m- Xylenes	ND		ug/kg dry	1.4	24	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
99-87-6	p-Isopropyltoluene	ND		ug/kg dry	0.65	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
135-98-8	sec-Butylbenzene	ND		ug/kg dry	1.4	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
100-42-5	Styrene	ND		ug/kg dry	1.1	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
98-06-6	tert-Butylbenzene	ND		ug/kg dry	1.2	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
127-18-4	Tetrachloroethylene	ND		ug/kg dry	1.4	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
108-88-3	Toluene	2.0	J	ug/kg dry	0.60	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
156-60-5	trans-1,2-Dichloroethylene	ND		ug/kg dry	1.7	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/kg dry	1.8	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
79-01-6	Trichloroethylene	ND		ug/kg dry	1.5	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS

Sample Information

Client Sample ID: B-2 0-2'

York Sample ID: 11A0547-03

York Project (SDG) No.
11A0547

Client Project ID
10742

Matrix
Soil

Collection Date/Time
January 21, 2011 12:00 am

Date Received
01/21/2011

Volatile Organics, 8260 List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 5035B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
75-69-4	Trichlorofluoromethane	ND		ug/kg dry	2.4	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
75-01-4	Vinyl Chloride	ND		ug/kg dry	2.5	12	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS
1330-20-7	Xylenes, Total	ND		ug/kg dry	2.7	36	2	EPA SW846-8260B	01/24/2011 18:34	01/24/2011 18:34	SS

Semi-Volatiles, 8270 Base/Neutrals

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	110	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
95-50-1	1,2-Dichlorobenzene	ND		ug/kg dry	88.3	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
541-73-1	1,3-Dichlorobenzene	ND		ug/kg dry	96.1	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
106-46-7	1,4-Dichlorobenzene	ND		ug/kg dry	69.2	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
121-14-2	2,4-Dinitrotoluene	ND		ug/kg dry	88.3	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
606-20-2	2,6-Dinitrotoluene	ND		ug/kg dry	96.1	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
91-58-7	2-Chloronaphthalene	ND		ug/kg dry	61.6	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
91-57-6	2-Methylnaphthalene	74.3	J	ug/kg dry	70.3	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
91-94-1	3,3'-Dichlorobenzidine	ND		ug/kg dry	50.8	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
99-09-2	3-Nitroaniline	ND		ug/kg dry	73.2	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
101-55-3	4-Bromophenyl phenyl ether	ND		ug/kg dry	84.2	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
59-50-7	4-Chloro-3-methylphenol	ND		ug/kg dry	21.7	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
106-47-8	4-Chloroaniline	ND		ug/kg dry	79.7	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
7005-72-3	4-Chlorophenyl phenyl ether	ND		ug/kg dry	58.2	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
100-02-7	4-Nitroaniline	ND		ug/kg dry	67.0	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
83-32-9	Acenaphthene	342		ug/kg dry	117	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
208-96-8	Acenaphthylene	215		ug/kg dry	56.5	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
62-53-3	Aniline	ND		ug/kg dry	72.6	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
120-12-7	Anthracene	777		ug/kg dry	50.0	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
56-55-3	Benzo(a)anthracene	2650		ug/kg dry	78.1	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
50-32-8	Benzo(a)pyrene	2340		ug/kg dry	52.6	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
205-99-2	Benzo(b)fluoranthene	2480		ug/kg dry	76.8	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
191-24-2	Benzo(g,h,i)perylene	268		ug/kg dry	60.7	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
207-08-9	Benzo(k)fluoranthene	2210		ug/kg dry	78.1	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
85-68-7	Benzyl butyl phthalate	ND		ug/kg dry	84.2	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
111-91-1	Bis(2-chloroethoxy)methane	ND		ug/kg dry	74.4	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
111-44-4	Bis(2-chloroethyl)ether	ND		ug/kg dry	68.5	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
108-60-1	Bis(2-chloroisopropyl)ether	ND		ug/kg dry	75.0	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
117-81-7	Bis(2-ethylhexyl)phthalate	ND		ug/kg dry	67.6	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD

Sample Information

Client Sample ID: B-2 0-2'

York Sample ID: 11A0547-03

York Project (SDG) No.
11A0547

Client Project ID
10742

Matrix
Soil

Collection Date/Time
January 21, 2011 12:00 am

Date Received
01/21/2011

Semi-Volatiles, 8270 Base/Neutrals

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
218-01-9	Chrysene	2510		ug/kg dry	81.3	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
53-70-3	Dibenzo(a,h)anthracene	ND		ug/kg dry	51.0	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
132-64-9	Dibenzofuran	ND		ug/kg dry	65.1	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
84-66-2	Diethyl phthalate	ND		ug/kg dry	106	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
131-11-3	Dimethyl phthalate	ND		ug/kg dry	58.2	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
84-74-2	Di-n-butyl phthalate	ND		ug/kg dry	60.3	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
117-84-0	Di-n-octyl phthalate	ND		ug/kg dry	90.8	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
206-44-0	Fluoranthene	2390		ug/kg dry	117	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
86-73-7	Fluorene	370		ug/kg dry	56.5	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
118-74-1	Hexachlorobenzene	ND		ug/kg dry	32.9	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	80.7	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
77-47-4	Hexachlorocyclopentadiene	ND		ug/kg dry	150	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
67-72-1	Hexachloroethane	ND		ug/kg dry	72.6	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
193-39-5	Indeno(1,2,3-cd)pyrene	339		ug/kg dry	74.4	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
78-59-1	Isophorone	ND		ug/kg dry	75.0	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
91-20-3	Naphthalene	65.8	J	ug/kg dry	60.3	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
98-95-3	Nitrobenzene	ND		ug/kg dry	90.8	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
62-75-9	N-Nitrosodimethylamine	ND		ug/kg dry	73.0	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
621-64-7	N-nitroso-di-n-propylamine	ND		ug/kg dry	52.7	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
86-30-6	N-Nitrosodiphenylamine	ND		ug/kg dry	117	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
85-01-8	Phenanthrene	2540		ug/kg dry	74.5	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
129-00-0	Pyrene	3600		ug/kg dry	72.4	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD
110-86-1	Pyridine	ND		ug/kg dry	78.8	202	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:12	TD

Sample Information

Client Sample ID: B-2 0-2'

York Sample ID: 11A0547-03

York Project (SDG) No.
11A0547

Client Project ID
10742

Matrix
Soil

Collection Date/Time
January 21, 2011 12:00 am

Date Received
01/21/2011

Pesticides/PCBs, EPA TCL List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
72-54-8	4,4'-DDD	ND		ug/kg dry	1.78	4.00	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:28	JW
72-55-9	4,4'-DDE	8.89		ug/kg dry	2.29	4.00	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:28	JW
50-29-3	4,4'-DDT	25.6		ug/kg dry	1.79	4.00	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:28	JW
309-00-2	Aldrin	ND		ug/kg dry	2.55	4.00	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:28	JW
319-84-6	alpha-BHC	ND		ug/kg dry	3.01	4.00	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:28	JW
12674-11-2	Aroclor 1016	ND		ug/kg dry	9.56	20.6	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
11104-28-2	Aroclor 1221	ND		ug/kg dry	9.56	20.6	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
11141-16-5	Aroclor 1232	ND		ug/kg dry	9.56	20.6	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
53469-21-9	Aroclor 1242	ND		ug/kg dry	9.56	20.6	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
12672-29-6	Aroclor 1248	ND		ug/kg dry	9.56	20.6	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
11097-69-1	Aroclor 1254	ND		ug/kg dry	8.23	20.6	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
11096-82-5	Aroclor 1260	ND		ug/kg dry	8.23	20.6	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
319-85-7	beta-BHC	ND		ug/kg dry	2.52	4.00	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:28	JW
57-74-9	Chlordane, total	51.3		ug/kg dry	16.0	16.0	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:28	JW
319-86-8	delta-BHC	ND		ug/kg dry	2.18	4.00	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:28	JW
60-57-1	Dieldrin	ND		ug/kg dry	2.36	4.00	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:28	JW
959-98-8	Endosulfan I	ND		ug/kg dry	1.94	4.00	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:28	JW
33213-65-9	Endosulfan II	ND		ug/kg dry	2.45	4.00	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:28	JW
1031-07-8	Endosulfan sulfate	ND		ug/kg dry	2.05	4.00	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:28	JW
72-20-8	Endrin	ND		ug/kg dry	2.42	4.00	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:28	JW
7421-93-4	Endrin aldehyde	ND		ug/kg dry	2.69	4.00	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:28	JW
53494-70-5	Endrin ketone	ND		ug/kg dry	1.76	4.00	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:28	JW
58-89-9	gamma-BHC (Lindane)	ND		ug/kg dry	2.77	4.00	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:28	JW
76-44-8	Heptachlor	ND		ug/kg dry	3.18	4.00	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:28	JW
1024-57-3	Heptachlor epoxide	ND		ug/kg dry	1.76	4.00	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:28	JW
72-43-5	Methoxychlor	ND		ug/kg dry	10.3	20.0	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:28	JW
1336-36-3	Total PCBs	ND		ug/kg dry	8.23	20.6	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
8001-35-2	Toxaphene	ND		ug/kg dry		400	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:28	JW

Sample Information

Client Sample ID: B-2 0-2'

York Sample ID: 11A0547-03

York Project (SDG) No.
11A0547

Client Project ID
10742

Matrix
Soil

Collection Date/Time
January 21, 2011 12:00 am

Date Received
01/21/2011

Metals, Target Analyte

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA SW 846-3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7429-90-5	Aluminum	2650		mg/kg dry	1.53	2.42	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:47	MW
7440-36-0	Antimony	1.52		mg/kg dry	0.170	0.363	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:47	MW
7440-38-2	Arsenic	9.69		mg/kg dry	0.230	0.605	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:47	MW
7440-39-3	Barium	130		mg/kg dry	0.291	0.605	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:47	MW
7440-41-7	Beryllium	ND		mg/kg dry	0.010	0.121	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:47	MW
7440-43-9	Cadmium	ND		mg/kg dry	0.157	0.605	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:47	MW
7440-70-2	Calcium	22600		mg/kg dry	0.053	2.42	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:47	MW
7440-47-3	Chromium	7.15		mg/kg dry	0.097	0.605	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:47	MW
7440-48-4	Cobalt	2.92		mg/kg dry	0.097	0.605	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:47	MW
7440-50-8	Copper	41.6		mg/kg dry	0.170	0.605	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:47	MW
7439-89-6	Iron	13600		mg/kg dry	0.666	1.21	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:47	MW
7439-92-1	Lead	342		mg/kg dry	0.121	0.363	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:47	MW
7439-95-4	Magnesium	1250		mg/kg dry	0.993	2.42	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:47	MW
7439-96-5	Manganese	108		mg/kg dry	0.097	1.21	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:47	MW
7440-02-0	Nickel	4.52		mg/kg dry	0.085	0.605	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:47	MW
7440-09-7	Potassium	540		mg/kg dry	3.29	12.1	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:47	MW
7782-49-2	Selenium	4.19		mg/kg dry	0.255	0.605	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:47	MW
7440-22-4	Silver	ND		mg/kg dry	0.109	0.605	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:47	MW
7440-23-5	Sodium	335		mg/kg dry	8.14	12.1	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:47	MW
7440-28-0	Thallium	ND		mg/kg dry	0.230	0.605	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:47	MW
7440-62-2	Vanadium	7.54		mg/kg dry	0.097	0.605	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:47	MW
7440-66-6	Zinc	203		mg/kg dry	0.085	0.605	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:47	MW

Mercury by 7470/7471

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA SW846-7471

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-97-6	Mercury	0.460		mg/kg dry	0.117	0.121	1	EPA SW846-7471	01/24/2011 15:10	01/24/2011 15:10	AA

Sample Information

Client Sample ID: B-2 0-2'

York Sample ID: 11A0547-03

York Project (SDG) No.
11A0547

Client Project ID
10742

Matrix
Soil

Collection Date/Time
January 21, 2011 12:00 am

Date Received
01/21/2011

Total Solids

Log-in Notes:

Sample Notes:

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	82.6		%	0.100	0.100	1	SM 2540G	01/24/2011 16:29	01/24/2011 16:29	MZ

Sample Information

Client Sample ID: B-2 10-12'

York Sample ID: 11A0547-04

York Project (SDG) No.
11A0547

Client Project ID
10742

Matrix
Water

Collection Date/Time
January 21, 2011 12:00 am

Date Received
01/21/2011

Volatile Organics, 8260 List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 5035B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	1,1,1,2-Tetrachloroethane	ND		ug/kg dry	1.4	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
71-55-6	1,1,1-Trichloroethane	ND		ug/kg dry	2.4	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/kg dry	1.5	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND		ug/kg dry	1.5	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
79-00-5	1,1,2-Trichloroethane	ND		ug/kg dry	1.6	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
75-34-3	1,1-Dichloroethane	ND		ug/kg dry	1.8	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
75-35-4	1,1-Dichloroethylene	ND		ug/kg dry	3.4	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
563-58-6	1,1-Dichloropropylene	ND		ug/kg dry	1.1	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
87-61-6	1,2,3-Trichlorobenzene	ND		ug/kg dry	0.94	24	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
96-18-4	1,2,3-Trichloropropane	ND		ug/kg dry	2.9	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	1.2	24	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
95-63-6	1,2,4-Trimethylbenzene	ND		ug/kg dry	1.3	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
96-12-8	1,2-Dibromo-3-chloropropane	ND		ug/kg dry	3.4	24	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
106-93-4	1,2-Dibromoethane	ND		ug/kg dry	1.7	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
95-50-1	1,2-Dichlorobenzene	ND		ug/kg dry	1.5	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
107-06-2	1,2-Dichloroethane	ND		ug/kg dry	1.7	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
78-87-5	1,2-Dichloropropane	ND		ug/kg dry	0.56	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
108-67-8	1,3,5-Trimethylbenzene	ND		ug/kg dry	0.94	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
541-73-1	1,3-Dichlorobenzene	ND		ug/kg dry	1.2	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
142-28-9	1,3-Dichloropropane	ND		ug/kg dry	1.8	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
106-46-7	1,4-Dichlorobenzene	ND		ug/kg dry	1.7	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
594-20-7	2,2-Dichloropropane	ND		ug/kg dry	2.4	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
95-49-8	2-Chlorotoluene	ND		ug/kg dry	1.2	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
106-43-4	4-Chlorotoluene	ND		ug/kg dry	1.2	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS

Sample Information

Client Sample ID: B-2 10-12'

York Sample ID: 11A0547-04

York Project (SDG) No.
11A0547

Client Project ID
10742

Matrix
Water

Collection Date/Time
January 21, 2011 12:00 am

Date Received
01/21/2011

Volatile Organics, 8260 List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 5035B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
71-43-2	Benzene	ND		ug/kg dry	1.2	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
108-86-1	Bromobenzene	ND		ug/kg dry	1.6	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
74-97-5	Bromochloromethane	ND		ug/kg dry	3.3	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
75-27-4	Bromodichloromethane	ND		ug/kg dry	1.6	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
75-25-2	Bromoform	ND		ug/kg dry	1.5	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
74-83-9	Bromomethane	ND		ug/kg dry	3.2	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
56-23-5	Carbon tetrachloride	ND		ug/kg dry	2.6	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
108-90-7	Chlorobenzene	ND		ug/kg dry	0.89	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
75-00-3	Chloroethane	ND		ug/kg dry	1.9	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
67-66-3	Chloroform	ND		ug/kg dry	0.92	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
74-87-3	Chloromethane	ND		ug/kg dry	2.3	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
156-59-2	cis-1,2-Dichloroethylene	ND		ug/kg dry	2.4	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/kg dry	0.89	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
124-48-1	Dibromochloromethane	ND		ug/kg dry	1.7	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
74-95-3	Dibromomethane	ND		ug/kg dry	3.4	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
75-71-8	Dichlorodifluoromethane	ND		ug/kg dry	2.1	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
100-41-4	Ethyl Benzene	ND		ug/kg dry	0.89	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	1.1	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
98-82-8	Isopropylbenzene	ND		ug/kg dry	0.99	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/kg dry	0.97	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
75-09-2	Methylene chloride	20	J, B	ug/kg dry	2.7	24	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
91-20-3	Naphthalene	ND		ug/kg dry	1.3	24	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
104-51-8	n-Butylbenzene	ND		ug/kg dry	0.81	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
103-65-1	n-Propylbenzene	ND		ug/kg dry	1.5	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
95-47-6	o-Xylene	ND		ug/kg dry	1.3	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
1330-20-7P/M	p- & m- Xylenes	ND		ug/kg dry	1.4	24	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
99-87-6	p-Isopropyltoluene	ND		ug/kg dry	0.64	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
135-98-8	sec-Butylbenzene	ND		ug/kg dry	1.3	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
100-42-5	Styrene	ND		ug/kg dry	1.1	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
98-06-6	tert-Butylbenzene	ND		ug/kg dry	1.2	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
127-18-4	Tetrachloroethylene	ND		ug/kg dry	1.3	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
108-88-3	Toluene	ND		ug/kg dry	0.59	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
156-60-5	trans-1,2-Dichloroethylene	ND		ug/kg dry	1.7	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/kg dry	1.7	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
79-01-6	Trichloroethylene	ND		ug/kg dry	1.5	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS

Sample Information

Client Sample ID: B-2 10-12'

York Sample ID: 11A0547-04

York Project (SDG) No.
11A0547

Client Project ID
10742

Matrix
Water

Collection Date/Time
January 21, 2011 12:00 am

Date Received
01/21/2011

Volatile Organics, 8260 List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 5035B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
75-69-4	Trichlorofluoromethane	ND		ug/kg dry	2.3	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
75-01-4	Vinyl Chloride	ND		ug/kg dry	2.5	12	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS
1330-20-7	Xylenes, Total	ND		ug/kg dry	2.7	35	2	EPA SW846-8260B	01/24/2011 19:21	01/24/2011 19:21	SS

Semi-Volatiles, 8270 Base/Neutrals

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	107	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
95-50-1	1,2-Dichlorobenzene	ND		ug/kg dry	85.9	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
541-73-1	1,3-Dichlorobenzene	ND		ug/kg dry	93.5	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
106-46-7	1,4-Dichlorobenzene	ND		ug/kg dry	67.4	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
121-14-2	2,4-Dinitrotoluene	ND		ug/kg dry	85.9	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
606-20-2	2,6-Dinitrotoluene	ND		ug/kg dry	93.5	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
91-58-7	2-Chloronaphthalene	ND		ug/kg dry	60.0	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
91-57-6	2-Methylnaphthalene	ND		ug/kg dry	68.4	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
91-94-1	3,3'-Dichlorobenzidine	ND		ug/kg dry	49.5	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
99-09-2	3-Nitroaniline	ND		ug/kg dry	71.2	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
101-55-3	4-Bromophenyl phenyl ether	ND		ug/kg dry	81.9	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
59-50-7	4-Chloro-3-methylphenol	ND		ug/kg dry	21.2	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
106-47-8	4-Chloroaniline	ND		ug/kg dry	77.6	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
7005-72-3	4-Chlorophenyl phenyl ether	ND		ug/kg dry	56.6	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
100-02-7	4-Nitroaniline	ND		ug/kg dry	65.2	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
83-32-9	Acenaphthene	ND		ug/kg dry	114	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
208-96-8	Acenaphthylene	ND		ug/kg dry	55.0	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
62-53-3	Aniline	ND		ug/kg dry	70.6	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
120-12-7	Anthracene	58.9	J	ug/kg dry	48.7	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
56-55-3	Benzo(a)anthracene	162	J	ug/kg dry	76.0	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
50-32-8	Benzo(a)pyrene	141	J	ug/kg dry	51.2	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
205-99-2	Benzo(b)fluoranthene	124	J	ug/kg dry	74.7	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
191-24-2	Benzo(g,h,i)perylene	ND		ug/kg dry	59.0	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
207-08-9	Benzo(k)fluoranthene	151	J	ug/kg dry	76.0	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
85-68-7	Benzyl butyl phthalate	ND		ug/kg dry	81.9	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
111-91-1	Bis(2-chloroethoxy)methane	ND		ug/kg dry	72.4	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
111-44-4	Bis(2-chloroethyl)ether	ND		ug/kg dry	66.7	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
108-60-1	Bis(2-chloroisopropyl)ether	ND		ug/kg dry	72.9	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
117-81-7	Bis(2-ethylhexyl)phthalate	78.9	J	ug/kg dry	65.8	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD

Sample Information

Client Sample ID: B-2 10-12'

York Sample ID: 11A0547-04

York Project (SDG) No.
11A0547

Client Project ID
10742

Matrix
Water

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January 21, 2011 12:00 am

Date Received
01/21/2011

Semi-Volatiles, 8270 Base/Neutrals

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
218-01-9	Chrysene	156	J	ug/kg dry	79.1	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
53-70-3	Dibenzo(a,h)anthracene	ND		ug/kg dry	49.6	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
132-64-9	Dibenzofuran	ND		ug/kg dry	63.4	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
84-66-2	Diethyl phthalate	ND		ug/kg dry	103	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
131-11-3	Dimethyl phthalate	ND		ug/kg dry	56.6	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
84-74-2	Di-n-butyl phthalate	ND		ug/kg dry	58.7	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
117-84-0	Di-n-octyl phthalate	ND		ug/kg dry	88.4	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
206-44-0	Fluoranthene	273		ug/kg dry	114	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
86-73-7	Fluorene	ND		ug/kg dry	55.0	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
118-74-1	Hexachlorobenzene	ND		ug/kg dry	32.0	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	78.6	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
77-47-4	Hexachlorocyclopentadiene	ND		ug/kg dry	146	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
67-72-1	Hexachloroethane	ND		ug/kg dry	70.6	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
193-39-5	Indeno(1,2,3-cd)pyrene	ND		ug/kg dry	72.4	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
78-59-1	Isophorone	ND		ug/kg dry	72.9	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
91-20-3	Naphthalene	ND		ug/kg dry	58.7	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
98-95-3	Nitrobenzene	ND		ug/kg dry	88.4	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
62-75-9	N-Nitrosodimethylamine	ND		ug/kg dry	71.0	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
621-64-7	N-nitroso-di-n-propylamine	ND		ug/kg dry	51.3	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
86-30-6	N-Nitrosodiphenylamine	ND		ug/kg dry	114	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
85-01-8	Phenanthrene	200		ug/kg dry	72.5	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
129-00-0	Pyrene	277		ug/kg dry	70.5	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD
110-86-1	Pyridine	ND		ug/kg dry	76.7	196	1	EPA SW-846 8270C	01/27/2011 14:43	01/29/2011 06:43	TD

Sample Information

Client Sample ID: B-2 10-12'

York Sample ID: 11A0547-04

York Project (SDG) No.
11A0547

Client Project ID
10742

Matrix
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Collection Date/Time
January 21, 2011 12:00 am

Date Received
01/21/2011

Pesticides/PCBs, EPA TCL List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
72-54-8	4,4'-DDD	ND		ug/kg dry	1.73	3.89	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:43	JW
72-55-9	4,4'-DDE	ND		ug/kg dry	2.23	3.89	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:43	JW
50-29-3	4,4'-DDT	ND		ug/kg dry	1.74	3.89	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:43	JW
309-00-2	Aldrin	ND		ug/kg dry	2.49	3.89	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:43	JW
319-84-6	alpha-BHC	ND		ug/kg dry	2.93	3.89	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:43	JW
12674-11-2	Aroclor 1016	ND		ug/kg dry	9.31	20.0	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
11104-28-2	Aroclor 1221	ND		ug/kg dry	9.31	20.0	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
11141-16-5	Aroclor 1232	ND		ug/kg dry	9.31	20.0	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
53469-21-9	Aroclor 1242	ND		ug/kg dry	9.31	20.0	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
12672-29-6	Aroclor 1248	ND		ug/kg dry	9.31	20.0	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
11097-69-1	Aroclor 1254	ND		ug/kg dry	8.01	20.0	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
11096-82-5	Aroclor 1260	ND		ug/kg dry	8.01	20.0	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
319-85-7	beta-BHC	ND		ug/kg dry	2.45	3.89	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:43	JW
57-74-9	Chlordane, total	ND		ug/kg dry	15.6	15.6	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:43	JW
319-86-8	delta-BHC	ND		ug/kg dry	2.12	3.89	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:43	JW
60-57-1	Dieldrin	ND		ug/kg dry	2.30	3.89	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:43	JW
959-98-8	Endosulfan I	ND		ug/kg dry	1.89	3.89	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:43	JW
33213-65-9	Endosulfan II	ND		ug/kg dry	2.38	3.89	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:43	JW
1031-07-8	Endosulfan sulfate	ND		ug/kg dry	1.99	3.89	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:43	JW
72-20-8	Endrin	ND		ug/kg dry	2.36	3.89	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:43	JW
7421-93-4	Endrin aldehyde	ND		ug/kg dry	2.62	3.89	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:43	JW
53494-70-5	Endrin ketone	ND		ug/kg dry	1.71	3.89	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:43	JW
58-89-9	gamma-BHC (Lindane)	ND		ug/kg dry	2.70	3.89	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:43	JW
76-44-8	Heptachlor	ND		ug/kg dry	3.10	3.89	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:43	JW
1024-57-3	Heptachlor epoxide	ND		ug/kg dry	1.71	3.89	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:43	JW
72-43-5	Methoxychlor	ND		ug/kg dry	10.0	19.4	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:43	JW
1336-36-3	Total PCBs	ND		ug/kg dry	8.01	20.0	1	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 00:00	JW
8001-35-2	Toxaphene	ND		ug/kg dry		389	10	EPA SW 846-8081/8082	01/26/2011 00:00	01/26/2011 13:43	JW

Sample Information

Client Sample ID: B-2 10-12'

York Sample ID: 11A0547-04

York Project (SDG) No.
11A0547

Client Project ID
10742

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Water

Collection Date/Time
January 21, 2011 12:00 am

Date Received
01/21/2011

Metals, Target Analyte

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA SW 846-3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7429-90-5	Aluminum	4150		mg/kg dry	1.48	2.36	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:52	MW
7440-36-0	Antimony	ND		mg/kg dry	0.165	0.353	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:52	MW
7440-38-2	Arsenic	4.19		mg/kg dry	0.224	0.589	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:52	MW
7440-39-3	Barium	22.1		mg/kg dry	0.283	0.589	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:52	MW
7440-41-7	Beryllium	ND		mg/kg dry	0.009	0.118	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:52	MW
7440-43-9	Cadmium	ND		mg/kg dry	0.153	0.589	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:52	MW
7440-70-2	Calcium	538		mg/kg dry	0.051	2.36	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:52	MW
7440-47-3	Chromium	6.78		mg/kg dry	0.094	0.589	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:52	MW
7440-48-4	Cobalt	4.96		mg/kg dry	0.094	0.589	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:52	MW
7440-50-8	Copper	6.13		mg/kg dry	0.165	0.589	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:52	MW
7439-89-6	Iron	11200		mg/kg dry	0.648	1.18	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:52	MW
7439-92-1	Lead	4.94		mg/kg dry	0.118	0.353	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:52	MW
7439-95-4	Magnesium	1100		mg/kg dry	0.966	2.36	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:52	MW
7439-96-5	Manganese	114		mg/kg dry	0.094	1.18	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:52	MW
7440-02-0	Nickel	6.82		mg/kg dry	0.082	0.589	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:52	MW
7440-09-7	Potassium	489		mg/kg dry	3.20	11.8	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:52	MW
7782-49-2	Selenium	2.86		mg/kg dry	0.249	0.589	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:52	MW
7440-22-4	Silver	ND		mg/kg dry	0.106	0.589	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:52	MW
7440-23-5	Sodium	206		mg/kg dry	7.92	11.8	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:52	MW
7440-28-0	Thallium	ND		mg/kg dry	0.224	0.589	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:52	MW
7440-62-2	Vanadium	12.0		mg/kg dry	0.094	0.589	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:52	MW
7440-66-6	Zinc	24.4		mg/kg dry	0.082	0.589	1	EPA SW846-6010B	01/24/2011 15:30	01/24/2011 20:52	MW

Mercury by 7470/7471

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA SW846-7471

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-97-6	Mercury	ND		mg/kg dry	0.114	0.118	1	EPA SW846-7471	01/24/2011 15:10	01/24/2011 15:10	AA

Sample Information

Client Sample ID: B-2 10-12'

York Sample ID: 11A0547-04

York Project (SDG) No.
11A0547

Client Project ID
10742

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January 21, 2011 12:00 am

Date Received
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Total Solids

Log-in Notes:

Sample Notes:

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	84.9		%	0.100	0.100	1	SM 2540G	01/24/2011 16:29	01/24/2011 16:29	MZ

Sample Information

Client Sample ID: B-1 GW

York Sample ID: 11A0547-05

York Project (SDG) No.
11A0547

Client Project ID
10742

Matrix
Water

Collection Date/Time
January 21, 2011 12:00 am

Date Received
01/21/2011

Volatile Organics, 8260 List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	1,1,1,2-Tetrachloroethane	ND		ug/L	0.54	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
71-55-6	1,1,1-Trichloroethane	ND		ug/L	0.95	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/L	0.57	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND		ug/L	0.60	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
79-00-5	1,1,2-Trichloroethane	ND		ug/L	0.61	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
75-34-3	1,1-Dichloroethane	ND		ug/L	0.69	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
75-35-4	1,1-Dichloroethylene	ND		ug/L	1.3	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
563-58-6	1,1-Dichloropropylene	ND		ug/L	0.43	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
87-61-6	1,2,3-Trichlorobenzene	ND		ug/L	0.37	10	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
96-18-4	1,2,3-Trichloropropane	ND		ug/L	1.1	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
120-82-1	1,2,4-Trichlorobenzene	ND		ug/L	0.48	10	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
95-63-6	1,2,4-Trimethylbenzene	ND		ug/L	0.53	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
96-12-8	1,2-Dibromo-3-chloropropane	ND		ug/L	1.3	10	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
106-93-4	1,2-Dibromoethane	ND		ug/L	0.68	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
95-50-1	1,2-Dichlorobenzene	ND		ug/L	0.59	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
107-06-2	1,2-Dichloroethane	ND		ug/L	0.65	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
78-87-5	1,2-Dichloropropane	ND		ug/L	0.22	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
108-67-8	1,3,5-Trimethylbenzene	ND		ug/L	0.37	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
541-73-1	1,3-Dichlorobenzene	ND		ug/L	0.47	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
142-28-9	1,3-Dichloropropane	ND		ug/L	0.69	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
106-46-7	1,4-Dichlorobenzene	ND		ug/L	0.68	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
594-20-7	2,2-Dichloropropane	ND		ug/L	0.96	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
95-49-8	2-Chlorotoluene	ND		ug/L	0.49	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
106-43-4	4-Chlorotoluene	ND		ug/L	0.49	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS

Sample Information

Client Sample ID: B-1 GW

York Sample ID: 11A0547-05

York Project (SDG) No.
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Client Project ID
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Collection Date/Time
January 21, 2011 12:00 am

Date Received
01/21/2011

Volatile Organics, 8260 List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
71-43-2	Benzene	ND		ug/L	0.48	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
108-86-1	Bromobenzene	ND		ug/L	0.61	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
74-97-5	Bromochloromethane	ND		ug/L	1.3	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
75-27-4	Bromodichloromethane	ND		ug/L	0.62	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
75-25-2	Bromoform	ND		ug/L	0.58	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
74-83-9	Bromomethane	ND		ug/L	1.2	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
56-23-5	Carbon tetrachloride	ND		ug/L	1.0	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
108-90-7	Chlorobenzene	ND		ug/L	0.35	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
75-00-3	Chloroethane	ND		ug/L	0.76	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
67-66-3	Chloroform	ND		ug/L	0.36	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
74-87-3	Chloromethane	ND		ug/L	0.89	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
156-59-2	cis-1,2-Dichloroethylene	ND		ug/L	0.96	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/L	0.35	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
124-48-1	Dibromochloromethane	ND		ug/L	0.67	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
74-95-3	Dibromomethane	ND		ug/L	1.3	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
75-71-8	Dichlorodifluoromethane	ND		ug/L	0.83	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
100-41-4	Ethyl Benzene	ND		ug/L	0.35	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
87-68-3	Hexachlorobutadiene	ND		ug/L	0.43	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
98-82-8	Isopropylbenzene	ND		ug/L	0.39	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/L	0.38	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
75-09-2	Methylene chloride	2.5	J, B	ug/L	1.1	10	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
91-20-3	Naphthalene	ND		ug/L	0.50	10	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
104-51-8	n-Butylbenzene	ND		ug/L	0.32	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
103-65-1	n-Propylbenzene	ND		ug/L	0.58	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
95-47-6	o-Xylene	ND		ug/L	0.50	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
1330-20-7P/M	p- & m- Xylenes	ND		ug/L	0.55	10	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
99-87-6	p-Isopropyltoluene	ND		ug/L	0.25	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
135-98-8	sec-Butylbenzene	ND		ug/L	0.52	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
100-42-5	Styrene	ND		ug/L	0.43	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
98-06-6	tert-Butylbenzene	ND		ug/L	0.46	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
127-18-4	Tetrachloroethylene	ND		ug/L	0.52	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
108-88-3	Toluene	ND		ug/L	0.23	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
156-60-5	trans-1,2-Dichloroethylene	ND		ug/L	0.65	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/L	0.68	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
79-01-6	Trichloroethylene	ND		ug/L	0.57	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS

Sample Information

Client Sample ID: B-1 GW

York Sample ID: 11A0547-05

York Project (SDG) No.
11A0547

Client Project ID
10742

Matrix
Water

Collection Date/Time
January 21, 2011 12:00 am

Date Received
01/21/2011

Volatile Organics, 8260 List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
75-69-4	Trichlorofluoromethane	ND		ug/L	0.91	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
75-01-4	Vinyl Chloride	ND		ug/L	0.97	5.0	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS
1330-20-7	Xylenes, Total	ND		ug/L	1.0	15	1	EPA SW846-8260B	01/24/2011 15:21	01/25/2011 05:53	SS

Semi-Volatiles, 8270 Base/Neutrals

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3510C

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
120-82-1	1,2,4-Trichlorobenzene	ND		ug/L	1.46	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
95-50-1	1,2-Dichlorobenzene	ND		ug/L	1.82	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
541-73-1	1,3-Dichlorobenzene	ND		ug/L	3.05	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
106-46-7	1,4-Dichlorobenzene	ND		ug/L	3.58	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
121-14-2	2,4-Dinitrotoluene	ND		ug/L	2.63	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
606-20-2	2,6-Dinitrotoluene	ND		ug/L	3.90	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
91-58-7	2-Chloronaphthalene	ND		ug/L	3.88	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
91-57-6	2-Methylnaphthalene	ND		ug/L	3.42	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
88-74-4	2-Nitroaniline	ND		ug/L	3.34	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
91-94-1	3,3'-Dichlorobenzidine	ND		ug/L	3.90	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
99-09-2	3-Nitroaniline	ND		ug/L	1.77	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
101-55-3	4-Bromophenyl phenyl ether	ND		ug/L	3.83	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
106-47-8	4-Chloroaniline	ND		ug/L	4.16	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
7005-72-3	4-Chlorophenyl phenyl ether	ND		ug/L	3.47	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
100-02-7	4-Nitroaniline	ND		ug/L	4.19	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
83-32-9	Acenaphthene	ND		ug/L	3.60	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
208-96-8	Acenaphthylene	ND		ug/L	4.75	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
62-53-3	Aniline	ND		ug/L	2.18	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
120-12-7	Anthracene	ND		ug/L	4.07	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
56-55-3	Benzo(a)anthracene	ND		ug/L	4.52	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
50-32-8	Benzo(a)pyrene	ND		ug/L	5.39	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
205-99-2	Benzo(b)fluoranthene	ND		ug/L	4.58	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
191-24-2	Benzo(g,h,i)perylene	ND		ug/L	4.61	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
207-08-9	Benzo(k)fluoranthene	ND		ug/L	3.84	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
85-68-7	Benzyl butyl phthalate	ND		ug/L	2.56	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
111-91-1	Bis(2-chloroethoxy)methane	ND		ug/L	5.39	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
111-44-4	Bis(2-chloroethyl)ether	ND		ug/L	4.58	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
108-60-1	Bis(2-chloroisopropyl)ether	ND		ug/L	4.61	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD

Sample Information

Client Sample ID: B-1 GW

York Sample ID: 11A0547-05

York Project (SDG) No.
11A0547

Client Project ID
10742

Matrix
Water

Collection Date/Time
January 21, 2011 12:00 am

Date Received
01/21/2011

Semi-Volatiles, 8270 Base/Neutrals

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3510C

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
117-81-7	Bis(2-ethylhexyl)phthalate	ND		ug/L	2.86	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
218-01-9	Chrysene	ND		ug/L	4.61	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
53-70-3	Dibenzo(a,h)anthracene	ND		ug/L	3.44	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
132-64-9	Dibenzofuran	ND		ug/L	3.22	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
84-66-2	Diethyl phthalate	ND		ug/L	2.44	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
131-11-3	Dimethyl phthalate	ND		ug/L	5.39	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
84-74-2	Di-n-butyl phthalate	ND		ug/L	4.58	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
117-84-0	Di-n-octyl phthalate	ND		ug/L	4.61	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
206-44-0	Fluoranthene	ND		ug/L	1.77	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
86-73-7	Fluorene	ND		ug/L	3.58	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
118-74-1	Hexachlorobenzene	ND		ug/L	3.28	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
87-68-3	Hexachlorobutadiene	ND		ug/L	3.68	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
77-47-4	Hexachlorocyclopentadiene	ND		ug/L	3.83	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
67-72-1	Hexachloroethane	ND		ug/L	4.03	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
193-39-5	Indeno(1,2,3-cd)pyrene	ND		ug/L	3.05	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
78-59-1	Isophorone	ND		ug/L	3.58	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
91-20-3	Naphthalene	ND		ug/L	4.29	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
98-95-3	Nitrobenzene	ND		ug/L	2.18	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
62-75-9	N-Nitrosodimethylamine	ND		ug/L	3.45	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
621-64-7	N-nitroso-di-n-propylamine	ND		ug/L	2.86	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
86-30-6	N-Nitrosodiphenylamine	ND		ug/L	4.02	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
85-01-8	Phenanthrene	ND		ug/L	4.01	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
129-00-0	Pyrene	ND		ug/L	2.63	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD
110-86-1	Pyridine	ND		ug/L	3.54	5.56	1	EPA SW-846 8270C	01/25/2011 08:54	01/26/2011 11:36	TD

Sample Information

Client Sample ID: B-1 GW

York Sample ID: 11A0547-05

York Project (SDG) No.
11A0547

Client Project ID
10742

Matrix
Water

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January 21, 2011 12:00 am

Date Received
01/21/2011

Pesticides/PCBs, EPA TCL List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA SW846-3510C Low Level

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
72-54-8	4,4'-DDD	ND		ug/L	0.00109	0.00114	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
72-55-9	4,4'-DDE	ND		ug/L	0.00114	0.00114	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
50-29-3	4,4'-DDT	ND		ug/L	0.000960	0.00114	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
309-00-2	Aldrin	ND		ug/L	0.000994	0.00114	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
319-84-6	alpha-BHC	ND		ug/L	0.00110	0.00114	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
12674-11-2	Aroclor 1016	ND		ug/L	0.0415	0.0571	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
11104-28-2	Aroclor 1221	ND		ug/L	0.0415	0.0571	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
11141-16-5	Aroclor 1232	ND		ug/L	0.0415	0.0571	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
53469-21-9	Aroclor 1242	ND		ug/L	0.0415	0.0571	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
12672-29-6	Aroclor 1248	ND		ug/L	0.0415	0.0571	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
11097-69-1	Aroclor 1254	ND		ug/L	0.0482	0.0571	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
11096-82-5	Aroclor 1260	ND		ug/L	0.0482	0.0571	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
319-85-7	beta-BHC	ND		ug/L	0.000903	0.00114	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
57-74-9	Chlordane, total	ND		ug/L	0.00457	0.00457	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
319-86-8	delta-BHC	ND		ug/L	0.00110	0.00114	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
60-57-1	Dieldrin	ND		ug/L	0.000811	0.00114	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
959-98-8	Endosulfan I	ND		ug/L	0.000903	0.00114	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
33213-65-9	Endosulfan II	ND		ug/L	0.000960	0.00114	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
1031-07-8	Endosulfan sulfate	ND		ug/L	0.00109	0.00114	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
72-20-8	Endrin	ND		ug/L	0.00107	0.00114	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
7421-93-4	Endrin aldehyde	ND		ug/L	0.000777	0.00114	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
53494-70-5	Endrin ketone	ND		ug/L	0.00104	0.00114	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
58-89-9	gamma-BHC (Lindane)	ND		ug/L	0.00110	0.00114	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
76-44-8	Heptachlor	ND		ug/L	0.00109	0.00114	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
1024-57-3	Heptachlor epoxide	ND		ug/L	0.000857	0.00114	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
72-43-5	Methoxychlor	ND		ug/L	0.00224	0.00571	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
1336-36-3	Total PCBs	ND		ug/L	0.0415	0.0571	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW
8001-35-2	Toxaphene	ND		ug/L	0.114	0.114	1	EPA SW 846-8081/8082	01/27/2011 09:45	01/27/2011 14:06	JW

Sample Information

Client Sample ID: B-1 GW

York Sample ID: 11A0547-05

York Project (SDG) No.
11A0547

Client Project ID
10742

Matrix
Water

Collection Date/Time
January 21, 2011 12:00 am

Date Received
01/21/2011

Metals, Dissolved - Target Analyte (TAL)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA SW 846-3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7429-90-5	Aluminum	ND		mg/L	0.007	0.010	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 18:56	MW
7440-36-0	Antimony	ND		mg/L	0.002	0.005	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 18:56	MW
7440-38-2	Arsenic	ND		mg/L	0.001	0.010	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 18:56	MW
7440-39-3	Barium	0.061		mg/L	0.004	0.010	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 18:56	MW
7440-41-7	Beryllium	ND		mg/L	0.0009	0.001	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 18:56	MW
7440-43-9	Cadmium	ND		mg/L	0.001	0.003	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 18:56	MW
7440-70-2	Calcium	124		mg/L	0.009	0.020	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 18:56	MW
7440-47-3	Chromium	ND		mg/L	0.0009	0.005	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 18:56	MW
7440-48-4	Cobalt	ND		mg/L	0.001	0.005	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 18:56	MW
7440-50-8	Copper	ND		mg/L	0.002	0.005	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 18:56	MW
7439-89-6	Iron	0.036		mg/L	0.006	0.010	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 18:56	MW
7439-92-1	Lead	ND		mg/L	0.001	0.003	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 18:56	MW
7439-95-4	Magnesium	9.79		mg/L	0.008	0.020	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 18:56	MW
7439-96-5	Manganese	0.152		mg/L	0.001	0.005	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 18:56	MW
7440-02-0	Nickel	ND		mg/L	0.0008	0.005	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 18:56	MW
7440-09-7	Potassium	26.4		mg/L	0.026	0.050	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 18:56	MW
7782-49-2	Selenium	0.024		mg/L	0.002	0.010	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 18:56	MW
7440-22-4	Silver	ND		mg/L	0.001	0.005	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 18:56	MW
7440-23-5	Sodium	16.6		mg/L	0.066	0.100	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 18:56	MW
7440-28-0	Thallium	ND		mg/L	0.002	0.010	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 18:56	MW
7440-62-2	Vanadium	ND		mg/L	0.001	0.010	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 18:56	MW
7440-66-6	Zinc	ND		mg/L	0.0009	0.020	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 18:56	MW

Metals, Target Analyte

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA SW 846-3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7429-90-5	Aluminum	39.0		mg/L	0.007	0.010	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 19:01	MW
7440-36-0	Antimony	ND		mg/L	0.002	0.005	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 19:01	MW
7440-38-2	Arsenic	0.042		mg/L	0.001	0.010	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 19:01	MW
7440-39-3	Barium	1.02		mg/L	0.004	0.010	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 19:01	MW
7440-41-7	Beryllium	0.004		mg/L	0.0009	0.001	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 19:01	MW
7440-43-9	Cadmium	ND		mg/L	0.001	0.003	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 19:01	MW
7440-70-2	Calcium	150		mg/L	0.009	0.020	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 19:01	MW
7440-47-3	Chromium	0.091		mg/L	0.0009	0.005	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 19:01	MW
7440-48-4	Cobalt	0.076		mg/L	0.001	0.005	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 19:01	MW
7440-50-8	Copper	0.169		mg/L	0.002	0.005	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 19:01	MW

Sample Information

Client Sample ID: B-1 GW

York Sample ID: 11A0547-05

York Project (SDG) No.
11A0547

Client Project ID
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January 21, 2011 12:00 am

Date Received
01/21/2011

Metals, Target Analyte

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA SW 846-3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-89-6	Iron	77.4		mg/L	0.006	0.010	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 19:01	MW
7439-92-1	Lead	0.446		mg/L	0.001	0.003	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 19:01	MW
7439-95-4	Magnesium	19.6		mg/L	0.008	0.020	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 19:01	MW
7439-96-5	Manganese	3.51		mg/L	0.001	0.005	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 19:01	MW
7440-02-0	Nickel	0.077		mg/L	0.0008	0.005	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 19:01	MW
7440-09-7	Potassium	32.5		mg/L	0.026	0.050	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 19:01	MW
7782-49-2	Selenium	0.035		mg/L	0.002	0.010	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 19:01	MW
7440-22-4	Silver	ND		mg/L	0.001	0.005	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 19:01	MW
7440-23-5	Sodium	16.6		mg/L	0.066	0.100	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 19:01	MW
7440-28-0	Thallium	ND		mg/L	0.002	0.010	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 19:01	MW
7440-62-2	Vanadium	0.155		mg/L	0.001	0.010	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 19:01	MW
7440-66-6	Zinc	0.346		mg/L	0.0009	0.020	1	EPA SW846-6010B	01/24/2011 15:22	01/24/2011 19:01	MW

Mercury by 7470/7471

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA SW846-7470

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-97-6	Mercury	ND		mg/L	0.00003900	0.0002000	1	EPA SW846-7470	01/24/2011 15:15	01/24/2011 15:15	AA

Mercury, Dissolved

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA SW846-7470

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-97-6	Mercury	ND		mg/L	0.00003900	0.0002000	1	EPA SW846-7470	01/24/2011 15:13	01/24/2011 15:13	AA

Notes and Definitions

QL-02	This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
J	Detected below the Reporting Limit but greater than or equal to the Method Detection Limit (MDL); therefore, the result is an estimated concentration.
B	Analyte is found in the associated analysis batch blank.

ND	Analyte NOT DETECTED at the stated Reporting Limit (RL) or above.
RL	REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.
MDL	METHOD DETECTION LIMIT - the minimum concentration that can be measured and reported with a 99% confidence that the concentration is greater than zero. If requested or required, a value reported below the RL and above the MDL is considered estimated and is noted with a "J" flag.
NR	Not reported
RPD	Relative Percent Difference
Wet	The data has been reported on an as-received (wet weight) basis
Low Bias	Low Bias flag indicates that the recovery of the flagged analyte is below the laboratory or regulatory lower control limit. The data user should take note that this analyte may be biased low but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
High Bias	High Bias flag indicates that the recovery of the flagged analyte is above the laboratory or regulatory upper control limit. The data user should take note that this analyte may be biased high but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
Non-Dir.	Non-dir. flag (Non-Directional Bias) indicates that the Relative Percent Difference (RPD) (a measure of precision) among the MS and MSD data is outside the laboratory or regulatory control limit. This alerts the data user where the MS and MSD are from site-specific samples that the RPD is high due to either non-homogeneous distribution of target analyte between the MS/MSD or indicates poor reproducibility for other reasons.

Corrective Action:

APPENDIX D

SOIL BORING LOGS

APPENDIX E

NYCDEP APPROVAL LETTER



Caswell F. Holloway
Commissioner

Angela Licata
Deputy Commissioner
Bureau of Environmental
Planning and Analysis
alicata@dep.nyc.gov

59-17 Junction Boulevard
Flushing, NY 11373
T: (718) 595-4398
F: (718) 595-4479

January 6, 2010

Mr. Rory Levy
CEQR Examiner
New York City Board of Standards and Appeals
40 Rector Street, 9th Floor
New York, New York 10006

Re: 107 Union Street
Block 335, Lots 42
11BSA009K/11DEPTECH010K
Brooklyn, New York

Dear Mr. Levy:

The New York City Department of Environmental Protection, Bureau of Environmental Planning and Analysis (DEP) has reviewed the December 2010 Phase II Environmental Site Investigation Work Plan (Workplan) and Health and Safety Plan (HASP), prepared by EEA Inc. on behalf of Herman Galvis of Passiv House Xperimental LLC (applicant) for the above-referenced project. The applicant is seeking a Bulk and Use variance from the New York City Board of Standards and Appeals (BSA) to develop a two-story residential building within an M1-1 district on Block 335, Lot 42, located between Columbia Street and Van Brunt Street in the Flatlands section of Brooklyn Community District 6. As currently proposed, the action would permit construction of a 4,600 square foot two-family, four-story residential building with a ground floor studio apartment. The site is currently a vacant 2,300 square foot property.

The December 2010 Phase II Workplan proposes the installation of two soil borings to a depth of approximately 12 feet below ground surface. Two soil samples will be collected from each boring location and one groundwater samples (via temporary monitoring wells) will also be collected. Soil and groundwater samples will be collected and analyzed for Volatile Organic Compounds (VOCs) by United States Environmental Protection Agency Method 8260, Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270B/N only, Pesticides and Polychlorinated Biphenyls (PCBs) by EPA Method 8081/ 8082, Target Analyte List (TAL) metals (filtered and unfiltered for groundwater samples). In addition, the HASP identifies appropriate protection for the on-site workers during the Phase II Environmental Site Investigation.

DEP finds the Phase II Workplan and HASP for the proposed project acceptable as long as the following information is incorporated into the Workplan.

- BSA should instruct the applicant that soil and groundwater samples should be collected and analyzed by a New York State Department of Health Environmental Laboratory Approval Program certified laboratory for the presence of VOCs by Method EPA 8260, SVOCs by EPA Method 8270, Pesticides/PCBs by EPA Method 8081/8082 and TAL metals (Filtered and unfiltered for groundwater samples).
- BSA should also inform the applicant that upon completion of the investigation activities, a detailed Phase II report must be submitted to DEP for review and approval. The report should include, at a minimum, an executive summary, narrative of the field activities, laboratory data and conclusions, comparison of soil and groundwater analytical result with the current New York State Department of Environmental Conservation 6 NYCRR Part 375 Soil Cleanup Objectives and DEC Technical and Operational Guidance Series 1.1.1 Ambient Water Quality Standards and Guidance Values, updated site plans depicting sample locations, boring logs, and remedial recommendations, if warranted.

Future correspondence and submittal related to this project should include the following tracking number **11DEPTECH010K**. If you have any questions or comments, you may contact Ms. Mahalia Myrie at (718) 595-3212.

Sincerely,



Gary C. Heath

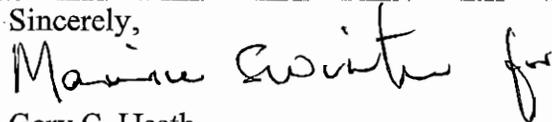
Director, Bureau Operations and Environmental Analysis

cc: G. Heath
M. Winter
M. Myrie
C. Chung
S. Vafadari
W. Yu
File

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- BSA should also inform the applicant that upon completion of the investigation activities, a detailed Phase II report must be submitted to DEP for review and approval. The report should include, at a minimum, an executive summary, narrative of the field activities, laboratory data and conclusions, comparison of soil and groundwater analytical result with the current New York State Department of Environmental Conservation 6 NYCRR Part 375 Soil Cleanup Objectives and DEC Technical and Operational Guidance Series 1.1.1 Ambient Water Quality Standards and Guidance Values, updated site plans depicting sample locations, boring logs, and remedial recommendations, if warranted.

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Sincerely,



Gary C. Heath

Director, Bureau Operations and Environmental Analysis

cc: G. Heath
M. Winter
M. Myrie
C. Chung
S. Vafadari
W. Yu
File

APPENDIX G

Design Diagrams and Specifications for Vapor Barrier/Waterproofing Membrane



IntePlus® XF FILM

Guide Specification

VB-350 (16mil) Vapor Retarder

UNDER-SLAB VAPOR RETARDER (03300 & 07260)

PART I – GENERAL

1-1 SUMMARY

A. Products Supplied Under This Section

1. Vapor Retarder, Seam Tape & Accessories for installation under concrete slabs

B. Related Sections

1. Section 03300 Cast-in-place Concrete
2. Section 07260 Vapor Retarder

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. ASTM E 1745-09 Standard Specification for Plastic Water Vapor Retarders used in Contact with Soil or Granular Fill under Concrete Slabs.
2. ASTM E 154-99 (2005) Standard Test Methods for Water Vapor Retarders used in Contact with Earth under Concrete Slabs, on Walls, or as Ground Cover.
3. ASTM E 96-05 Standard Test Methods for Water Vapor Transmission of Materials.
4. ASTM E 1643-09 Selection, Design, Installation, and Inspection of Water Vapor Retarders used in Contact with Earth or Granular Fill under Concrete Slabs.
5. ASTM F 1249 Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor.
6. ASTM D 903 Standard Test Method for Peel or Stripping Strength of Adhesive Bonds

B. American Concrete Institute (ACI)

1. ACI 302.2R-06 Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials. Vapor Retarder component is not less than 10 mils thick.

1.3 SUBMITTALS

A. Quality Control / Assurance

1. Summary of test results as per paragraph 8.3 of ASTM E 1745.
2. Manufacturer's samples, literature.
3. Manufacturer's installation instructions for placement, seaming and penetration repair instructions.

PART II – PRODUCTS

2.1 MATERIALS

A. Vapor Retarder (Performance Based Specification)

1. Vapor Retarder membrane must have the following properties:
 - a. Minimum 15 mil thick plastic geo-membrane
 - b. Manufactured with prime high-grade 100% virgin polyolefin resins
 - c. Water Vapor Retarder ASTM E 1745 Meets Class A (Plastics)
 - d. Water Vapor Permeance ASTM E 96 0.003 perms (g/hr/m²)
 - e. Water Vapor Permeance ASTM E 96 0.009 perms (US) or lower
 - f. Puncture Resistance ASTM E 1745 Class A minimum 2200 grams
 - g. Tensile Strength ASTM E 1745 Class A minimum 45.0 lbf/in



IntePlus® XF FILM

Guide Specification

VB-350 (16mil) Vapor Retarder

UNDER-SLAB VAPOR RETARDER (03300 & 07260)

2. Approved Manufacturer
 - a. Barrier-Bac VB-350 (16 mil) by Inteplast Group, 877-535-0555, www.BarrierBac.com
 - b. Vapor Block 15 (mil) manufactured by Raven Industries, 800-635-3456, www.ravenind.com
 - c. Griffolyn 15 mil manufactured by Reef Industries, 800-231-6074, www.reefindustries.com
 - d. Moistop Ultra 15 (mil) manufactured by Fortifiber, 800-773-4777, www.fortifiber.com

2.2 ACCESSORIES

A. Seam Tape

1. 1. Tape manufactured and/or supplied by the approved manufacturers listed in section 2.1 Materials (B.):
 - a. Water Vapor Permeance ASTM E 96B <0.01 Perms

B. Pipe Boots

1. Construct Pipe Boots from Vapor Retarder material and pressure sensitive tape per manufacturer's instructions.

B. Pipe Boots

1. Mastic must have the following qualities:
 - a. Water Vapor Transmission ASTM E 96 — 0.3 perms or lower

PART III—EXECUTION

3.1 PREPARATION

- A. Ensure that base material is approved by Architect or Geotechnical Engineer
 1. Level and compact base material.

3.2 INSTALLATION

- A. Install vapor retarder in accordance with manufacturer's instructions and ASTM E 1643:

1. Unroll vapor retarder with the longest dimension parallel with the direction of the concrete placement.
2. Lap vapor retarder over footings and/or seal to foundation walls.
3. Overlap joints 6 inches and seal with manufacturer's tape.
4. Seal all penetrations (including pipes) per manufacturer's instructions.
5. No penetration of the vapor retarder is allowed except for reinforcing steel and permanent utilities.
7. Repair damaged areas by cutting patches of vapor retarder, overlapping damaged area 6 inches and taping all sides with tape.



Technical Data

VB-350(16mil) Vapor Retarder

DIVISION: 07260, 03300

1.0 PRODUCT NAME

VB-350 (16 mil)
 Class A Vapor Retarder
 Exceeds astm e 1745 class a, b & c
 Retarder Specifications

VB-350 (16 mil) Vapor Retarder is manufactured in 12.75 ft x 150 ft rolls (1913 ft²).

VB-350 (16 mil) Vapor Retarder weighs approximately 137 lbs. per roll.

2.0 MANUFACTURER

Inteplast Group
 9 Peach Tree Hill Road
 Livingston, NJ 07039

Technical Assistance
 Tel: (877) 535-0555
 Fax: (800) 709-6002

4.0 TECHNICAL DATA

Applicable Standards:

- ASTM, American Society for Testing & Materials
- ASTM E 1745 Standard Specification for Water Vapor Retarders used in Contact with Soil or Granular Fill Under Concrete Slabs.
 - ASTM E 154 Standard Test Methods for Water Vapor Retarders used in Contact with Earth Under Concrete Slabs, on Walls, or as a Ground cover.
 - ASTM D 1709 Standard Test Methods for Impact Resistance of Plastic Films by the Free Falling Dart Method.
 - ASTM E 96 Standard Test Method for Water Vapor Transmission of Materials.
 - ASTM D 882 Standard Test Method for Tensile Properties of Thin Plastic Sheeting.
 - ASTM E 1643 Standard Practice for installation of Water Vapor Retarders used in Contact with Earth or Granular Fill Under Concrete Slabs.

3.0 PRODUCT DESCRIPTION

Uses: VB-350 (16 mil) Vapor Retarder is a high performance under slab vapor retarder developed for the construction industry to retard moisture migration through concrete slabs. It may also be used to control radon, methane, sulphates and many other soil contaminants.

3.1 COMPOSITION

VB-350 (16 mil) Vapor Retarder is manufactured to the highest standards with only high-grade virgin polyolefin resins. The manufacturing process for the VB-350 (16 mil) Vapor Retarder is made by IntePlus® XF Film, a three-layer, co-extruded, cross-laminated system.

ACI, American Concrete Institute

- ACI 302.1 R-04 Minimum Thickness (10 mil)

Table 1: Physical Properties of VB-350 (16 mil) Vapor Retarder

Classification	ASTM E 1745	Exceed Class A, B and C
Water Vapor Permeance	ASTM E 96	0.009 perms (US)
Tensile Strength	ASTM E 154-93 (ASTM D 882)	63 lbf/in
Puncture Resistance	ASTM D 1709	2750 grams
Life Expectancy	ASTM E 154	indefinite
Chemical Resistance	ASTM E 154	unaffected



Technical Data

VB-350 (16mil) Vapor Retarder

DIVISION: 07260, 03300

5.0 INSTALLATION

VB-350 (16 mil) Vapor Retarder shall be installed over tamped earth, sand or aggregate base by unrolling and completely covering area to receive building slab or specified area. Overlap all seams a minimum of 6" and seal with Barrier-Bac Seam Tape or heat weld. All penetrations must be sealed with Barrier-Bac membrane and Barrier-Bac Seam Tape per manufacturer's recommendations.

Specific project details and recommendations can be provided by *Inteplast Group* upon request.

6.0 AVAILABILITY & COST

VB-350 (16 mil) Vapor Retarder is available nationally through our network of building supply companies. Please contact our corporate office for a distributor in your area. VB-350 (16 mil) Vapor Retarder is cost efficient. Pricing can be obtained by contacting your local Barrier-Bac distributors or sales representatives.

7.0 WARRANTY

We warrant and guarantee our specifications as published. Published test results are based upon accepted

industry practice as well as the test methods called for and listed on our test documents. We believe, to the best of our knowledge, that our published results are accurate and reliable and that they represent our vapor retarder membrane. *Inteplast Group* cannot control site conditions and improper installation practices. Therefore, no warranty, expressed or implied, is given, including those of merchantability, fitness for a particular purpose or any other matter with respect to the product.

8.0 MAINTENANCE

No maintenance is required.

9.0 TECHNICAL SERVICES

Technical services for all of our products can be obtained by calling our corporate office.

Corporate Office:
(877)535-0555

10.0 FILING SYSTEMS

Barrier-Bac brochures are available from Barrier-Bac distributors, sales representatives, *Inteplast Group* and on our website:
<http://www.BarrierBac.com>



INTEPLAST GROUP

OFFICE: 9 Peach Tree Hill Rd., Livingston, NJ 07039
PLANT: 101 Inteplast Blvd., Lolita, TX 77971

TEL: 877-535-0555
FAX: 800-709-6002

E-MAIL: info@BarrierBac.com

WEB SITE: www.BarrierBac.com / www.inteplast.com

VB Series of Under Slab Vapor Barriers

VB Series - Description

VB Series vapor barriers are IntePlus® XF membranes constructed to restrict moisture migration through concrete slabs. Manufactured by Inteplast Group, these membranes are available in 11 and 16 mil thickness. VB Series vapor barriers are also offered as composites: IntePlus® membrane laminated to polypropylene nonwoven geotextiles, for added strength to meet the toughest performance specifications. These materials are made from virgin resins and have been independently tested against ASTM E 1745 requirements (Standard Test Methods for Water Vapor Barriers used in contact with earth under concrete slabs) showing superior permeance and physical properties.



VB-350 Longhorn Quarry Football Stadium, San Antonio, TX

VB Series - Application

VB Series vapor barriers restrict transmission of water vapor from passing upward through concrete slabs-on-grade. Properly installed VB Series vapor barriers will protect floors susceptible to moisture damage from vapor migration through the concrete slab. Also, VB Series vapor barriers significantly decrease interior moisture condensation, mold and help provide a dryer, healthier environment to your building.



VB Series - Availability

VB Series vapor barriers are available in roll sizes 12.75' x 200' in 11 mil and 12.75' x 150' in 16 mil thickness. Composite products can be delivered in roll size 12' x 150'. Other sizes are available upon request.

VB-250 Walgreens Distribution Warehouse, Houston, TX

Specifications: VB Series

VB-250 (250 gsm/11 mil) & VB-350 (350 gsm/16 mil)

VB-250 and VB-350 meet and/or exceed all ASTM E 1745 Class A requirements.

	Test Standards/Methods	VB-250	VB-350
Classification	ASTM E 1745-09	Exceed Class A, B and C	Exceed Class A, B and C
Water Vapor Permeance	ASTM E 96, Procedure B	0.020 (US Perms)	0.009 (US Perms)
		0.006 (WVT, g/h-m ²)	0.003 (WVT, g/h-m ²)
Tensile Strength	ASTM E 154-93 (ASTM D 882)	50 lbf/in	63 lbf/in
Puncture Resistance	ASTM D 1709	2400 grams	2750 grams
Life Expectancy	ASTM E 154-93	Indefinite	Indefinite
Chemical Resistance	ASTM E 154-93	unaffected	unaffected

Note: Information herein, to the best of our knowledge, are typical property values and intended as guides only. Inteplast Group makes no warranties as to the suitability for specific use of merchantability of products referred to, no guarantee, expressed or implied, is made as to product application for a particular use.

TEL: 877-535-0555

FAX: 800-709-6002

E-MAIL: info@BarrierBac.com

WEBSITE: www.BarrierBac.com



INTEPLAST GROUP

OFFICE: 9 Peach Tree Hill Rd., Livingston, NJ 07039
PLANT: 101 Inteplast Blvd., Lolita, TX 77971

APPENDIX J

""Gzco r ig'P qp/J c| ctf qwu'Y cwg'O cplguy

Please print or type
(Form designed for use on elite (12-pitch) typewriter.)

#1

NON-HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of
3. Generator's Name and Mailing Address			4011	
4. Generator's Phone (.....)				
5. Transporter 1 Company Name J & D Trucking	6. US EPA ID Number	A. Transporter's Phone 856-691-5145		
7. Transporter 2 Company Name	8. US EPA ID Number	B. Transporter's Phone		
9. Designated Facility Name and Site Address Salem County Utilities Authority 52 McKillip Road Alloway, NJ 08001		10. US EPA ID Number	C. Facility's Phone 856-935-7900	
11. Waste Shipping Name and Description			12. Containers No. Type	13. Total Quantity
a. Soil for Cover / Non-Hazardous / Non-Regulated			001 DT	P
b.				
c.				
d.				
D. Additional Descriptions for Materials Listed Above			E. Handling Codes for Wastes Listed Above	
15. Special Handling Instructions and Additional Information				
16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.				
Printed/Typed Name Deslauriers(agent)		Signature <i>[Signature]</i>		Month Day Year 03 15 07
17. Transporter 1 Acknowledgement of Receipt of Materials		Printed/Typed Name J & D Trucking JPE 110		Signature <i>[Signature]</i> Month Day Year 03 15 07
18. Transporter 2 Acknowledgement of Receipt of Materials		Printed/Typed Name		Signature Month Day Year
19. Discrepancy Indication Space				
20. Facility Owner or Operator Certification of Receipt of waste materials covered by this manifest except as noted in Item 19.				
Printed/Typed Name Salem County Utilities Authority		Signature		Month Day Year

GENERATOR

TRANSPORTER

FACILITY