FORMER
110th STREET SERVICE STATION

2040 FREDERICK DOUGLAS BOULEVARD
HARLEM NEW YORK
Block 1826 Lot 1

Site Management Plan

NYSDEC Site Number: C231087

Prepared for:
Crescent 110 Equities LLC
316 West 118th Street
New York, NY 10026

AMC Engineering PLLC
99 Jericho Turnpike, Suite 300J
Jericho, NY 11753

Revisions to Final Approved Site Management Plan:

Revision #	Submitted Date	Summary of Revision	DEC Approval Date

DECEMBER 2015

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CERTIFICATIONS

I, Ariel Czemerinski, certify that I am currently a NYS registered professional engineer and that this Site Management Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

076508	12/3/2015	
NYS Professional Engineer #	Date	Signature

Site Management Plan
Former 110th Street Service Station

LIST OF ACRONYMS

Acronym	Definition
AMC	AMC Engineering
AWQS	Ambient Water Quality Standards
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
BTEX	Benzene, Toluene, Ethylbenzene and Xylene
CQMP	Construction Quality Management Plan
DUSR	Data Usability Statement Report
EBC	Environmental Business Consultants
FER	Final Engineering Report
HDPE	High Density Polyethylene
IRM	Interim Remedial Measure
NYC	New York City
NYCDEP	New York City Department of Environmental Protection
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PS	Public School
PVC	Polyvinyl Chloride
RAO	Remedial Action Objectives
RAWP	Remedial Action Work Plan
RI	Remedial Investigation
RSCOs	Recommended Site Cleanup Objectives
SCG	Standards, Criteria, and Guidelines
SMMP	Soil/Materials Management Plan
SSDS	Sub-slab Depressurization System
SWPPP	Stormwater Pollution Prevention Plan
SVOCs	Semi-Volatile Organic Compounds
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds

ES EXECUTIVE SUMMARY

The following provides a brief summary of the controls implemented for the Site, as well as the inspections, monitoring, maintenance and reporting activities required by this Site Management Plan:

Site Identification: C231087 Former 110th Street Service Station

Institutional Controls:	1. The property may be used for restricted residential; commercial use
	2. The property may be used for : restricted residential use; • All ECs must be operated and maintained as specified in this SMP; • All ECs must be inspected at a frequency and in a manner defined in the SMP. • The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the NY City Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department. • Groundwater and other environmental or public health monitoring must be performed as defined in this SMP; • Data and information pertinent to site management must be reported at the frequency and in a manner as defined in this SMP; • All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP; • Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP; • Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP; • Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the Environmental Easement.
	3. All ECs must be inspected at a frequency and in a manner defined in the SMP.

Site Identification: C231087 Former 110th Street Service Station

Engineering Controls:	1. Cover system 2. Chemical Oxidant Treatment	
Inspections:		Frequency
1. Cover inspection		Annually
Monitoring:		
1. Groundwater Monitoring Wells MW1501-1506, MW6		Quarterly
Reporting:		
1. Groundwater Data		Quarterly
2. Periodic Review Report		Annually

Further descriptions of the above requirements are provided in detail in the latter sections of this Site Management Plan.

1.0 INTRODUCTION

1.1 General

This Site Management Plan (SMP) is a required element of the remedial program for the Former 110th Street Service Station located in Harlem, New York (hereinafter referred to as the "Site"). See **Figure 1**. The Site is currently in the New York State (NYS) Brownfield Cleanup Program (BCP) Site No. C231087 which is administered by New York State Department of Environmental Conservation (NYSDEC).

Cresent 110 Equities LLC entered into a Brownfield Cleanup Agreement (BCA), on April 21, 2014 with the NYSDEC to remediate the site. A figure showing the boundaries of this site is provided in **Figure 2**. The boundaries of the site are more fully described in the metes and bounds site description that is part of the Environmental Easement provided in **Attachment A**.

After completion of the remedial work, some contamination was left at this site, which is hereafter referred to as "remaining contamination". Institutional and Engineering Controls (ICs and ECs) have been incorporated into the site remedy to control exposure to remaining contamination to ensure protection of public health and the environment. An Environmental Easement granted to the NYSDEC, and recorded with the New York County Clerk, requires compliance with this SMP and all ECs and ICs placed on the site.

This SMP was prepared to manage remaining contamination at the site until the Environmental Easement is extinguished in accordance with ECL Article 71, Title 36. This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor of the Environmental Easement and the grantor's successors and assigns. This SMP may only be revised with the approval of the NYSDEC.

It is important to note that:

This SMP details the site-specific implementation procedures that are required by the Environmental Easement. Failure to properly implement the SMP is a violation of the

Environmental Easement, which is grounds for revocation of the Certificate of Completion (COC);

Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6NYCRR Part 375 and the BCA Site # C231087-04-14 for the site, and thereby subject to applicable penalties.

All reports associated with the site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State. A list of contacts for persons involved with the site is provided in **Attachment B** of this SMP.

This SMP was prepared by AMC Engineering, PLLC, on behalf of Cresent 110 Equities LLC, in accordance with the requirements of the NYSDEC's DER-10 ("Technical Guidance for Site Investigation and Remediation"), dated May 2010, and the guidelines provided by the NYSDEC. This SMP addresses the means for implementing the ICs and/or ECs that are required by the Environmental Easement for the site.

Crescent 110 Equities LLC will be responsible for implementing the requirements of the SMP until the closing of the first condominium unit at which point the Condominium Board (Board) shall assume the obligations of the SMP. Within thirty (30) days after the first condominium unit closing, the Board shall send a notice to NYSDEC advising NYSDEC that such first condominium unit closing has occurred and that the Board has assumed responsibility for implementing the SMP.

1.2 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. Revisions will be necessary upon, but not limited to, the following occurring: a change in media monitoring requirements, upgrades to or shut-down of a remedial system, post-remedial removal of contaminated sediment or soil, or other significant change to the site conditions. In accordance with the Environmental Easement for the site, the NYSDEC will provide a notice of any approved changes to the SMP, and append these notices to the SMP that is retained in its files.

1.3 Notifications

Notifications will be submitted by the property owner to the NYSDEC, as needed, in accordance with NYSDEC's DER – 10 for the following reasons:

- 60-day advance notice of any proposed changes in site use that are required under the terms of the BCA, 6NYCRR Part 375 and/or Environmental Conservation Law.
- 7-day advance notice of any field activity associated with the remedial program.
- 15-day advance notice of any proposed ground-intrusive activity pursuant to the Excavation Work Plan.
- Notice within 48-hours of any damage or defect to the foundation, structures or EC that reduces or has the potential to reduce the effectiveness of an EC, and likewise, any action to be taken to mitigate the damage or defect.
- Verbal notice by noon of the following day of any emergency, such as a fire; flood; or earthquake that reduces or has the potential to reduce the effectiveness of ECs in place at the site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action submitted to the NYSDEC within 45 days describing and documenting actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the site or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser/Remedial Party has been provided with a copy of the Brownfield Cleanup Agreement (BCA) and all approved work plans and reports, including this SMP.

- Within 15 days after the transfer of all or part of the site, the new owner's name, contact representative, and contact information will be confirmed in writing to the NYSDEC.

Table 1 below and in the Tables section of this SMP includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in **Attachment B**.

Table 1: Notifications*

Name	**Contact Information**
Dana Mecomber	(718) 482-7541, dana.mecomber@dec.ny.gov
Jane O'Connell	(718) 482-4599, jane.oconnell@dec.ny.gov
Kelly Lewandowski	518-402-9581, kelly.lewandowski@dec.ny.gov

* Note: Notifications are subject to change and will be updated as necessary.

2.0 SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

2.1 Site Location and Description

The Site is located on the northeast corner of Frederick Douglass Boulevard and W. 110th Street, Harlem, New York (**Figure 1**), and is designated as Block 1826 Lot 1 by the New York City Department of Assessment. The Lot has 73 feet of street frontage on Frederick Douglass Boulevard, approximately 160 feet of frontage along Frederick Douglass Circle, approximately 125 feet along West 11th Street and approximately 9 feet of frontage along Central Park North (W. 110th Street) for a total area of 13,513 square feet (0.31 acres) (see **Figure 2**). The boundaries of the site are more fully described in **Attachment A**.

The owner(s) of the site parcel(s) at the time of issuance of this SMP is:

Cresent 110 Equities LLC

2.2 Physical Setting

2.2.1 Land Use

The property has an elevation of approximately 48 feet above the National Geodetic Vertical Datum (NGVD) feet. The Site is zoned R8A Residential with a C1-4 Commercial overlay and is currently under construction with a new 12-story multi-use building. Site occupants when construction is completed will include retail, community and residential.

The Site is uniquely situated opposite the northwest corner of Central Park. The surrounding land use is primarily residential or a mix of first floor retail and residential to the east, west and south, along with a mix of commercial and residential uses to the north. Morningside Park is one block to the west with the Columbia University campus located just northwest of the park. There are several building which have been assigned landmark status within 1/2 mile of the project Site.

2.2.2 Geology

The geologic setting of Manhattan is well documented and consists of crystalline bedrock overlain by layers of unconsolidated deposits. The bedrock is a high-grade metamorphic rock consisting of a sequence of Cambrian and Ordovician age gneiss, schistose-gneiss, and marble. The bedrock is characterized by numerous faults and fractures, many of which contain groundwater. Unconsolidated sediments overlie the bedrock and consist of Pleistocene aged sand, gravel and silty clays, deposited by glacial-fluvial activity.

Subsurface soils at the site prior to excavation for the new building included a silty non-native fill with brick, concrete and other rubble to a depth of approximately 15 feet below grade. A native brown silty sand is present immediately below the fill material with silty clay at depths ranging from 22 to 40 feet below grade, A Geologic cross-section is included as **Figure 3**. Site specific boring logs are provided in **Attachment C**.

2.2.3 Hydrogeology

The depth to groundwater beneath the site, as determined from field measurements, is approximately 35 feet below grade. Based on groundwater contour maps, groundwater flow is southeasterly.

A groundwater contour map is shown in **Figure 4**. Groundwater elevation data is provided in **Table 2**. Groundwater monitoring well construction logs are provided in **Attachment D**.

2.3 Investigation and Remedial History

The following narrative provides a remedial history timeline and a brief summary of the available project records to document key investigative and remedial milestones for the Site. Full titles for each of the reports referenced below are provided in Section 8.0 - References.

Previous owners of the property are shown below. The property was purchased by the requestor in December 2013. The building was vacant at that time and has remained so to the present.
The City of New York obtained title to the property through condemnation proceedings in 1974 which were part of a larger area wide urban renewal project. Tenants of the property included

110th Street Service Station Inc. who operated the station under Amoco and BP branding. In 1996, 110th Street Service Station Inc. purchased the property from the City through the NYC Economic Development Corporation to secure financing for improvements. The deed from the City to NYCEDC included a right of re-acquisition for the Grantor (the City). NYCEDC recently had the City assign the re-acquisition option to NYCEDC, which NYCEDC then exercised to re-acquire the Site and sell it to the requestor.

Previous Owners

Dates	Name	Comments	Contact Info
Prior to 8/15/1974	City of New York	Condemnation proceedings	Municipal Building, 1 Centre Street New York, NY 10007
From 8/15/1974 to 7/24/1996	City of New York	Condemnation proceedings	Municipal Building, 1 Centre Street New York, NY 10007
From 7/24/1996 to 8/7/1996	Economic Development Corporation	Deed	110 William St, New York, NY 10038
From 8/7/1996 to 12/20/2013	110th Street Service Station Incorporated	Deed	Roee Wiczyk C/O Robert A Korren, PLLC 1 Barker Ave Suite 485 White Plains, New York, 10601
From 12/19/2013 to Present	Crescent 110 Equities, LLC	Deed	316 West 118th Street, New York, NY 10026

Investigations performed at the Site include the following:

- Phase I Environmental Site Assessment, 2040 Frederick Douglas Boulevard, NY. Environmental Business Consultants, October 14, 2013.
- Spill File 9509121 Documents from FOIA Request.

October 2013 Phase I Environmental Assessment Report (EBC)

A Phase I Environmental Site Assessment (ESA) report was prepared by Environmental Business Consultants (EBC) in October 2013.

According to a review of NYC records, City Directory Listings and Sanborn maps, as well as personal interviews, the Site the northwest portion of the Site was originally developed in 1912 with a single-story building and a booth occupied by Aero Drome, a moving pictures company. In 1922, the Site was developed with a two-story commercial building in the northern portion. In

1922, this two-story building (with a cellar) was occupied by stores on the first floor and a dance hall and a billiard parlor on the second floor. In 1951, the first floor of this building was occupied by a gasoline station and auto repair facility with the second floor occupied by offices. Six 550-gallon and two 1000-gallon gasoline tanks were depicted in the southwest portion of the Site in the 1951 Sanborn map. The present day commercial building located in the eastern portion of the Site was constructed in 1955 and since the time of construction of this building to the present day, the Site has been utilized as a gasoline station.

The Phase I identified the historic use of the property as a gas station and auto repair shop as noted in Sanborn Fire Insurance maps from 1951 to 2007 as recognized environmental conditions (RECs) requiring further investigation.

The Phase I noted that the subject site has been assigned an E-designation (E-120) for Hazardous Materials Phase I and Phase II Testing Protocol (Hazmat-E) as part of the rezoning adopted in November of 2003 as part of the Frederick Douglas Boulevard rezoning action (CEQR No. 03DCP026M).

Any development scenario for the Site is subject to the E-designation Environmental Review Program administered by the NYCOER due to the hazardous materials and Noise “E” designations assigned to the Site.

The Hazmat E requires a detailed environmental review and release by the NYC Office of Environmental Remediation (NYCOER). Such reviews require a full subsurface investigation, remedial and health and safety planning, implementation of a remedial program and documentation that the remedial program was completed during redevelopment of the property.

The Phase I recommended the following:

"Based on the information contained in the DEC files, remediation of the property has not been completed. This will require continuation of current remedial actions or alternate remedial actions as needed to close the spill file. In addition, alternate and / or supplemental methods may

be needed to complete the remediation under a redevelopment scenario. At a minimum this would include removal of the USTs, dispensers and piping, and excavation of impacted soil. Since there is no data concerning other areas of the property including the dispenser area, it is possible that other areas of the Site are contaminated as well."

"Redevelopment will also require a full environmental review under the E-designation. This will include the collection and analysis of soil, soil vapor and groundwater across the entire site for an expanded list of parameters. Samples will be collected from areas of concern including the hydraulic lift area, garage area and dispenser area."

"EBC therefore recommends that a full Phase II investigation be completed under a NYC OER approved Remedial Investigation Work Plan. Upon receipt of the laboratory results a Remedial Work Plan which addresses existing petroleum contamination and any additional issues as identified under the RI should be developed which incorporates the contemplated redevelopment scenario for the property. This Remedial Work Plan should then be submitted to the NYSDEC and NYCOER for approval.".

Spill File 9509121 Documents from FOIA Request

The following documents were received by the NYSDEC in response to a FOIA request made in October 2013.

- A NYSDEC Spill Response form dated September 24, 1995 in reference to spill # 9509121.

- A NYSDEC Stipulation Letter was executed on March 7, 2006 for the Site. This letter indicates that the owner of the Site 110th Street Service Station has agreed to clean up and remove a discharge of petroleum which occurred at the Site by taking the steps and according to condition which were set forth in the Corrective Action Plan.

- On March 9, 2006, Impact Environmental submitted an addendum to the RAP which stated proposed changes to the Soil Vapor Extraction system discharge location to

address concerns of the NYSDEC. The exhaust location was moved to five feet above the gas station roof.

- A NYSDEC letter dated March 17, 2006 noted the approval of the RAP addendum letter, which was dated March 9, 2006.

- A NYSDEC letter dated April 13, 2009 requested the installation of additional monitoring wells for the Site. The Department required three additional ground water monitoring wells must be installed at the site. These ground water monitoring wells must not be tied into the remedial system in order to better monitor system effectiveness. One monitoring well must be installed in the source area immediately south of the UST. One monitoring well must be installed south of MW-6 to ensure free product is not migrating towards the subway. One monitoring well must be installed north of SVElMW4 to ensure free product does not migrate beneath the neighboring residential properties. An Investigation Work Plan must be submitted to the Department within 30 days detailing the proposed monitoring well installation. The Investigation Work Plan must have an implementation schedule for the work and submission of a report.

- A revised Investigation Plan by Impact Environmental dated September 3, 2009 indicates that revisions were made to further delineate the extent of free product on the site to test the current soil conditions. Four (4) additional wells were installed in the following locations;

    - On site approximately 20 feet to the east of monitoring well MW-4.
    - In the sidewalk approximately 25 feet southwest of MW-6.
    - On site, to the west of the UST location.
    - In the source area between SVE/MW-2 and SVE/MW-3.
    - In addition, MW-6 will be re-drilled in the same location and a two inch diameter well will be installed in order to facilitate the recovery of free product.

- Wells not containing free product will be purged and sampled. Additional soil sampling was proposed for the Site. During monitoring well installation, soil samples will be collected continuously from the surface to five feet below the water table. Samples collected will be screened utilizing a photo ionization detector (PID). From each well location, the sample collected at the water table, and the sample with the highest PID reading or apparent contamination will be containerized for laboratory analysis. In addition, investigation and monitoring reports will be issued summarizing sampling preformed.

- A letter from the NYSDEC to Impact Environmental reviewed the Investigation plan and made the following comments:

    - Soil Sampling - During monitoring well installation, soil samples should be collected. The soil boring should extend a minimum of 5 ft below the water table. The soil sample at the water table and the sample with the highest PID or apparent contamination above or below the water table should be collected for laboratory analysis.

    - Source Area Monitoring Well - At the meeting we discussed the requirement for placing a ground water monitoring well which is not connected to the system in the source area in between SVE/MW2 and SVE/MW3. No source area monitoring well was proposed in this area in this plan.

    - A request for a work plan modification by Impact Environmental was submitted to the NYSDEC on April 2, 2010. A change in the location for SVE/MW-5 was requested to be moved further south.

NYSDEC Facility Information Report dated September 9, 2013 indicated that the Site is currently equipped with one (1) 550-gallon waste oil UST and four (4) 8,000-gallon gasoline USTs, which were installed in 1999. These USTs are currently registered and were last inspected on September 22, 2010. Registration expiries September 15, 2018. The Site was formerly

equipped with thirteen (13) 550-gallon gasoline USTs which were installed in 1998 and one (1) 4,000-gallon gasoline UST.

2.4 Remedial Action Objectives

The Remedial Action Objectives (RAOs) for the Site as listed in the Decision Document dated September 2014 are as follows:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater containing contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure to, contaminants volatilizing from contaminated soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

Soil Vapor

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at the Site.

2.5 Remaining Contamination

2.5.1 Soil

The majority of the Site was excavated to a depth of approximately 30 feet below grade. Areas along the east property line and southeast corner were excavated to 15 feet while a 4 ft strip along the west property line and a 7 ft x 19 ft area along the northwest corner remained unexcavated (see **Figure 5**). Over excavation was performed at several locations to either meet SCOs or to accommodate structural elements of the new building as follows:

HS5 - 35 ft

HS6 - 32.5 ft

HS7 - 33 ft

HS8 - 35 ft

HS10 - 34 ft

EP11 - 36.5 ft

EP13 - 36 ft

EP14 - 34.5 ft

Elevator Pit (passengers) - 35 ft

Elevator Pit (automobile) - 34 ft.

Endpoint soil samples collected following excavation indicate that soil remains at the Site with constituents above Unrestricted Use, Restricted Residential Use and Groundwater Protection SCOs at some locations. These areas include metals above Unrestricted SCOs at depths of 15-16 ft and 27-28 ft along the along east, west, southeast corner and northwest corner property lines, pesticides above Unrestricted SCOs at a depth of 28 ft in the northwest corner of the site, SVOCs above Restricted Residential SCOs in the northwestern corner of the Site and petroleum VOCs above Groundwater Protection SCOs at 33 feet in HS7 and at 27 feet at one location near the east property line.

Parameters reported above Unrestricted Use, Restricted Residential Use or Groundwater Protection SCOS following the remedial action are provided in **Table 3** and posted in **Figure 6**. Petroleum contaminated soil may be encountered if excavation is done to a depth greater than 3

feet below the existing cellar slab in the HS7 source area, or below a depth of 25 feet in the vicinity of SWEP8 located between the east wall of the building's cellar level and the east property line.

Petroleum contaminated soil within the HS7 hotspot area is being remediated through chemical oxidant injections. Groundwater performance samples will be collected from the monitoring well network to upon completion of remediation to demonstrate achievement of improvement in groundwater quality downgradient of this area. The petroleum contamination in the vicinity of SWEP8 has been isolated and rendered inert by a three foot thick concrete cap at 15 feet below grade and by cement grout injections both above and below the zone of impacted soil.

2.5.2 Groundwater

Remaining petroleum impact to on-site groundwater above standards is limited to benzene in monitoring wells MW1502 (4.7 ug/L) and MW1503 (1.6 ug/L). Benzene was highest in MW1502, immediately down gradient of the HS8 source area. Groundwater exceedances for all VOC parameters are listed below.

Remaining On-Site Groundwater Sample Exceedences

COMPOUND	**NYSDEC GQS**	**MW1502**	**MW1503**
	µg/L	10/1/2015 µg/L	10/1/2015 µg/L
Acetone	50	140	240
Benzene	1	4.7	1.6
Bromomethane	5	31	17
Chloromethane	5	130	180

Note that acetone is a common laboratory introduced contaminant and was not identified during the RI as a Site-related contaminant. Bromomethane and chloromethane are also not known to be Site-related contaminants and were not reported to be present in soil or groundwater during the RI.

VOCs above standards were reported in two of the three off-site wells (MW1504, MW1506) and included: 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, benzene, ethylbenzene, isopropylbenzene, n-propylbenzene, sec-butyl benzene, 2-isopropylbenzene, xylene and chloromethane.

Table 4 and **Figure 7** summarize the results of all samples of groundwater that exceed the SCGs after completion of the remedial action.

Remediation of dissolved phase VOCs in groundwater is being accomplished through a chemical oxidant injection program. The area of injection is within and up gradient of the source area. Injections at these locations will deliver oxidant to the subsurface allowing it to flow south-southeast with groundwater treating both residual contaminants in soil and the groundwater. The injection program will utilize up to twelve new injections wells (IW3, IW4, IW6, IW7, IW11, IW13-IW19, IW21) for oxidant application. The need for subsequent applications will be determined following the collection and analysis of performance monitoring samples from the monitoring wells (MW1501-1506, MW6).

2.5.3 Soil Vapor

A soil vapor intrusion evaluation was completed during the Remedial Investigation. Based on that evaluation, additional actions were needed to address the potential for exposures via soil vapor intrusion at the site. However, the majority of the Site was excavated to a depth of approximately 30 feet below grade, to remediate the residual groundwater contamination, a chemical oxidant injection program has been implemented and lastly the sub-cellar level of the building will be utilized as a parking garage (see **Figure 8**). The parking garage will be ventilated in accordance with the NYC Mechanical Code. These remedial actions have reduced the potential for soil vapor intrusion concerns at the Site.

3.0 INSTITUTIONAL AND ENGINEERING CONTROL PLAN

3.1 General

Since remaining contamination exists at the site, Institutional Controls (ICs) and Engineering Controls (ECs) are required to protect human health and the environment. This IC/EC Plan describes the procedures for the implementation and management of all IC/ECs at the site. The IC/EC Plan is one component of the SMP and is subject to revision by the NYSDEC.

This plan provides:

- A description of all IC/ECs on the site;
- The basic implementation and intended role of each IC/EC;
- A description of the key components of the ICs set forth in the Environmental Easement;
- A description of the controls to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of IC/ECs, such as the implementation of the Excavation Work Plan (EWP) (as provided in **Attachment E** for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the site; and
- Any other provisions necessary to identify or establish methods for implementing the IC/ECs required by the site remedy, as determined by the NYSDEC.

3.2 Institutional Controls

A series of ICs is required by the Decision Document to: (1) implement, maintain and monitor Engineering Control systems; (2) prevent future exposure to remaining contamination; and, (3) limit the use and development of the site to Restricted Residential uses only. Adherence to these ICs on the site is required by the Environmental Easement and will be implemented under this SMP. ICs identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement. The IC boundaries are shown on **Figure 9**. These ICs are:

- The property may be used for : restricted residential use;
- All ECs must be operated and maintained as specified in this SMP;
- All ECs must be inspected at a frequency and in a manner defined in the SMP.
- The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the NY City Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department.
- Groundwater and other environmental or public health monitoring must be performed as defined in this SMP;
- Data and information pertinent to site management must be reported at the frequency and in a manner as defined in this SMP;
- All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP;
- Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP;
- Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP;
- Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the Environmental Easement;
- Vegetable gardens and farming on the site are prohibited (refers to gardening in on-site soil and does not prohibit raised gardens, rooftop gardens, etc.)

3.3 Engineering Controls

3.3.1 Cover (or Cap)

Exposure to remaining contamination at the site is prevented by a cover system placed over the Track 4 portions of the Site. This cover system is comprised of concrete-covered sidewalks and concrete building slabs. **Figure 10** presents the location of the cover system and applicable demarcation layers. The Excavation Work Plan (EWP) provided in **Attachment E** outlines the procedures required to be implemented in the event the cover system is breached, penetrated or

temporarily removed, and any underlying remaining contamination is disturbed. Procedures for the inspection of this cover are provided in the Monitoring and Sampling Plan included in Section 4.0 of this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and associated Community Air Monitoring Plan (CAMP) prepared for the site and provided in **Attachments F** and **G**, respectively.

3.3.2 Chemical Oxidant Treatment

To continue reductions in any remaining residual mass of VOCs in groundwater within the petroleum "hotspot" areas, a chemical oxidant (sodium persulfate) will be injected into the groundwater at the locations with remaining petroleum VOCs in groundwater.

Sodium persulfate will be delivered to the site as a dry powder and mixed with an activator (chelated iron, calcium peroxide or sodium hydroxide) and water to form a 10 to 20% solution. The initial application consisted of approximately 2,688 pounds of oxidant and activator.

Injection well points were installed to a depth of approximately 45 feet below grade with 10 feet of PVC screen. Subsequent applications of oxidant will be calculated based upon data obtained from performance monitoring samples following the initial application.

The overall oxidant demand, in pounds of activated persulfate, needed to complete the remediation of the Site, requires an estimate of contaminant mass in groundwater. The estimate of contaminant mass for each parameter in groundwater was performed by assigning the highest concentration for each parameter reported in groundwater following the completion of remedial actions. The total contaminant mass for each parameter was then calculated by multiplying the area of the zone by the depth of impact, porosity and stoichiometric demand. The total contaminant demand to remediate the VOCs in groundwater was calculated at 4.87 pounds of activated persulfate.

The need for subsequent applications will be determined following the collection and analysis of performance monitoring samples. Minimal oxidant will be lost to soil due to the presence of medium sand immediately below the clay zone.

Procedures for performing the chemical oxidant injections are documented in the Operation and Maintenance Plan (Section 5.0 of this SMP). The locations of the injection wells are shown in **Figure 11**.

3.3.3 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.4 of NYSDEC DER-10.

3.3.3.1 Cover (or Cap)

The composite cover system is a permanent control and the quality and integrity of this system will be inspected at defined, regular intervals in accordance with this SMP in perpetuity.

3.3.3.2 Oxidant Injections

Oxidant injections will continue until significant reductions are no longer achieved an asymptotic levels are indicated.

3.3.3.3 Monitoring Wells associated with Monitored Natural Attenuation

Groundwater monitoring activities to assess the effectiveness of the remedy and natural attenuation will continue, as determined by the NYSDEC with consultation with NYSDOH, until residual groundwater concentrations are found to be consistently below ambient water quality standards, the site SCGs, or have become asymptotic at an acceptable level over an extended period. In the event that monitoring data indicates that monitoring for natural attenuation may no longer be required, a proposal to discontinue the system will be submitted by the remedial party. Monitoring will continue until permission to discontinue is granted in writing by the NYSDEC. If groundwater contaminant levels become asymptotic at a level that is not acceptable to the NYSDEC, additional source removal, treatment and/or control measures will be evaluated.

4.0 Monitoring and Sampling Plan

4.1 General

This Monitoring and Sampling Plan describes the measures for evaluating the overall performance and effectiveness of the remedy. This Monitoring and Sampling Plan may only be revised with the approval of the NYSDEC. Details regarding the sampling procedures, data quality usability objectives, analytical methods, etc. for all samples collected as part of site management for the site are included in the Quality Assurance Project Plan provided in **Attachment H**.

This Monitoring and Sampling Plan describes the methods to be used for:

- Sampling and analysis of all appropriate media (e.g., groundwater);
- Assessing compliance with applicable NYSDEC standards, criteria and guidance (SCGs), particularly groundwater standards and Part 375 SCOs for soil; and
- Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment;

To adequately address these issues, this Monitoring and Sampling Plan provides information on:

- Sampling locations, protocol and frequency;
- Information on all designed monitoring systems;
- Analytical sampling program requirements;
- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and
- Annual inspection and periodic certification.

Reporting requirements are provided in Section 7.0 of this SMP.

4.2 Site-Wide Inspection

Site-wide inspections will be performed at a minimum of once per year. Modification to the frequency or duration of the inspections will require approval from the NYSDEC. Site-wide inspections will also be performed after all severe weather conditions that may affect ECs or monitoring devices. During these inspections, an inspection form will be completed as provided in **Attachment I** – Site Management Forms. The form will compile sufficient information to assess the following:

- Compliance with all ICs, including site usage;
- An evaluation of the condition and continued effectiveness of ECs;
- General site conditions at the time of the inspection;
- The site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection; and
- Confirm that site records are up to date.

Inspections of all remedial components installed at the site will be conducted. A comprehensive site-wide inspection will be conducted and documented according to the SMP schedule, regardless of the frequency of the Periodic Review Report. The inspections will determine and document the following:

- Whether ECs continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Environmental Easement;
- Achievement of remedial performance criteria; and
- If site records are complete and up to date; and

Reporting requirements are outlined in Section 7.0 of this plan.

Inspections will also be performed in the event of an emergency. If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs that reduces or has the potential

to reduce the effectiveness of ECs in place at the site, verbal notice to the NYSDEC must be given by noon of the following day. In addition, an inspection of the site will be conducted within 5 days of the event to verify the effectiveness of the IC/ECs implemented at the site by a qualified environmental professional, as determined by the NYSDEC. Written confirmation must be provided to the NYSDEC within 7 days of the event that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

4.3 Post-Remediation Media Monitoring and Sampling

Groundwater performance monitoring samples will be collected from seven monitoring well locations, installed within and downgradient of the treatment area on a routine basis. Sampling locations, required analytical parameters and schedule are provided in **Table 5** – Post Remedial Sampling Requirements and Schedule below. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

Table 5 – Post Remediation Sampling Requirements and Schedule

Sampling Location	**Analytical Parameters**				**Schedule**
	VOCs (EPA 8260C)	SVOCs (EPA 8270D)	pH (field)	Persulfate (field)	
MW1501	X	X	X	X	4 weeks after oxidant injection, then quarterly
MW1502	X	X	X	X	4 weeks after oxidant injection, then quarterly
MW1503	X	X	X	X	4 weeks after oxidant injection, then quarterly
MW1504	X	X	X	X	4 weeks after oxidant injection, then quarterly
MW1505	X	X	X	X	4 weeks after oxidant injection, then quarterly
MW1506	X	X	X	X	4 weeks after oxidant injection, then quarterly
MW6	X	X	X	X	4 weeks after oxidant injection, then quarterly

Detailed sample collection and analytical procedures and protocols are provided in **Attachment J** – Field Activities Plan and **Attachment H** – Quality Assurance Project Plan.

4.3.1 Groundwater Sampling

Groundwater monitoring will be performed four weeks following each injection and then on a quarterly basis to assess the performance of the remedy. Modification to the frequency or sampling requirements will require approval from the NYSDEC. One groundwater sample will

be obtained in accordance with low flow sampling protocol from each monitoring well using dedicated polyethylene tubing, a check valve and a peristaltic pump. The sample will be drawn directly into pre-cleaned laboratory supplied glassware, stored in a cooler with ice. If free-phase gasoline or oil is reported in the sample, the DEC will be immediately notified. Samples will either be picked up at the Site by a laboratory dispatched courier at the end of the day or transported back to the EBC office where they will be picked up the following day by the laboratory courier. All samples will be analyzed by a NYSDOH ELAP certified environmental laboratory certified in the appropriate category. Field parameters including pH and persulfate will be taken in the field. pH will be recorded using a calibrated pH meter. Persulfate will be analyzed using a field titration test kit provided by the persulfate supplier.

The network of monitoring wells has been installed to monitor on-site and downgradient groundwater conditions at the site. This includes wells, MW1501, MW1502, MW1503, MW1505 which are located on-site and MW1504, MW1506 and MW6 which are located off-site and downgradient of the Site.

Table 6 summarizes the well identification number, purpose, location, depths, diameter and screened intervals of the wells. As part of the groundwater monitoring, four on-site wells and three downgradient wells are sampled to evaluate the effectiveness of the remedial system.

Table 6 – Monitoring Well Construction Details

Monitoring Well ID	Well Location	Coordinates (long/lat)	Well Dia. (in.)	Elevation (above mean sea level)			
				Casing	Surface	Screen Top	Screen Bottom
MW1501	On-site	40.800665°N 73.957457°W	1	22.54	22.82	12.82	2.82
MW1502	On-site	40.800743°N 73.957427°W	1	22.65	22.80	12.80	2.80
MW1503	On-site	40.800837°N 73.957451° W	1	22.61	22.82	12.82	2.82
MW1504	downgradient Off-site	40.800743°N, 73.957557° W	1	50.04	50.16	15.16	5.16
MW1505	downgradient Off-site	40.800927°N, 73.957600° W	1	22.66	22.83	12.83	2.83
MW1506	downgradient Off-site	40.800509° N, 73.957579° W	1	48.01	48.15	13.15	3.15
MW6	downgradient Off-site	40.800650° N, 73.957584° W	1	49.30	49.58	14.58	4.58

Monitoring well construction logs are included in **Attachment D** of this document.

If biofouling or silt accumulation occurs in the on-site and/or off-site monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced, if an event renders the wells unusable.

Repairs and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance.

The NYSDEC will be notified prior to any repair or decommissioning of any monitoring well for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent Periodic Review Report. Well decommissioning without replacement will be done only with the prior approval of the NYSDEC. Well abandonment will be performed in accordance with NYSDEC's guidance entitled "CP-43: Groundwater Monitoring Well Decommissioning Procedures." Monitoring wells that are decommissioned because they have been rendered unusable will be replaced in kind in the nearest available location, unless otherwise approved by the NYSDEC.

The sampling frequency may only be modified with the approval of the NYSDEC. This SMP will be modified to reflect changes in sampling plans approved by the NYSDEC. Deliverables for the groundwater monitoring program are specified in Section 7.0 – Reporting Requirements.

4.3.2 Monitoring and Sampling Protocol

All sampling activities will be recorded in a field book and associated sampling log as provided in **Attachment I** - Site Management Forms. Other observations (e.g., groundwater monitoring well integrity, etc.) will be noted on the sampling log. The sampling log will serve as the inspection form for the monitoring network. Additional detail regarding monitoring and sampling protocols are provided in the site-specific Field Activities Plan provided as **Attachment J** of this document.

5.0 OPERATION AND MAINTENANCE PLAN

5.1 General

The site remedy does not rely on any mechanical systems, such as groundwater treatment systems, sub-slab depressurization systems or air sparge / soil vapor extraction systems to protect public health and the environment. Therefore, the operation and maintenance of such components is not included in this SMP.

6.0 PERIODIC ASSESSMENTS/EVALUATIONS

6.1 Climate Change Vulnerability Assessment

Increases in both the severity and frequency of storms/weather events, an increase in sea level elevations along with accompanying flooding impacts, shifting precipitation patterns and wide temperature fluctuation, resulting from global climactic change and instability, have the potential to significantly impact the performance, effectiveness and protectiveness of a given site and associated remedial systems. Vulnerability assessments provide information so that the site and associated remedial systems are prepared for the impacts of the increasing frequency and intensity of severe storms/weather events and associated flooding.

This section provides a summary of vulnerability assessments that will be conducted for the site during periodic assessments, and briefly summarizes the vulnerability of the site and/or engineering controls to severe storms/weather events and associated flooding.

The Site is located in the north central area of Manhattan, NY City. It is located at an elevation of 49 feet above sea level and is flanked to the west by the Morningside Heights highlands which rise to an elevation of +100 ft. As such the site is not located within a flood hazard area. The concrete building slab is approximately three feet thick and along with other three foot thick foundation elements, covers the entire Site. The Site is served by the NYC Municipal sewer system and the completed building will meet all NYC building codes for drainage. Therefore the Site is not considered to be vulnerable to storm events related to climate change.

6.2 Green Remediation Evaluation

NYSDEC's DER-31 Green Remediation requires that green remediation concepts and techniques be considered during all stages of the remedial program including site management, with the goal of improving the sustainability of the cleanup and summarizing the net environmental benefit of any implemented green technology. This section of the SMP provides a summary of any green remediation evaluations to be completed for the site during site management, and as reported in the Periodic Review Report (PRR).

6.2.1 Timing of Green Remediation Evaluations

For major remedial system components, green remediation evaluations and corresponding modifications will be undertaken as part of a formal Remedial System Optimization (RSO), or at any time that the Project Manager feels appropriate, e.g. during significant maintenance events or in conjunction with storm recovery activities.

Modifications resulting from green remediation evaluations will be routinely implemented and scheduled to occur during planned/routine operation and maintenance activities. Reporting of these modifications will be presented in the PRR.

6.2.2 Chemical Injections

Chemical injections will be performed in such a manner as to conserve materials and resources to the greatest extent possible. Consideration will be given to energy usage, as appropriate.

6.2.3 Frequency of Sampling and Other Periodic Activities

Transportation to and from the Site and use of consumables in relation to visiting the Site in order to conduct system checks and or collect samples and shipping samples to a laboratory for analyses have direct and/or inherent energy costs. The schedule and/or means of these periodic activities have been prepared so that these tasks can be accomplished in a manner that does not impact remedy protectiveness but reduces expenditure of energy or resources.

As part of this effort consideration shall be given to:

- Reduced sampling frequencies;
- Reduced site visits and system checks;
- Coordination/consolidation of activities to maximize foreman/labor time; and
- Use of mass transit for site visits, where available.

6.3 Remedial System Optimization

A Remedial Site Optimization (RSO) study will be conducted any time that the NYSDEC or the remedial party requests in writing that an in-depth evaluation of the remedy is needed. An RSO may be appropriate if any of the following occur:

- The remedial actions have not met or are not expected to meet RAOs in the time frame estimated in the Decision Document;
- The management and operation of the remedial system is exceeding the estimated costs;
- The remedial system is not performing as expected or as designed;
- Previously unidentified source material may be suspected;
- Plume shift has potentially occurred;
- Site conditions change due to development, change of use, change in groundwater use, etc.;
- There is an anticipated transfer of the site management to another remedial party or agency; and
- A new and applicable remedial technology becomes available.

An RSO will provide a critique of a site's conceptual model, give a summary of past performance, document current cleanup practices, summarize progress made toward the site's cleanup goals, gather additional performance or media specific data and information and provide recommendations for improvements to enhance the ability of the present system to reach RAOs or to provide a basis for changing the remedial strategy.

The RSO study will focuses on overall site cleanup strategy, process optimization and management with the intent of identifying impediments to cleanup and improvements to site operations to increase efficiency, cost effectiveness and remedial time frames. Green remediation technology and principals are to be considered when performing the RSO.

7.0 REPORTING REQUIREMENTS

7.1 Site Management Reports

All site management inspection, maintenance and monitoring events will be recorded on the appropriate site management forms provided in **Attachment I**. These forms are subject to NYSDEC revision.

All applicable inspection forms and other records, including media sampling data and system maintenance reports, generated for the site during the reporting period will be provided in electronic format to the NYSDEC in accordance with the requirements of **Table 7** and summarized in the Periodic Review Report.

Table 7: Schedule of Interim Monitoring/Inspection Reports

Task/Report	Reporting Frequency*
Groundwater Monitoring and Treatment	Quarterly (1 month following sampling event, if ISCO injections are performed they will take place approx 1 mo. prior to GW sampling event)
Periodic Review Report	Annually, or as otherwise determined by the Department

* The frequency of events will be conducted as specified until otherwise approved by the NYSDEC.

All interim monitoring/inspections reports will include, at a minimum:

- Date of event or reporting period;
- Name, company, and position of person(s) conducting monitoring/inspection activities;
- Description of the activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet);

- Type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air, etc);
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);
- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- A determination as to whether contaminant conditions have changed since the last reporting event.

Routine maintenance event reporting forms will include, at a minimum:

- Date of event;
- Name, company, and position of person(s) conducting maintenance activities;
- Description of maintenance activities performed;
- Any modifications to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and,
- Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc., (attached to the checklist/form).

Non-routine maintenance event reporting forms will include, at a minimum:

- Date of event;
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Description of non-routine activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet); and

- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form).

Data will be reported in digital format as determined by the NYSDEC. Currently, data is to be supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link http://www.dec.ny.gov/chemical/62440.html.

7.2 Periodic Review Report

A Periodic Review Report (PRR) will be submitted to the Department beginning sixteen (16) months after the Certificate of Completion is issued. After submittal of the initial Periodic Review Report, the next PRR shall be submitted every 3 years to the Department or at another frequency as may be required by the Department. In the event that the site is subdivided into separate parcels with different ownership, a single Periodic Review Report will be prepared that addresses the site described in **Attachment A** Environmental Easement. The report will be prepared in accordance with NYSDEC's DER-10 and submitted within 30 days of the end of each certification period. Media sampling results will also be incorporated into the Periodic Review Report. The report will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the site.
- Results of the required annual site inspections and severe condition inspections, if applicable.
- All applicable site management forms and other records generated for the site during the reporting period in the NYSDEC-approved electronic format, if not previously submitted.
- A summary of any discharge monitoring data and/or information generated during the reporting period, with comments and conclusions.
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor, etc.), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends.

- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted in digital format as determined by the NYSDEC. Currently, data is supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link: http://www.dec.ny.gov/chemical/62440.html.

- A site evaluation, which includes the following:

  – The compliance of the remedy with the requirements of the site-specific RAWP, ROD or Decision Document;

  – The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;

  – Any new conclusions or observations regarding site contamination based on inspections or data generated by the Monitoring and Sampling Plan for the media being monitored;

  – Recommendations regarding any necessary changes to the remedy and/or Monitoring and Sampling Plan; and

  – Trends in contaminant levels in the affected media will be evaluated to determine if the remedy continues to be effective in achieving remedial goals as specified by the Decision Document.

  – The overall performance and effectiveness of the remedy.

If applicable add:

- A performance summary for all treatment systems at the site during the calendar year, including information such as:

  – The number of days the system operated for the reporting period;

  – The average, high, and low flows per day;

  – The contaminant mass removed;

  – A description of breakdowns and/or repairs along with an explanation for any significant downtime;

  – A description of the resolution of performance problems;

  – Alarm conditions;

  – Trends in equipment failure;

- A summary of the performance, effluent and/or effectiveness monitoring; and
- Comments, conclusions, and recommendations based on data evaluation.

7.2.1 Certification of Institutional and Engineering Controls

Following the last inspection of the reporting period, a qualified environmental professional will prepare, and include in the Periodic Review Report, the following certification as per the requirements of NYSDEC DER-10:

"For each institutional or engineering control identified for the site, I certify that all of the following statements are true:

- *The inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;*
- *The institutional control and/or engineering control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;*
- *Nothing has occurred that would impair the ability of the control to protect the public health and environment;*
- *Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;*
- *Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;*
- *If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;*
- *Use of the site is compliant with the environmental easement;*
- *The engineering control systems are performing as designed and are effective;*
- *To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program [and generally accepted engineering practices]; and*
- *The information presented in this report is accurate and complete.*

- *No new information has come to my attention, including groundwater monitoring data from wells located at the site boundary, if any, to indicate that the assumptions made in the qualitative exposure assessment of off-site contamination are no longer valid; and*

- *The assumptions made in the qualitative exposure assessment remain valid.*

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner/Remedial Party or Owner's/Remedial Party's Designated Site Representative] (and if the site consists of multiple properties): *[I have been authorized and designated by all site owners/remedial parties to sign this certification] for the site."*

The signed certification will be included in the Periodic Review Report.
The Periodic Review Report will be submitted, in electronic format, to the NYSDEC Central Office, Regional Office in which the site is located and the NYSDOH Bureau of Environmental Exposure Investigation. The Periodic Review Report may need to be submitted in hard-copy format, as requested by the NYSDEC project manager.

7.3 Corrective Measures Work Plan

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a Corrective Measures Work Plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the Corrective Measures Work Plan until it has been approved by the NYSDEC.

7.4 Remedial Site Optimization Report

In the event that an RSO is to be performed (see Section 6.3, upon completion of an RSO, an RSO report must be submitted to the Department for approval. The RSO report will document the research/ investigation and data gathering that was conducted, evaluate the results and facts obtained, present a revised conceptual site model and present recommendations. RSO

recommendations are to be implemented upon approval from the NYSDEC. Additional work plans, design documents, HASPs etc., may still be required to implement the recommendations, based upon the actions that need to be taken. A final engineering report and update to the SMP may also be required.

The RSO report will be submitted, in electronic format, to the NYSDEC Central Office, Regional Office in which the site is located, Site Control and the NYSDOH Bureau of Environmental Exposure Investigation.

8.0 REFERENCES

6 NYCRR Part 375 Environmental Remediation Programs Subparts 375-1, 375-3 and 375-6. December 14, 2006.

AMC Engineering, PLLC, *Remedial Action Work Plan, Former 110th Street Service Station Site, 2040 Frederick Douglas Boulevard, Harlem, NY. August, 2014.*

Environmental Business Consultants, *Phase I Environmental Site Assessment, 2040 Frederick Douglas Boulevard, Harlem, NY. October 14, 2013.*

Environmental Business Consultants, *Remedial Investigation Report, Former 110th Street Service Station Site, 2040 Frederick Douglas Boulevard, Harlem, NY. June 2014.*

Spill File 9509121 Documents from FOIA Request.

NYSDEC, Division of Environmental Remediation, December 2002, *DER-10, Technical Guidance for Site Investigation and Remediation.*

NYSDEC, Division of Water, June 1998, Addendum April 2000, *Technical and Administrative Guidance Series 1:1:1, Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations.*

NYSDOH, Center for Environmental Health, October 2006, *Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York.*

TABLES

Table 1: Notifications*

Name	Contact Information
Dana Mecomber	(718) 482-7541, dana.mecomber@dec.ny.gov
Jane O'Connell	(718) 482-4599, jane.oconnell@dec.ny.gov
Kelly Lewandowski	518-402-9581, kelly.lewandowski@dec.ny.gov

* Note: Notifications are subject to change and will be updated as necessary.

Table 2
2040 Frederick Douglas Boulevard,
Harlem, New York
Monitoring Well Gauging Data

Well No.	Total Well Depth (ft)	Casing Elevation	DTW (ft)	DTP (ft)	Product Thickness (ft)	GW Elevation
MW1501	20	22.54	11.03			-11.51
MW1502	20	22.65	10.97			-11.68
MW1503	20	22.61	11.05			-11.56
MW1504	45	50.04				
MW1505	20	22.66				
MW1506	43	48.01				
MW6	45	49.3				
IW1	Not Installed					
IW2						
IW3	20	22.7	10.98			-11.72
IW4	20	22.72	10.98			-11.74
IW5	Not Installled					
IW6	20	22.54	10.86			-11.68
IW7	20	22.54	10.85			-11.69
IW8	Not Installed					
IW9						
IW10						
IW11	20	22.69	11.09			-11.60
IW12	Not Installed					
IW13						
IW14	20	39.49				
IW15	20	39.42				
IW16	20	22.75	10.15			-12.60
IW17	20	22.61	10.89			-11.72
IW18	20	22.72				
IW19	20	22.69				
IW20	Not Installed					
IW21	20	22.81				

Notes:
DTW - Depth to Water (ft)
DTP - Depth to Product (ft)
N/A - not accessible

TABLE 3
Endpoint Samples with Detections Above SCOs

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	NYDEC Part 375.6 Groundwater Protection Soil CleanUp Objectives	HS 6 SSW 6/17/2015 32' µg/Kg		HS 6 ESW 6/17/2015 32' µg/Kg		HS7A BOTTOM 7/6/2015 33' µg/Kg		HS 8 ESW 6/22/2015 34.5' µg/Kg	
				Result	RL	Result	RL	Result	RL	Result	RL
Acetone	50	100,000	50	58	47	<SCOs	-	<SCOs	-	60	36
m&p-Xylenes	260	100,000	1,600	<SCOs	-	<SCOs	-	3,300	270	<SCOs	-
o-Xylene	260	100,000	1,600	<SCOs	-	<SCOs	-	1,200	270	<SCOs	-
Chromium	30	180	19	<SCOs	-	36.8	0.40	<SCOs	-	<SCOs	-
Lead	63	400	450	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-
Manganese	1,600	2,000	390	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-
Mercury	0.18	0.81	0.73	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	NYDEC Part 375.6 Groundwater Protection Soil CleanUp Objectives	EP1 5/4/2015 15' µg/Kg		EP2 5/15/2015 14' µg/Kg		EP3 5/15/2015 15' 5/15/2015 µg/Kg		EP4 5/26/2015 29.5' µg/Kg		EP6 6/19/2015 29.5' µg/Kg		^EP11 6/19/2015 31' µg/Kg		^EP13 6/19/2015 32' µg/Kg		^EP14 6/19/2015 31' µg/Kg		EP18 7/24/2015 16' µg/Kg		EP19 7/24/2015 15' µg/Kg		SW EP1 5/29/2015 28' µg/Kg	
				Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
1,2,4-Trimethylbenzene	3,600	52,000	3,600	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	7,800	540	<SCOs	-	<SCOs	-	<SCOs	-
Acetone	50	100,000	50	<SCOs	-	<SCOs	-	<SCOs	-	71	50	<SCOs	-	<SCOs	-	<SCOs	-	110	54	<SCOs	-	<SCOs	-	<SCOs	-
Benzene	60	4,800	60	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	300	490	640	280	460	5.4	<SCOs	-	<SCOs	-	<SCOs	-
Ethylbenzene	1,000	41,000	1,000	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	1,400	540	<SCOs	-	<SCOs	-	<SCOs	-
4,4' -DDE	3.3	8,900	17,000	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	19	11	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-
Chromium	30	180	19	20.1	0.38	22.9	0.36	24.8	0.34	20.9	0.42	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	33.3	0.40
Lead	63	400	450	140	0.8	235	7.3	84.9	0.7	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	146	0.8	126	0.8
Manganese	1,600	2,000	390	393	3.8	407	3.6	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	467	3.6	468	4.2	<SCOs	-
Mercury	0.18	0.81	0.73	1.17	0.03	0.38	0.03	0.5	0.03	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	0.24	0.03	0.4	0.03	0.71	0.03
Zinc	109	2,200	2,480	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	142	0.8

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	NYDEC Part 375.6 Groundwater Protection Soil CleanUp Objectives	SW EP2 5/29/2015 27' µg/Kg		SW EP3 5/29/2015 28' µg/Kg		SW EP 3A 6/17/2015 15' µg/Kg		SW EP 4A 6/17/2015 15' µg/Kg		SW EP5 5/29/2015 30' µg/Kg		SW EP 5A 6/17/2015 15' µg/Kg		SW EP7 5/29/2015 28' µg/Kg		SW EP7A 6/19/2015 15' µg/Kg		SW EP8 7/16/2015 27' µg/Kg		SW EP9 7/23/2015 28' µg/Kg		SW EP11 7/27/2015 29' µg/Kg	
				Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
1,2,4-Trimethylbenzene	3,600	52,000	3,600	<SCOs	-	<SCOs	-	>SCOs	-	>SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	19,000	1,500	<SCOs	-	<SCOs	-
Benzene	60	4,800	60	200	64	<SCOs	-	>SCOs	-	>SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	960	1,500	<SCOs	-	<SCOs	-
Ethylbenzene	1,000	41,000	1,000	<SCOs	-	<SCOs	-	>SCOs	-	>SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	8,100	1,500	<SCOs	-	<SCOs	-
m&p-Xylenes	260	100,000	1,600	<SCOs	-	<SCOs	-	>SCOs	-	>SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	42,000	1,500	<SCOs	-	<SCOs	-
o-Xylene	260	100,000	1,600	<SCOs	-	<SCOs	-	>SCOs	-	>SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	1,100	1,500	<SCOs	-	<SCOs	-
Toluene	700	100,000	700	<SCOs	-	<SCOs	-	>SCOs	-	>SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	1,100	1,500	<SCOs	-	<SCOs	-
Benz(a)anthracene	1,000	1,000	520	<SCOs	-	<SCOs	-	5,000	1,200	>SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-
Benzo(a)pyrene	1,000	1,000	22,000	<SCOs	-	<SCOs	-	4,200	250	>SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-
Benzo(b)fluoranthene	1,000	1,000	1,700	<SCOs	-	<SCOs	-	5,700	1,200	>SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-
Benzo(k)fluoranthene	800	3,900	1,700	<SCOs	-	<SCOs	-	3,100	250	>SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-
Chrysene	1,000	3,900	5,900	<SCOs	-	<SCOs	-	4,600	1,200	>SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-
Dibenz(a,h)anthracene	330	330	895,000,000	<SCOs	-	<SCOs	-	570	250	>SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-
Indeno(1,2,3-cd)pyrene	500	500	8,200	<SCOs	-	<SCOs	-	2,500	250	>SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-
Pyrene	100,000	100,000	3,900	<SCOs	-	<SCOs	-	7000	1,200	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-
4,4' -DDE	3.3	8,900	17,000	<SCOs	-	<SCOs	-	<SCOs	-	10	2.2	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-
4,4' -DDT	3.3	7,900	136,000	<SCOs	-	5.8	2.4	<SCOs	-	19	2.2	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-
Dieldrin	5	200	100	<SCOs	-	5.1	4.0	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-
Chromium	30	180	19	<SCOs	-	34.2	0.41	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	35.1	0.42	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-
Copper	50	270	1,720	<SCOs	-	55.5	0.41	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	59.3	0.42	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-
Lead	63	400	450	<SCOs	-	<SCOs	-	187	7.3	<SCOs	-	<SCOs	-	140	0.8	83.6	0.8	99.9	0.8	<SCOs	-	<SCOs	-	234	7.7
Mercury	0.18	0.81	0.73	0.76	0.04	<SCOs	-	0.53	0.03	0.41	0.03	<SCOs	-	0.65	0.03	0.72	0.03	0.9	0.03	<SCOs	-	0.19	0.03	0.63	0.03
Nickel	30	140	130	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	30.5	0.42	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-
Zinc	109	2,200	2,480	<SCOs	-	<SCOs	-	<SCOs	-	<SCOs	-	222	7.3	<SCOs	-	147	7.5	<SCOs	-	118	0.8	<SCOs	-	<SCOs	-

Notes:

* - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives

RL - Reporting Limit

Bold/highlighted- Indicated exceedance of the NYSDEC UUSCO Guidance Value

Bold/highlighted- Indicated exceedance of the NYSDEC RRSCO Guidance Value

Bold/highlighted- Indicated exceedance of relevant NYSDEC GPSCO Guidance Value

Relevant defined as those parameters found in soil which were also affecting groundwater (i.e. petroleum VOCs)

^ Initial Sample. Prior to Overexcavation. Subsequent samples designated as EP11A, EP13A and EP14A >SCOs.

SW - Denotes sidewall sample

Former 110th Street Service Station,
2040 Frederick Douglas Blvd
New York, New York

Table 4
Ground Water Analytical Results
Volatile Organic Compounds
Remaining Above Standards

Compound	Groundwater Quality	MW1501		MW1502		MW1502		MW1503		MW1503		MW1504		MW1505		MW1505		MW1506		MW1506		MW6	
		9/1/2015		9/1/2015		10/1/2015		9/1/2015		10/1/2015		10/1/2015		9/1/2015		10/1/2015		4/13/2015		10/1/2015		10/1/2015	
	µg/L	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
1,1,1,2-Tetrachlorothane	5	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
1,1,1-Trichloroethane	5	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 10	10	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 100	100	< 5.0	5.0
1,1,2,2-Tetrachloroethane	5	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
1,1,2-Trichloroethane	1	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
1,1-Dichloroethane	5	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 10	10	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 100	100	< 5.0	5.0
1,1-Dichloroethene	5	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
1,1-Dichloropropene		< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
1,2,3-Trichlorobenzene		< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
1,2,3-Trichloropropane	0.04	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
1,2,4-Trichlorobenzene		< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
1,2,4-Trimethylbenzene	5	**0.79**	1.0	**2.1**	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	**32**	5.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	**0.31**	1.0
1,2-Dibromo-3-chloropropane	0.04	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
1,2-Dibromoethane		< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
1,2-Dichlorobenzene	5	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 4.0	4.0	< 20	20	< 1.0	1.0
1,2-Dichloroethane	0.6	< 0.60	0.60	< 0.60	0.60	< 0.60	0.60	< 0.60	0.60	< 1.2	1.2	< 0.60	0.60	< 0.60	0.60	< 0.60	0.60	< 3.0	3.0	< 12	12	< 0.60	0.60
1,2-Dichloropropane	0.94	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
1,3,5-Trimethylbenzene	5	**1.3**	1.0	**1.4**	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	**11**	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
1,3-Dichlorobenzene		< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 3.0	3.0	< 20	20	< 1.0	1.0
1,3-Dichloropropane	5	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
1,4-Dichlorobenzene	5	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
2,2-Dichloropropane	5	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
2-Chlorotoluene	5	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
2-Hexanone (Methyl Butyl Ketone)		< 2.5	2.5	< 2.5	2.5	< 2.5	2.5	< 2.5	2.5	< 5.0	5.0	< 2.5	2.5	< 2.5	2.5	< 2.5	2.5	< 13	13	< 50	50	< 2.5	2.5
2-Isopropyltoluene	5	< 1.0	1.0	**0.88**	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	**0.6**	1.0	< 1.0	1.0	**0.59**	1.0	**2.4**	5.0	**5.8**	20	< 1.0	1.0
4-Chlorotoluene	5	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
4-Methyl-2-Pentanone		< 2.5	2.5	**9.5**	2.5	7.3	2.5	< 2.5	2.5	< 5.0	5.0	< 2.5	2.5	< 2.5	2.5	< 2.5	2.5	< 13	13	< 50	50	< 2.5	2.5
Acetone	50	**13**	5.0	**18**	5.0	**140**	50	**6.5**	5.0	**240**	50	**14**	5.0	**3.3**	5.0	**3.9**	5.0	< 25	25	< 100	100	< 5.0	5.0
Acrolein		< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 10	10	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 25	25	< 100	100	< 5.0	5.0
Acrylonitrile	5	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 10	10	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 25	25	< 100	100	< 5.0	5.0
Benzene	1	**0.86**	0.70	**170**	7.0	**4.7**	0.70	**0.84**	0.70	**1.6**	1.4	**15**	0.70	< 0.70	0.70	< 0.70	0.70	< 3.5	3.5	< 14	14	< 0.70	0.70
Bromobenzene	5	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
Bromochloromethane	5	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
Bromodichloromethane		< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
Bromoform		< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 10	10	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 25	25	< 100	100	< 5.0	5.0
Bromomethane	5	< 5.0	5.0	< 5.0	5.0	**31**	50	< 5.0	5.0	**17**	10	**< 5.0**	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 100	100	< 5.0	5.0
Carbon Disulfide	60	< 1.0	1.0	< 1.0	1.0	**6**	1.0	< 1.0	1.0	**17**	2.0	**0.77**	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
Carbon tetrachloride	5	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
Chlorobenzene	5	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 10	10	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 100	100	< 5.0	5.0
Chloroethane	5	< 5.0	5.0	< 5.0	5.0	**1.8**	5.0	< 5.0	5.0	**0.95**	10	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 100	100	< 5.0	5.0
Chloroform	7	**0.8**	5.0	< 5.0	5.0	**1.2**	5.0	< 5.0	5.0	**2.9**	10	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 100	100	< 5.0	5.0
Chloromethane	5	< 5.0	5.0	**0.97**	5.0	**130**	50	< 5.0	5.0	**180**	50	**1.6**	5.0	< 5.0	5.0	**1.3**	5.0	< 5.0	5.0	**11**	100	**1.4**	5.0
cis-1,2-Dichloroethene	5	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
cis-1,3-Dichloropropene		< 0.40	0.40	< 0.40	0.40	< 0.40	0.40	< 0.40	0.40	< 0.80	0.80	< 0.40	0.40	< 0.40	0.40	< 0.40	0.40	< 2.0	2.0	< 8.0	8.0	< 0.40	0.40
Dibromochloromethane		< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
Dibromomethane	5	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
Dichlorodifluoromethane	5	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
Ethylbenzene	5	**3**	1.0	**13**	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	**23**	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
Hexachlorobutadiene	0.5	< 0.5	0.5	< 0.5	0.5	< 1.0	1.0	< 0.5	0.5	< 2.0	2.0	< 1.0	1.0	< 0.5	0.5	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
Isopropylbenzene	5	**1.5**	1.0	**6.6**	1.0	< 1.0	1.0	**0.63**	1.0	**2.7**	2.0	**5.1**	1.0	**0.46**	1.0	**1.2**	1.0	**14**	5.0	**15**	20	< 1.0	1.0
m&p-Xylenes	5	**2.9**	1.0	**5.9**	1.0	< 1.0	1.0	**0.3**	1.0	**0.91**	2.0	**35**	1.0	< 1.0	1.0	< 1.0	1.0	**1.4**	5.0	< 20	20	< 1.0	1.0
Methyl Ethyl Ketone (2-Butanone)		< 2.5	2.5	< 2.5	2.5	**18**	2.5	< 2.5	2.5	**22**	5.0	< 2.5	2.5	< 2.5	2.5	< 2.5	2.5	< 13	13	< 50	50	< 2.5	2.5
Methyl t-butyl ether (MTBE)	10	**2.7**	1.0	**120**	10	**5.8**	1.0	**7.5**	1.0	**7.8**	2.0	**3.1**	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
Methylene chloride	5	< 3.0	3.0	< 3.0	3.0	< 3.0	3.0	< 3.0	3.0	**3.3**	6.0	< 3.0	3.0	< 3.0	3.0	< 3.0	3.0	< 5.0	5.0	< 60	60	< 3.0	3.0
Naphthalene	10	**3.5**	1.0	**2.8**	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	**9.1**	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
n-Butylbenzene	5	< 1.0	1.0	**0.35**	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	**1.9**	1.0	< 1.0	1.0	< 1.0	1.0	**2.7**	5.0	< 20	20	< 1.0	1.0
n-Propylbenzene	5	**1.1**	1.0	**5.8**	1.0	< 1.0	1.0	**0.34**	1.0	**2.4**	2.0	**9.1**	1.0	< 1.0	1.0	< 1.0	1.0	**16**	5.0	**10**	20	< 1.0	1.0
o-Xylene	5	**0.53**	1.0	**1.5**	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	**7.8**	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
p-Isopropyltoluene		< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	**1.1**	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
sec-Butylbenzene	5	**0.49**	1.0	**1.8**	1.0	< 1.0	1.0	**0.26**	1.0	< 2.0	2.0	**1.4**	1.0	< 1.0	1.0	1.3	1.0	**6.1**	5.0	**14**	20	< 1.0	1.0
Styrene	5	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
tert-Butylbenzene	5	< 1.0	1.0	**0.71**	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	**0.34**	1.0	< 1.0	1.0	< 1.0	1.0	**1.5**	5.0	< 20	20	< 1.0	1.0
Tetrachloroethene	5	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
Tetrahydrofuran (THF)		< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 10	10	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 25	25	< 100	100	< 5.0	5.0
Toluene	5	**0.48**	1.0	**5**	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	**4.9**	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
trans-1,2-Dichloroethene	5	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 10	10	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 100	100	< 5.0	5.0
trans-1,3-Dichloropropene	0.4	< 0.40	0.40	< 0.40	0.40	< 0.40	0.40	< 0.40	0.40	< 0.80	0.80	< 0.40	0.40	< 0.40	0.40	< 0.40	0.40	< 2.0	2.0	< 8.0	8.0	< 0.40	0.40
trans-1,4-dichloro-2-butene	5	< 2.5	2.5	< 2.5	2.5	< 2.5	2.5	< 2.5	2.5	< 5.0	5.0	< 2.5	2.5	< 2.5	2.5	< 2.5	2.5	< 13	13	< 50	50	< 2.5	2.5
Trichloroethene	5	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
Trichlorofluoromethane	5	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
Trichlorotrifluoroethane		< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 5.0	5.0	< 20	20	< 1.0	1.0
Vinyl Chloride	2	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 2.0	2.0	< 20	20	< 1.0	1.0

Notes:
RL- Reporting Limit
Bold/highlighted- Indicated exceedance of the NYSDEC Groundwater Standard

Table 5 – Post Remediation Sampling Requirements and Schedule

Sampling Location	**Analytical Parameters**				**Schedule**
	VOCs (EPA 8260C)	SVOCs (EPA 8270D)	pH (field)	Persulfate (field)	
MW1501	X	X	X	X	4 weeks after oxidant injection, then quarterly
MW1502	X	X	X	X	4 weeks after oxidant injection, then quarterly
MW1503	X	X	X	X	4 weeks after oxidant injection, then quarterly
MW1504	X	X	X	X	4 weeks after oxidant injection, then quarterly
MW1505	X	X	X	X	4 weeks after oxidant injection, then quarterly
MW1506	X	X	X	X	4 weeks after oxidant injection, then quarterly
MW6	X	X	X	X	4 weeks after oxidant injection, then quarterly

Table 6 – Monitoring Well Construction Details

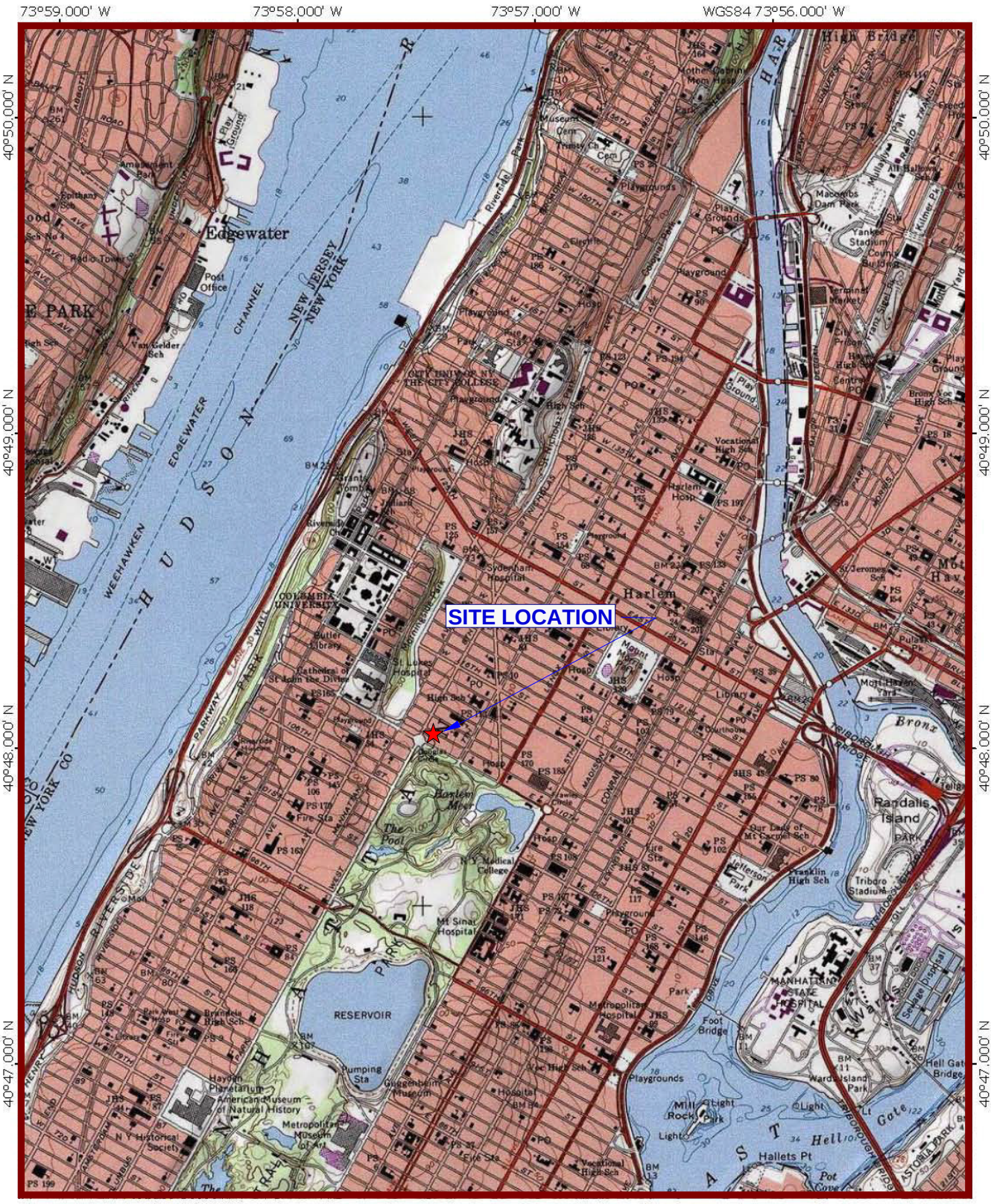
Monitoring Well ID	Well Location	Coordinates (long/lat)	Well Dia. (in.)	Elevation (above mean sea level)			
				Casing	Surface	Screen Top	Screen Bottom
MW1501	On-site	40.800665°N 73.957457°W	1	22.54	22.82	12.82	2.82
MW1502	On-site	40.800743°N 73.957427°W	1	22.65	22.80	12.80	2.80
MW1503	On-site	40.800837°N 73.957451° W	1	22.61	22.82	12.82	2.82
MW1504	downgradient Off-site	40.800743°N, 73.957557° W	1	50.04	50.16	15.16	5.16
MW1505	downgradient Off-site	40.800927°N, 73.957600° W	1	22.66	22.83	12.83	2.83
MW1506	downgradient Off-site	40.800509° N, 73.957579° W	1	48.01	48.15	13.15	3.15
MW6	downgradient Off-site	40.800650° N, 73.957584° W	1	49.30	49.58	14.58	4.58

Table 7: Schedule of Interim Monitoring/Inspection Reports

Task/Report	Reporting Frequency*
Groundwater Monitoring and Treatment	Quarterly (1 month following sampling event, if ISCO injections are performed they will take place approx 1 mo. Prior to GW sampling event)
Periodic Review Report	Annually, or as otherwise determined by the Department

* The frequency of events will be conducted as specified until otherwise approved by the NYSDEC.

FIGURES



USGS Central Park Quadrangle. 1995, Contour Interval = 10 feet

0 .5 1 MILES

1000 0 1000 2000 3000 4000 5000 FEET

1 .5 0 KILOMETERS 1

1000 0 METERS 1000

MN TN

13°

08/12/10

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FORMER 110TH STREET SERVICE STATION

2040 FREDERICK DOUGLAS BOULEVARD, HARLEM, NY

FIGURE 1 TOPOGRAPHIC MAP

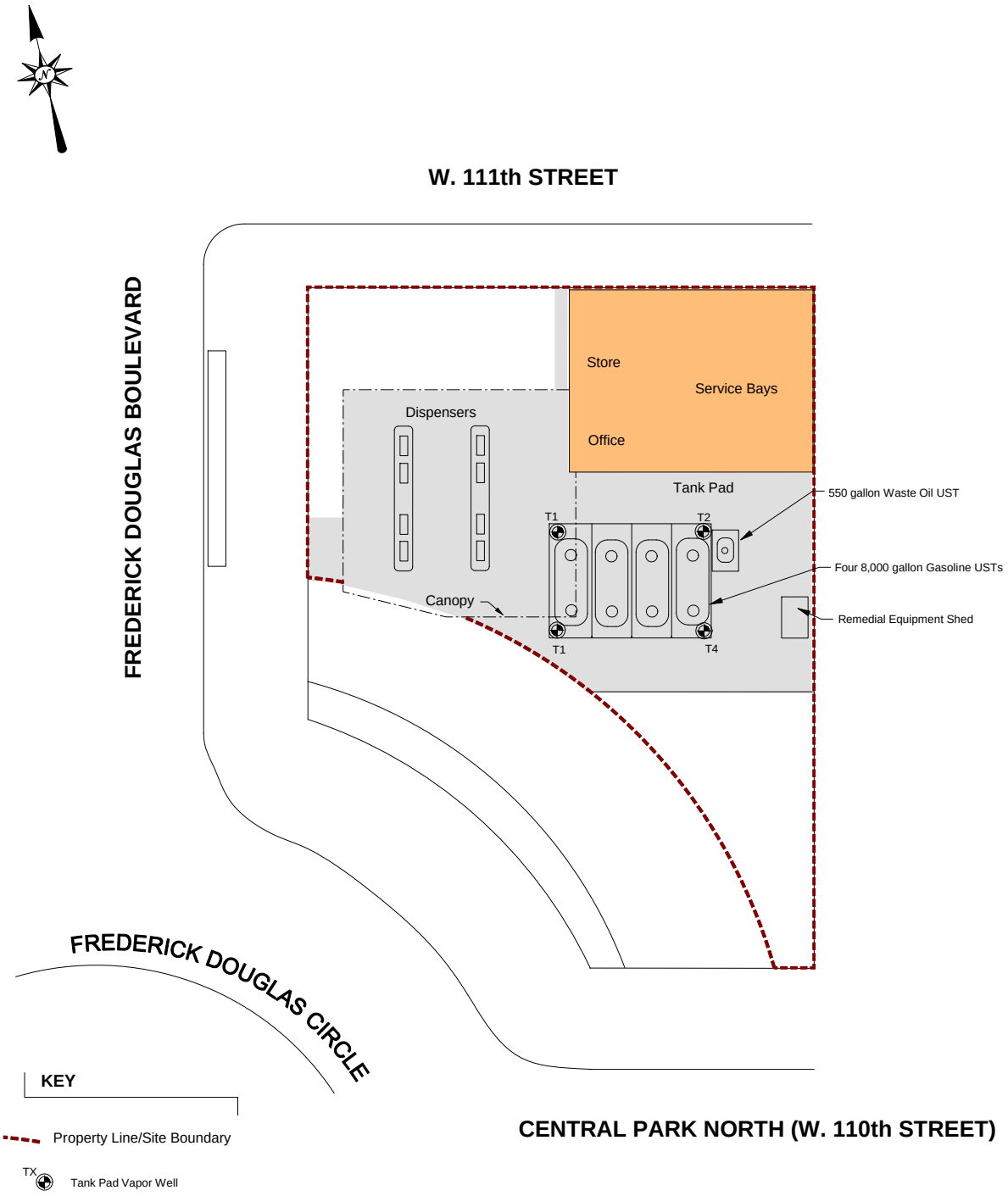

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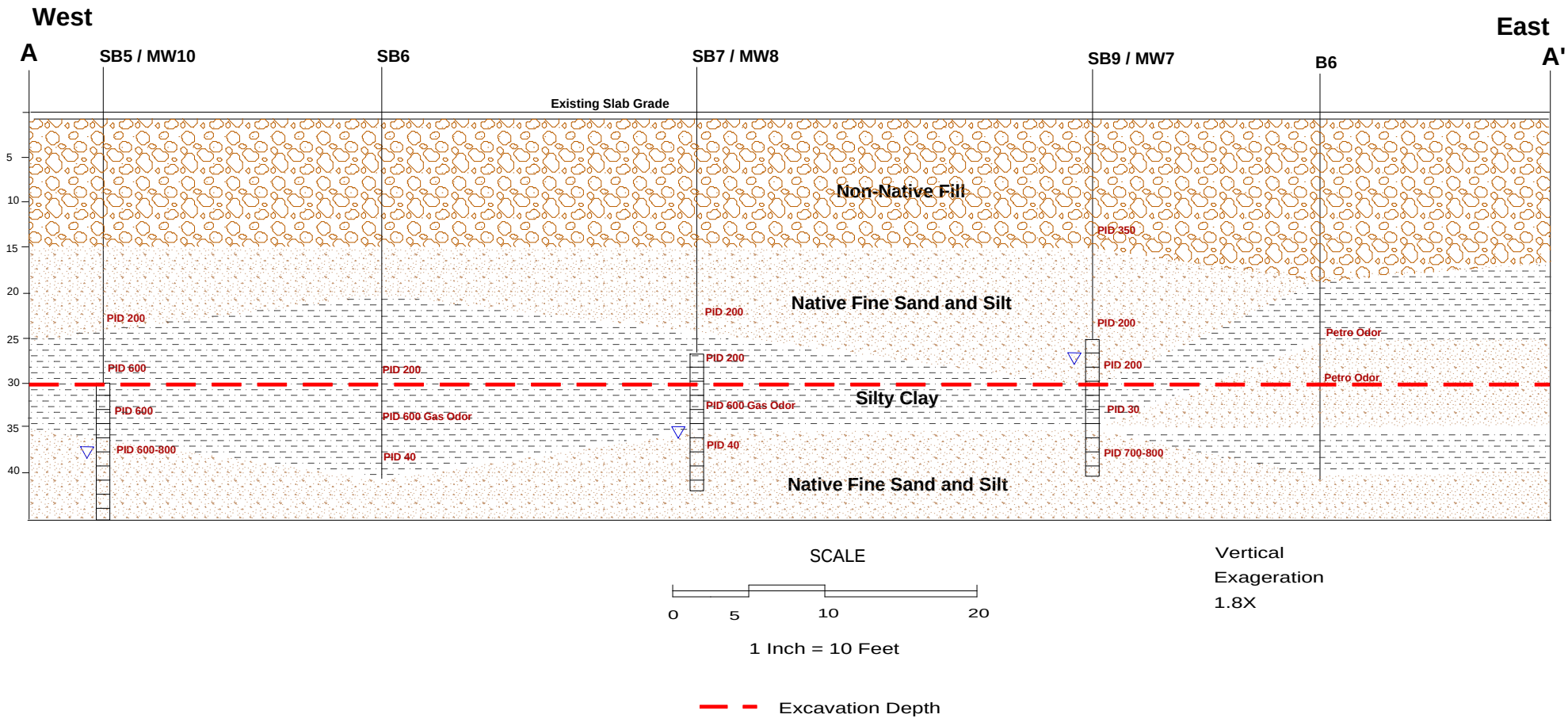
FIGURE 2

SITE ADDRESS: FORMER 110TH STREET SERVICE STATION
2040 FREDERICK DOUGLAS BOULEVARD, HARLEM, NY

DRAWING TITLE: SITE PLAN - PRIOR TO REMEDIAL ACTION



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Former 110 Service Station
2040 Frederick Douglas Blvd, Harlem, NY

FIGURE 3

Geologic Cross Section
Prior to Remedial Action

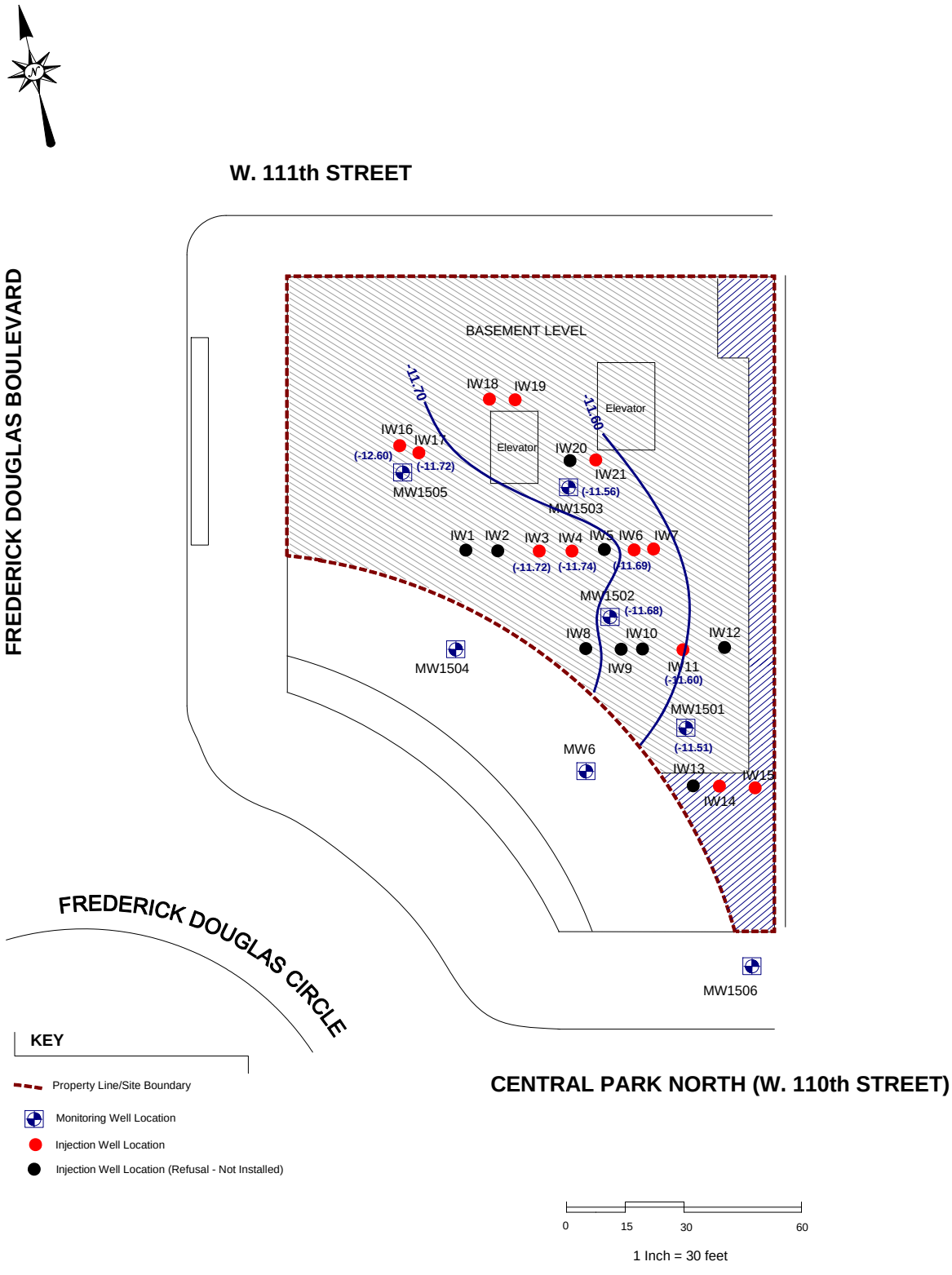

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FIGURE 4

SITE ADDRESS: FORMER 110TH STREET SERVICE STATION
2040 FREDERICK DOUGLAS BOULEVARD, HARLEM, NY

DRAWING TITLE: GROUNDWATER ELEVATION (11-19-15)

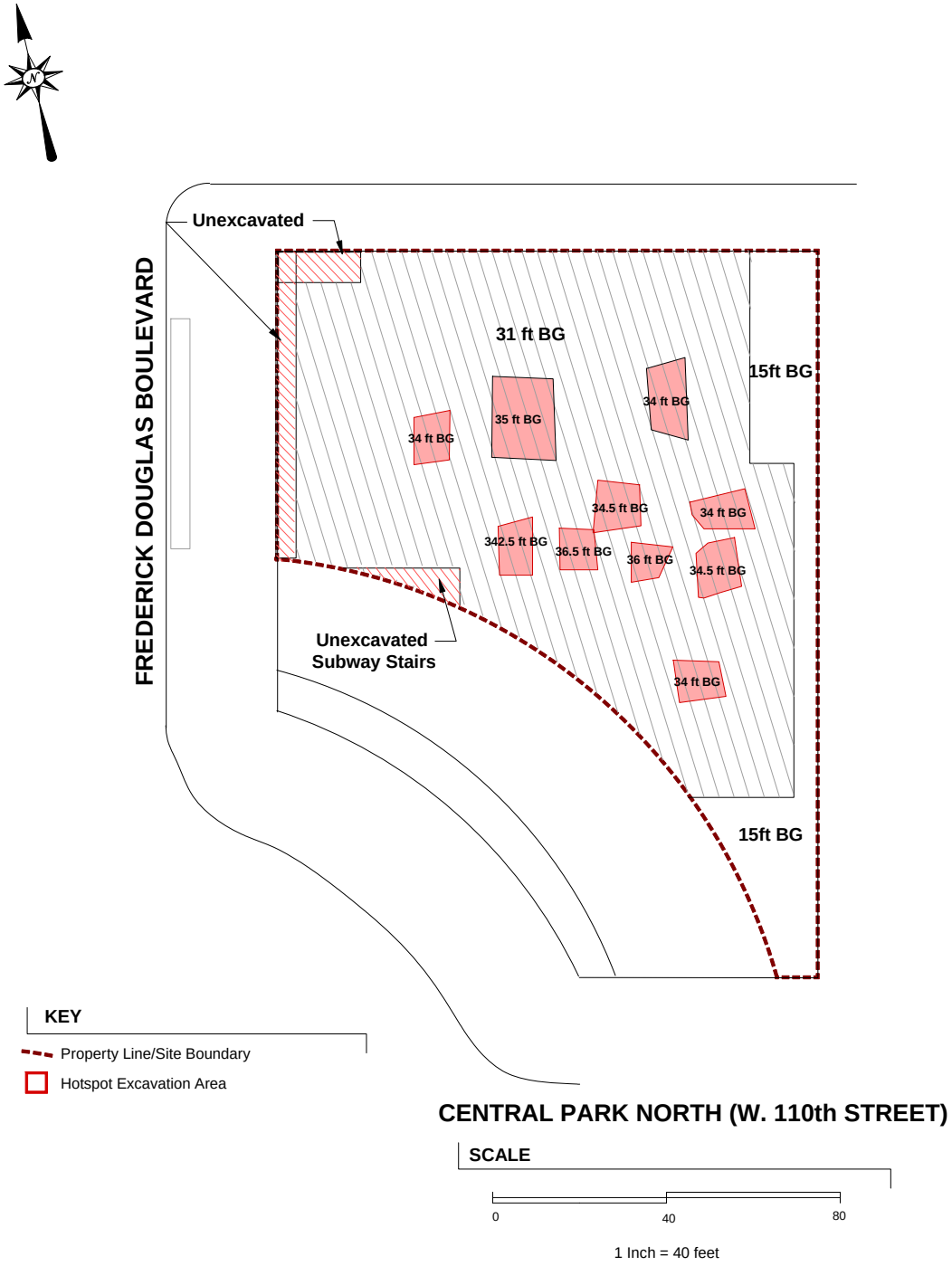

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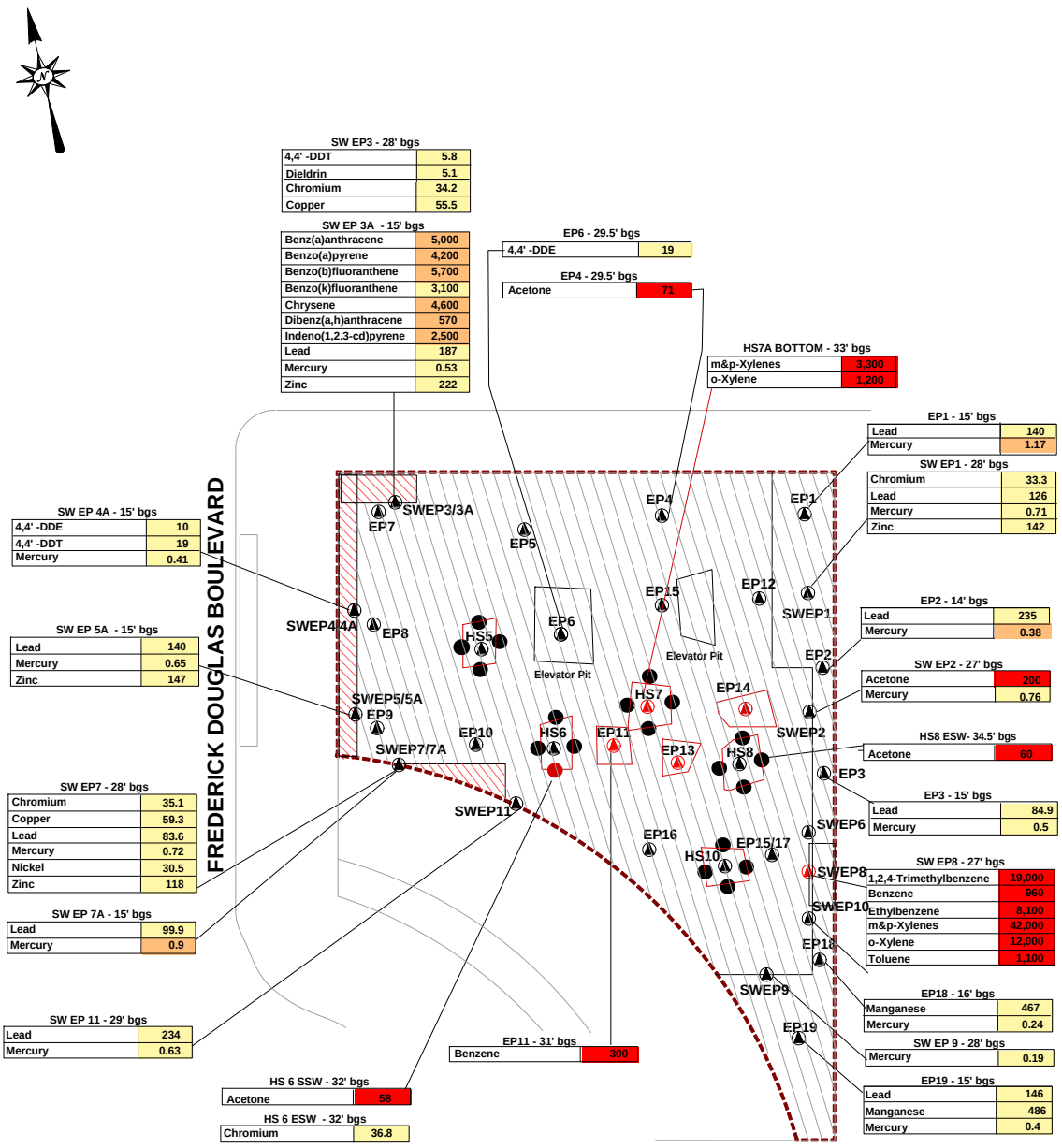
FIGURE 5

Site Address: Former 110th Street Service Station
2040 Frederick Douglas Boulevard, Harlem, NY

Drawing Title: Final Excavation Depths



KEY

- Property Line/Site Boundary
- Hotspot Excavation Area
- Endpoint Sample Location
- Sidewall Sample Location
- Results Exceed Unrestricted Use SCOs
- Results Exceed Restricted Residential SCOs
- Results Exceed Relevant GW Protection SCOs
- ND Not Detected Above Unrestricted / GW Protection SCOs
- * Reporting Limit for Benzene and Acetone > GW Prot SCOs

Metals:Units: mg/kg,

VOCs, SVOCs, Pesticides: ug/kg

CENTRAL PARK NORTH (W. 110th STREET)

SCALE

0 45 90

1 Inch = 45 feet

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FIGURE 6

Site Address: Former 110th Street Service Station
2040 Frederick Douglas Boulevard, Harlem, NY

Drawing Title: Remaining Soil Above SCOs

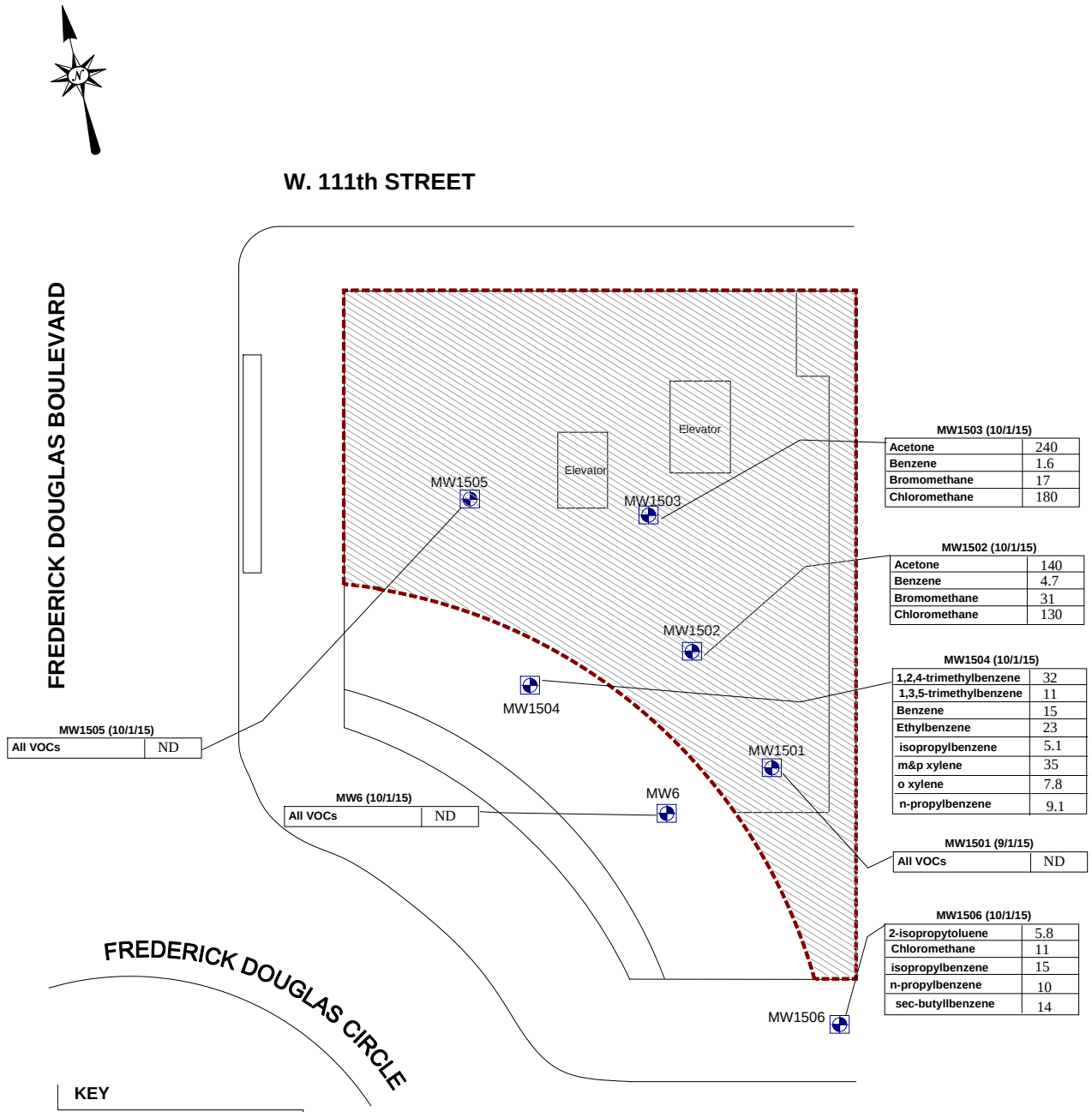

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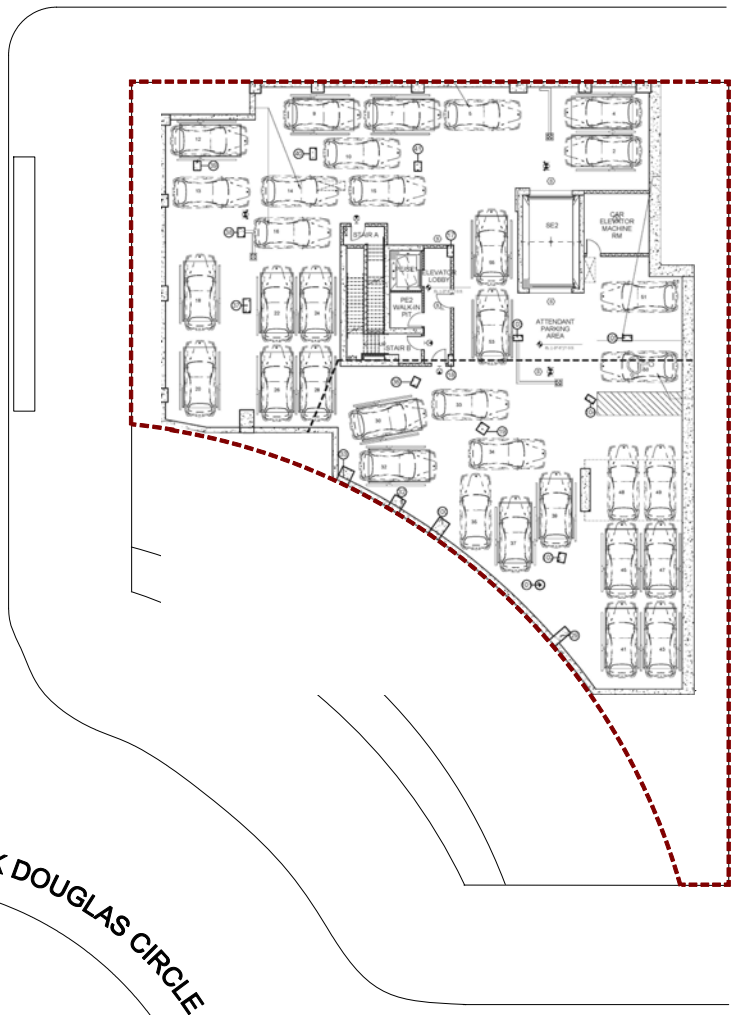
FIGURE 7

SITE ADDRESS: FORMER 110TH STREET SERVICE STATION
2040 FREDERICK DOUGLAS BOULEVARD, HARLEM, NY

DRAWING TITLE: GROUNDWATER SAMPLING RESULTS ABOVE STANDARDS

W. 111th STREET

FREDERICK DOUGLAS BOULEVARD



FREDERICK DOUGLAS CIRCLE

KEY

Property Line/Site Boundary

CENTRAL PARK NORTH (W. 110th STREET)

0 15 30 60

1 Inch = 30 feet

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FIGURE 8

SITE ADDRESS: FORMER 110TH STREET SERVICE STATION
2040 FREDERICK DOUGLAS BOULEVARD, HARLEM, NY

DRAWING TITLE: SUB-CELLAR GARAGE PLAN

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FIGURE 9

SITE ADDRESS: FORMER 110TH STREET SERVICE STATION
2040 FREDERICK DOUGLAS BOULEVARD, HARLEM, NY

DRAWING TITLE: INSTITUTIONAL CONTROL BOUNDARY

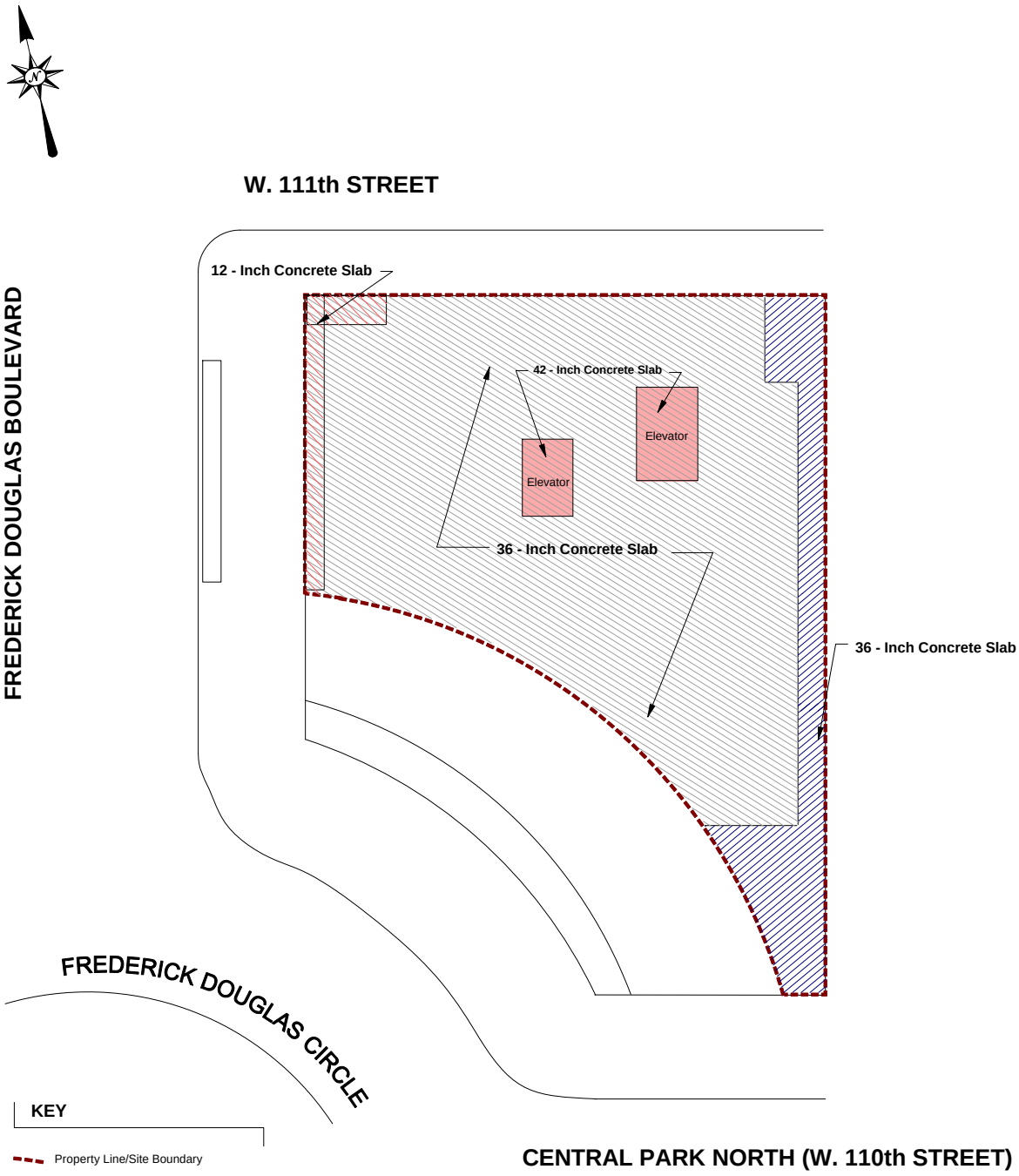

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FIGURE 10

SITE ADDRESS: FORMER 110TH STREET SERVICE STATION
2040 FREDERICK DOUGLAS BOULEVARD, HARLEM, NY

DRAWING TITLE: SITE COVER SYSTEM

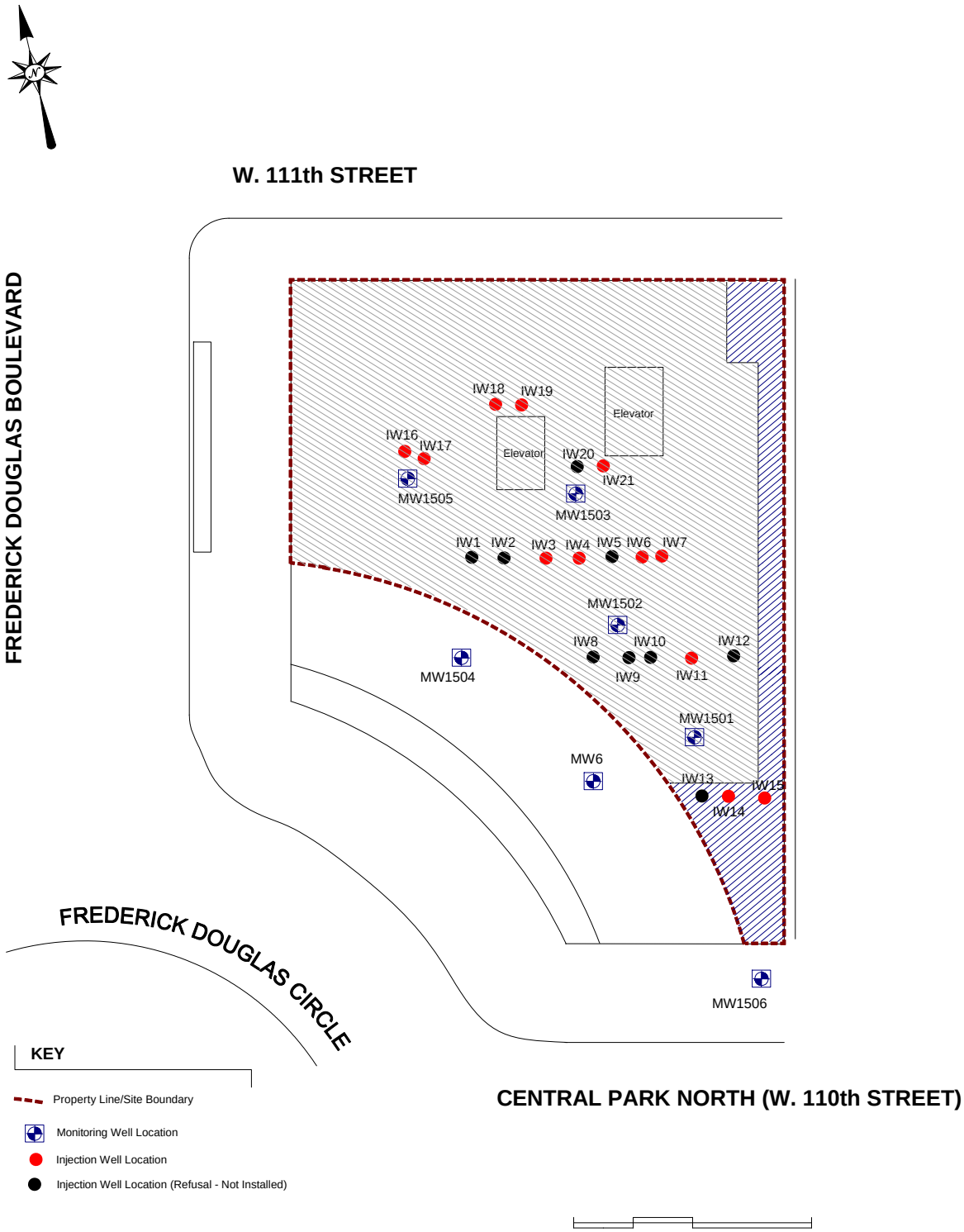

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FIGURE 1 1

SITE ADDRESS: FORMER 110TH STREET SERVICE STATION
2040 FREDERICK DOUGLAS BOULEVARD, HARLEM, NY

DRAWING TITLE: INJECTION WELL & MONITORING WELL LOCATIONS

APPENDIX A
Environmental Easement

ENVIRONMENTAL EASEMENT GRANTED PURSUANT TO ARTICLE 71, TITLE 36 OF THE NEW YORK STATE ENVIRONMENTAL CONSERVATION LAW

THIS INDENTURE made this 30th day of September, 2015 between Owner(s) Crescent 110 Equities, LLC, having an office at 316 West 118th Street, New York, New York 10026, County of New York, State of New York (the "Grantor"), and The People of the State of New York (the "Grantee."), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to encourage the remediation of abandoned and likely contaminated properties ("sites") that threaten the health and vitality of the communities they burden while at the same time ensuring the protection of public health and the environment; and

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to establish within the Department a statutory environmental remediation program that includes the use of Environmental Easements as an enforceable means of ensuring the performance of operation, maintenance, and/or monitoring requirements and the restriction of future uses of the land, when an environmental remediation project leaves residual contamination at levels that have been determined to be safe for a specific use, but not all uses, or which includes engineered structures that must be maintained or protected against damage to perform properly and be effective, or which requires groundwater use or soil management restrictions; and

WHEREAS, the Legislature of the State of New York has declared that Environmental Easement shall mean an interest in real property, created under and subject to the provisions of Article 71, Title 36 of the New York State Environmental Conservation Law ("ECL") which contains a use restriction and/or a prohibition on the use of land in a manner inconsistent with engineering controls which are intended to ensure the long term effectiveness of a site remedial program or eliminate potential exposure pathways to hazardous waste or petroleum; and

WHEREAS, Grantor, is the owner of real property located at the address of 2040 Frederick Douglas Boulevard in the City of New York, County of New York and State of New York, known and designated on the tax map of the New York City Department of Finance as tax map parcel number: Block 1826 Lot 1, being the same as that property conveyed to Grantor by deed dated December 18, 2013 and recorded in the City Register of the City of New York in CRFN #2014000024658. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately 0.310 +/- acres, and is hereinafter more fully described in the Land Title Survey dated May 4, 2015 prepared by Montrose Surveying Co., LLP, which will be attached to the Site Management Plan. The Controlled Property description is set forth in and attached hereto as Schedule A; and

WHEREAS, the Department accepts this Environmental Easement in order to ensure the protection of public health and the environment and to achieve the requirements for remediation established for the Controlled Property until such time as this Environmental Easement is

extinguished pursuant to ECL Article 71, Title 36; and

NOW THEREFORE, in consideration of the mutual covenants contained herein and the terms and conditions of Brownfield Cleanup Agreement Index Number: C231087-04-14, Grantor conveys to Grantee a permanent Environmental Easement pursuant to ECL Article 71, Title 36 in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement")

1. Purposes. Grantor and Grantee acknowledge that the Purposes of this Environmental Easement are: to convey to Grantee real property rights and interests that will run with the land in perpetuity in order to provide an effective and enforceable means of encouraging the reuse and redevelopment of this Controlled Property at a level that has been determined to be safe for a specific use while ensuring the performance of operation, maintenance, and/or monitoring requirements; and to ensure the restriction of future uses of the land that are inconsistent with the above-stated purpose.

2. Institutional and Engineering Controls. The controls and requirements listed in the Department approved Site Management Plan ("SMP") including any and all Department approved amendments to the SMP are incorporated into and made part of this Environmental Easement. These controls and requirements apply to the use of the Controlled Property, run with the land, are binding on the Grantor and the Grantor's successors and assigns, and are enforceable in law or equity against any owner of the Controlled Property, any lessees and any person using the Controlled Property.

A. (1) The Controlled Property may be used for:

Restricted Residential as described in 6 NYCRR Part 375-1.8(g)(2)(ii), Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iv)

(2) All Engineering Controls must be operated and maintained as specified in the Site Management Plan (SMP);

(3) All Engineering Controls must be inspected at a frequency and in a manner defined in the SMP;

(4) The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the New York City Department of Health and Mental Hygiene to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department;

(5) Groundwater and other environmental or public health monitoring must be performed as defined in the SMP;

(6) Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in the SMP;

(7) All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the SMP;

(8) Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP;

(9) Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy shall be performed as defined in the SMP;

(10) Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by this Environmental Easement.

B. The Controlled Property shall not be used for Residential purposes as defined in 6NYCRR 375-1.8(g)(2)(i), and the above-stated engineering controls may not be discontinued without an amendment or extinguishment of this Environmental Easement.

C. The SMP describes obligations that the Grantor assumes on behalf of Grantor, its successors and assigns. The Grantor's assumption of the obligations contained in the SMP which may include sampling, monitoring, and/or operating a treatment system, and providing certified reports to the NYSDEC, is and remains a fundamental element of the Department's determination that the Controlled Property is safe for a specific use, but not all uses. The SMP may be modified in accordance with the Department's statutory and regulatory authority. The Grantor and all successors and assigns, assume the burden of complying with the SMP and obtaining an up-to-date version of the SMP from:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, New York 12233
Phone: (518) 402-9553

D. Grantor must provide all persons who acquire any interest in the Controlled Property a true and complete copy of the SMP that the Department approves for the Controlled Property and all Department-approved amendments to that SMP.

E. Grantor covenants and agrees that until such time as the Environmental Easement is extinguished in accordance with the requirements of ECL Article 71, Title 36 of the ECL, the property deed and all subsequent instruments of conveyance relating to the Controlled Property shall state in at least fifteen-point bold-faced type:

This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation

pursuant to Title 36 of Article 71 of the Environmental Conservation Law.

F. Grantor covenants and agrees that this Environmental Easement shall be incorporated in full or by reference in any leases, licenses, or other instruments granting a right to use the Controlled Property.

G. Grantor covenants and agrees that it shall, at such time as NYSDEC may require, submit to NYSDEC a written statement by an expert the NYSDEC may find acceptable certifying under penalty of perjury, in such form and manner as the Department may require, that:

(1) the inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under the direction of the individual set forth at 6 NYCRR Part 375-1.8(h)(3).

(2) the institutional controls and/or engineering controls employed at such site:

(i) are in-place;

(ii) are unchanged from the previous certification, or that any identified changes to the controls employed were approved b the NYSDEC and that all controls are in the Department-approved format; and

(iii) that nothing has occurred that would impair the ability of such control to protect the public health and environment;

(3) the owner will continue to allow access to such real property to evaluate the continued maintenance of such controls;

(4) nothing has occurred that would constitute a violation or failure to comply with any site management plan for such controls;

(5) the report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

(6) to the best of his/her knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and

(7) the information presented is accurate and complete.

3. Right to Enter and Inspect. Grantee, its agents, employees, or other representatives of the State may enter and inspect the Controlled Property in a reasonable manner and at reasonable times to assure compliance with the above-stated restrictions.

4. Reserved Grantor's Rights. Grantor reserves for itself, its assigns, representatives, and successors in interest with respect to the Property, all rights as fee owner of the Property, including:

A. Use of the Controlled Property for all purposes not inconsistent with, or limited by the terms of this Environmental Easement;

B. The right to give, sell, assign, or otherwise transfer part or all of the underlying fee interest to the Controlled Property, subject and subordinate to this Environmental Easement;

5. Enforcement

A. This Environmental Easement is enforceable in law or equity in perpetuity by Grantor, Grantee, or any affected local government, as defined in ECL Section 71-3603, against the owner of the Property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. It is not a defense in any action to enforce this Environmental Easement that: it is not appurtenant to an interest in real property; it is not of a character that has been recognized traditionally at common law; it imposes a negative burden; it imposes affirmative obligations upon the owner of any interest in the burdened property; the benefit does not touch or concern real property; there is no privity of estate or of contract; or it imposes an unreasonable restraint on alienation.

B. If any person violates this Environmental Easement, the Grantee may revoke the Certificate of Completion with respect to the Controlled Property.

C. Grantee shall notify Grantor of a breach or suspected breach of any of the terms of this Environmental Easement. Such notice shall set forth how Grantor can cure such breach or suspected breach and give Grantor a reasonable amount of time from the date of receipt of notice in which to cure. At the expiration of such period of time to cure, or any extensions granted by Grantee, the Grantee shall notify Grantor of any failure to adequately cure the breach or suspected breach, and Grantee may take any other appropriate action reasonably necessary to remedy any breach of this Environmental Easement, including the commencement of any proceedings in accordance with applicable law.

D. The failure of Grantee to enforce any of the terms contained herein shall not be deemed a waiver of any such term nor bar any enforcement rights.

6. Notice. Whenever notice to the Grantee (other than the annual certification) or approval from the Grantee is required, the Party providing such notice or seeking such approval shall identify the Controlled Property by referencing the following information:

County, NYSDEC Site Number, NYSDEC Brownfield Cleanup Agreement, State Assistance Contract or Order Number, and the County tax map number or the Liber and Page or computerized system identification number.

Parties shall address correspondence to:

Site Number: C231087
Office of General Counsel
NYSDEC
625 Broadway
Albany New York 12233-5500

With a copy to:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, NY 12233

All notices and correspondence shall be delivered by hand, by registered mail or by Certified mail and return receipt requested. The Parties may provide for other means of receiving and

communicating notices and responses to requests for approval.

7. Recordation. Grantor shall record this instrument, within thirty (30) days of execution of this instrument by the Commissioner or her/his authorized representative in the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

8. Amendment. Any amendment to this Environmental Easement may only be executed by the Commissioner of the New York State Department of Environmental Conservation or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

9. Extinguishment. This Environmental Easement may be extinguished only by a release by the Commissioner of the New York State Department of Environmental Conservation, or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

10. Joint Obligation. If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.

Remainder of Page Intentionally Left Blank

IN WITNESS WHEREOF, Grantor has caused this instrument to be signed in its name.

Crescent 110 Equities, LLC:

By: _____

Print Name: Robert Ezrapour

Title: Manager Date: 9/30/2015

Grantor's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF New York)

On the 30 day of September, in the year 20 15, before me, the undersigned, personally appeared Robert Ezrapour, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

_____
Notary Public - State of New York

JULIE TRAPINI
Notary Public, State of New York
Registration No. 01TR6292053
Qualified in New York County
Commission Expires Oct. 28, 2017

THIS ENVIRONMENTAL EASEMENT IS HEREBY ACCEPTED BY THE PEOPLE OF THE STATE OF NEW YORK, Acting By and Through the Department of Environmental Conservation as Designee of the Commissioner,

By: _____
Robert W. Schick, Director
Division of Environmental Remediation

Grantee's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF ALBANY)

On the _____ day of _____, in the year 20__, before me, the undersigned, personally appeared Robert W. Schick, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

_____
Notary Public - State of New York

SCHEDULE "A" PROPERTY DESCRIPTION

Tax Block 1826, Tax Lot 1 (0.31001 Acre)

ALL that certain plot, piece or parcel of land situate, lying and being in the Borough of Manhattan, City and State of New York, being known and designated as Block 1826, Lot 1, on the tax map dated March 17, 1975, for the Borough of Manhattan, more particularly bounded and described as follows:

BEGINNING at the corner formed by the intersection of the southerly side of One Hundred Eleventh Street with the easterly side of Eighth Avenue;

RUNNING THENCE southerly along the easterly side of Eighth Avenue 72 feet 10 inches to the intersection of the easterly side of Eighth Avenue with the northerly side of Frederick Douglass Circle;

THENCE along said Frederick Douglass Circle in a southerly direction on a curve to the right with a radius of 142 feet and a central angle of 64 degrees 41 minutes 31 seconds, a distance of 160 feet 4 inches per deed (160.333 feet per survey) to the northerly side of Cathedral Parkway;

THENCE easterly along said side of Cathedral Parkway a/k/a Central Park North and 110th Street a distance of 9 feet and 8 and ¾ inches;

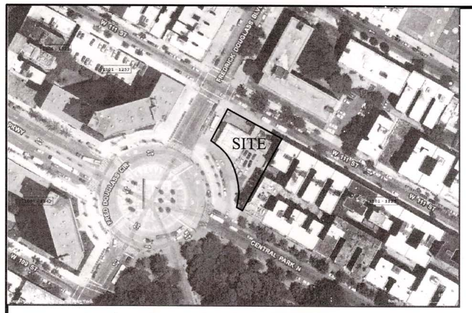
THENCE RUNNING northerly and at right angles to the last described line a distance of 171 feet 10 inches to the southerly side of West 111th Street;

THENCE RUNNING westerly along said side of west 111th Street a distance of 125 feet to the point or place of BEGINNING.

TITLE NO. 3115–00234

SURVEY NO. 54982–8

54982–8.DWG
54982–1.CRD



VICINITY MAP
NOT TO SCALE

LEGAL DESCRIPTION/ ENVIRONMENTAL EASEMENT DESCRIPTION

Tax Block 1826 Tax Lot 1 (0.31001 ACRE)
Environmental Easement (BCP# C–231087)

ALL that certain plot, piece or parcel of land situate, lying and being in the Borough of Manhattan, City and State of New York, being known and designated as Block 1826, Lot 1 on the tax map dated March 17, 1975, for the Borough of Manhattan, more particularly bounded and described as follows:

BEGINNING at the corner formed by the intersection of the southerly Side of One Hundred Eleventh Street with the easterly side of Eighth Avenue;

RUNNING THENCE southerly along the easterly side of Eighth Avenue, 72 feet 10 inches to the intersection of the easterly side of Eighth Avenue with the northerly side of Frederick Douglass circle;

THENCE along said Frederick Douglass Circle in a southerly direction on a curve to the right with a radius of 142 feet and a central angle of 64 degrees 41 minutes 31 seconds, a distance of 160 feet 4 inches per deed (160.333 feet per survey) to the northerly side of Cathedral Parkway;

THENCE easterly along said side of Cathedral Parkway a/k/a Central Park North and 110th Street, a distance of 9 feet 8–3/4 inches;

THENCE RUNNING northerly and at right angles to the last described line, a distance of 171 feet 10 inches to the southerly side of West 111th Street;

THENCE RUNNING westerly along said side of west 111th Street, a distance of 125 feet to the point or place of BEGINNING.

SCHEDULE B

3. Easement pertaining to a Stairway for a Subway Entrance Agreement recorded in Liber 3542 Cp. 349. (Plotted).

4. Permit to replace grates granted by NEW YORK CITY TRANSIT AUTHORITY to SOCONY MOBIL OIL COMPANY recorded in Liber 5157 Cp. 138. (Not Plottable).

5. Agreement between SOCONY MOBIL OIL COMPANY, INC. and NEW YORK CITY TRANSIT AUTHORITY dated 11/19/1963, recorded 02/04/1964 in Liber 5266 Cp. 11; which said Agreement reinstates the terms of the Agreement recorded in Liber 3542 Cp. 349 and amends the same. (Plotted).

6. Urban Renewal Plan, Terms, Covenants and Restrictions contained in Agreement between THE CITY OF NEW YORK and THE KINGS CHAPEL ASSEMBLY OF THE APOSTLE FAITH, INC., dated 09/13/1973, recorded 12/15/1974 in Reel 321 Page 1861. (Not Plottable).

7. Terms of Final Decree Index No. 40416175 in action entitled in the Matter of the Application of The City of New York, relative to acquiring title in fee simple absolute to the Real Property required for an Urban Renewal Project known as Harlem–East Harlem Neighborhood Development Area (Douglas Circle) which said Decree vested title to the premises herein described to the City of New York dated 11/19/1985, recorded 11/27/1985 in Reel 990 Page 1049. (Not Plottable).

With regard thereto:
Damage Map Harlem–East Harlem Neighborhood Development Project filed 03/17/1975 as Map No. 3960.

8. One dollar condemnation clause contained in deed from the City of New York to NEW YORK CITY ECONOMIC DEVELOPMENT CORPORATION dated 07/24/1996 and recorded in Reel 2353 Page 691 on 08/07/1996. Policy insures that an award in condemnation will not result in a diminution of value. (Not Plottable).

With regard thereto:

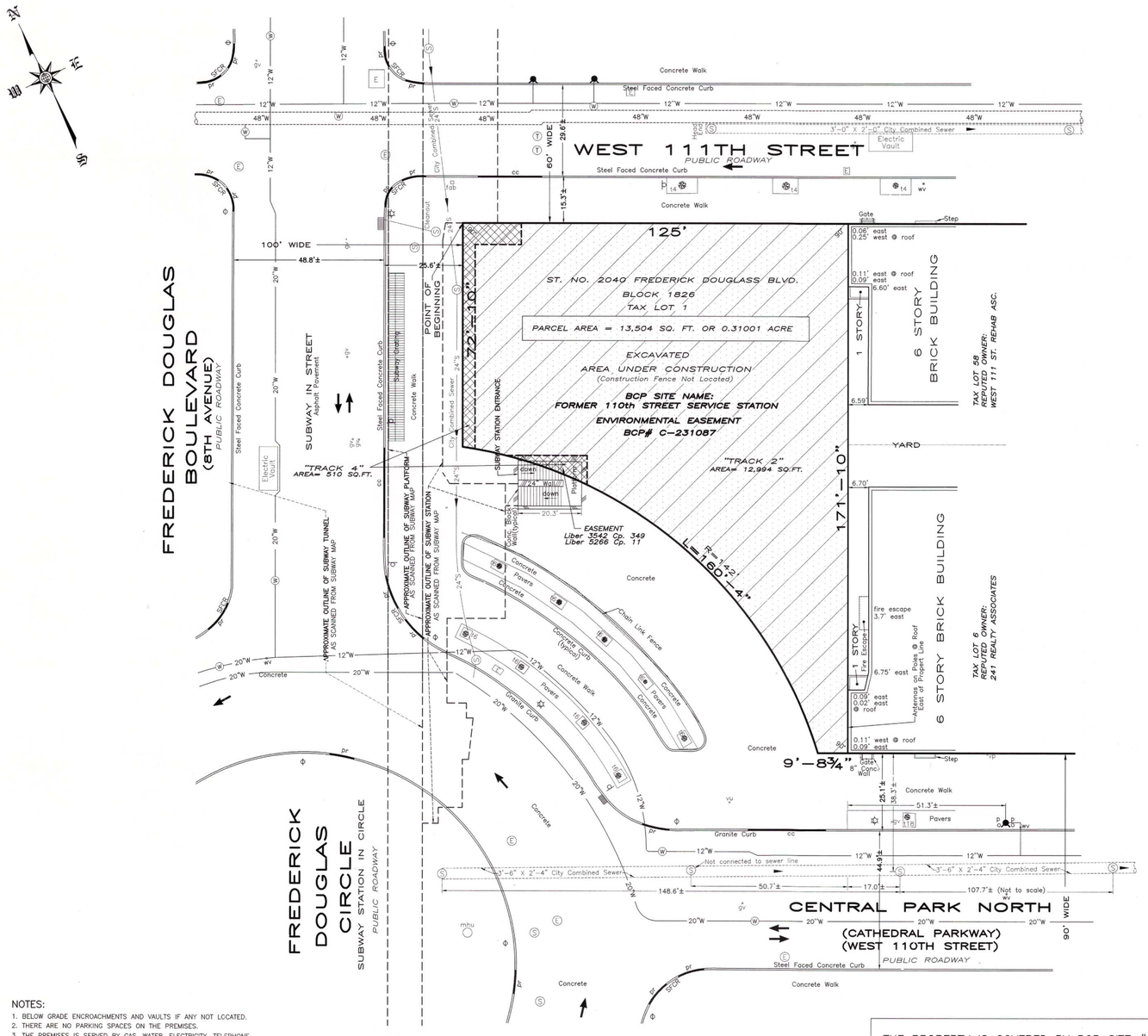
Satisfaction and Termination of covenants and Restrictions recorded 01/21/2014 in CRFN 2014000024661, which terminates all of the Covenants and Restrictions contained in the deed recorded in Reel 2353 Page 691 except for the One Dollar Condemnation Clause.

9. One dollar condemnation clause contained in deed from the City of New York to 110TH STREET SERVICE STATION, INC. dated 07/24/1996 and recorded in Reel 2353 Page 701 on 08/07/1996. Policy insures that an award in condemnation will not result in a diminution of value. (Not Plottable).

With regard thereto:

Satisfaction and Termination of Covenants and Restrictions recorded 01/21/2014 in CRFN 2014000024660, which terminates all of the Covenants and Restrictions contained in the deed recorded in Reel 2353 Page 701 except for the One Dollar Condemnation Clause.

10. Terms, Conditions, Covenants, Restrictions and Easements, including Right of Reverter in favor of the City of New York contained in deed from NEW YORK CITY ECONOMIC DEVELOPMENT CORPORATION to CRESCENT 110 EQUITIES LLC dated 12/18/2013, recorded 01/21/2014 in CRFN 2014000024658. (Not Plottable).



LEGEND

ASPH.....ASPHALT	PR.....PEDESTRIAN RAMP
BK.....BRICK	RET.....RETAINING
BSMT.....BASEMENT	RIM.....RIM ELEVATION SEWER MANHOLE
CC.....CURB CUT	SFCR.....STEEL FACED CURB ROUND
CCR.....CONCRETE CURB ROUND	STY.....STORY
CD.....CELLAR DOOR	TB.....TOP OF BANK ELEVATION
CLF.....CHAIN LINK FENCE	⏀.....TRAFFIC LIGHT
CO.....CATCH BASIN CLEAN OUT	TEL.....TELEPHONE
CONC.....CONCRETE	TP.....TREE PIT
CRF.....CHAIN ROPE FENCE	⏀.....TRAFFIC SIGN
CWA.....CELLAR WINDOW AREA	TW.....ELEVATION AT TOP OF WALL
DR.....DRAIN	UP.....UTILITY POLE
EL.....ELEVATION	VU.....VALVE UNKNOWN
FAB.....FIRE ALARM BOX	VLTU.....VAULT UNKNOWN
FC.....FILL CAP	VP.....VENT PIPE
FL EL.....FLOOR ELEVATION	WV.....WATER VALVE
GP.....GUARD POLE	12"G.....GAS MAIN WITH SIZE
GV.....GAS VALVE	12"S.....SEWER MAIN WITH SIZE
IF.....IRON FENCE	12"W.....WATER MAIN WITH SIZE
INL.....CATCH BASIN INLET ELEVATION	■.....CATCH BASIN
INV.....SEWER INVERT ELEVATION	Ⓔ Ⓔ.....ELECTRIC MANHOLE / VAULT
☼.....LIGHT POLE	Ⓕ.....FIRE MANHOLE
MB.....MAIL BOX	Ⓖ.....GAS MANHOLE
MHU.....UNKNOWN MANHOLE	Ⓢ.....SEWER MANHOLE
OF.....OIL FILL	Ⓣ.....TELEPHONE MANHOLE
OHW.....OVERHEAD WIRES	Ⓦ.....WATER MANHOLE
P.....POLE	TR.....TRAFFIC VAULT
PAVT.....PAVEMENT	●.....HYDRANT
PM.....PARKING METER	18.....TREE WITH SIZE
PMULT.....POLE, MULTIPLE USAGE	17.0.....ESTABLISHED/LEGAL GRADE

MANHATTAN TOPO BUREAU DATUM
MEAN SEA LEVEL 0.00 (NAVD 1988) — 1.65
MEAN SEA LEVEL 0.00 (NGVD1929) — 2.75

NAVD 1988 DATUM IS 1.65 FEET BELOW THE MANHATTAN TOPO BUREAU DATUM

FLOOD HAZARD NOTE

THE PARCEL SURVEYED IS COMPRISED OF AREAS DESIGNATED AS ZONE X (LESS THAN 0.2% CHANCE OF FLOODING)
FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP
COMMUNITY PANEL NUMBER 360497 0087 F
EFFECTIVE DATE SEPTEMBER 5, 2007

20 0 20 40 60
GRAPHIC SCALE – FEET

NOTES:

1. BELOW GRADE ENCROACHMENTS AND VAULTS IF ANY NOT LOCATED.
2. THERE ARE NO PARKING SPACES ON THE PREMISES.
3. THE PREMISES IS SERVED BY GAS, WATER, ELECTRICITY, TELEPHONE AND SANITARY SEWER LINES INSTALLED IN STREET.
4. PROFESSIONAL LIABILITY INSURANCE POLICY OBTAINED BY THE SURVEYOR IN THE MINIMUM AMOUNT OF $ 2,000,000.00 TO BE IN EFFECT THROUGHOUT THE CONTRACT TERM. CERTIFICATE OF INSURANCE TO BE FURNISHED UPON REQUEST.
5. THE PREMISES HAS ACCESS TO WEST 111th STREET, FREDERICK DOUGLAS BOULEVARD & CENTRAL PARK NORTH.
6. THERE IS EVIDENCE OF CONSTRUCTION OR EARTH MOVING.
7. THERE IS NO EVIDENCE OF USE OF PREMISES AS SOLID WASTE DUMP.
8. NO EVIDENCE OF WETLANDS OBSERVED.
9. NO EVIDENCE OF CEMETERIES OR BURIAL GROUNDS FOUND.
10. THE PROPERTY DESCRIBED HEREIN IS THE SAME PROPERTY DESCRIBED IN CHICAGO TITLE INSURANCE COMPANY COMMITMENT NO. 3115–0023+ WITH AN EFFECTIVE DATE OF APRIL 22, 2015.
11. THE STREET ADDRESS OF THE SUBJECT PROPERTY IS 2040 FREDERICK DOUGLAS BOULEVARD, NEW YORK, NY.

TRACK 2

TRACK 4

ENVIRONMENTAL EASEMENT BOUNDARY

THE PROPERTY IS COVERED BY BCP SITE # C–231087

ENVIRONMENTAL EASEMENT AREA ACCESS

THE DEC OR THEIR AGENT MAY ACCESS THE ENVIRONMENTAL EASEMENT AREA AS SHOWN HEREON THROUGH ANY EXISTING STREET ACCESS OR BUILDING INGRESS/EGRESS ACCESS POINT.

This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation pursuant to Title 36 of Article 71 of the New York Environmental Conservation Law.

THE ENGINEERING AND INSTITUTIONAL CONTROLS for the Easement are set forth in more detail in the Site Management Plan ("SMP"). A copy of the SMP must be obtained by any party with an interest in the property. The SMP may be obtained from the New York State Department of Environmental Conservation, Division of Environmental Remediation, Site Control Section, 625 Broadway, Albany, NY 12233 or at derweb@gw.dec.state.ny.us.

DRAWN: GP

ESTABLISHED 1876 * SUCCESSOR TO:

B.G. MEINKHEIM C.S.*C.U. POWELL C.E.,C.S.*L.C.L. SMITH C.S.*NATHAN CAMPBELL C.E.,C.S.*A.U. WHITSON C.E.,C.S.*
WILLIAM L. SAVACOOL C.E.,L.S.,C.S.*A.U. WHITSON INC. C.E.,C.S.*G. WEBER L.S.,C.S.*C. STODOLPH R.A.,L.S.*WHITSON & POWELL INC. P.E.,L.S.,C.S.*KELLER & POWELL P.E.,L.S.,C.S.*LOUIS MONTROSE C.E.,L.S.,C.S.*FRED J. POWELL P.E.,L.S.,C.S.*

REV	DATE	DESCRIPTION	ck

REV	DATE	DESCRIPTION	ck
	05–04–15	ENVIRONMENTAL EASEMENT SURVEY	
A	– – –	TRACK INFORMATION INDICATED	

MONTROSE
SURVEYING CO., LLP.
CITY & LAND SURVEYORS
116 20 METROPOLITAN AVE • RICHMOND HILL NY 11418–1090 • (718) 849–0600

STATE OF NEW YORK SAMUD JALILPOUR 050236 LICENSED LAND SURVEYOR

CITY OF NEW YORK
COUNTY NEW YORK
TAX BLOCK 1826
TAX LOT 1

SCALE: 1" = 20'

TP-584 (4/13)

New York State Department of Taxation and Finance

Combined Real Estate Transfer Tax Return, Credit Line Mortgage Certificate, and Certification of Exemption from the Payment of Estimated Personal Income Tax

Recording office time stamp

See Form TP-584-I, Instructions for Form TP-584, *before completing this form. Print or type.*

Schedule A — Information relating to conveyance

Grantor/Transferor

☐ Individual
☑ Corporation
☐ Partnership
☐ Estate/Trust
☐ Single member LLC
☐ Other

Name *(if individual, last, first, middle initial)* (☐ *check if more than one grantor)*
110TH STREET SERVICE STATION INC.

Social security number

Mailing address 2040 8TH AVENUE

Social security number

City	State	ZIP code	Federal EIN
NEW YORK	NY	10026	13 3053992

Single member's name if grantor is a single member LLC *(see instructions)*

Single member EIN or SSN

Grantee/Transferee

☐ Individual
☑ Corporation
☐ Partnership
☐ Estate/Trust
☐ Single member LLC
☐ Other

Name *(if individual, last, first, middle initial)* (☐ *check if more than one grantee)*
NEW YORK CITY ECONOMIC DEVELOPMENT CORPORATION

Social security number

Mailing address 110 WILLIAM STREET

Social security number

City	State	ZIP code	Federal EIN
NEW YORK	NY	10038	13 2577233

Single member's name if grantee is a single member LLC *(see instructions)*

Single member EIN or SSN

Location and description of property conveyed

Tax map designation - Section, block & lot *(include dots and dashes)*	SWIS code (six digits)	Street address	City, town, or village	County
1 - 1826 - 1	650000	2040 **********	NEW YORK	MANHATTAN / NEW YORK

Type of property conveyed *(check applicable box)*

1 ☐ One- to three-family house
2 ☐ Residential cooperative
3 ☐ Residential condominium
4 ☐ Vacant land
5 ☑ Commercial/Industrial
6 ☐ Apartment building
7 ☐ Office building
8 ☐ Other _____

Date of conveyance: 12 (month) 18 (day) 2013 (year)

Percentage of real property conveyed which is residential real property 0.00 % *(see instructions)*

Condition of conveyance *(check all that apply)*

a. ☑ Conveyance of fee interest
b. ☐ Acquisition of a controlling interest (state percentage acquired _____ %)
c. ☐ Transfer of a controlling interest (state percentage transferred _____ %)
d. ☐ Conveyance to cooperative housing corporation
e. ☐ Conveyance pursuant to or in lieu of foreclosure or enforcement of security interest *(attach Form TP-584.1, Schedule E)*
f. ☐ Conveyance which consists of a mere change of identity or form of ownership or organization *(attach Form TP-584.1, Schedule F)*
g. ☐ Conveyance for which credit for tax previously paid will be claimed *(attach Form TP-584.1, Schedule G)*
h. ☐ Conveyance of cooperative apartment(s)
i. ☐ Syndication
j. ☐ Conveyance of air rights or development rights
k. ☐ Contract assignment
l. ☐ Option assignment or surrender
m. ☐ Leasehold assignment or surrender
n. ☐ Leasehold grant
o. ☐ Conveyance of an easement
p. ☑ Conveyance for which exemption from transfer tax claimed *(complete Schedule B, Part III)*
q. ☐ Conveyance of property partly within and partly outside the state
r. ☐ Conveyance pursuant to divorce or separation
s. ☑ Other *(describe)* LAND SALE

For recording officer's use	Amount received	Date received	Transaction number
	Schedule B., Part I $ Schedule B., Part II $		

20131023001333O103

Schedule B — Real estate transfer tax return (Tax Law, Article 31)

Part I – Computation of tax due

1	Enter amount of consideration for the conveyance *(if you are claiming a total exemption from tax, check the exemption claimed box, enter consideration and proceed to Part III)* ☑ **Exemption claimed**	1.	0 00
2	Continuing lien deduction *(see instructions if property is taken subject to mortgage or lien)*	2.	0 00
3	Taxable consideration *(subtract line 2 from line 1)*	3.	0 00
4	Tax: $2 for each $500, or fractional part thereof, of consideration on line 3	4.	0 00
5	Amount of credit claimed for tax previously paid *(see instructions and attach Form TP-584.1,* Schedule G*)*	5.	0 00
6	Total tax due* *(subtract line 5 from line 4)*	6.	0 00

Part II – Computation of additional tax due on the conveyance of residential real property for $1 million or more

1	Enter amount of consideration for conveyance *(from* Part I*, line 1)*	1.	0 00
2	Taxable consideration *(multiply line 1 by the percentage of the premises which is residential real property, as shown in* Schedule A*)*	2.	0 00
3	Total additional transfer tax due* *(multiply line 2 by 1% (.01))*	3.	0 00

Part III – Explanation of exemption claimed on Part I, line 1 *(check any boxes that apply)*

The conveyance of real property is exempt from the real estate transfer tax for the following reason:

a. Conveyance is to the United Nations, the United States of America, the state of New York, or any of their instrumentalities, agencies, or political subdivisions (or any public corporation, including a public corporation created pursuant to agreement or compact with another state or Canada) ..... a ☑

b. Conveyance is to secure a debt or other obligation ..... b ☐

c. Conveyance is without additional consideration to confirm, correct, modify, or supplement a prior conveyance ..... c ☐

d. Conveyance of real property is without consideration and not in connection with a sale, including conveyances conveying realty as bona fide gifts ..... d ☐

e. Conveyance is given in connection with a tax sale ..... e ☐

f. Conveyance is a mere change of identity or form of ownership or organization where there is no change in beneficial ownership. (This exemption cannot be claimed for a conveyance to a cooperative housing corporation of real property comprising the cooperative dwelling or dwellings.) Attach Form TP-584.1, Schedule F ..... f ☐

g. Conveyance consists of deed of partition ..... g ☐

h. Conveyance is given pursuant to the federal Bankruptcy Act ..... h ☐

i. Conveyance consists of the execution of a contract to sell real property, without the use or occupancy of such property, or the granting of an option to purchase real property, without the use or occupancy of such property ..... i ☐

j. Conveyance of an option or contract to purchase real property with the use or occupancy of such property where the consideration is less than $200,000 and such property was used solely by the grantor as the grantor's personal residence and consists of a one-, two-, or three-family house, an individual residential condominium unit, or the sale of stock in a cooperative housing corporation in connection with the grant or transfer of a proprietary leasehold covering an individual residential cooperative apartment ..... j ☐

k. Conveyance is not a conveyance within the meaning of Tax Law, Article 31, section 1401(e) *(attach documents supporting such claim)* ..... k ☐

*The total tax (from Part I, line 6 and Part II, line 3 above) is due within 15 days from the date conveyance. Please make check(s) payable to the county clerk where the recording is to take place. If the recording is to take place in the New York City boroughs of Manhattan, Bronx, Brooklyn, or Queens, make check(s) payable to the ***NYC Department of Finance***. If a recording is not required, send this return and your check(s) made payable to the ***NYS Department of Taxation and Finance***, directly to the NYS Tax Department, RETT Return Processing, PO Box 5045, Albany NY 12205-5045.

Schedule C — Credit Line Mortgage Certificate (Tax Law, Article 11)

Complete the following only if the interest being transferred is a fee simple interest.
I (we) certify that: *(check the appropriate box)*

1. ☑ The real property being sold or transferred is not subject to an outstanding credit line mortgage.

2. ☐ The real property being sold or transferred is subject to an outstanding credit line mortgage. However, an exemption from the tax is claimed for the following reason:
   - ☐ The transfer of real property is a transfer of a fee simple interest to a person or persons who held a fee simple interest in the real property (whether as a joint tenant, a tenant in common or otherwise) immediately before the transfer.
   - ☐ The transfer of real property is (A) to a person or persons related by blood, marriage or adoption to the original obligor or to one or more of the original obligors or (B) to a person or entity where 50% or more of the beneficial interest in such real property after the transfer is held by the transferor or such related person or persons (as in the case of a transfer to a trustee for the benefit of a minor or the transfer to a trust for the benefit of the transferor).
   - ☐ The transfer of real property is a transfer to a trustee in bankruptcy, a receiver, assignee, or other officer of a court.
   - ☐ The maximum principal amount secured by the credit line mortgage is $3,000,000 or more, and the real property being sold or transferred is **not** principally improved nor will it be improved by a one- to six-family owner-occupied residence or dwelling.

     Please note: for purposes of determining whether the maximum principal amount secured is $3,000,000 or more as described above, the amounts secured by two or more credit line mortgages may be aggregated under certain circumstances. See TSB-M-96(6)-R for more information regarding these aggregation requirements.
   - ☐ Other *(attach detailed explanation)*.

3. ☐ The real property being transferred is presently subject to an outstanding credit line mortgage. However, no tax is due for the following reason:
   - ☐ A certificate of discharge of the credit line mortgage is being offered at the time of recording the deed.
   - ☐ A check has been drawn payable for transmission to the credit line mortgagee or his agent for the balance due, and a satisfaction of such mortgage will be recorded as soon as it is available.

4. ☐ The real property being transferred is subject to an outstanding credit line mortgage recorded in _____ (insert liber and page or reel or other identification of the mortgage). The maximum principal amount of debt or obligation secured by the mortgage is _____. No exemption from tax is claimed and the tax of _____ is being paid herewith. *(Make check payable to county clerk where deed will be recorded or, if the recording is to take place in New York City but not in Richmond County, make check payable to the **NYC Department of Finance**.)*

Signature (both the grantor(s) and grantee(s) must sign)

The undersigned certify that the above information contained in schedules A, B, and C, including any return, certification, schedule, or attachment, is to the best of his/her knowledge, true and complete, and authorize the person(s) submitting such form on their behalf to receive a copy for purposes of recording the deed or other instrument effecting the conveyance.

Grantor signature	Title	Grantee signature	Title
Grantor signature	Title	Grantee signature	Title

Reminder: Did you complete all of the required information in Schedules A, B, and C? Are you required to complete Schedule D? If you checked e, f, or g in Schedule A, did you complete Form TP-584.1? Have you attached your check(s) made payable to the county clerk where recording will take place or, if the recording is in the New York City boroughs of Manhattan, Bronx, Brooklyn, or Queens, to the ***NYC Department of Finance***? If no recording is required, send your check(s), made payable to the ***Department of Taxation and Finance***, directly to the NYS Tax Department, RETT Return Processing, PO Box 5045, Albany NY 12205-5045.

Signature (both the grantor(s) and grantee(s) must sign)

The undersigned certify that the above information contained in schedules A, B, and C, including any return, certification, schedule, or attachment, is to the best of his/her knowledge, true and complete, and authorize the person(s) submitting such form on their behalf to receive a copy for purposes of recording the deed or other instrument effecting the conveyance.

Grantor signature	Title	Grantee signature	Title
Grantor signature	Title	Grantee signature	Title

APPENDIX B
List of Site Contacts

Emergency Contact List

General Contacts

General Emergencies	911
NYC Police	911
NYC Fire Department	911
NYC Department of Health	212-676-2400
Mount Sinai Hospital	212-659-9210
Poison Control	800-222-1222
National Response Center	800-424-8802
NYSDEC Spills Hotline	800-457-7362

Project Contacts

NYSDEC Project Manager	Dana Mecomber	718-482-7541
NYSDEC Chief, Superfund and Brownfield Cleanup Section	Jane O'Connell	718-482-4599
NYSDOH Project Manager	Julia Kenney	518-402-7860
EBC BCP Program Manager	Charles Sosik	631-504-6000
Remedial Engineer	Ariel Czemerinski	516-987-1662
Owner's Representative	Evan Kashanian	646-834-9380

APPENDIX C
Boring Logs

Geologic Boring Log Details

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS

SB2

Location: Performed within the southern portion of the existing building.			Depth to Water (ft. from grade.)	Site Elevation Datum
Site Name: ART1301	Address: 2040 Frederick Douglas Blvd, Harlem, New York		Date / DTW	Ground Elevation
			Groundwater depth	
Drilling Company: Eastern Environmental Solutions	Method: Geoprobe			Well Specifications
Date Started: 4/12/2014	Date Completed: 4/12/2014			None
Completion Depth: 40 feet	Geologist Kevin Waters			

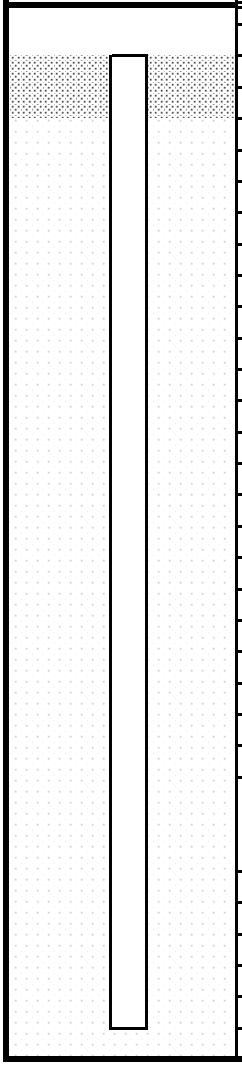
SB2 (NTS)	DEPTH (ft below grade)	SAMPLES Reco-very (in.)	Blow per 6 in.	PID (ppm)	SOIL DESCRIPTION
	0				
	to 5	8		0.0	8" - Brown sandy fill material
	to 10	12		0.0	12" - Brown sandy fill material
	to 15	8		0.0	8" - Brown sandy fill material
	to 20	18		0.0	18" - Brown silty sand with rock
	to 25	20		0.0	20" - Browm silty sand with rock
	to 30	15		0.0	15" - Grey/black silty clay. No odor. **Retained soil sample B2(25-27')*
	to 35	18		0.0	18" - Grey/black silty clay. No odor
	to 40	26		0.6	26" - Brown silty sand with rock **Retained soil sample B2(35-37') /B2 (38-40')*

Geologic Boring Log Details

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS

SB3

Location: Performed within the northern portion of the existing building.		Depth to Water (ft. from grade.)	Site Elevation Datum
Site Name: ART1301	Address: 2040 Frederick Douglas Blvd, Harlem, New York	Date / DTW: Groundwater depth	Ground Elevation
Drilling Company: Eastern Environmental Solutions	Method: Geoprobe		Well Specifications
Date Started: 4/12/2014	Date Completed: 4/12/2014		None
Completion Depth: 40 feet	Geologist Kevin Waters		

SB3 (NTS)	DEPTH (ft below grade)	SAMPLES Reco-very (in.)	Blow per 6 in.	PID (ppm)	SOIL DESCRIPTION
	0 to 5	16		0.0	16" - Brown sandy fill material with brick
	5 to 10	21		0.0	21" - Brown sandy fill material with brick
	10 to 15	30		0.0	30" - Brown sandy fill material with brick
	15 to 20	28		0.0	28" - Brown sandy fill material with brick
	20 to 25	34		0.0	26" - Brown decomposed schist 8" - Brown sands with rock
	25 to 30	26		0.0	16" - Brown sand with rock and gravel 10" - Schist Refusal encountered at 29ftbg. **Retained soil sample B3(25-27') /B3(27-29')*
	30 to 35				
	35 to 40				

Geologic Boring Log Details

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS

SB5

Location: Performed on western portion of property between dispensers islands.		Depth to Water (ft. from grade.)	Site Elevation Datum
Site Name: ART1301	Address: 2040 Frederick Douglas Blvd, Harlem, New York	Date / DTW	Ground Elevation
		Groundwater depth	
Drilling Company: Eastern Environmental Solutions	Method: Geoprobe		Well Specifications
Date Started: 4/12/2014	Date Completed: 4/12/2014		None
Completion Depth: 40 feet	Geologist Kevin Waters		

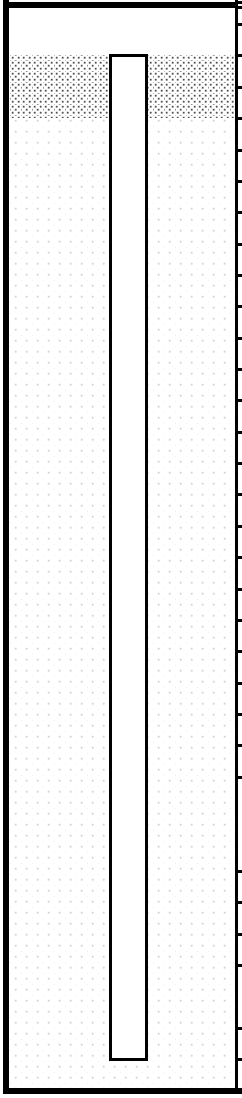
SB5 (NTS)	DEPTH (ft below grade)	SAMPLES Reco-very (in.)	Blow per 6 in.	PID (ppm)	SOIL DESCRIPTION
	0				
	to 5	10		0.0	10" - Brown sandy sill material with brick
	to 10	8		0.0	8" - Brown sandy fill material with brick
	to 15	6		0.0	6" - Dark brown sandy silt with fill material and rock
	to 20	6		0.0	6" - Dark brown sandy silt with fill material and rock
	to 25	12		200	12" - Grey/black silty sand with clay
	to 30	22		600	22" - Grey/black silty clay **Retained soil sample B5(25-27')*
	to 35	10		600	10" - Brown silty sand and rock
	to 40	3		0	3" - Brown silty sand and rock **Retained soil sample B5(35-37')*

Geologic Boring Log Details

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS

SB6

Location: Performed south of existing building between dispenser islands and UST field.			Depth to Water (ft. from grade.)	Site Elevation Datum
Site Name: ART1301	Address: 2040 Frederick Douglas Blvd, Harlem, New York		Date / DTW	Ground Elevation
			Groundwater depth	
Drilling Company: Eastern Environmental Solutions	Method: Geoprobe			Well Specifications
Date Started: 4/9/2014	Date Completed: 4/9/2014			None
Completion Depth: 40 feet	Geologist Kevin Waters			

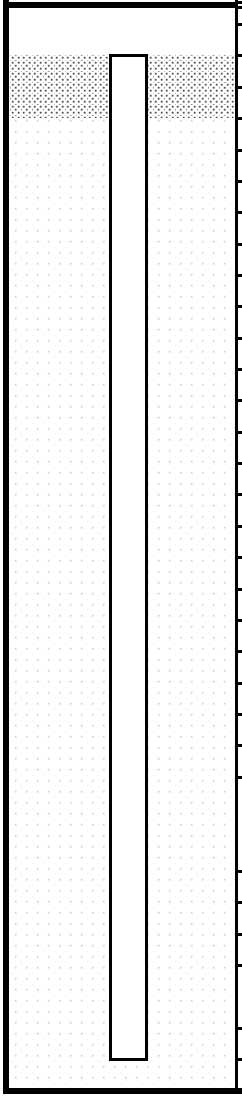
SB6 (NTS)	DEPTH (ft below grade)	SAMPLES Recovery (in.)	Blow per 6 in.	PID (ppm)	SOIL DESCRIPTION
	0 to 5	8		0.0	8" - Concrete
	5 to 10	8		0.0	8" - Brown silty sand and fill material
	10 to 15	14		0.0	14" - Brown silty sand
	15 to 20	9		0.0	9" - Dark brown silty sand
	20 to 25	7		1	7" - Brown/grey silty sand
	25 to 30	19		200	19" - Grey/black silty clay. Gas odor. **Retained soil sample B6(25-27')*
	30 to 35	19		600	19" - Grey/black silty clay with rock. Gas odor **Retained soil sample B6(30-32')*
	35 to 40	23		40	23" - Grey/brown silty clay. Gas odor **Retained soil sample B6(38-40')*

Geologic Boring Log Details

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS

SB7

Location: Performed north of UST field.		Depth to Water (ft. from grade.)		Site Elevation Datum
Site Name: ART1301	Address: 2040 Frederick Douglas Blvd, Harlem, New York	Date	DTW	Ground Elevation
		Groundwater depth		
Drilling Company: Eastern Environmental Solutions	Method: Geoprobe			Well Specifications
Date Started: 4/10/2014	Date Completed: 4/10/2014			None
Completion Depth: 40 feet	Geologist Kevin Waters			

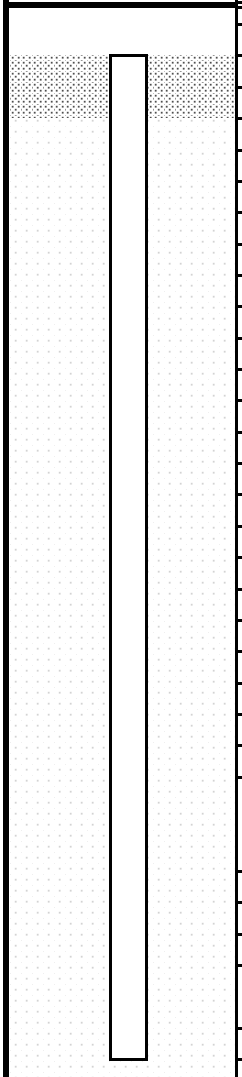
SB7 (NTS)	DEPTH (ft below grade)	SAMPLES Reco-very (in.)	Blow per 6 in.	PID (ppm)	SOIL DESCRIPTION
	0 to 5	2		0.0	2" - concrete
	5 to 10	6		0.0	6" - Brown sandy fill material
	10 to 15	5		5.0	5" - Brown sandy fill material
	15 to 20	13		200	13" - Gray silty clay. Gas odor
	20 to 25	12		250	12" - Black silty sand. Gas odor.
	25 to 30	10		250	10" - Grey silty clay with rock **Retained soil sample B7(25-27')*
	30 to 35	12		300	6" - Grey silty clay 6" - Brown/blck sand **Retained soil sample B7(30-32')*
	35 to 40	24		70	24" - Black/reddish brown sands **Retained soil sample B7(38-40')*

Geologic Boring Log Details

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS

SB8

Location: Performed on the eastern side of the tankfield.		Depth to Water (ft. from grade.)	Site Elevation Datum
Site Name: ART1301	Address: 2040 Frederick Douglas Blvd, Harlem, New York	Date / DTW	Ground Elevation
		Groundwater depth	
Drilling Company: Eastern Environmental Solutions	Method: Geoprobe		Well Specifications
Date Started: 4/9/2014	Date Completed: 4/9/2014		None
Completion Depth: 40 feet	Geologist Kevin Waters		

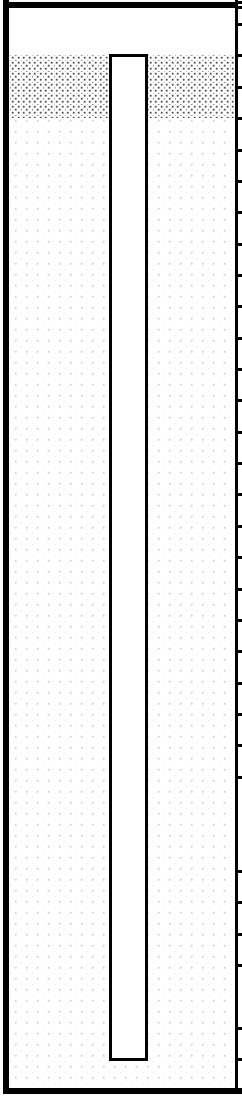
SB8 (NTS)	DEPTH (ft below grade)	SAMPLES Reco-very (in.)	Blow per 6 in.	PID (ppm)	SOIL DESCRIPTION
	0 to 5	8		0.0	8" - concrete
	5 to 10	12		0.0	12" - Brown silty sand
	10 to 15	7		0.0	7" - Brown silty sand with rock
	15 to 20	10		0.0	10" - Brown silty sand with rock
	20 to 25	30		17	15" - Brown silty sand with rock 15" - Grey silty sand with rock. Slight odor.
	25 to 30	29		300	29" - Brown/Grey sandy silt with sheen. Gas odor. Moist. **Retained soil sample B8(25-27')*
	30 to 35	34		50	4" - Brown Grey silty sand 15" - Gray/black silrty sand 15" - Grey silty clay **Retained soil sample B8(30-32')*
	35 to 40	31		700	9" - Brown silty sand 8" - Black sands 14" - Brown silty sand **Retained soil sample B8(38-40')*

Geologic Boring Log Details

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS

SB9

Location: Performed south of UST field.			Depth to Water (ft. from grade.)	Site Elevation Datum
Site Name: ART1301	Address: 2040 Frederick Douglas Blvd, Harlem, New York	Date / DTW	Groundwater depth	Ground Elevation
Drilling Company: Eastern Environmental Solutions	Method: Geoprobe			Well Specifications
Date Started: 4/9/2014	Date Completed: 4/9/2014			None
Completion Depth: 40 feet	Geologist Kevin Waters			

SB9 (NTS)	DEPTH (ft below grade)	SAMPLES Reco-very (in.)	Blow per 6 in.	PID (ppm)	SOIL DESCRIPTION
	0 to 5	12		2.0	12" - Brown sandy silt with fill material and brick
	5 to 10	9		0.0	9" - Brown sandy silt with fill material and brick
	10 to 15	18		0.0	18" - Brown sandy silt with fill material and brick
	15 to 20	30		350	15" - Brown silty sand 15" - Black silty sand. Gas odor
	20 to 25	22		200	22" - Black/brown silty sand. Gas odor.
	25 to 30	21		200	21" - Orange/brown silty sand with rock and brick. Gas odor. **Retained soil sample B9(25-27')*
	30 to 35	18		200	18" - Grey/black silty clay. Gas odor. **Retained soil sample B9(35-37')*
	35 to 40	31		800	7" - Brown silty sand 8" - Black sands 16" - Red/brown silty sand **Retained soil sample B9(38-40')*

Geologic Boring Log Details

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS

SB10

Location: Performed on the southern portion of the property, along W 100th Street.			Depth to Water (ft. from grade.)	Site Elevation Datum
Site Name: ART1301	Address: 2040 Frederick Douglas Blvd, Harlem, New York		Date / DTW	Ground Elevation
			Groundwater depth	
Drilling Company: Eastern Environmental Solutions	Method: Geoprobe			Well Specifications
Date Started: 4/9/2014	Date Completed: 4/9/2014			None
Completion Depth: 40 feet	Geologist Kevin Waters			

SB10 (NTS)	DEPTH (ft below grade)	SAMPLES Reco-very (in.)	Blow per 6 in.	PID (ppm)	SOIL DESCRIPTION
	0				
	to 5	12		0.0	12" - Brown sandy fill material with concrete and rock.
	to 10	12		0.0	12" - Brown silty sand with rock
	to 15	24		0.0	24" - Brown silty sand with rock
	to 20	10		0.0	10" - Rock and brick
	to 25	19		0.0	19" - Brown silty sand with rock
	to 30	8		200	8" - Brown silty sand with rock. Moist at 30ft. Gas odor. **Retained soil sample B10(25-27')*
	to 35	39		10	12" - Brown/black silty sand, slight odor. 27" - Brown silty sand, slight odor. **Retained soil sample B10(30-32')*
	to 40	25		40	12" - Brown sands 13" - Brown/black sands, gas odor. **Retained soil sample B10(38-40')*

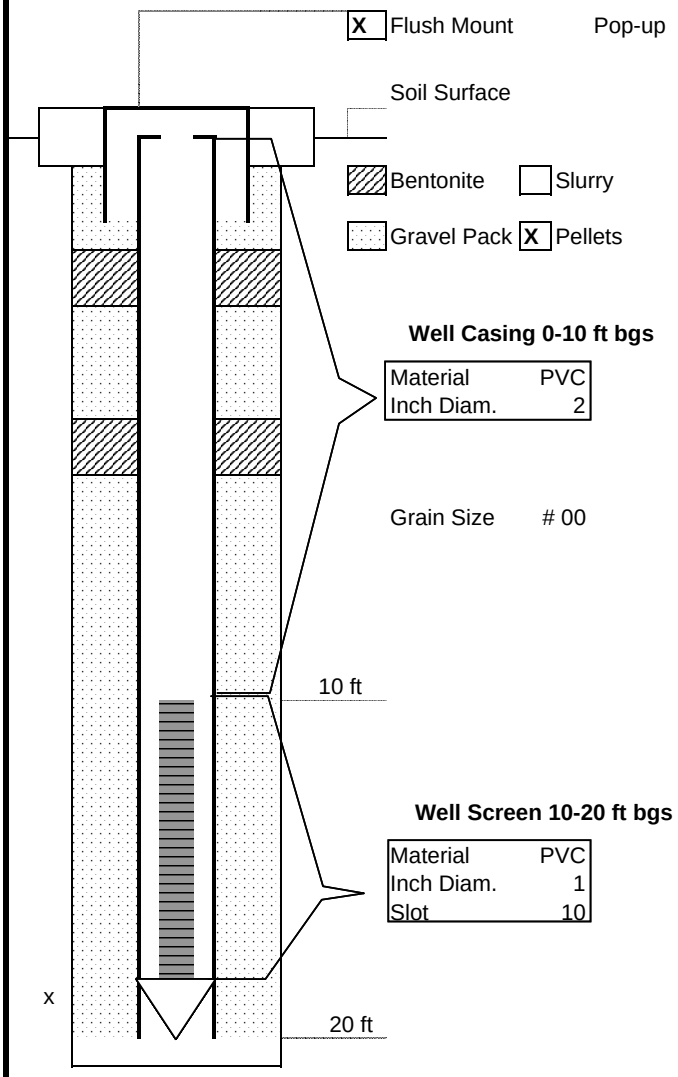
APPENDIX D
Monitoring Well Construction Logs

GROUNDWATER MONITORING WELL

CONSTRUCTION LOG

MW1501

ENVIRONMENTAL BUSINESS CONSULTANTS



Note: Drawing is not to scale.
Depths are given in feet below land surface.

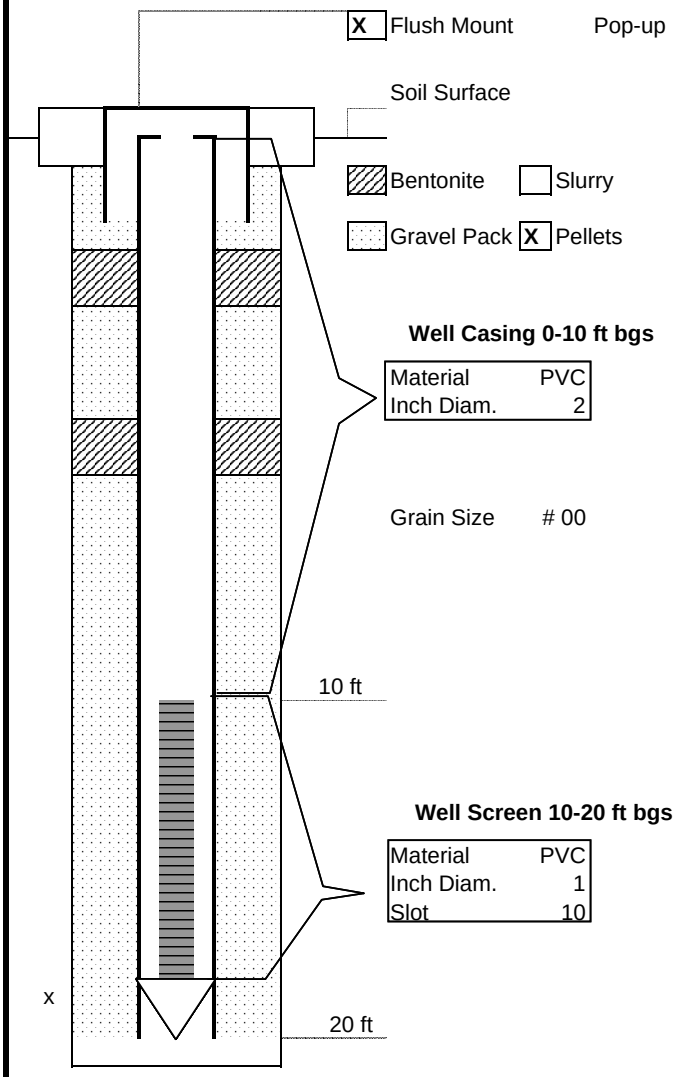
Monitoring Well No.:	MW1501
Project:	Former 110th Street Service Station 2040 Frederick Douglas Blvd, New York, NY
Depth to Groundwater	16.44 Date: 9/1/215
Installation Depth:	20 feet below basement slab
Survey Point Elevation:	
Installation Date:	August 11, 2015
Drilling Contractor:	C2 Environmental
Installation Method:	Geoprobe - Hollow Probe Rods
Field Oversight:	K. Waters

GROUNDWATER MONITORING WELL

ENVIRONMENTAL BUSINESS CONSULTANTS

CONSTRUCTION LOG

MW1502



Note: Drawing is not to scale.
Depths are given in feet below land surface.

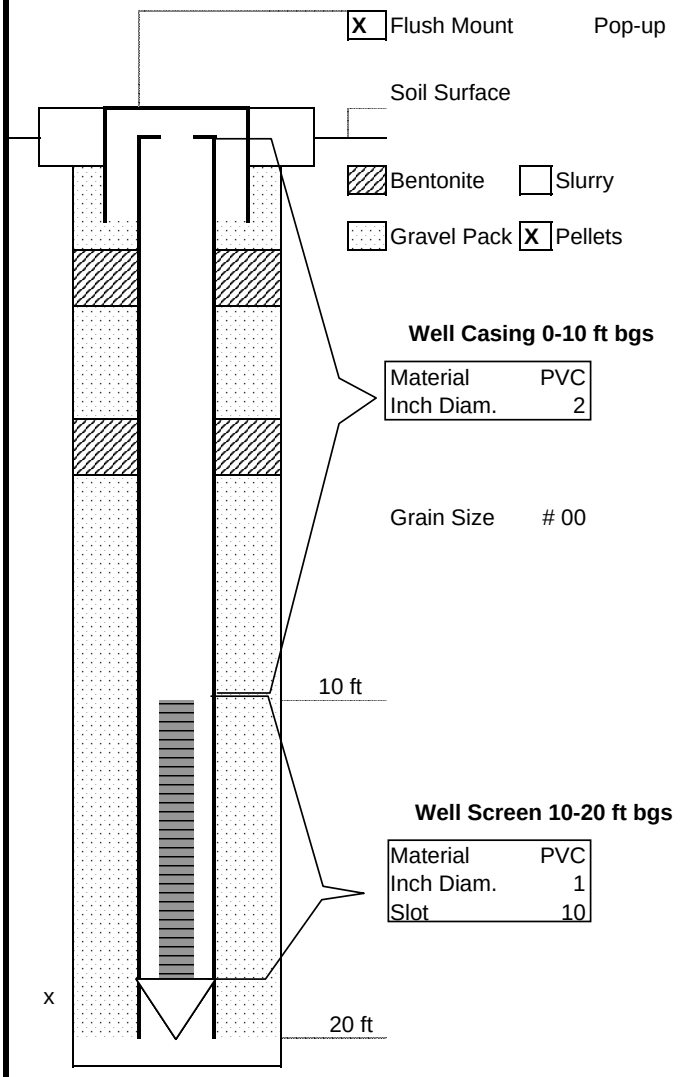
Monitoring Well No.:	MW1502
Project:	Former 110th Street Service Station 2040 Frederick Douglas Blvd, New York, NY
Depth to Groundwater	10.62 Date: 9/1/2015
Installation Depth:	20 feet below basement slab
Survey Point Elevation:	
Installation Date:	August 11, 2015
Drilling Contractor:	C2 Environmental
Installation Method:	Geoprobe - Hollow Probe Rods
Field Oversight:	K. Waters

GROUNDWATER MONITORING WELL

CONSTRUCTION LOG

MW1503

ENVIRONMENTAL BUSINESS CONSULTANTS



Note: Drawing is not to scale.
Depths are given in feet below land surface.

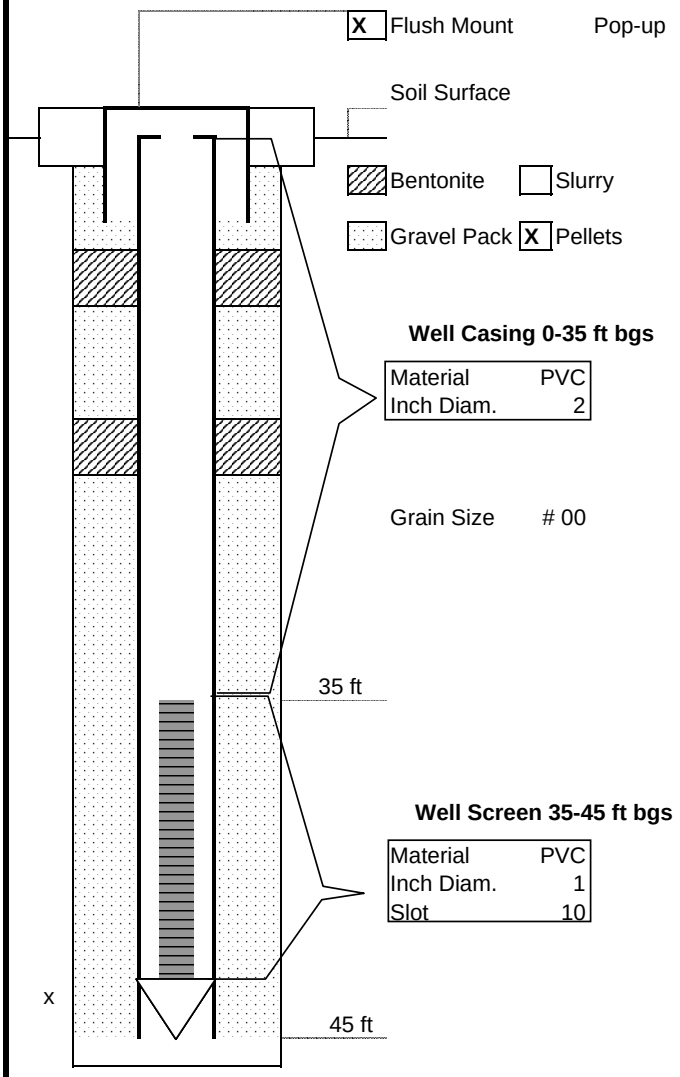
Monitoring Well No.:	MW1503
Project:	Former 110th Street Service Station
	2040 Frederick Douglas Blvd, New York, NY
Depth to Groundwater	16.92 Date: 9/1/2015
Installation Depth:	20 feet below basement slab
Survey Point Elevation:	NA
Installation Date:	July 27, 2015
Drilling Contractor:	C2 Environmental
Installation Method:	Geoprobe - Hollow Probe Rods
Field Oversight:	K. Waters

GROUNDWATER MONITORING WELL

CONSTRUCTION LOG

MW1504

ENVIRONMENTAL BUSINESS CONSULTANTS



Note: Drawing is not to scale.
Depths are given in feet below land surface.

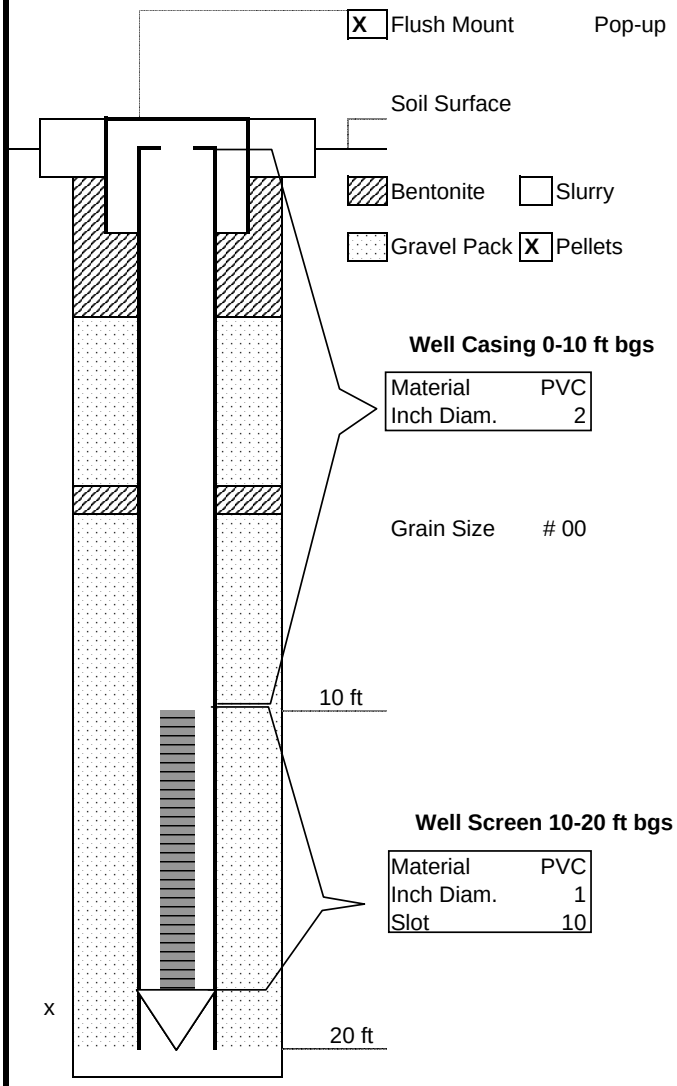
Monitoring Well No.:	MW1504
Project:	Former 110th Street Service Station 2040 Frederick Douglas Blvd, New York, NY
Depth to Groundwater	Date:
Installation Depth:	45 feet below sidewalk
Survey Point Elevation:	NA
Installation Date:	September 28, 2015
Drilling Contractor:	C2 Environmental
Installation Method:	Geoprobe - Hollow Probe Rods
Field Oversight:	K. Waters

GROUNDWATER MONITORING WELL

ENVIRONMENTAL BUSINESS CONSULTANTS

CONSTRUCTION LOG

MW1505



Note: Drawing is not to scale.
Depths are given in feet below land surface.

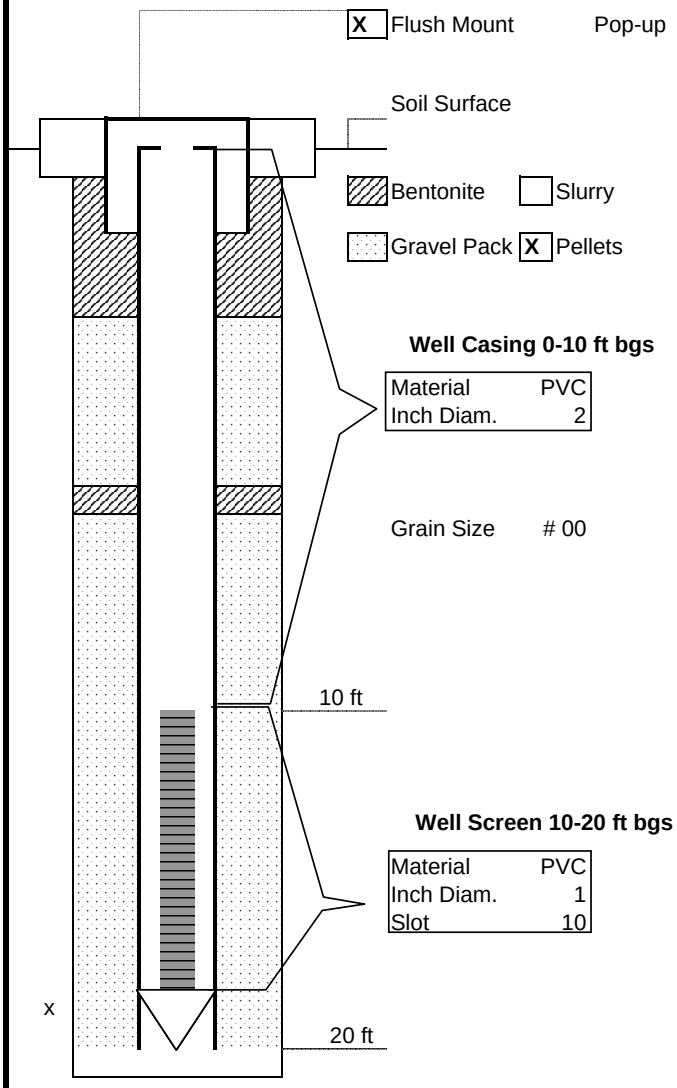
Monitoring Well No.:	MW1505
Project:	Former 110th Street Service Station
	2040 Frederick Douglas Blvd, New York, NY
Depth to Groundwater	12.29 Date: 7/27/2015
Installation Depth:	20 feet below basement slab
Survey Point Elevation:	NA
Installation Date:	July 27, 2015
Drilling Contractor:	C2 Environmental
Installation Method:	Geoprobe - Hollow Probe Rods
Field Oversight:	K. Waters

GROUNDWATER MONITORING WELL

ENVIRONMENTAL BUSINESS CONSULTANTS

CONSTRUCTION LOG

MW6



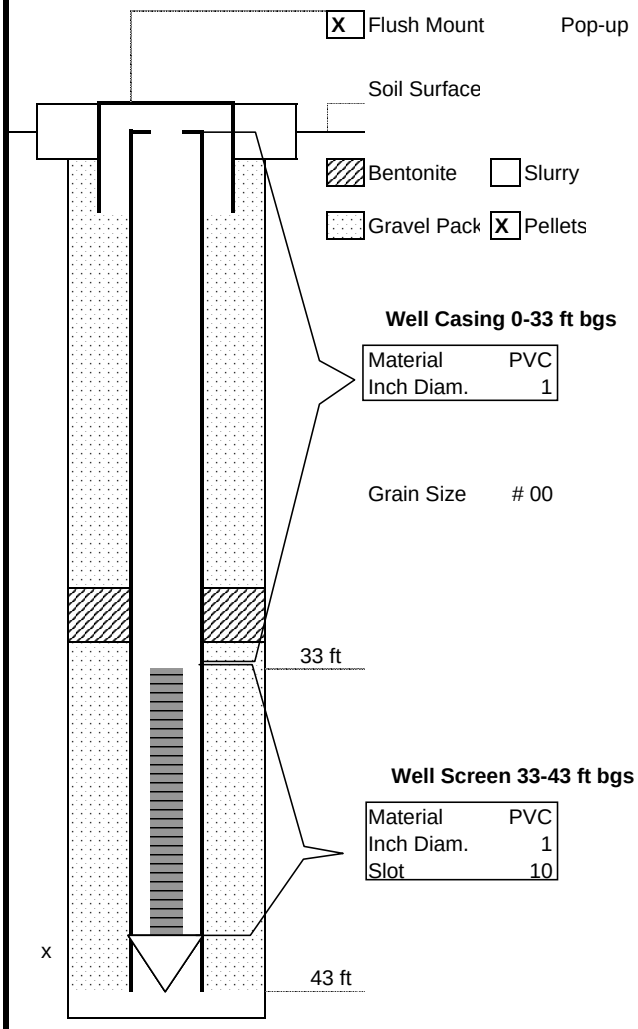
Note: Drawing is not to scale.
Depths are given in feet below land surface.

Monitoring Well No.:	MW6
Project:	Former 110th Street Service Station
	2040 Frederick Douglas Blvd, New York, NY
Depth to Groundwater	Date:
Installation Depth:	45 ft below sidewalk
Survey Point Elevation:	NA
Installation Date:	September 11, 2015
Drilling Contractor:	C2 Environmental
Installation Method:	Geoprobe - Hollow Probe Rods
Field Oversight:	K. Waters

GROUNDWATER MONITORING WELL

CONSTRUCTION LOG

MW15 (1506)



Note: Drawing is not to scale.
Depths are given in feet below land surface.

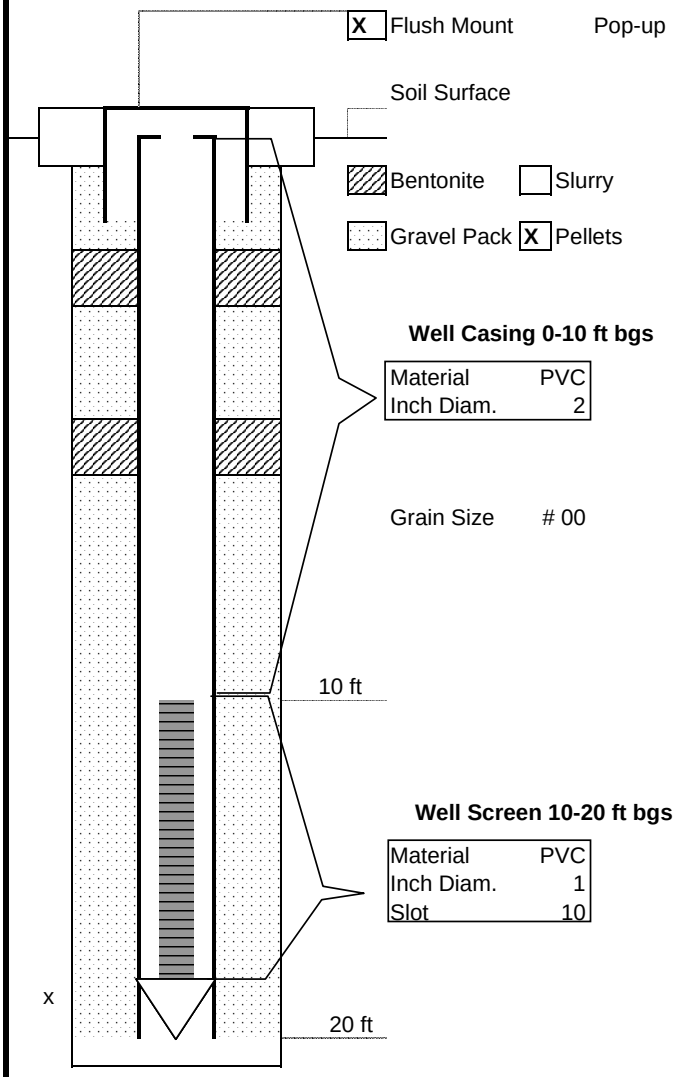
Monitoring Well No.:	MW15 (1506)
Project:	Former 110th Street Service Station
	2040 Frederick Douglas Blvd, New York, NY
Depth to Groundwate:	34.85 Date: 4/8/2015
Installation Depth:	43 ft below sidewalk
Survey Point Elevation:	NA
Installation Date:	December 18, 2014
Drilling Contractor:	Eastern Environmental
Installation Method:	Geoprobe - Hollow Probe Rods
Field Oversight:	K. Waters

GROUNDWATER MONITORING WELL

CONSTRUCTION LOG

IW3

ENVIRONMENTAL BUSINESS CONSULTANTS



Note: Drawing is not to scale.
Depths are given in feet below land surface.

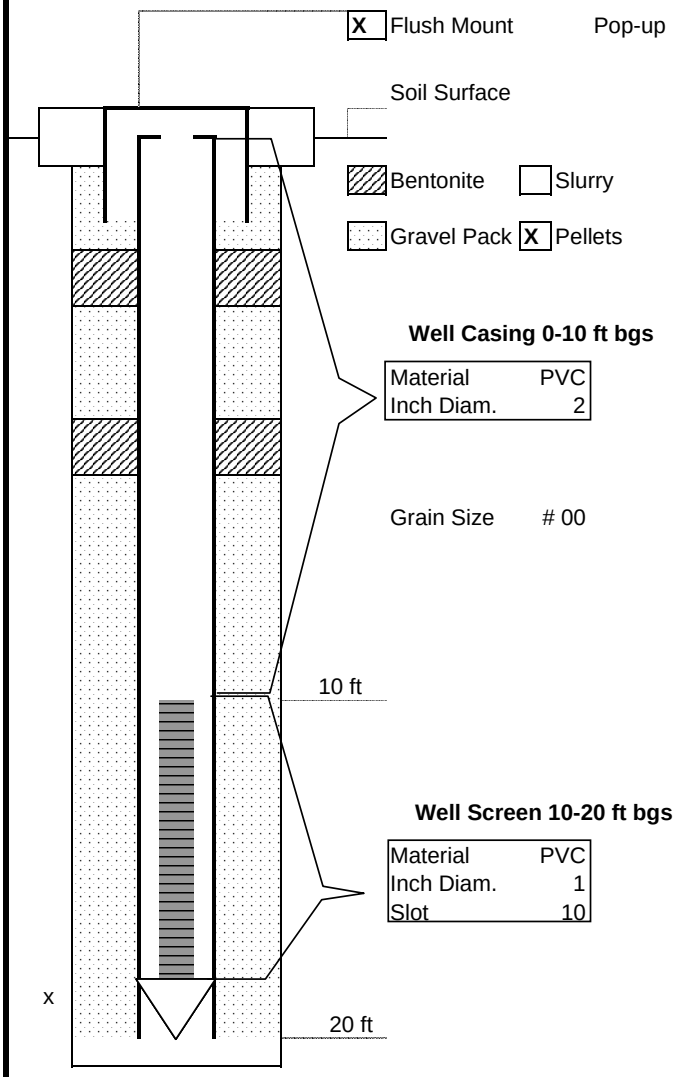
Monitoring Well No.:	IW3
Project:	Former 110th Street Service Station
	2040 Frederick Douglas Blvd, New York, NY
Depth to Groundwater	14' Date: 7/27/2015
Installation Depth:	20 feet bg
Survey Point Elevation:	NA
Installation Date:	July 27, 2015
Drilling Contractor:	C2 Environmental
Installation Method:	Geoprobe - Hollow Probe Rods
Field Oversight:	K. Waters

GROUNDWATER MONITORING WELL

CONSTRUCTION LOG

IW4

ENVIRONMENTAL BUSINESS CONSULTANTS



Note: Drawing is not to scale.
Depths are given in feet below land surface.

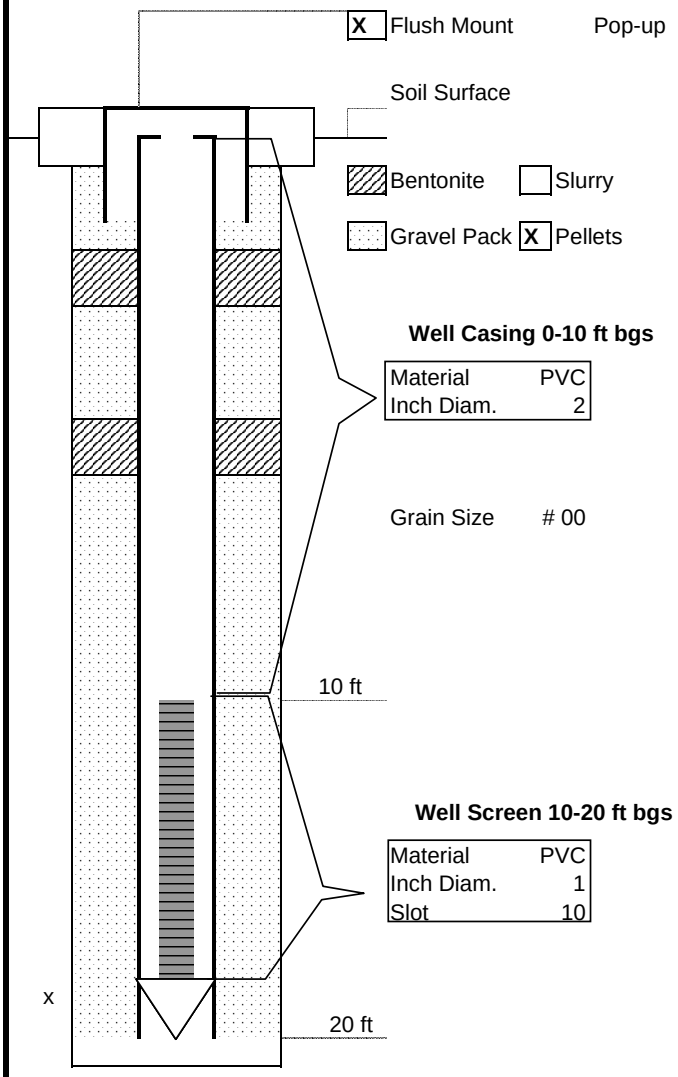
Monitoring Well No.:	IW4
Project:	Former 110th Street Service Station
	2040 Frederick Douglas Blvd, New York, NY
Depth to Groundwater	14' Date: 7/27/2015
Installation Depth:	20 feet bg
Survey Point Elevation:	NA
Installation Date:	July 27, 2015
Drilling Contractor:	C2 Environmental
Installation Method:	Geoprobe - Hollow Probe Rods
Field Oversight:	K. Waters

GROUNDWATER MONITORING WELL

CONSTRUCTION LOG

IW6

ENVIRONMENTAL BUSINESS CONSULTANTS



Note: Drawing is not to scale.
Depths are given in feet below land surface.

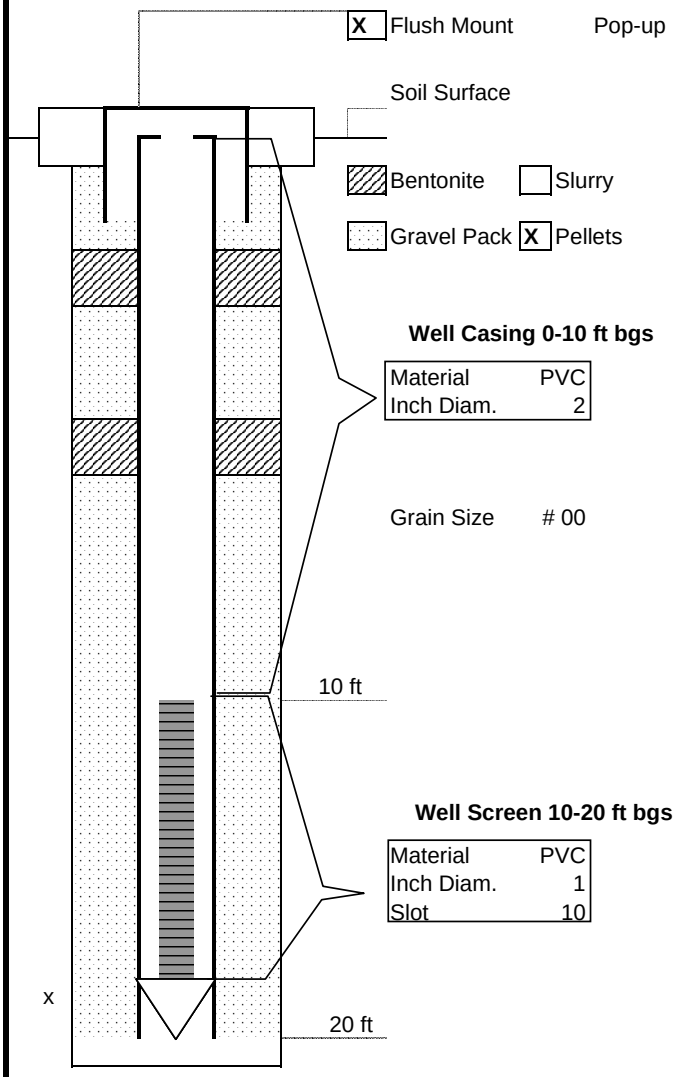
Monitoring Well No.:	IW6
Project:	Former 110th Street Service Station
	2040 Frederick Douglas Blvd, New York, NY
Depth to Groundwater	Date: 7/27/2015
Installation Depth:	20 feet bg
Survey Point Elevation:	NA
Installation Date:	July 27, 2015
Drilling Contractor:	C2 Environmental
Installation Method:	Geoprobe - Hollow Probe Rods
Field Oversight:	K. Waters

GROUNDWATER MONITORING WELL

CONSTRUCTION LOG

IW7

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS



Note: Drawing is not to scale.
Depths are given in feet below land surface.

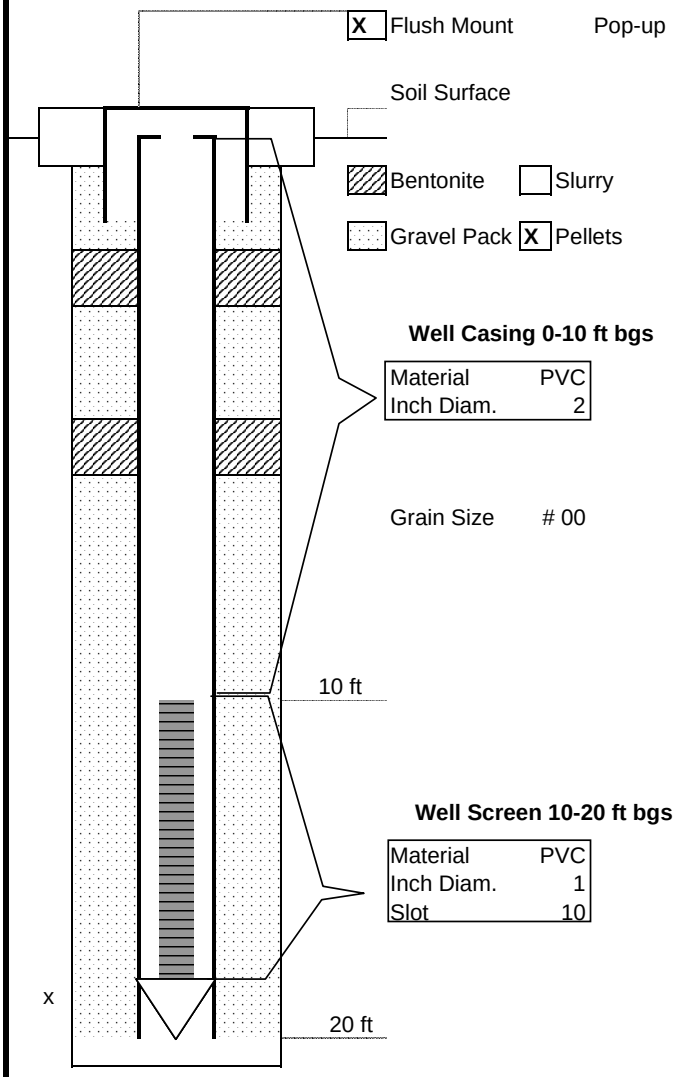
Monitoring Well No.:	IW7
Project:	Former 110th Street Service Station
	2040 Frederick Douglas Blvd, New York, NY
Depth to Groundwater	12' Date: 7/27/2015
Installation Depth:	20 feet bg
Survey Point Elevation:	NA
Installation Date:	July 27, 2015
Drilling Contractor:	C2 Environmental
Installation Method:	Geoprobe - Hollow Probe Rods
Field Oversight:	K. Waters

GROUNDWATER MONITORING WELL

CONSTRUCTION LOG

IW11

ENVIRONMENTAL BUSINESS CONSULTANTS



Note: Drawing is not to scale.
Depths are given in feet below land surface.

Monitoring Well No.: IW11

Project: Former 110th Street Service Station

2040 Frederick Douglas Blvd, New York, NY

Depth to Groundwater Date:

Installation Depth: 20 feet bg

Survey Point Elevation: NA

Installation Date: August 12, 2015

Drilling Contractor: C2 Environmental

Installation Method: Geoprobe - Hollow Probe Rods

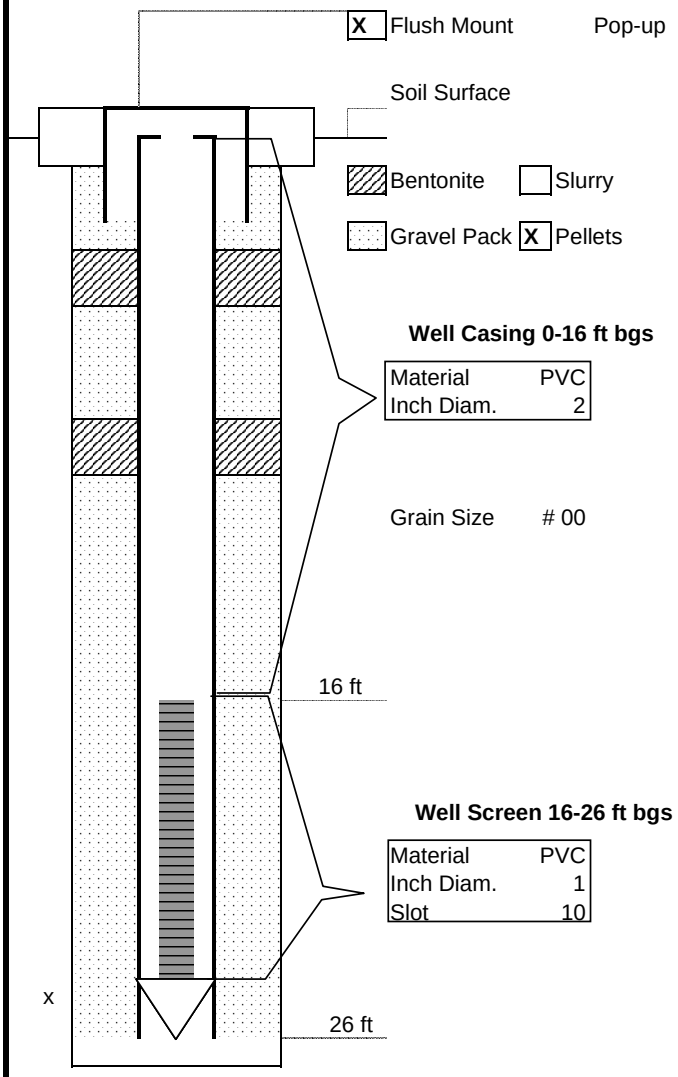
Field Oversight: K. Waters

GROUNDWATER MONITORING WELL

CONSTRUCTION LOG

IW14

ENVIRONMENTAL BUSINESS CONSULTANTS



Note: Drawing is not to scale.
Depths are given in feet below land surface.

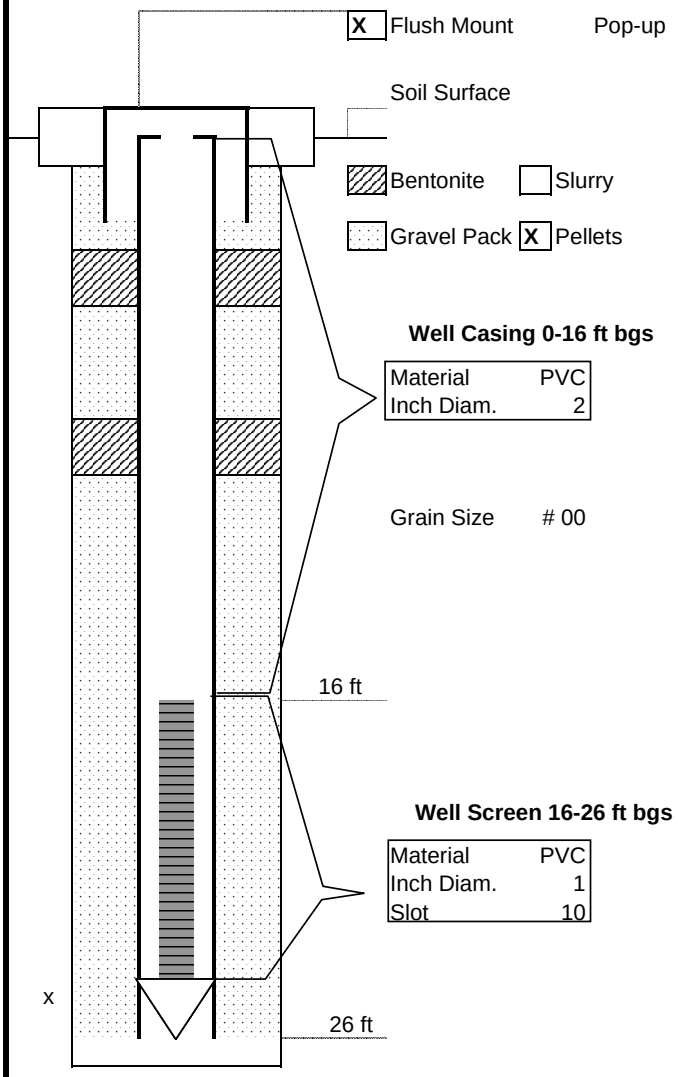
Monitoring Well No.:	IW14
Project:	Former 110th Street Service Station
	2040 Frederick Douglas Blvd, New York, NY
Depth to Groundwater	Date:
Installation Depth:	26 ft bg
Survey Point Elevation:	NA
Installation Date:	September 28, 2015
Drilling Contractor:	C2 Environmental
Installation Method:	Geoprobe - Hollow Probe Rods
Field Oversight:	K. Waters

GROUNDWATER MONITORING WELL

CONSTRUCTION LOG

IW15

ENVIRONMENTAL BUSINESS CONSULTANTS



Note: Drawing is not to scale.
Depths are given in feet below land surface.

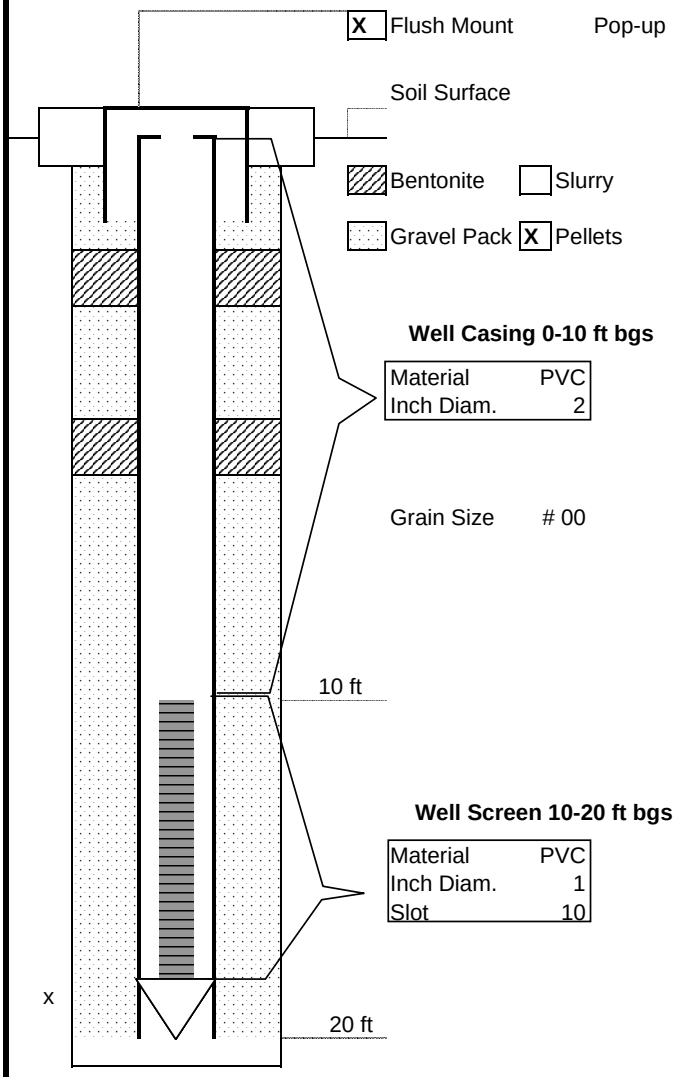
Monitoring Well No.:	IW15
Project:	Former 110th Street Service Station
	2040 Frederick Douglas Blvd, New York, NY
Depth to Groundwater	Date:
Installation Depth:	26 ft bg
Survey Point Elevation:	NA
Installation Date:	September 28, 2015
Drilling Contractor:	C2 Environmental
Installation Method:	Geoprobe - Hollow Probe Rods
Field Oversight:	K. Waters

GROUNDWATER MONITORING WELL

CONSTRUCTION LOG

IW16

ENVIRONMENTAL BUSINESS CONSULTANTS



Note: Drawing is not to scale.
Depths are given in feet below land surface.

Monitoring Well No.: IW16

Project: Former 110th Street Service Station

2040 Frederick Douglas Blvd, New York, NY

Depth to Groundwater Date:

Installation Depth: 20 feet bg

Survey Point Elevation: NA

Installation Date: July 27, 2015

Drilling Contractor: C2 Environmental

Installation Method: Geoprobe - Hollow Probe Rods

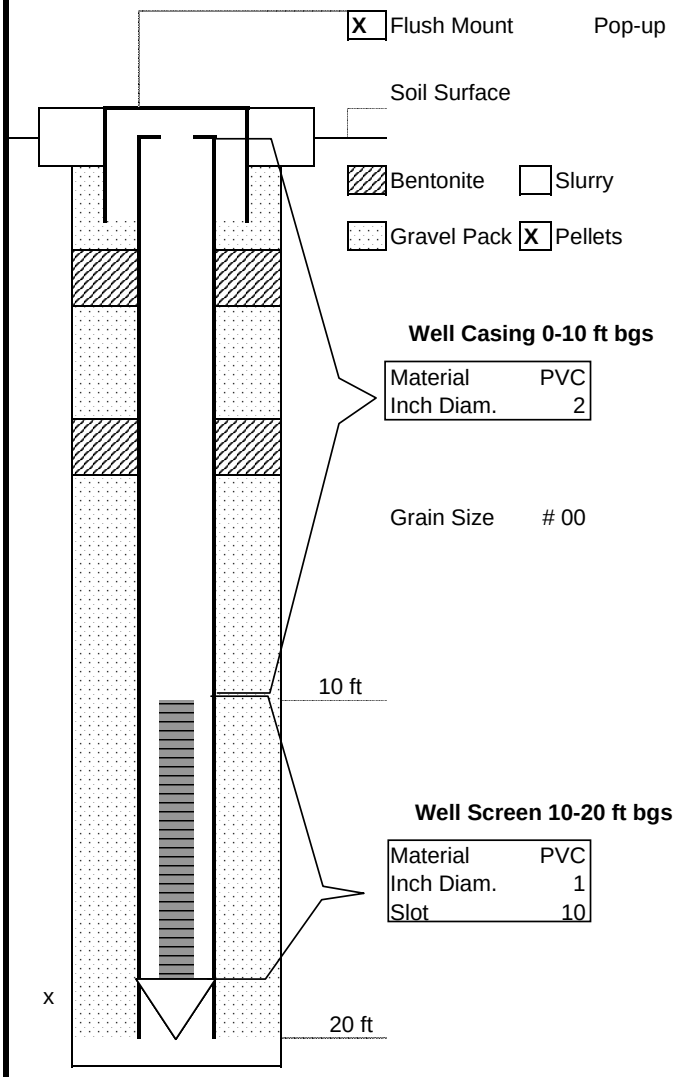
Field Oversight: K. Waters

GROUNDWATER MONITORING WELL

CONSTRUCTION LOG

IW17

ENVIRONMENTAL BUSINESS CONSULTANTS



Note: Drawing is not to scale.
Depths are given in feet below land surface.

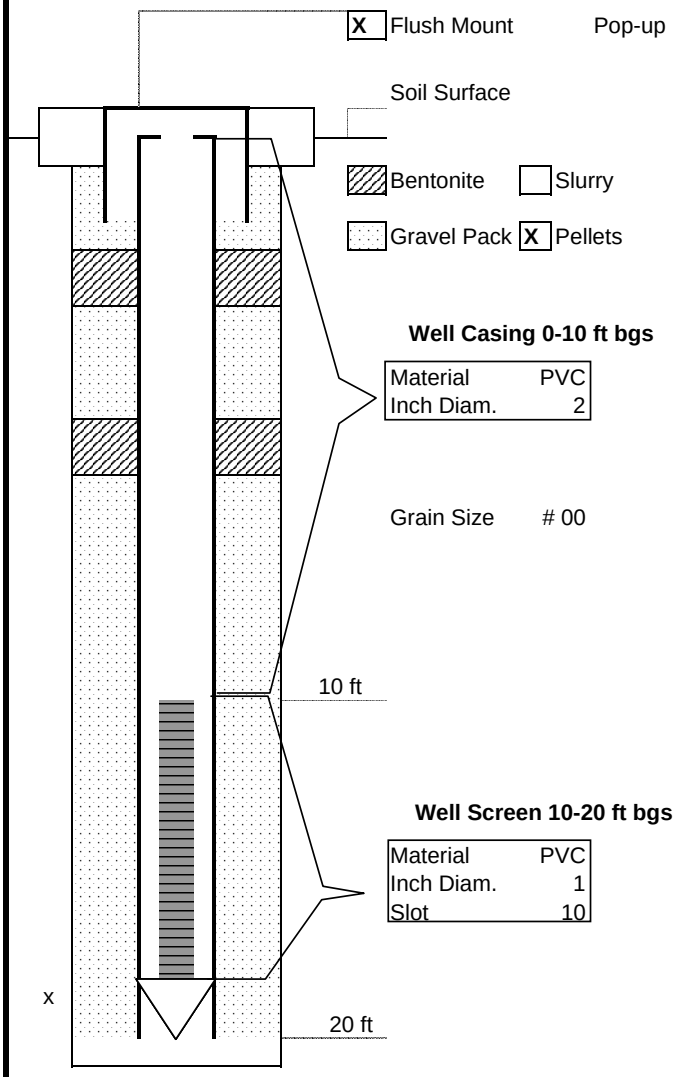
Monitoring Well No.:	IW17
Project:	Former 110th Street Service Station
	2040 Frederick Douglas Blvd, New York, NY
Depth to Groundwater	Date:
Installation Depth:	20 feet bg
Survey Point Elevation:	NA
Installation Date:	July 27, 2015
Drilling Contractor:	C2 Environmental
Installation Method:	Geoprobe - Hollow Probe Rods
Field Oversight:	K. Waters

GROUNDWATER MONITORING WELL

CONSTRUCTION LOG

IW18

ENVIRONMENTAL BUSINESS CONSULTANTS



Note: Drawing is not to scale.
Depths are given in feet below land surface.

Monitoring Well No.: IW18

Project: Former 110th Street Service Station

2040 Frederick Douglas Blvd, New York, NY

Depth to Groundwater Date:

Installation Depth: 20 feet bg

Survey Point Elevation: NA

Installation Date: July 27, 2015

Drilling Contractor: C2 Environmental

Installation Method: Geoprobe - Hollow Probe Rods

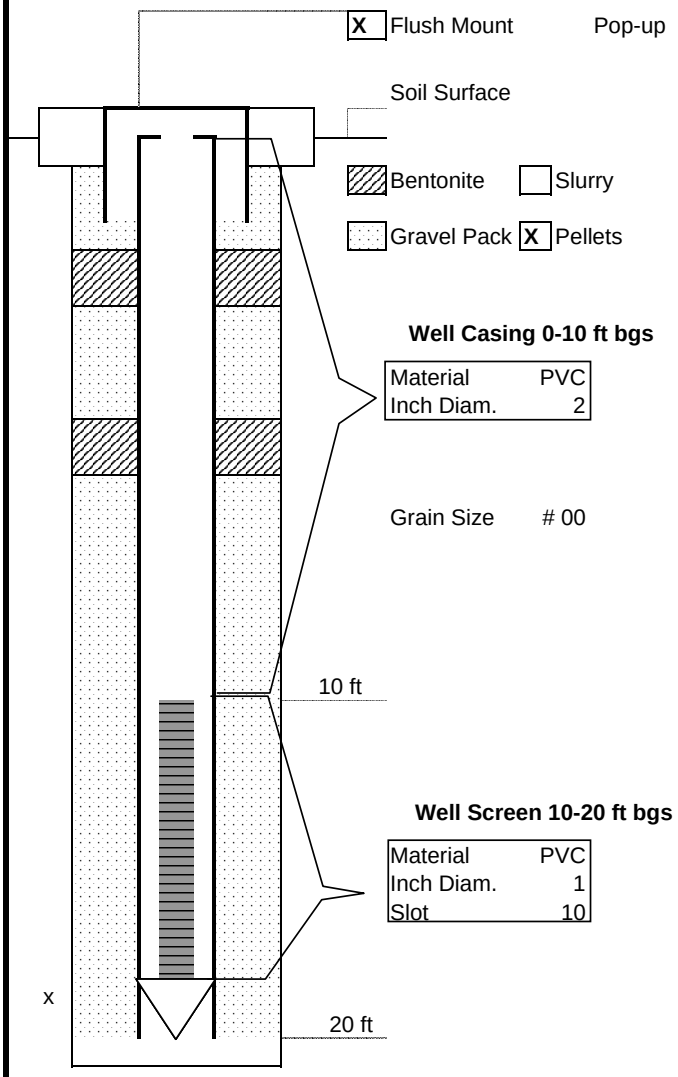
Field Oversight: K. Waters

GROUNDWATER MONITORING WELL

CONSTRUCTION LOG

IW19

ENVIRONMENTAL BUSINESS CONSULTANTS



Note: Drawing is not to scale.
Depths are given in feet below land surface.

Monitoring Well No.: IW19

Project: Former 110th Street Service Station

2040 Frederick Douglas Blvd, New York, NY

Depth to Groundwater Date:

Installation Depth: 20 feet bg

Survey Point Elevation: NA

Installation Date: July 27, 2015

Drilling Contractor: C2 Environmental

Installation Method: Geoprobe - Hollow Probe Rods

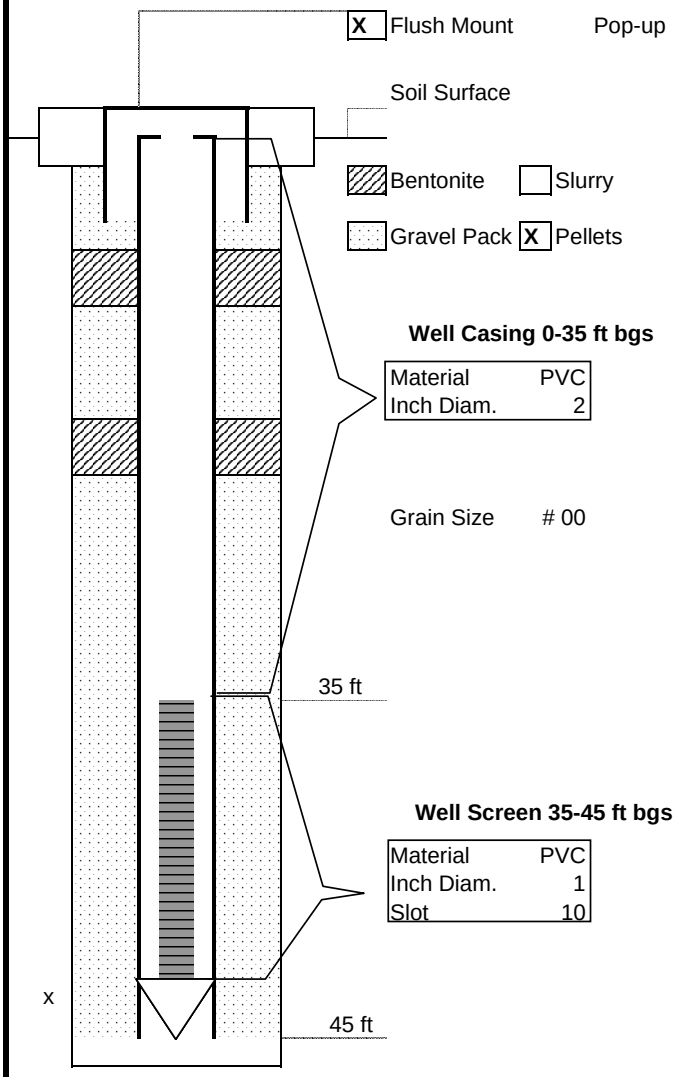
Field Oversight: K. Waters

GROUNDWATER MONITORING WELL

CONSTRUCTION LOG

IW21

ENVIRONMENTAL BUSINESS CONSULTANTS



Note: Drawing is not to scale.
Depths are given in feet below land surface.

Monitoring Well No.:	IW21
Project:	Former 110th Street Service Station
	2040 Frederick Douglas Blvd, New York, NY
Depth to Groundwater	Date:
Installation Depth:	45 ft bg
Survey Point Elevation:	NA
Installation Date:	July 27, 2015
Drilling Contractor:	C2 Environmental
Installation Method:	Geoprobe - Hollow Probe Rods
Field Oversight:	K. Waters

APPENDIX E
Excavation Work Plan

EXCAVATION WORK PLAN

E-1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the site owner or their representative will notify the Department. Currently, this notification will be made to:

Jane O'Connell
Chief, Superfund and Brownfield Cleanup Section
NYSDEC Region 2
47-40 21st Street
Long Island City, NY 11101
P: (718) 482-4599

Dana Mecomber, P.E., MPA
Project Manager
NYSDEC Region 2
47-40 21st Street
Long Island City, NY 11101
P: (718) 482-7541

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent, plans for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control,
- A summary of environmental conditions anticipated in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;

- A schedule for the work, detailing the start and completion of all intrusive work,
- A summary of the applicable components of this EWP,
- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120,
- A copy of the contractor's health and safety plan, in electronic format, if it differs from the HASP provided in the Remedial Action Work Plan,
- Identification of disposal facilities for potential waste streams,
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

E-2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based soil screening will be performed by a qualified environmental professional during all remedial and development excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the COC.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal, material that requires testing, material that can be returned to the subsurface, and material that can be used as cover soil.

E-3 STOCKPILE METHODS

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by NYSDEC.

E-4 MATERIALS EXCAVATION AND LOAD OUT

A qualified environmental professional or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The owner of the property and its contractors are solely responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the site.

Loaded vehicles leaving the site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

The qualified environmental professional will be responsible for ensuring that all outbound trucks will be cleaned as needed before leaving the site until the activities performed under this section are complete. Locations where vehicles enter or exit the site shall be inspected daily for evidence of off-site soil tracking.

The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

E-5 MATERIALS TRANSPORT OFF-SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the site will be secured with covers. If loads contain wet material capable of producing free liquid, truck liners will be used. All trucks will be inspected prior to leaving the site. Trucks will be dry brushed when possible to remove collected soil.

Truck transport routes are as follows (see **Figure E1**): ENTERING SITE - from the Cross Bronx Expressway take the Amsterdam Avenue exit and head south on Amsterdam Avenue to Cathedral Parkway (W. 110th Street). Turn left, heading east on Cathedral Parkway (W 110th Street) to roundabout. Take third exit to Site on the right. EXITING SITE – head west on Cathedral Parkway (W. 110th Street) to Amsterdam Avenue. Turn right on Amsterdam Avenue and continue to the Cross Bronx Expressway on-ramp.

Trucks will be prohibited from stopping and idling in the neighborhood outside the project site. Egress points for truck and equipment transport from the site will be kept clean of dirt and other materials during site remediation and development.

Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

E-6 MATERIALS DISPOSAL OFF-SITE

All soil/fill/solid waste excavated and removed from the site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this site is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Material that does not meet Track 1 unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

E-7 MATERIALS REUSE ON-SITE

Chemical criteria for on-site reuse of material must meet the protection of groundwater SCOs for petroleum constituents and restricted residential SCOs for the remaining parameters as listed in **Table E1**. The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for re-use on-site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the site will not be reused on-site.

E-8 FLUIDS MANAGEMENT

All liquids to be removed from the site, including excavation dewatering and groundwater monitoring well purge and development waters, will be handled, transported and disposed in

accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the site, but will be managed off-site.

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a SPDES permit.

E-9 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with the RAWP. The demarcation layer, consisting of the waterproofing membrane and concrete slab will be replaced in any areas where a soil cover is replaced, to provide a visual reference to the top of the 'Remaining Contamination Zone', the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this Site Management Plan. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), as shown on **Figure 8** in the SMP, this will constitute a modification of the cover element of the remedy and the upper surface of the 'Remaining Contamination. A figure showing the modified surface will be included in the subsequent Periodic Review Report and in any updates to the Site Management Plan.

E-10 BACKFILL FROM OFF-SITE SOURCES

All materials proposed for import onto the site will be approved by the qualified environmental professional and will be in compliance with provisions in this SMP prior to receipt at the site.

Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the site.

All imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards are listed in **Table E-1**. Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover

soil objectives for this site, will not be imported onto the site without prior approval by NYSDEC. Solid waste will not be imported onto the site.

Fill and stone materials which can be certified as virgin mined material from a permitted mine or quarry will not require testing assuming adequate documentation is obtained and submitted to the NYSDEC for approval. Under no circumstances will fill materials be imported to the site without prior approval from the NYSDEC Project Manager. If sufficient documentation is not obtained, fill materials will be tested in accordance with the sampling frequency outlined in DER-10 table 5.4(e)10. Sample analysis will include TCL VOCs, TCL SVOCs, PCBs, Pesticides and TAL metals. Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the Site without prior approval by NYSDEC.

Trucks entering the site with imported soils will be securely covered with covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

E-11 STORMWATER POLLUTION PREVENTION

Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be

inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters

Silt fencing or hay bales will be installed around the entire perimeter of the construction area.

E-12 CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for full a full list of analytes (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the periodic reports prepared pursuant to Section 5 of the SMP.

E-13 COMMUNITY AIR MONITORING PLAN

The CAMP provides measures for protection for the downwind community (i.e., off-site receptors including residences, businesses, and on-site workers not directly involved in the remedial work) from potential airborne contaminant releases resulting from remedial activities at construction sites.

The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that the remedial

work did not spread contamination off-site through the air. The primary concerns for this site are nuisance odors and dust particulates.

Exceedances observed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers and included in the Daily Report. The complete CAMP developed for this site is included in **Attachment F** of the project SMP.

E-14 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-site and on-site. If nuisance odors are identified at the site boundary, or if odor complaints are received, 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. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the property owner's Remediation Engineer, and any measures that are implemented will be discussed in the Periodic Review Report.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

E-15 DUST CONTROL PLAN

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

E-16 OTHER NUISANCES

A plan for rodent control will be developed and utilized by the contractor prior to and during site clearing and site grubbing, and during all excavation work.

A plan will be developed and utilized by the contractor for all excavation work to ensure compliance with local noise control ordinances.

TABLE E1
Soil Import Criteria

Contaminant	CAS Number	Restricted-Residential	Protection of Ground-water
METALS			
Arsenic	7440-38 -2	16f	16f
Barium	7440-39 -3	400	820
Beryllium	7440-41 -7	72	47
Cadmium	7440-43 -9	4.3	7.5
Chromium, hexavalent h	18540-29-9	110	19
Chromium, trivalenth	16065-83-1	180	NS
Copper	7440-50 -8	270	1,720
Total Cyanide h		27	40
Lead	7439-92 -1	400	450
Manganese	7439-96 -5	2,000f	2,000f
Total Mercury		0.81j	0.73
Nickel	7440-02 -0	310	130
Selenium	7782-49 -2	180	4f
Silver	7440-22 -4	180	8.3
Zinc	7440-66 -6	10,000 d	2,480
PESTICIDES / PCBs			
2,4,5-TP Acid (Silvex)	93-72-1	100a	3.8
4,4'-DDE	72-55-9	8.9	17
4,4'-DDT	50-29-3	7.9	136
4,4'-DDD	72-54-8	13	14
Aldrin	309-00-2	0.097	0.19
alpha-BHC	319-84-6	0.48	0.02
beta-BHC	319-85-7	0.36	0.09
Chlordane (alpha)	5103-71 -9	4.2	2.9
delta-BHC	319-86-8	100a	0.25
Dibenzofuran	132-64-9	59	210
Dieldrin	60-57-1	0.2	0.1
Endosulfan I	959-98-8	24i	102
Endosulfan II	33213-65-9	24i	102
Endosulfan sulfate	1031-07 -8	24i	1,000c
Endrin	72-20-8	11	0.06
Heptachlor	76-44-8	2.1	0.38
Lindane	58-89-9	1.3	0.1
Polychlorinated biphenyls	1336-36 -3	1	3.2
SEMI-VOLATILES			
Acenaphthene	83-32-9	100a	98
Acenapthylene	208-96-8	100a	107
Anthracene	120-12-7	100a	1,000c
Benz(a)anthracene	56-55-3	1f	1f
Benzo(a)pyrene	50-32-8	1f	22
Benzo(b) fluoranthene	205-99-2	1f	1.7
Benzo(g,h,i) perylene	191-24-2	100a	1,000c
Benzo(k) fluoranthene	207-08-9	3.9	1.7
Chrysene	218-01-9	3.9	1f
Dibenz(a,h) anthracene	53-70-3	0.33e	1,000c
Fluoranthene	206-44-0	100a	1,000c
Fluorene	86-73-7	100a	386
Indeno(1,2,3-cd) pyrene	193-39-5	0.5f	8.2
m-Cresol	108-39-4	100a	0.33e
Naphthalene	91-20-3	100a	12
o-Cresol	95-48-7	100a	0.33e
p-Cresol	106-44-5	100a	0.33e
Pentachlorophenol	87-86-5	6.7	0.8e
Phenanthrene	85-01-8	100a	1,000c
Phenol	108-95-2	100a	0.33e
Pyrene	129-00-0	100a	1,000c

TABLE E1
Soil Import Criteria

Contaminant	CAS Number	Restricted-Residential	Protection of Ground-water
VOLATILES			
1,1,1-Trichloroethane	71-55-6	100a	0.68
1,1-Dichloroethane	75-34-3	26	0.27
1,1-Dichloroethene	75-35-4	100a	0.33
1,2-Dichlorobenzene	95-50-1	100a	1.1
1,2-Dichloroethane	107-06-2	3.1	0.02f
cis-1,2-Dichloroethene	156-59-2	100a	0.25
trans-1,2-Dichloroethene	156-60-5	100a	0.19
1,3-Dichlorobenzene	541-73-1	49	2.4
1,4-Dichlorobenzene	106-46-7	13	1.8
1,4-Dioxane	123-91-1	13	0.1e
Acetone	67-64-1	100b	0.05
Benzene	71-43-2	4.8	0.06
Butylbenzene	104-51-8	100a	12
Carbon tetrachloride	56-23-5	2.4	0.76
Chlorobenzene	108-90-7	100a	1.1
Chloroform	67-66-3	49	0.37
Ethylbenzene	100-41-4	41	1
Hexachlorobenzene	118-74-1	1.2	3.2
Methyl ethyl ketone	78-93-3	100a	0.12
Methyl tert-butyl ether	1634-04 -4	100a	0.93
Methylene chloride	75-09-2	100a	0.05
n-Propylbenzene	103-65-1	100a	3.9
sec-Butylbenzene	135-98-8	100a	11
tert-Butylbenzene	98-06-6	100a	5.9
Tetrachloroethene	127-18-4	19	1.3
Toluene	108-88-3	100a	0.7
Trichloroethene	79-01-6	21	0.47
1,2,4-Trimethylbenzene	95-63-6	52	3.6
1,3,5-Trimethylbenzene	108-67-8	52	8.4
Vinyl chloride	75-01-4	0.9	0.02
Xylene (mixed)	1330-20 -7	100a	1.6

All soil cleanup objectives (SCOs) are in parts per million (ppm). NS=Not specified.
Support Document (TSD). Footnotes

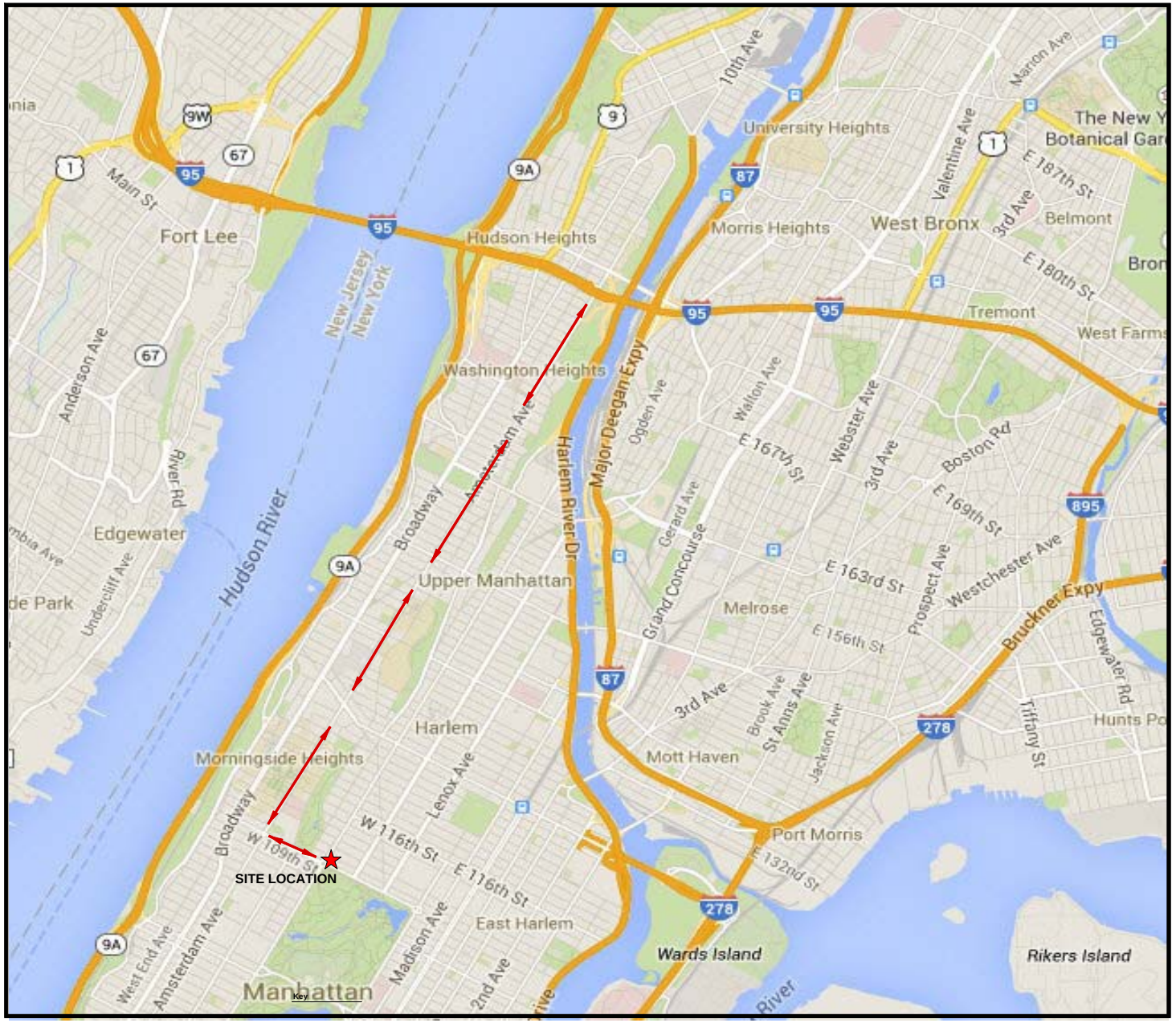
a The SCOs for residential, restricted-residential and ecological resources use were
maximum value of 100 ppm. See TSD section 9.3.

b The SCOs for commercial use were capped at a maximum value of 500 ppm. See
9.3.

c The SCOs for industrial use and the protection of groundwater were capped at a r
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

e For constituents where the calculated SCO was lower than the contract required d
(CRQL), the CRQL is used as the SCO value.



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2040 FREDERICK DOUGLAS BLVD, HARLEM, NY

FIGURE E1 TRUCK ROUTE

APPENDIX F
Community Air Monitoring Plan

COMMUNITY AIR MONITORING PLAN

FORMER 110TH STREET SERVICE STATION
2040 FREDERICK DOUGLAS BOULEVARD
HARLEM, NY

MAY - 2014

FORMER 110TH STREET SERVICE STATION

COMMUNITY AIR MONITORING PLAN
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APPENDICES

1.0 INTRODUCTION

This Community Air Monitoring Plan (CAMP) has been prepared for the excavation and building activities to be performed under a Remedial Action Work Plan (RAWP) at the Former 110th Street Service Station. The CAMP provides measures for protection for the downwind community (i.e., off-site receptors including residences, businesses, and on-site workers not directly involved in the investigation activities) from potential airborne contaminant releases resulting from remedial activities at the site.

Compliance with this CAMP is required during all activities associated with excavation and sampling activities that have the potential to generate airborne particulate matter and volatile organic compounds (VOCs). These activities include excavation and soil sampling. This CAMP has been prepared to ensure that remedial activities do not adversely affect passersby, residents, or workers in the area immediately surrounding the Site and to preclude or minimize airborne migration of remediation-related contaminants to off-site areas.

1.1 Regulatory Requirements

This CAMP was established in accordance with the following requirements:

- New York State Department of Health's (NYSDOH) Generic Community Air Monitoring Plan as presented in DER-10 Technical Guidance for Site Investigation and Remediation (NYSDEC May 3, 2010). This guidance specifies that a community air-monitoring program shall be implemented to protect the surrounding community and to confirm that the work does not spread contamination off-site through the air;

- New York State Department of Environmental Conservation (NYSDEC) Technical and Guidance Memorandum (TAGM) #4031 - Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites: This guidance provides a basis for developing and implementing a fugitive dust suppression and particulate monitoring program as an element of a hazardous waste site's health and safety program.

2.0 AIR MONITORING

VOCs are the constituents of concern at the Site. The appropriate method to monitor air for these constituents during remediation activities is through real-time VOC and air particulate (dust) monitoring.

2.1 Meteorological Data

At a minimum, wind direction will be evaluated at the start of each workday, noon of each workday, and the end of each workday. These readings will be utilized to position the monitoring equipment in appropriate upwind and downwind locations.

2.2 Community Air Monitoring Requirements

To establish ambient air background concentrations, air will be monitored at several locations around the site perimeter before activities begin. These points will be monitored periodically in series during the site work. When the excavation area is within 20 feet of potentially exposed populations or occupied structures, the perimeter monitoring points will be located to represent the nearest potentially exposed individuals and locations of ventilation system intakes for nearby structures (i.e apartment buildings) at the downwind location.

Fugitive respirable dust will be monitored using a MiniRam Model PDM-3 aerosol monitor (or equivalent). Air will be monitored for VOCs with a portable Ionscience 3000 photoionization detector (PID), or equivalent. All air monitoring data will be documented in a site log book by the designated site safety officer. The site safety officer or delegate must ensure that air monitoring instruments are calibrated and maintained in accordance with manufacturer's specifications. All instruments will be zeroed daily and checked for accuracy. A daily log will be kept. If additional monitoring is required, the protocols will be developed and appended to this plan

3.0 VOC MONITORING, RESPONSE LEVELS, AND ACTIONS

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present.

The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

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

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown. All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

All readings will be recorded and made available for NYSDEC and NYSDOH personnel to review. If an exceedance of the Action Limits occurs, an Action Limit Report, as shown in Appendix A, will be completed.

3.1 Potential Corrective Measures and VOC Suppression Techniques

If the 15-minute integrated VOC level at the downwind location persists at a concentration that exceeds the upwind level by more than 5 ppm but less than 25 ppm during remediation activities, then vapor suppression techniques will be employed. The following techniques, or others, may be employed to mitigate the generation and migration of fugitive organic vapors:

- Collection of purge water in covered containers;
- storage of excess sample and soil in drums or covering with plastic

4.0 PARTICULATE MONITORING

Air monitoring for particulates (i.e., dust) will be performed continuously during remediation activities using both air monitoring equipment and visual observation at upwind and downwind locations. Monitoring equipment capable of measuring particulate matter smaller than 10 microns (PM_{10}) and capable of integrating (averaging) over periods of 15 minutes or less will be set up at upwind (i.e., background) and downwind locations, at heights approximately four to five feet above land surface (i.e., the breathing zone). Monitoring equipment will be MIE Data Ram monitors, or equivalent. The audible alarm on the particulate monitoring device will be set at 90 micrograms per cubic meter ($\mu g/m^3$). This setting will allow proactive evaluation of worksite conditions prior to reaching the action level of 100 $\mu g/m^3$ above background. The monitors will be calibrated at least once per day prior to work activities and recalibrated as needed thereafter. In addition, fugitive dust migration will be visually assessed during all intrusive work activities.

The following summarizes particulate action levels and the appropriate responses:

- If the downwind PM-10 particulate level is 100 $\mu g/m^3$ greater than background (upwind perimeter) for the 15-minute period, or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 $\mu g/m^3$ 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 $\mu g/m^3$ above the upwind level, work must be stopped and an evaluation of activities initiated. Work can resume provided that dust suppression measures (as described in Section 2.3.1 below) and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 $\mu g/m^3$ of the upwind level and in preventing visible dust migration.

All readings will be recorded and be available for NYSDEC and NYSDOH personnel to review. If an exceedance of the Action Limits occurs, an Action Limit Report as shown in **Appendix A** will be completed.

4.1 Potential Particulate Suppression Techniques

If the integrated particulate level at the downwind location exceeds the upwind level by more than 100 $\mu g/m^3$ at any time during drilling activities, then dust suppression techniques will be employed. The following techniques, or others, may be employed to mitigate the generation and migration of fugitive dusts:

- Placement of soil in drums or covering stockpiles with plastic;
- Misting of the excavation area with a fine water spray from a hand-held spray bottle

Work may continue with dust suppression techniques provided that downwind PM_{10} levels are not more than 150 $\mu g/m^3$ greater than the upwind levels.

There may also be situations where the dust is generated by excavation activities and migrates to downwind locations, but is not detected by the monitoring equipment at or above the action level. Therefore, if dust is observed leaving the working area, dust suppression techniques such as those listed above will be employed.

If dust suppression techniques do not lower particulates to below 150 $\mu g/m^3$, or visible dust persists, work will be suspended until appropriate corrective measures are identified and implemented to remedy the situation.

All air monitoring readings will be recorded in the field logbook and will be available for the NYSDEC and NYSDOH personnel to review.

5.0 DATA QUALITY ASSURANCE

5.1 Calibration

Instrument calibration shall be documented on instrument calibration and maintenance sheets or in the designated field logbook. All instruments shall be calibrated as required by the manufacturer. Calibration checks may be used during the day to confirm instrument accuracy. Duplicate readings may be taken to confirm individual instrument response.

5.2 Operations

All instruments shall be operated in accordance with the manufacturer's specifications. Manufacturers' literature, including an operations manual for each piece of monitoring equipment will be maintained on-site by the SSO for reference.

5.3 Data Review

The SSO will interpret all monitoring data based the established criteria and his/her professional judgment. The SSO shall review the data with the PM to evaluate the potential for worker exposure, upgrades/downgrades in level of protection, comparison to direct reading instrumentation and changes in the integrated monitoring strategy.

Monitoring and sampling data, along with all sample documentation will be periodically reviewed by the PM.

6.0 RECORDS AND REPORTING

All air readings must be recorded on daily air monitoring log sheets and made available for review by personnel from NYSDEC and NYSDOH.

ATTACHMENT G
Health and Safety Plan

FORMER
110th STREET SERVICE STATION
2040 FREDERICK DOUGLAS BOULEVARD
HARLEM, NEW YORK
Block 1826 Lot 1

HEALTH AND SAFETY PLAN

November 2015

Prepared for:
Crescent 110 Equities LLC
316 West 118th Street
New York, NY 10026

Prepared By:

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS
1808 Middle Country Road
Ridge, NY 11961

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Former 110th Street Service Station
2040 Frederick Douglas Boulevard, Harlem, New York

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CONSTRUCTION HEALTH AND SAFETY PLAN
Former 110th Street Service Station
2040 Frederick Douglas Boulevard, Harlem, New York

FIGURES

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STATEMENT OF COMMITMENT

This Health and Safety Plan (HASP) has been prepared to ensure that workers are not exposed to risks from hazardous materials during any future excavation work at 2040 Frederick Douglas Boulevard, Harlem, New York.

This HASP, which applies to persons present at the site actually or potentially exposed to hazardous materials, describes emergency response procedures for actual and potential chemical hazards. This HASP is also intended to inform and guide personnel entering the work area or exclusion zone. Persons are to acknowledge that they understand the potential hazards and the contents of this Health and Safety policy by signing off on receipt of their individual copy of the document. Contractors and suppliers are retained as independent contractors and are responsible for ensuring the health and safety of their own employees.

1.0 INTRODUCTION AND SITE ENTRY REQUIREMENTS

This document describes the health and safety guidelines developed by Environmental Business Consultants (EBC) for the planned Remedial Action at 2040 Frederick Douglas Boulevard, Harlem, New York to protect on-site personnel, visitors, and the public from physical harm and exposure to hazardous materials or wastes during excavation activities. In accordance with the Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.120 Hazardous Waste Operations and Emergency Response Final rule, this CHASP, including the attachments, addresses safety and health hazards related to excavation, loading and other soil disturbance activities and is based on the best information available. The CHASP may be revised by EBC at the request of the client and/or a regulatory agency upon receipt of new information regarding site conditions. Changes will be documented by written amendments signed by EBC's project manager, site safety officer and/or the EBC health and safety consultant.

1.1 Training Requirements

Personnel entering the exclusion zone or decontamination zone are required to be certified in health and safety practices for hazardous waste site operations as specified in the Federal OSHA Regulations CFR 1910.120e (revised 3/6/90).

Paragraph (e - 3) of the above referenced regulations requires that all on-site management personnel directly responsible for or who supervise employees engaged in hazardous waste operations, must initially receive 8 hours of supervisor training related to managing hazardous waste work.

Paragraph (e - 8) of the above referenced regulations requires that workers and supervisors receive 8 hours of refresher training annually on the items specified in Paragraph (e-1) and/or (e-3).

Additionally all on-site personnel must receive adequate site-specific training in the form of an on-site Health and Safety briefing prior to participating in field work with emphasis on the following:

- Protection of the adjacent community from hazardous vapors and / or dust which may be released during intrusive activities.
- Identification of chemicals known or suspected to be present on-site and the health effects and hazards of those substances.
- The need for vigilance in personnel protection, and the importance of attention to proper use, fit and care of personnel protective equipment.
- Decontamination procedures.
- Site control including work zones, access and security.
- Hazards and protection against heat or cold.
- The proper observance of daily health and safety practices, such as entry and exit of work zones and site. Proper hygiene during lunch, break, etc.
- Emergency procedures to be followed in case of fire, explosion and sudden release of hazardous gases.

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Health and Safety meetings will be conducted on a daily basis and will cover protective clothing and other equipment to be used that day, potential and chemical and physical hazards, emergency procedures, and conditions and activities from the previous day.

1.2 Medical Monitoring Requirements

Field personnel and visitors entering the exclusion zone or decontamination zone must have completed appropriate medical monitoring required under OSHA 29 CFR 1910.120(f) if respirators or other breathing related PPE is needed. Medical monitoring enables a physician to monitor each employee's health, physical condition, and his fitness to wear respiratory protective equipment and carry out on-site tasks.

1.3 Site Safety Plan Acceptance, Acknowledgment and Amendments

The project superintendent and the site safety officer are responsible for informing personnel (EBC employees and/or owner or owners representatives) entering the work area of the contents of this plan and ensuring that each person signs the safety plan acknowledging the on-site hazards and procedures required to minimize exposure to adverse effects of these hazards. A copy of the Acknowledgement Form is included in **Appendix A**.

Site conditions may warrant an amendment to the HASP. Amendments to the HASP are acknowledged by completing forms included in **Appendix B**.

1.4 Key Personnel - Roles and Responsibilities

Personnel responsible for implementing this Health and Safety Plan are:

Name	Title	Address	Contact Numbers
Ms. Chawinie Miller	Health & Safety Manager	1808 Middle Country Rd Ridge, NY 11961	(631) 504-6000
Mr. Kevin Waters	Site Safety Officer	1808 Middle Country Rd Ridge, NY 11961	(631) 504-6000

The site safety officer will conduct daily (tail gate or tool box) safety meetings at the project site and oversee daily safety issues. Each subcontractor and supplier (defined as an OSHA employer) is also responsible for the health and safety of its employees. If there is any dispute about health and safety or project activities, on-site personnel will attempt to resolve the issue. If the issue cannot be resolved at the site, then the project manager will be consulted.

The site safety officer is also responsible for coordinating health and safety activities related to hazardous material exposure on-site. The site safety officer is responsible for the following:

1. Educating personnel about information in this CHASP and other safety requirements to be observed during site operations, including, but not limited to, decontamination procedures, designation of work zones and levels of protection, air monitoring, fit testing, and emergency procedures dealing with fire and first aid.

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2. Coordinating site safety decisions with the project manager.

3. Designating exclusion, decontamination and support zones on a daily basis.

4. Monitoring the condition and status of known on-site hazards and maintaining and implementing the air quality monitoring program specified in this CHASP.

5. Maintaining the work zone entry/exit log and site entry/exit log.

6. Maintaining records of safety problems, corrective measures and documentation of chemical exposures or physical injuries (the site safety officer will document these conditions in a bound notebook and maintain a copy of the notebook on-site).

The person who observes safety concerns and potential hazards that have not been addressed in the daily safety meetings should immediately report their observations/concerns to the site safety officer or appropriate key personnel.

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2.0 SITE BACKGROUND AND SCOPE OF WORK

The Site address is 2040 Frederick Douglas Boulevard, Harlem, New York 10026. It is located on the southeast corner of Frederick Douglas Boulevard and W. 110th Street, Harlem, New York, and is designated as Block 1826 Lot 1 by the New York City Department of Assessment. The Lot has 73 feet of street frontage on Frederick Douglas Boulevard, approximately 160 feet of frontage along Frederick Douglas Circle, approximately 125 feet along West 11th Street and approximately 9 feet of frontage along Central Park North (W. 110th Street) for a total area of 13,513 square feet (0.31 acres).

The Lot is currently developed with a one-story service station building and roof canopy over the dispenser area. The building has a footprint of approximately 2,773 s.f. which, according to the NYC Department of Buildings, was constructed in 1955.

The elevation of the property is approximately 49 feet above the National Geodetic Vertical Datum (NGVD) feet. based upon regional groundwater contour maps, and measurements made at the property, the depth to groundwater beneath the site is approximately 35 feet below existing grade and flows southeasterly.

2.1 Remaining Contamination

2.1.1 Soil

The majority of the Site was excavated to a depth of approximately 30 feet below grade. Areas along the east property line and southeast corner were excavated to 15 feet while a 4 ft strip along the west property line and a 7 ft x 19 ft area along the northwest corner remained unexcavated (see Figure 5). Over excavation was performed at several locations to either meet SCOs or to accommodate structural elements of the new building as follows:

HS5 - 35 ft
HS6 - 32.5 ft
HS7 - 33 ft
HS8 - 35 ft
HS10 - 34 ft
EP11 - 36.5 ft
EP13 - 36 ft
EP14 - 34.5 ft
Elevator Pit (passengers) - 35 ft
Elevator Pit (automobile) - 34 ft.

Endpoint soil samples collected following excavation indicate that soil remains at the Site with constituents above Unrestricted Use, Restricted Residential Use and Groundwater Protection SCOs at some locations. These areas include metals above Unrestricted SCOs at depths of 15-16 ft and 27-28 ft along the along east, west, southeast corner and northwest corner property lines, pesticides above Unrestricted SCOs at a depth of 28 ft in the northwest corner of the site, SVOCs above Restricted Residential SCOs in the northwestern corner of the Site and petroleum VOCs above Groundwater Protection SCOs at 33 feet in HS7 and at 27 feet at one location near the east property line.

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Parameters reported above Unrestricted Use, Restricted Residential Use or Groundwater Protection SCOS following the remedial action are provided in Table 3 and posted in Figure 6. Petroleum contaminated soil may be encountered if excavation is done to a depth greater than 3 feet below the existing cellar slab in the HS7 source area, or below a depth of 25 feet in the vicinity of SWEP8 located between the east wall of the building's cellar level and the east property line.

Petroleum contaminated soil within the HS7 hotspot area is being remediated through chemical oxidant injections. Groundwater performance samples will be collected from the monitoring well network to upon completion of remediation to demonstrate achievement of improvement in groundwater quality downgradient of this area. The petroleum contamination in the vicinity of SWEP8 has been isolated and rendered inert by a three foot thick concrete cap at 15 feet below grade and by cement grout injections both above and below the zone of impacted soil.

2.1.2 Groundwater

Remaining petroleum impact to on-site groundwater above standards is limited to benzene in monitoring wells MW1502 (4.7 ug/L) and MW1503 (1.6 ug/L). Benzene was highest in MW1502, immediately down gradient of the HS8 source area. Groundwater exceedances for all VOC parameters are listed below.

Remaining On-Site Groundwater Sample Exceedences

COMPOUND	NYSDEC GQS µg/L	MW1502 10/1/2015 µg/L	MW1503 10/1/2015 µg/L
Acetone	50	140	240
Benzene	1	4.7	1.6
Bromomethane	5	31	17
Chloromethane	5	130	180

Note that acetone is a common laboratory introduced contaminant and was not identified during the RI as a Site-related contaminant. Bromomethane and chloromethane are also not known to be Site-related contaminants and were not reported to be present in soil or groundwater during the RI.

VOCs above standards were reported in two of the three off-site wells (MW1504, MW1506) and included: 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, benzene, ethylbenzene, isopropylbenzene, n-propylbenzene, sec-butyl benzene, 2-isopropylbenzene, xylene and chloromethane.

2.1.3 Soil Vapor

A soil vapor intrusion evaluation was completed during the Remedial Investigation. Based on that evaluation no additional actions were needed to address potential soil vapor intrusion at the site. In addition, the sub-cellar level of the building will be utilized as a parking garage (see Figure 8). The parking garage will be ventilated in accordance with the New York City Mechanical Code, eliminated any concern of vapor intrusion.

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3.0 HAZARD ASSESSMENT

This section identifies the hazards associated with the proposed scope of work, general physical hazards that can be expected at most sites; and presents a summary of documented or potential chemical hazards at the site. Every effort must be made to reduce or eliminate these hazards. Those that cannot be eliminated must be guarded against using engineering controls and/or personal protective equipment.

3.0 HAZARD ASSESSMENT

This section identifies the hazards associated with the proposed scope of work, general physical hazards that can be expected at most sites; and presents a summary of documented or potential chemical hazards at the site. Every effort must be made to reduce or eliminate these hazards. Those that cannot be eliminated must be guarded against using engineering controls and/or personal protective equipment.

3.1 Physical Hazards

3.1.1 Tripping Hazards

An area of risk associated with on-site activities are presented by uneven ground, concrete, curbstones or equipment which may be present at the site thereby creating a potential tripping hazard. During intrusive work, care should be taken to mark or remove any obstacles within the exclusion zone.

3.1.2 Climbing Hazards

During site activities, workers may have to work on excavating equipment by climbing. The excavating contractor will conform with any applicable NIOSH and OSHA requirements or climbing activities.

3.1.3 Cuts and Lacerations

Field activities that involve excavating activities usually involve contact with various types of machinery. A first aid kit approved by the American Red Cross will be available during all intrusive activities.

3.1.4 Lifting Hazards

Improper lifting by workers is one of the leading causes of industrial injuries. Field workers in the excavation program may be required to lift heavy objects. Therefore, all members of the field crew should be trained in the proper methods of lifting heavy objects. All workers should be cautioned against lifting objects too heavy for one person.

3.1.5 Utility Hazards

Before conducting any excavation, the excavation contractor will be responsible for locating and verifying all existing utilities at each excavation.

3.1.6 Traffic Hazards

All traffic, vehicular and pedestrian, shall be maintained and protected at all times consistent with local, state and federal agency regulations regarding such traffic and in accordance with

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NYCDOT guidelines. The excavation contractor shall carry on his operations without undue interference or delays to traffic. The excavation contractor shall furnish all labor, materials, guards, barricades, signs, lights, and anything else necessary to maintain traffic and to protect his work and the public, during operations.

3.2 Work in Extreme Temperatures

Work under extremely hot or cold weather conditions requires special protocols to minimize the chance that employees will be affected by heat or cold stress.

3.2.1 Heat Stress

The combination of high ambient temperature, high humidity, physical exertion, and personal protective apparel, which limits the dissipation of body heat and moisture, can cause heat stress.

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

1. Prevention
    a. Provide plenty of fluids. Available in the support zone will be a 50% solution of fruit punch and water or plain water.
    b. Work in Pairs. Individuals should avoid undertaking any activity alone.
    c. Provide cooling devices. A spray hose and a source of water will be provided to reduce body temperature, cool protective clothing and/or act as a quick-drench shower in case of an exposure incident.
    d. Adjustment of the work schedule. As is practical, the most labor-intensive tasks should be carried out during the coolest part of the day.

2. Recognition and Treatment
    a Heat Rash (or prickly heat):
        Cause: Continuous exposure to hot and humid air, aggravated by chafing clothing.
        Symptoms: Eruption of red pimples around sweat ducts accompanied by intense itching and tingling.
        Treatment: Remove source or irritation and cool skin with water or wet cloths.

    b. Heat Cramps (or heat prostration)
        Cause: Profuse perspiration accompanied by inadequate replenishment of body water and electrolytes.
        Symptoms: Muscular weakness, staggering gait, nausea, dizziness, shallow breathing, pale and clammy skin, approximately normal body temperature.
        Treatment: Perform the following while making arrangement for transport to a medical facility. Remove the worker to a contamination reduction zone. Remove protective clothing. Lie worker down on back in a cool place and raise feet 6 to 12 inches. Keep warm, but loosen all clothing. If conscious, provide sips of salt-water solution, using one teaspoon of salt in 12 ounces of water. Transport to a medical

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facility.

c. Heat Stroke

Cause: Same as heat exhaustion. This is also an extremely serious condition.

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

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

3.2.2 Cold Exposure

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

3.3 Chemical Hazards

"Urban fill" materials, present throughout the New York City area typically contain elevated levels of semi-volatile organic compounds and metals. These "contaminants" are not related to a chemical release occurring on the site, but are inherent in the reworked fill material in the area which contains ash and bits of tar and asphalt. Considering the previous sampling results and the past and present use of the site, the following compounds are considered for the site as potential contaminants: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, polychlorinated biphenyl's (PCBs), and heavy metals such as arsenic, chromium, lead and mercury.

Based on the findings of the Remedial Investigation and the inherent properties of urban fill, the following compounds are considered for the site as potential contaminants: volatile organic compounds (VOCs), semi-volatile organic compounds, pesticides and metals.

Volatile organic compounds reported to be present in soil, soil gas and/or groundwater include the following:

1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Benzene	Ethylbenzene
m&p xylenes	o-xylenes	Toluene	

Semi-Volatile organic compounds reported to be present in soil and/or groundwater include the following:

Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluorenthene	Benzo(k)fluorenthene
Chrysene	Dibenzo(a,h)anthracene	Ideno(1,2,3-cd)pyrene	

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Pesticides reported to be present in soil groundwater include the following

4,4'-DDE	4,4'-DDT	Deildrin

Metals reported to be present in soil groundwater include the following

Copper	Chromium	Lead	Mercury	Nickel	Zinc

The primary routes of exposure to these contaminants are inhalation, ingestion and absorption.

Appendix C includes information sheets for suspected chemicals that may be encountered at the site.

3.3.1 Respirable Dust

Dust may be generated from vehicular traffic and/or excavation activities. If visible observation detects elevated levels of dust, a program of wetting will be employed by the site safety officer. If elevated dust levels persist, the site safety office will employ dust monitoring using a particulate monitor (Miniram or equivalent). If monitoring detects concentrations greater than 150 µg/m3 over daily background, the site safety officer will take corrective actions as defined herein, including the use of water for dust suppression and if this is not effective, requiring workers to wear APRs with efficiency particulate air (HEPA) cartridges.

Absorption pathways for dust and direct contact with soils or groundwater will be mitigated with the implementation of latex gloves, hand washing and decontamination exercises when necessary.

3.3.2 Dust Control and Monitoring During Earthwork

Dust generated during excavation activities or other earthwork may contain contaminants identified in soils at the site. Dust will be controlled by wetting the working surface with water. Calcium chloride may be used if the problem cannot be controlled with water. Air monitoring and dust control techniques are specified in a site specific Dust Control Plan (if applicable). Site workers will not be required to wear APR's unless dust concentrations are consistently over 150 $\mu g/m^3$ over site-specific background in the breathing zone as measured by a dust monitor unless the site safety officer directs workers to wear APRs. The site safety officer will use visible dust as an indicator to implement the dust control plan.

3.3.3 Organic Vapors

Elevated levels of VOCs were detected in both soil and groundwater samples collected during previous investigations at the site. Therefore, excavation activities may cause the release of organic vapors to the atmosphere. The site safety officer will periodically monitor organic vapors with a Photoionization Detector (PID) during excavation activities to determine whether organic vapor concentrations exceed action levels shown in Section 5 and/or the Community Air Monitoring Plan.

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4.0 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) shall be selected in accordance with the site air monitoring program, OSHA 29 CFR 1910.120(c), (g), and 1910.132. Protective equipment shall be NIOSH approved and respiratory protection shall conform to OSHA 29 CFR Part 1910.133 and 1910.134 specifications; head protection shall conform to 1910.135; eye and face protection shall conform to 1910.133; and foot protection shall conform to 1910.136. The only true difference among the levels of protection from D thru B is the addition of the type of respiratory protection. **It is anticipated that work will be performed in Level D PPE.**

4.1 Level D

Level D PPE shall be donned when the atmosphere contains no known hazards and work functions preclude splashes, immersion, or the potential for inhalation of, or contact with, hazardous concentrations of harmful chemicals. Level D PPE consists of:

- standard work uniform, coveralls, or tyvek, as needed;
- steel toe and steel shank work boots;
- hard hat;
- gloves, as needed;
- safety glasses;
- hearing protection;
- equipment replacements are available as needed.

4.2 Level C

Level C PPE shall be donned when the concentrations of measured total organic vapors in the breathing zone exceed background concentrations (using a portable OVA, or equivalent), but are less than 5 ppm. The specifications on the APR filters used must be appropriate for contaminants identified or expected to be encountered. Level C PPE shall be donned when the identified contaminants have adequate warning properties and criteria for using APR have been met. Level C PPE consists of:

- chemical resistant or coated tyvek coveralls;
- steel-toe and steel-shank workboots;
- chemical resistant overboots or disposable boot covers;
- disposable inner gloves (surgical gloves);
- disposable outer gloves;
- full face APR fitted with organic vapor/dust and mist filters or filters appropriate for the identified or expected contaminants;
- hard hat;
- splash shield, as needed; and,
- ankles/wrists taped with duct tape.

The site safety officer will verify if Level C is appropriate by checking organic vapor concentrations using compound and/or class-specific detector tubes.

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- chemical resistant coveralls;
- steel-toe and steel-shank workboots;
- chemical resistant overboots or disposable boot covers;
- disposable inner gloves;
- disposable outer gloves;
- hard hat; and,
- ankles/wrists taped.

The exact PPE ensemble is decided on a site-by-site basis by the Site Safety Officer with the intent to provide the most protective and efficient worker PPE.

4.3 Activity-Specific Levels of Personal Protection

The required level of PPE is activity-specific and is based on air monitoring results (Section 4.0) and properties of identified or expected contaminants. **It is expected that site work will be performed in Level D.** If air monitoring results indicate the necessity to upgrade the level of protection engineering controls (i.e. Facing equipment away from the wind and placing site personnel upwind of drilling locations, active venting, etc.) will be implemented before requiring the use of respiratory protection.

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5.0 AIR MONITORING AND ACTION LEVELS

29 CFR 1910.120(h) specifies that monitoring shall be performed where there may be a question of employee exposure to hazardous concentrations of hazardous substances in order to assure proper selection of engineering controls, work practices and personal protective equipment so that employees are not exposed to levels which exceed permissible exposure limits, or published exposure levels if there are no permissible exposure limits, for hazardous substances.

5.1 Air Monitoring Requirements

If excavation work is performed, air will be monitored for VOCs with a portable ION Science 3000EX photoionization detector, or the equivalent. If necessary, Lower Explosive Limit (LEL) and oxygen will be monitored with a Combustible Gas Indicator (CGI). If appropriate, fugitive dust will be monitored using a MiniRam Model PDM-3 aerosol monitor. Air will be monitored when any of the following conditions apply:

- initial site entry;
- during any work where a potential IDLH condition or flammable atmosphere could develop;
- excavation work begins on another portion of the site;
- contaminants, other than those previously identified, have been discovered;
- each time a different task or activity is initiated;
- during trenching and/or excavation work.

The designated site safety officer will record air monitoring data and ensure that air monitoring instruments are calibrated and maintained in accordance with manufacturer's specifications. Instruments will be zeroed daily and checked for accuracy. Monitoring results will be recorded in a field notebook and will be transferred to instrument reading logs.

5.2 Work Stoppage Responses

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

1 The SSO will be consulted immediately
2 All personnel (except as necessary for continued monitoring and contaminant migration, if applicable) will be cleared from the work area (eg from the exclusion zone).
3 Monitoring will be continued until intrusive work resumes.

5.3 Action Levels During Excavation Activities

Instrument readings will be taken in the breathing zone above the excavation pit unless otherwise noted. Each action level is independent of all other action levels in determining responses.

Organic Vapors (PID)	LEL %	Responses
0-1 ppm above background	0%	• Continue excavating • Level D protection • Continue monitoring every 10 minutes

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1-5 ppm Above Background, Sustained Reading	1-10%	• Continue excavating • Go to Level C protection or employ engineering controls • Continue monitoring every 10 minutes
5-25 ppm Above Background, Sustaineed Reading	10-20%	• Discontinue excavating, unless PID is only action level exceeded. • Level C protection or employ engineering controls • Continue monitoring for organic vapors 200 ft downwind • Continuous monitoring for LEL at excavation pit
>25 ppm Above Background, Sustained Reading	>20%	• Discontinue excavating • Withdraw from area, shut off all engine ignition sources. • Allow pit to vent • Continuous monitoring for organic vapors 200 ft downwind.

Notes: Air monitoring will occur in the breathing zone 30 inches above the excavation pit. Readings may also be taken in the excavation pit but will not be used for action levels.

If action levels for any one of the monitoring parameters are exceeded, the appropriate responses listed in the right hand column should be taken. If instrument readings do not return to acceptable levels after the excavation pit has been vented for a period of greater than one-half hour, a decision will then be made whether or not to seal the pit with suppressant foam.

If, during excavation activities, downwind monitoring PID readings are greater than 5 ppm above background for more than one-half hour, excavation will stop until sustained levels are less then 5 ppm (see Community Air Monitoring Plan).

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6.0 SITE CONTROL

6.1 Work Zones

The primary purpose of site controls is to establish the perimeter of a hazardous area, to reduce the migration of contaminants into clean areas, and to prevent access or exposure to hazardous materials by unauthorized persons. When operations are to take place involving hazardous materials, the site safety officer will establish an exclusion zone, a decontamination zone, and a support zone. These zones "float" (move around the site) depending on the tasks being performed on any given day. The site safety officer will outline these locations before work begins and when zones change. The site safety officer records this information in the site log book.

It is expected that an exclusion zone, decontamination zone, and support zone will only be established during the remedial work required to excavate the SVOC hotspot area. A licensed Environmental Contractor with relative hazardous material handling experience and training is required to perform any soil disturbing activities within the hotspots identified within the Remedial Action Work Plan. All onsite workers must provide evidence of OSHA 40-hour Hazardous Waste Operations and Emergency Response Operations training to conduct work within the exclusion zone established by the site safety officer. The exclusion zone is defined by the site safety officer but will typically be a 50-foot area around work activities. Gross decontamination (as determined by the site Health and Safety Officer) is conducted in the exclusion zone; all other decontamination is performed in the decontamination zone or trailer.

Protective equipment is removed in the decontamination zone. Disposable protective equipment is stored in receptacles staged in the decontamination zone, and non-disposable equipment is decontaminated. All personnel and equipment exit the exclusion zone through the decontamination zone. If a decontamination trailer is provided the first aid equipment, an eye wash unit, and drinking water are kept in the decontamination trailer.

The support zone is used for vehicle parking, daily safety meetings, and supply storage. Eating, drinking, and smoking are permitted only in the support zone. When a decontamination trailer is not provided, the eye wash unit, first aid equipment, and drinking water are kept at a central location designated by the site safety officer.

6.1 General Site Work

Upon completion of the SVOC hotspot remedial activities by an Environmental Contractor, a general excavation contractor may continue with site excavation/grading as needed for basement excavation, shoring, other building requirements, or as necessary to excavate petroleum related VOC contaminated soil as deemed necessary by the Remedial Action Work Plan and/or Project Manager. All onsite employees must have obtained OSHA 24-hour Hazardous Waste Operations and Emergency Response Operations training prior to performing soil disturbing activities.

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7.0 CONTINGENCY PLAN/EMERGENCY RESPONSE PLAN

Site personnel must be prepared in the event of an emergency. Emergencies can take many forms: illnesses, injuries, chemical exposure, fires, explosions, spills, leaks, releases of harmful contaminants, or sudden changes in the weather.

Emergency telephone numbers and a map to the hospital will be posted in the command post. Site personnel should be familiar with the emergency procedures, and the locations of site safety, first aid, and communication equipment.

7.1 Emergency Equipment On-site

Private telephones:	Site personnel.
Two-way radios:	Site personnel where necessary.
Emergency Alarms:	On-site vehicle horns*.
First aid kits:	On-site, in vehicles or office.
Fire extinguisher:	On-site, in office or on equipment.

* Horns: Air horns will be supplied to personnel at the discretion of the project superintendent or site safety officer.

7.2 Emergency Telephone Numbers

General Emergencies	911
NYPD	911
NYC Fire Department	911
Mount Sinai Hospital	(212) 659-9210
NYSDEC Spills Hotline	1-800-457-7362
NYSDEC Project Manager	(718) 482-7541
NYC Department of Health	(212) 676-2400
National Response Center	1-800-424-8802
Poison Control	1-800-222-1222
Project Manager	1-631-504-6000
Site Safety Officer	1-631-504-6000

7.3 Personnel Responsibilities During an Emergency

The project manager is primarily responsible for responding to and correcting any emergency situations. However, in the absence of the project manager, the site safety officer shall act as the project manager's on-site designee and perform the following tasks:

- Take appropriate measures to protect personnel including: withdrawal from the exclusion zone, evacuate and secure the site, or upgrade/downgrade the level of protective clothing and respiratory protection;

- Ensure that appropriate federal, state, and local agencies are informed and emergency response plans are coordinated. In the event of fire or explosion, the local fire department should be summoned immediately. If toxic materials are released to the air, the local authorities should be informed in order to assess the need for evacuation;

- Ensure appropriate decontamination, treatment, or testing for exposed or injured personnel;

- Determine the cause of incidents and make recommendations to prevent recurrence; and,

- Ensure that all required reports have been prepared.

The following key personnel are planned for this project:

- Project Manager — Ms. Kristen DiScenza (631) 504-6000
- Construction Superintendent — To be added
- Site Safety Officer — Mr. Kevin Waters (631) 504-6000

7.4 Medical Emergencies

A person who becomes ill or injured in the exclusion zone will be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination will be completed and first aid administered prior to transport. First aid will be administered while waiting for an ambulance or paramedics. A Field Accident Report (**Appendix D**) must be filled out for any injury.

A person transporting an injured/exposed person to a clinic or hospital for treatment will take the directions to the hospital (**Appendix D**).and information on the chemical(s) to which they may have been exposed (**Appendix C**).

7.5 Fire or Explosion

In the event of a fire or explosion, the local fire department will be summoned immediately. The site safety officer or his designated alternate will advise the fire commander of the location, nature and identification of the hazardous materials on-site. If it is safe to do so, site personnel may:

- use fire fighting equipment available on site; or,
- remove or isolate flammable or other hazardous materials that may contribute to the fire.

7.6 Evacuation Routes

Evacuation routes established by work area locations for each site will be reviewed prior to commencing site operations. As the work areas change, the evacuation routes will be altered accordingly, and the new route will be reviewed.

Under extreme emergency conditions, evacuation is to be immediate without regard for equipment. The evacuation signal will be a continuous blast of a vehicle horn, if possible, and/or by verbal/radio communication. When evacuating the site, personnel will follow these instructions:

- Keep upwind of smoke, vapors, or spill location.

- Exit through the decontamination corridor if possible.
- If evacuation through the decontamination corridor is not possible, personnel should remove contaminated clothing once they are in a safe location and leave it near the exclusion zone or in a safe place.

- The site safety officer will conduct a head count to ensure that all personnel have been evacuated safely. The head count will be correlated to the site and/or exclusion zone entry/exit log.

- If emergency site evacuation is necessary, all personnel are to escape the emergency situation and decontaminate to the maximum extent practical.

7.7 Spill Control Procedures

Spills associated with site activities may be attributed to project equipment and include gasoline, diesel and hydraulic oil. In the event of a leak or a release, site personnel will inform their supervisor immediately, locate the source of spillage and stop the flow if it can be done safely. A spill containment kit including absorbent pads, booms and/or granulated speedy dry absorbent material will be available to site personnel to facilitate the immediate recovery of the spilled material. Daily inspections of site equipment components including hydraulic lines, fuel tanks, etc. will be performed by their respective operators as a preventative measure for equipment leaks and to ensure equipment soundness. In the event of a spill, site personnel will immediately notify the NYSDEC (1-800-457-7362), and a spill number will be generated.

7.8 Vapor Release Plan

If work zone organic vapor (excluding methane) exceeds 5 ppm, then a downwind reading will be made either 200 feet from the work zone or at the property line, whichever is closer. If readings at this location exceed 5 ppm over background, the work will be stopped.

If 5 ppm of VOCs are recorded over background on a PID at the property line, then an off-site reading will be taken within 20 feet of the nearest residential or commercial property, whichever is closer. If efforts to mitigate the emission source are unsuccessful for 30 minutes, then the designated site safety officer will:

- contact the local police;
- continue to monitor air every 30 minutes, 20 feet from the closest off-site property. If two successive readings are below 5 ppm (non-methane), off-site air monitoring will be halted.
- All property line and off site air monitoring locations and results associated with vapor releases will be recorded in the site safety log book.

APPENDIX A

SITE SAFETY ACKNOWLEDGEMENT FORM

1808 Middle Country Road
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Phone 631.504.6000
Fax 631.924.2870

DAILY BREIFING SIGN-IN SHEET

Date:_____ Person Conducting Briefing:_____

Project Name and Location:_____

1. AWARENESS (topics discussed, special safety concerns, recent incidents, etc…):

_____

_____

_____

_____

2. OTHER ISSUES (HASP changes, attendee comments, etc…):

_____

_____

_____

3. ATTENDEES (Print Name):

1.	11.
2.	12.
3.	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

APPENDIX B

SITE SAFETY PLAN AMENDMENTS

1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

SITE SAFETY PLAN AMENDMENT FORM

Site Safety Plan Amendment #: _____

Site Name: _____

Reason for Amendment: _____

_____

_____

_____

Alternative Procedures: _____

_____

_____

_____

Required Changes in PPE: _____

_____

_____

_____

_____ _____

Project Superintendent (signature) **Date**

_____ _____

Health and Safety Consultant (signature) **Date**

_____ _____

Site Safety Officer (signature) **Date**

APPENDIX C

CHEMICAL HAZARDS

CHEMICAL HAZARDS

The attached International Chemical Safety Cards are provided for contaminants of concern that have been identified in soils and/or groundwater at the site.

International Chemical Safety Cards

BENZENE

ICSC: 0015

Cyclohexatriene
Benzol
C_6H_6
Molecular mass: 78.1

ICSC # 0015
CAS # 71-43-2
RTECS # CY1400000
UN # 1114
EC # 601-020-00-8
May 06, 2003 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Highly flammable.	NO open flames, NO sparks, and NO smoking.	Powder, AFFF, foam, carbon dioxide.
EXPLOSION	Vapour/air mixtures are explosive. Risk of fire and explosion: see Chemical Dangers.	Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling. Use non-sparking handtools. Prevent build-up of electrostatic charges (e.g., by grounding).	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		AVOID ALL CONTACT!	
•**INHALATION**	Dizziness. Drowsiness. Headache. Nausea. Shortness of breath. Convulsions. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•**SKIN**	MAY BE ABSORBED! Dry skin. Redness. Pain. (Further see Inhalation).	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention.
•**EYES**	Redness. Pain.	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**	Abdominal pain. Sore throat. Vomiting. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Remove all ignition sources. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT wash away into sewer. Do NOT let this chemical enter the environment. Personal protection: complete protective clothing including self-contained breathing apparatus.	Fireproof. Separated from food and feedstuffs oxidants halogens	Do not transport with food and feedstuffs. Note: E F symbol T symbol R: 45-46-11-36/38-48/23/24/25-65 S: 53-45 UN Hazard Class: 3 UN Packing Group: II

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0015

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

BENZENE

ICSC: 0015

I M P O R T A N T D A T A

PHYSICAL STATE; APPEARANCE:
COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR.

PHYSICAL DANGERS:
The vapour is heavier than air and may travel along the ground; distant ignition possible. As a result of flow, agitation, etc., electrostatic charges can be generated.

CHEMICAL DANGERS:
Reacts violently with oxidants, nitric acid, sulfuric acid and halogens causing fire and explosion hazard. Attacks plastic and rubber.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 0.5 ppm as TWA 2.5 ppm as STEL (skin) A1 BEI (ACGIH 2004).
MAK: H
Carcinogen category: 1 Germ cell mutagen group: 3A (DFG 2004).
OSHA PEL: 1910.1028 TWA 1 ppm ST 5 ppm See Appendix F
NIOSH REL: Ca TWA 0.1 ppm ST 1 ppm See Appendix A
NIOSH IDLH: Ca 500 ppm See: 71432

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation through the skin and by ingestion

INHALATION RISK:
A harmful contamination of the air can be reached very quickly on evaporation of this substance at 20°C.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance is irritating to the eyes the skin and the respiratory tract Swallowing the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis. The substance may cause effects on the central nervous system , resulting in lowering of consciousness Exposure far above the occupational exposure limit value may result in unconsciousness death

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
The liquid defats the skin. The substance may have effects on the bone marrow immune system , resulting in a decrease of blood cells. This substance is carcinogenic to humans.

PHYSICAL PROPERTIES

Boiling point: 80°C
Melting point: 6°C
Relative density (water = 1): 0.88
Solubility in water, g/100 ml at 25°C: 0.18
Vapour pressure, kPa at 20°C: 10
Relative vapour density (air = 1): 2.7
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.2
Flash point:
-11°C c.c.
Auto-ignition temperature: 498°C
Explosive limits, vol% in air: 1.2-8.0
Octanol/water partition coefficient as log Pow: 2.13

ENVIRONMENTAL DATA

The substance is very toxic to aquatic organisms.

N O T E S

Use of alcoholic beverages enhances the harmful effect. Depending on the degree of exposure, periodic medical examination is indicated. The odour warning when the exposure limit value is exceeded is insufficient.

Transport Emergency Card: TEC (R)-30S1114 / 30GF1-II
NFPA Code: H2; F3; R0

ADDITIONAL INFORMATION

ICSC: 0015 **BENZENE**

IMPORTANT LEGAL NOTICE:

International Chemical Safety Cards

o-XYLENE

ICSC: 0084

ortho-Xylene
1,2-Dimethylbenzene
o-Xylol
$C_6H_4(CH_3)_2$ / C_8H_{10}
Molecular mass: 106.2

ICSC # 0084
CAS # 95-47-6
RTECS # ZE2450000
UN # 1307
EC # 601-022-00-9
August 03, 2002 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Flammable.	NO open flames, NO sparks, and NO smoking.	Powder, water spray, foam, carbon dioxide.
EXPLOSION	Above 32°C explosive vapour/air mixtures may be formed.	Above 32°C use a closed system, ventilation, and explosion-proof electrical equipment. Prevent build-up of electrostatic charges (e.g., by grounding).	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		STRICT HYGIENE! AVOID EXPOSURE OF (PREGNANT) WOMEN!	
•INHALATION	Dizziness. Drowsiness. Headache. Nausea.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	Dry skin. Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness. Pain.	Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Burning sensation. Abdominal pain. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Ventilation. Remove all ignition sources. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT let this chemical enter the environment. (Extra personal protection: filter respirator for organic gases and vapours.)	Fireproof. Separated from strong oxidants and strong acids .	Note: C Xn symbol R: 10-20/21-38 S: 2-25 UN Hazard Class: 3 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the

ICSC: 0084

International Chemical Safety Cards

o-XYLENE

ICSC: 0084

IMPORTANT DATA	**PHYSICAL STATE; APPEARANCE:** COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR. **PHYSICAL DANGERS:** As a result of flow, agitation, etc., electrostatic charges can be generated. **CHEMICAL DANGERS:** Reacts with strong acids and strong oxidants . **OCCUPATIONAL EXPOSURE LIMITS:** TLV: 100 ppm as TWA; 150 ppm as STEL A4 (ACGIH 2001). BEI specified by (ACGIH 2001). EU OEL: 50 ppm as TWA; 100 ppm as STEL (skin) (EU 2000). OSHA PEL†: TWA 100 ppm (435 mg/m^3) NIOSH REL: TWA 100 ppm (435 mg/m^3) ST 150 ppm (655 mg/m^3) NIOSH IDLH: 900 ppm See: 95476 **ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation, through the skin and by ingestion. **INHALATION RISK:** A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C. **EFFECTS OF SHORT-TERM EXPOSURE:** The substance is irritating to the eyes and the skin . The substance may cause effects on the central nervous system . If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis. **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** The liquid defats the skin. The substance may have effects on the central nervous system. Exposure to the substance may enhance hearing damage caused by exposure to noise. Animal tests show that this substance possibly causes toxicity to human reproduction or development.
PHYSICAL PROPERTIES	Boiling point: 144°C Melting point: -25°C Relative density (water = 1): 0.88 Solubility in water: none Vapour pressure, kPa at 20°C: 0.7 Relative vapour density (air = 1): 3.7 Relative density of the vapour/air-mixture at 20°C (air = 1): 1.02 Flash point: 32°C c.c. Auto-ignition temperature: 463°C Explosive limits, vol% in air: 0.9-6.7 Octanol/water partition coefficient as log Pow: 3.12
ENVIRONMENTAL DATA	The substance is toxic to aquatic organisms. 

N O T E S

Depending on the degree of exposure, periodic medical examination is indicated. The recommendations on this Card also apply to technical xylene. See ICSC 0086 p-Xylene and 0085 m-Xylene.

Transport Emergency Card: TEC (R)-30S1307-III

NFPA Code: H 2; F 3; R 0;
Card has been partially updated in January 2008: see Occupational Exposure Limits.

ADDITIONAL INFORMATION

ICSC: 0084 **o-XYLENE**

IMPORTANT LEGAL	Neither NIOSH, the CEC or the IPCS nor any person acting on behalf of NIOSH, 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. The only

International Chemical Safety Cards

m-XYLENE

ICSC: 0085

meta-Xylene
1,3-Dimethylbenzene
m-Xylol
$C_6H_4(CH_3)_2$ / C_8H_{10}
Molecular mass: 106.2

ICSC # 0085
CAS # 108-38-3
RTECS # ZE2275000
UN # 1307
EC # 601-022-00-9
August 03, 2002 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Flammable.	NO open flames, NO sparks, and NO smoking.	Powder, water spray, foam, carbon dioxide.
EXPLOSION	Above 27°C explosive vapour/air mixtures may be formed.	Above 27°C use a closed system, ventilation, and explosion-proof electrical equipment. Prevent build-up of electrostatic charges (e.g., by grounding).	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		STRICT HYGIENE!	
•INHALATION	Dizziness. Drowsiness. Headache. Nausea.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	Dry skin. Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness. Pain.	Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Burning sensation. Abdominal pain. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Ventilation. Remove all ignition sources. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT let this chemical enter the environment. (Extra personal protection: filter respirator for organic gases and vapours.)	Fireproof. Separated from strong oxidants strong acids	Note: C Xn symbol R: 10-20/21-38 S: 2-25 UN Hazard Class: 3 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0085

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

m-XYLENE

ICSC: 0085

I M P O R T A N T D A T A

PHYSICAL STATE; APPEARANCE:
COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR.

PHYSICAL DANGERS:
As a result of flow, agitation, etc., electrostatic charges can be generated.

CHEMICAL DANGERS:
Reacts with strong acids strong oxidants

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 100 ppm as TWA 150 ppm as STEL A4 (ACGIH 2001). BEI (ACGIH 2001).
MAK: 100 ppm 440 mg/m³
Peak limitation category: II(2)
skin absorption (H);
Pregnancy risk group: D
(DFG 2005).
EU OEL: 50 ppm as TWA 100 ppm as STEL (skin) (EU 2000).
OSHA PEL†: TWA 100 ppm (435 mg/m^3)
NIOSH REL: TWA 100 ppm (435 mg/m^3) ST 150 ppm (655 mg/m^3)
NIOSH IDLH: 900 ppm See: 95476

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation, through the skin and by ingestion.

INHALATION RISK:
A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance is irritating to the eyes and the skin The substance may cause effects on the central nervous system If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
The liquid defats the skin. The substance may have effects on the central nervous system Animal tests show that this substance possibly causes toxicity to human reproduction or development.

PHYSICAL PROPERTIES

Boiling point: 139°C
Melting point: -48°C
Relative density (water = 1): 0.86
Solubility in water:
none
Vapour pressure, kPa at 20°C: 0.8

Relative vapour density (air = 1): 3.7
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.02
Flash point: 27°C c.c.
Auto-ignition temperature: 527°C
Explosive limits, vol% in air: 1.1-7.0
Octanol/water partition coefficient as log Pow: 3.20

ENVIRONMENTAL DATA

The substance is toxic to aquatic organisms.

N O T E S

Depending on the degree of exposure, periodic medical examination is indicated. The recommendations on this Card also apply to technical xylene. See ICSC 0084 o-Xylene and 0086 p-Xylene.

NFPA Code: H 2; F 3; R 0;
Transport Emergency Card: TEC (R)-30S1307-III

ADDITIONAL INFORMATION

ICSC: 0085 **m-XYLENE**

International Chemical Safety Cards

TOLUENE

ICSC: 0078

Methylbenzene
Toluol
Phenylmethane
$C_6H_5CH_3$ / C_7H_8
Molecular mass: 92.1

ICSC # 0078
CAS # 108-88-3
RTECS # XS5250000
UN # 1294
EC # 601-021-00-3
October 10, 2002 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Highly flammable.	NO open flames, NO sparks, and NO smoking.	Powder, AFFF, foam, carbon dioxide.
EXPLOSION	Vapour/air mixtures are explosive.	Closed system, ventilation, explosion-proof electrical equipment and lighting. Prevent build-up of electrostatic charges (e.g., by grounding). Do NOT use compressed air for filling, discharging, or handling. Use non-sparking handtools.	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		STRICT HYGIENE! AVOID EXPOSURE OF (PREGNANT) WOMEN!	
•**INHALATION**	Cough. Sore throat. Dizziness. Drowsiness. Headache. Nausea. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•**SKIN**	Dry skin. Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention.
•**EYES**	Redness. Pain.	Safety goggles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•**INGESTION**	Burning sensation. Abdominal pain. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Evacuate danger area in large spill! Consult an expert in large spill! Remove all ignition sources. Ventilation. Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT wash away into sewer. Do NOT let this chemical enter the environment. Personal protection: self-contained breathing apparatus	Fireproof. Separated from strong oxidants.	F symbol Xn symbol R: 11-38-48/20-63-65-67 S: 2-36/37-46-62 UN Hazard Class: 3 UN Packing Group: II

ICSC: 0078

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

TOLUENE

ICSC: 0078

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR.

PHYSICAL DANGERS:
The vapour mixes well with air, explosive mixtures are formed easily. As a result of flow, agitation, etc., electrostatic charges can be generated.

CHEMICAL DANGERS:
Reacts violently with strong oxidants causing fire and explosion hazard.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 50 ppm as TWA (skin) A4 BEI issued (ACGIH 2004).
MAK: 50 ppm 190 mg/m³ H
Peak limitation category: II(4) Pregnancy risk group: C (DFG 2004).
OSHA PEL†: TWA 200 ppm C 300 ppm 500 ppm (10-minute maximum peak)
NIOSH REL: TWA 100 ppm (375 mg/m^3) ST 150 ppm (560 mg/m^3)
NIOSH IDLH: 500 ppm See: 108883

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation, through the skin and by ingestion.

INHALATION RISK:
A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20°C.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance is irritating to the eyes and the respiratory tract The substance may cause effects on the central nervous system If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis. Exposure at high levels may result in cardiac dysrhythmiaandunconsciousness.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
The liquid defats the skin. The substance may have effects on the central nervous system Exposure to the substance may enhance hearing damage caused by exposure to noise. Animal tests show that this substance possibly causes toxicity to human reproduction or development.

PHYSICAL PROPERTIES

Boiling point: 111°C
Melting point: -95°C
Relative density (water = 1): 0.87
Solubility in water: none
Vapour pressure, kPa at 25°C: 3.8
Relative vapour density (air = 1): 3.1
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.01
Flash point: 4°C c.c.
Auto-ignition temperature: 480°C
Explosive limits, vol% in air: 1.1-7.1
Octanol/water partition coefficient as log Pow: 2.69

ENVIRONMENTAL DATA

The substance is toxic to aquatic organisms.

N O T E S

Depending on the degree of exposure, periodic medical examination is suggested. Use of alcoholic beverages enhances the harmful effect.

Transport Emergency Card: TEC (R)-30S1294
NFPA Code: H 2; F 3; R 0;

ADDITIONAL INFORMATION

International Chemical Safety Cards

BENZ(a)ANTHRACENE

ICSC: 0385

1,2-Benzoanthracene
Benzo(a)anthracene
2,3-Benzphenanthrene
Naphthanthracene
$C_{18}H_{12}$
Molecular mass: 228.3

ICSC # 0385
CAS # 56-55-3
RTECS # CV9275000
EC # 601-033-00-9
October 23, 1995 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.		Water spray, powder. In case of fire in the surroundings: use appropriate extinguishing media.
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
Sweep spilled substance into sealable containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Personal protection: complete protective clothing including self-contained breathing apparatus.	Well closed.	T symbol N symbol R: 45-50/53 S: 53-45-60-61

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0385

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

ICSC: 0385

BENZ(a)ANTHRACENE

I M P O R T A N T D A T A

PHYSICAL STATE; APPEARANCE:
COLOURLESS TO YELLOW BROWN FLUORESCENT FLAKES OR POWDER.

PHYSICAL DANGERS:
Dust explosion possible if in powder or granular form, mixed with air.

CHEMICAL DANGERS:

OCCUPATIONAL EXPOSURE LIMITS:
TLV: A2 (suspected human carcinogen); (ACGIH 2004).
MAK:
Carcinogen category: 2 (as pyrolysis product of organic materials)
(DFG 2005).

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation, through the skin and by ingestion.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly.

EFFECTS OF SHORT-TERM EXPOSURE:

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
This substance is probably carcinogenic to humans.

PHYSICAL PROPERTIES

Sublimation point: 435°C
Melting point: 162°C
Relative density (water = 1): 1.274
Solubility in water:
none

Vapour pressure, Pa at 20°C: 292
Octanol/water partition coefficient as log Pow: 5.61

ENVIRONMENTAL DATA

Bioaccumulation of this chemical may occur in seafood.

N O T E S

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. Card has been partly updated in October 2005 and August 2006: see sections Occupational Exposure Limits, EU classification.

ADDITIONAL INFORMATION

ICSC: 0385 **BENZ(a)ANTHRACENE**

International Chemical Safety Cards

BENZO(a)PYRENE

ICSC: 0104

Benz(a)pyrene
3,4-Benzopyrene
Benzo(d,e,f)chrysene
$C_{20}H_{12}$
Molecular mass: 252.3

ICSC # 0104
CAS # 50-32-8
RTECS # DJ3675000
EC # 601-032-00-3
October 17, 2005 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Water spray, foam, powder, carbon dioxide.
EXPLOSION			
EXPOSURE	See EFFECTS OF LONG-TERM OR REPEATED EXPOSURE.	AVOID ALL CONTACT! AVOID EXPOSURE OF (PREGNANT) WOMEN!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN	MAY BE ABSORBED!	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety goggles 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.	Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Evacuate danger area! Personal protection: complete protective clothing including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Sweep spilled substance into sealable containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place.	Separated from strong oxidants.	T symbol N symbol R: 45-46-60-61-43-50/53 S: 53-45-60-61

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0104

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

BENZO(a)PYRENE

ICSC: 0104

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
PALE-YELLOW CRYSTALS

PHYSICAL DANGERS:

CHEMICAL DANGERS:
Reacts with strong oxidants causing fire and explosion hazard.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: Exposure by all routes should be carefully controlled to levels as low as possible A2 (suspected human carcinogen); (ACGIH 2005).
MAK:
Carcinogen category: 2; Germ cell mutagen group: 2; (DFG 2005).

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation of its aerosol, through the skin and by ingestion.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.

EFFECTS OF SHORT-TERM EXPOSURE:

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
This substance is carcinogenic to humans. May cause heritable genetic damage to human germ cells. Animal tests show that this substance possibly causes toxicity to human reproduction or development.

PHYSICAL PROPERTIES

Boiling point: 496°C
Melting point: 178.1°C
Density: 1.4
g/cm³

Solubility in water: none (<0.1 g/100 ml)
Vapour pressure :
negligible
Octanol/water partition coefficient as log Pow: 6.04

ENVIRONMENTAL DATA

The substance is very toxic to aquatic organisms. Bioaccumulation of this chemical may occur in fish, in plants and in molluscs. The substance may cause long-term effects in the aquatic environment.

NOTES

Do NOT take working clothes home. Benzo(a)pyrene is present as a component of polycyclic aromatic hydrocarbons (PAHs) in the environment, usually resulting from the incomplete combustion or pyrolysis of organic matters, especially fossil fuels and tobacco.

ADDITIONAL INFORMATION

International Chemical Safety Cards

BENZO(b)FLUORANTHENE

ICSC: 0720

Benz(e)acephenanthrylene
2,3-Benzofluoroanthene
Benzo(e)fluoranthene
3,4-Benzofluoranthene
$C_{20}H_{12}$
Molecular mass: 252.3

ICSC # 0720
CAS # 205-99-2
RTECS # CU1400000
EC # 601-034-00-4
March 25, 1999 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE			In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION			
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 spectacles 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.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into covered containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment.	Provision to contain effluent from fire extinguishing. Well closed.	T symbol N symbol R: 45-50/53 S: 53-45-60-61

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0720

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

BENZO(b)FLUORANTHENE

ICSC: 0720

I	**PHYSICAL STATE; APPEARANCE:** COLOURLESS CRYSTALS	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation

IMPORTANT DATA	**PHYSICAL DANGERS:** **CHEMICAL DANGERS:** Upon heating, toxic fumes are formed. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: A2 (suspected human carcinogen); (ACGIH 2004). MAK: Carcinogen category: 2; (DFG 2004). of its aerosol and through the skin. **INHALATION RISK:** Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly. **EFFECTS OF SHORT-TERM EXPOSURE:** **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** This substance is possibly carcinogenic to humans. May cause genetic damage in humans.
PHYSICAL PROPERTIES	Boiling point: 481°C Melting point: 168°C Solubility in water: none Octanol/water partition coefficient as log Pow: 6.12
ENVIRONMENTAL DATA	This substance may be hazardous to the environment; special attention should be given to air quality and water quality. 

N O T E S

Benzo(b)fluoranthene is present as a component of polycyclic aromatic hydrocarbons (PAH) content in the environment usually resulting from the incomplete combustion or pyrolysis of organic matters, especially fossil fuels and tobacco.ACGIH recommends environment containing benzo(b)fluoranthene should be evaluated in terms of the TLV-TWA for coal tar pitch volatile, as benzene soluble 0.2 mg/m^3. Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken.

ADDITIONAL INFORMATION

ICSC: 0720 **BENZO(b)FLUORANTHENE**

International Chemical Safety Cards

BENZO(k)FLUORANTHENE

ICSC: 0721

Dibenzo(b,jk)fluorene
8,9-Benzofluoranthene
11,12-Benzofluoranthene
$C_{20}H_{12}$
Molecular mass: 252.3

ICSC # 0721
CAS # 207-08-9
RTECS # DF6350000
EC # 601-036-00-5
March 25, 1999 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE			In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION			
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 spectacles or eye protection in combination with breathing protection if powder.	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.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into covered containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment.	Provision to contain effluent from fire extinguishing. Well closed.	T symbol N symbol R: 45-50/53 S: 53-45-60-61

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0721

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

BENZO(k)FLUORANTHENE

ICSC: 0721

I **M**	**PHYSICAL STATE; APPEARANCE:** YELLOW CRYSTALS	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation of its aerosol and through the skin.

P O R T A N T D A T A	**PHYSICAL DANGERS:** **CHEMICAL DANGERS:** Upon heating, toxic fumes are formed. **OCCUPATIONAL EXPOSURE LIMITS:** TLV not established. MAK: Carcinogen category: 2; (DFG 2004). **INHALATION RISK:** Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly. **EFFECTS OF SHORT-TERM EXPOSURE:** **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** This substance is possibly carcinogenic to humans.
PHYSICAL PROPERTIES	Boiling point: 480°C Melting point: 217°C Solubility in water: none Octanol/water partition coefficient as log Pow: 6.84
ENVIRONMENTAL DATA	This substance may be hazardous to the environment; special attention should be given to air quality and water quality. Bioaccumulation of this chemical may occur in crustacea and in fish. 

N O T E S

Benzo(k)fluoranthene is present as a component of polycyclic aromatic hydrocarbons (PAH) content in the environment usually resulting from the incomplete combustion or pyrolysis of organic matters, especially fossil fuels and tobacco.ACGIH recommends environment containing benzo(k)fluoranthene should be evaluated in terms of the TLV-TWA for coal tar pitch volatile, as benzene soluble 0.2 mg/m^3. Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken.

ADDITIONAL INFORMATION

ICSC: 0721 **BENZO(k)FLUORANTHENE**

International Chemical Safety Cards

CHRYSENE

ICSC: 1672

Benzoaphenanthrene
1,2-Benzophenanthrene
1,2,5,6-Dibenzonaphthalene
$C_{18}H_{12}$
Molecular mass: 228.3

ICSC # 1672
CAS # 218-01-9
RTECS # GC0700000
UN # 3077
EC # 601-048-00-0
October 12, 2006 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Water spray. Dry powder. Foam. Carbon dioxide.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE	See EFFECTS OF LONG-TERM OR REPEATED 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	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.	Rinse mouth.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Personal protection: P3 filter respirator for toxic particles. Do NOT let this chemical enter the environment. Sweep spilled substance into sealable containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place.	Separated from strong oxidants, Provision to contain effluent from fire extinguishing. Store in an area without drain or sewer access.	T symbol N symbol R: 45-68-50/53 S: 53-45-60-61 UN Hazard Class: 9 UN Packing Group: III Signal: Warning Aqua-Cancer Suspected of causing cancer Very toxic to aquatic life with long lasting effects Very toxic to aquatic life

SEE IMPORTANT INFORMATION ON BACK

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European

International Chemical Safety Cards

CHRYSENE

ICSC: 1672

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
COLOURLESS TO BEIGE CRYSTALS OR POWDER

PHYSICAL DANGERS:
Dust explosion possible if in powder or granular form, mixed with air.

CHEMICAL DANGERS:
The substance decomposes on burning producing toxic fumes Reacts violently with strong oxidants

OCCUPATIONAL EXPOSURE LIMITS:
TLV: A3 (confirmed animal carcinogen with unknown relevance to humans); (ACGIH 2006).
MAK not established.

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation of its aerosol, through the skin and by ingestion.

INHALATION RISK:
A harmful concentration of airborne particles can be reached quickly when dispersed

EFFECTS OF SHORT-TERM EXPOSURE:

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
This substance is possibly carcinogenic to humans.

PHYSICAL PROPERTIES

Boiling point: 448°C
Melting point: 254 - 256°C
Density: 1.3 g/cm³

Solubility in water:
very poor
Octanol/water partition coefficient as log Pow: 5.9

ENVIRONMENTAL DATA

The substance is very toxic to aquatic organisms. Bioaccumulation of this chemical may occur in seafood. It is strongly advised that this substance does not enter the environment.

NOTES

Depending on the degree of exposure, periodic medical examination is suggested. Do NOT take working clothes home. This substance does not usually occur as a pure substance but as a component of polyaromatic hydrocarbon (PAH) mixtures. Human population studies have associated PAH's exposure with cancer and cardiovascular diseases.

Transport Emergency Card: TEC (R)-90GM7-III

ADDITIONAL INFORMATION

International Chemical Safety Cards

INDENO(1,2,3-cd)PYRENE

ICSC: 0730

o-Phenylenepyrene
2,3-Phenylenepyrene
$C_{22}H_{12}$
Molecular mass: 276.3

ICSC # 0730
CAS # 193-39-5
RTECS # NK9300000
March 25, 1999 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE			In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION			
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 spectacles 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.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into covered containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment.	Provision to contain effluent from fire extinguishing. Well closed.	R: S:

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0730

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

INDENO(1,2,3-cd)PYRENE

ICSC: 0730

I **M** **P**	**PHYSICAL STATE; APPEARANCE:** YELLOW CRYSTALS **PHYSICAL DANGERS:**	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation of its aerosol and through the skin. **INHALATION RISK:**

O R T A N T D A T A	**CHEMICAL DANGERS:** Upon heating, toxic fumes are formed. **OCCUPATIONAL EXPOSURE LIMITS:** TLV not established. MAK: Carcinogen category: 2; (DFG 2004).	Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly. **EFFECTS OF SHORT-TERM EXPOSURE:** **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** This substance is possibly carcinogenic to humans.
PHYSICAL PROPERTIES	Boiling point: 536°C Melting point: 164°C Solubility in water: none	Octanol/water partition coefficient as log Pow: 6.58
ENVIRONMENTAL DATA	This substance may be hazardous to the environment; special attention should be given to air quality and water quality. Bioaccumulation of this chemical may occur in fish. 	

N O T E S

Indeno(1,2,3-cd)pyrene is present as a component of polycyclic aromatic hydrocarbons (PAH) content in the environment usually resulting from the incomplete combustion or pyrolysis of organic matters, especially fossil fuels and tobacco.ACGIH recommends environment containing Indeno(1,2,3-c,d)pyrene should be evaluated in terms of the TLV-TWA for coal tar pitch volatile, as benzene soluble 0.2 mg/m^3. Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken.

ADDITIONAL INFORMATION

ICSC: 0730 **INDENO(1,2,3-cd)PYRENE**

MSDS : 2,2-Bis-(4-chlorophenyl)-1,1-dichloroethylene, 99%
CAS : 72-55-9
SYNONYMS : p,p'-DDE ; ethylene,1,1-dichloro-2,2-bis-(p-chlorophenyl)- ; DDT dehydrochloride ; DDE; 1-1'-(Dichloroethenylidene)bis(4-chlorobenzene)

Catalog of Chemical Suppliers, Buyers, Custom Synthesis Companies And Equipment Manufacturers
[2,2-Bis-(4-chlorophenyl)-1,1-dichloroethylene, 99% 72-55-9]

Suppliers:

Not Available

Buyers:

Not Available

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

CAS#	Chemical Name	%	EINECS#
72-55-9	2,2-Bis-(4-chlorophenyl)-1,1-dichloroethylene	99	200-784-6

Hazard Symbols: XN
Risk Phrases: 22 33

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW
Harmful if swallowed. Danger of cumulative effects.Cancer suspect agent.Possible risks of irreversible effects.

Potential Health Effects
Eye:
May cause eye irritation.
Skin:
May cause skin irritation.
Ingestion:
May cause irritation of the digestive tract. May be harmful if swallowed. Ingestion of large amounts may cause liver and/or kidney damage.
Inhalation:
May cause respiratory tract irritation.
Chronic:
May cause cancer according to animal studies. Adverse reproductive effects have been reported in animals. Laboratory experiments have resulted in mutagenic effects.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:
Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin:
Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.
Ingestion:
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:
Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
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. Water runoff can cause environmental damage. Dike and collect water used to fight fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Will burn if involved in a fire.
Extinguishing Media:
For large fires, use water spray, fog or regular foam. For small fires, use dry chemical, carbon dioxide, water spray or regular foam. Cool containers with flooding quantities of water until well after fire is out.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks:
Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:
Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Do not ingest or inhale. Use with adequate ventilation.
Storage:
Keep container closed when not in use. 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
CAS# 72-55-9:

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 respirator use.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Crystals
Color: white
Odor: None reported.
pH: Not available.
Vapor Pressure: 6.5106 mm Hg @ 20 C
Viscosity: Not available.
Boiling Point: 336 deg C
Freezing/Melting Point: 88.00 - 90.00 deg C
Autoignition Temperature: Not available.
Flash Point: Not available.
Explosion Limits, lower: Not available.
Explosion Limits, upper: Not available.
Decomposition Temperature:
Solubility in water: 0.010 ppm
Specific Gravity/Density:
Molecular Formula: C14H8Cl4
Molecular Weight: 318.02

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:
Stable under normal temperatures and pressures.
Conditions to Avoid:
Incompatible materials, dust generation, strong oxidants.
Incompatibilities with Other Materials:
Strong oxidizing agents - strong bases.
Hazardous Decomposition Products:
Hydrogen chloride, carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:
CAS# 72-55-9: KV9450000
LD50/LC50:
CAS# 72-55-9: Oral, mouse: LD50 = 700 mg/kg; Oral, rat: LD50 = 880 mg/kg.
Carcinogenicity:
2,2-Bis-(4-chlorophenyl)-1,1-dichloroethylene -
California: carcinogen, initial date 1/1/89

Other:
See actual entry in RTECS for complete information.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

Ecotoxicity:
Estimated BCF value = 8,300 based on water solubility. Estimated Koc value = 8,300. There was no movement of DDE reported in soil column mobility experiments.

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Dispose of in a manner consistent with federal, state, and local regulations.

**** SECTION 14 - TRANSPORT INFORMATION ****

IATA
Not regulated as a hazardous material.
IMO
Not regulated as a hazardous material.
RID/ADR
Not regulated as a hazardous material.
USA RQ: CAS# 72-55-9: 1 lb final RQ; 0.454 kg final RQ

**** SECTION 15 - REGULATORY INFORMATION ****

European/International Regulations
European Labeling in Accordance with EC Directives
Hazard Symbols: XN
Risk Phrases:
R 22 Harmful if swallowed.
R 33 Danger of cumulative effects.
Safety Phrases:
S 24/25 Avoid contact with skin and eyes.
WGK (Water Danger/Protection)
CAS# 72-55-9: 3
Canada
None of the chemicals in this product are listed on the DSL/NDSL list.
CAS# 72-55-9 is listed on Canada's Ingredient Disclosure List.
US FEDERAL
TSCA
CAS# 72-55-9 is not listed on the TSCA inventory.
It is for research and development use only.

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 9/28/1998 Revision #3 Date: 3/18/2003

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company 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 the company has been advised of the possibility of such damages.

4-Cyano-4-Phenylpiperidine Hydrochloride, 99% (TLC)	51304-58-6
Methanesulfonamide	3144-09-0
gamma-Octanoic lactone, 98%	104-50-7
Cis,cis,cis,cis-1,2,3,4-cyclopentane- tetracarboxylic dianhydride,	4802-47-5
Tetrachloroethylene Carbonate, 98+%	22432-68-4
Oxamic Acid, 98%	471-47-6
1O,11-Dihydro-5H-Dibenzo(A,D)-Cycloheptene, 98%	833-48-7
Thallium (I) Sulfate, 99.9+%	7446-18-6
N-(2,6-Dimethylphenylcarbamoyl-Methyl)-Iminodiacetic Acid, 99%	59160-29-1
P-(Dimethylamino)cinnamic Acid, 99%	1552-96-1
Biebrich Scarlet, 99% (UV-VIS)	4196-99-0
4-Chlorobenzenediazonium hexafluoro- phosphate	1582-27-0
Ammonium hexachloroiridate(IV), 99.99%	16940-92-4
Methylamine-d2 deuteriochloride, 98+ atom % D	593-51-1
2,2-Bis-(4-chlorophenyl)-1,1-dichloroethylene, 99%	72-55-9
Nitro red	56431-61-9
Methyl 2,3-dichlorobenzoate, 98+%	2905-54-6
Isopropyl Bromoacetate, 98% (GC)	29921-57-1
1-Iodo-4-Nitrobenzene, 99%	636-98-6
4-Ethylcyclohexanol, 99% cis/trans mixture	4534-74-1
Fluorescamine	38183-12-9
Tris(2,2,6,6-Tetramethyl-3,5-Heptanedionato)Dysprosium(III), 99+%	15522-69-7
3-Amino-2,2,5,5-Tetramethyl-1-Pyrrolidinyloxy, 99% (Titr.)	34272-83-8
3,4-Dihydroxyphenylacetic Acid,98%	102-32-9

International Chemical Safety Cards

DDT

ICSC: 0034

Dichlorodiphenyltrichloroethane
1,1,1-Trichloro-2,2-bis(p-chlorophenyl)ethane
2,2-bis(p-Chlorophenyl)-1,1,1-trichloroethane
1,1'-(2,2,2-Trichloroethylidene)bis(4-chlorobenzene)
p,p'-DDT
$C_{14}H_9Cl_5$
Molecular mass: 354.5

ICSC # 0034
CAS # 50-29-3
RTECS # KJ3325000
UN # 2761
EC # 602-045-00-7
April 20, 2004 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible. Liquid formulations containing organic solvents may be flammable. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames.	Powder, water spray, foam, carbon dioxide.
EXPLOSION			
EXPOSURE		PREVENT DISPERSION OF DUST! STRICT HYGIENE! AVOID EXPOSURE OF (PREGNANT) WOMEN!	
•INHALATION	Cough.	Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness.	Safety goggles, or eye protection in combination with breathing protection if powder.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Tremors. Diarrhoea. Dizziness. Headache. Vomiting. Numbness. Paresthesias. Hyperexcitability. Convulsions.	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Give a slurry of activated charcoal in water to drink. Rest. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Do NOT let this chemical enter the environment. Sweep spilled substance into sealable non-metallic containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Personal protection: P3 filter respirator for toxic particles.	Provision to contain effluent from fire extinguishing. Separated from iron, aluminum and its salts, food and feedstuffs See Chemical Dangers.	Do not transport with food and feedstuffs. Severe marine pollutant. T symbol N symbol R: 25-40-48/25-50/53 S: 1/2-22-36/37-45-60-61 UN Hazard Class: 6.1 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

International Chemical Safety Cards

DDT

ICSC: 0034

I M P O R T A N T D A T A

PHYSICAL STATE; APPEARANCE:
COLOURLESS CRYSTALS WHITE POWDER.
TECHNICAL PRODUCT IS WAXY SOLID.

PHYSICAL DANGERS:

CHEMICAL DANGERS:
On combustion, forms toxic and corrosive fumesincludinghydrogen chloride. Reacts with aluminium and iron.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 1 mg/m³ as TWA A3 (ACGIH 2004).
MAK: 1 mg/m³ H
Peak limitation category: II(8)
(DFG 2003).
OSHA PEL: TWA 1 mg/m^3 skin
NIOSH REL: Ca TWA 0.5 mg/m^3 See Appendix A
NIOSH IDLH: Ca 500 mg/m^3 See: 50293

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by ingestion.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly especially if powdered.

EFFECTS OF SHORT-TERM EXPOSURE:
May cause mechanical irritation. The substance may cause effects on the central nervous system , resulting in convulsions and respiratory depression Exposure at high levels may result in death. Medical observation is indicated.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
The substance may have effects on the central nervous system and liver. This substance is possibly carcinogenic to humans. Animal tests show that this substance possibly causes toxicity to human reproduction or development.

PHYSICAL PROPERTIES

Boiling point: 260°C
Melting point: 109°C
Density: 1.6
g/cm3

Solubility in water: poor
Octanol/water partition coefficient as log Pow: 6.36

ENVIRONMENTAL DATA

The substance is very toxic to aquatic organisms. This substance may be hazardous to the environment; special attention should be given to birds. Bioaccumulation of this chemical may occur along the food chain, for example in milk and aquatic organisms. This substance does enter the environment under normal use. Great care, however, should be given to avoid any additional release, e.g. through inappropriate disposal.

N O T E S

Depending on the degree of exposure, periodic medical examination is indicated. Carrier solvents used in commercial formulations may change physical and toxicological properties. Do NOT take working clothes home. Consult national legislation. Agritan, Azotox, Anofex, Ixodex, Gesapon, Gesarex, Gesarol, Guesapon, Clofenotane, Zeidane, Dicophane, Neocid are trade names.

Transport Emergency Card: TEC (R)-61GT7-III

ADDITIONAL INFORMATION

ICSC: 0034 **DDT**

International Chemical Safety Cards

DIELDRIN

ICSC: 0787

1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo-1,4-exo- 5,8-dimethanonaphthalene
3,4,5,6,9,9-Hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2ß,2aalpha,3ß,6ß,6aalpha,7ß,7aalpha)-2,73,6-dimethanonaphth(2,3-b)oxirene
HEOD
$C_{12}H_8Cl_6O$
Molecular mass: 380.9

ICSC # 0787
CAS # 60-57-1
RTECS # IO1750000
UN # 2761
EC # 602-049-00-9
March 26, 1998 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Not combustible. Liquid formulations containing organic solvents may be flammable. Gives off irritating or toxic fumes (or gases) in a fire.		In case of fire in the surroundings: all extinguishing agents allowed.
EXPLOSION			
EXPOSURE		PREVENT DISPERSION OF DUST! STRICT HYGIENE! AVOID EXPOSURE OF ADOLESCENTS AND CHILDREN!	
•INHALATION	(See Ingestion).	Ventilation (not if powder).	Fresh air, rest. Refer for medical attention.
•SKIN	MAY BE ABSORBED! See Ingestion.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention.
•EYES		Safety goggles, or face shield.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Convulsions. Dizziness. Headache. Nausea. Vomiting. Muscle twitching.	Do not eat, drink, or smoke during work. Wash hands before eating.	Give a slurry of activated charcoal in water to drink. Do NOT induce vomiting. Rest. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Do NOT wash away into sewer. Sweep spilled substance into sealable containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. (Extra personal protection: chemical protection suit including self-contained breathing apparatus).	Provision to contain effluent from fire extinguishing. Separated from food and feedstuffs and incompatible materials: See Chemical Dangers. Well closed. Keep in a well-ventilated room. Store in an area without drain or sewer access.	Do not transport with food and feedstuffs. Severe marine pollutant. T+ symbol N symbol R: 25-27-40-48/25-50/53 S: 1/2-22-36/37-45-60-61 UN Hazard Class: 6.1 UN Packing Group: II

SEE IMPORTANT INFORMATION ON BACK

International Chemical Safety Cards

DIELDRIN

ICSC: 0787

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
COLOURLESS CRYSTALS

PHYSICAL DANGERS:

CHEMICAL DANGERS:
The substance decomposes on heating producing toxic fumes including hydrogen chloride. Reacts with oxidants and acids. Attacks metal due to the slow formation of hydrogen chloride in storage.

OCCUPATIONAL EXPOSURE LIMITS:
TLV (as TWA): 0.25 mg/m³, A4 (skin) (ACGIH 1997).
MAK: (Inhalable fraction) 0.25 mg/m³ :
Peak limitation category: II(8)
skin absorption (H); (DFG 2007).
OSHA PEL: TWA 0.25 mg/m^3 skin
NIOSH REL: Ca TWA 0.25 mg/m^3 skin See Appendix A
NIOSH IDLH: Ca 50 mg/m^3 See: 60571

ROUTES OF EXPOSURE:
The substance can be absorbed into the body through the skin and by ingestion.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly on spraying.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance may cause effects on the central nervous system , resulting in convulsions. Medical observation is indicated.

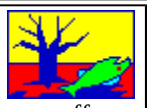
EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
The substance accumulates in the human body. Cumulative effects are possible: see Acute Hazards/Symptoms.

PHYSICAL PROPERTIES

Melting point: 175-176°C
Density: 1.7 g/cm³
Solubility in water: none

Vapour pressure, Pa at 20°C: 0.0004
Octanol/water partition coefficient as log Pow: 6.2

ENVIRONMENTAL DATA



The substance is very toxic to aquatic organisms. This substance may be hazardous to the environment; special attention should be given to honey bees, birds. In the food chain important to humans, bioaccumulation takes place, specifically in aquatic organisms. It is strongly advised not to let the chemical enter into the environment because it persists in the environment. The substance may cause long-term effects in the aquatic environment. Avoid release to the environment in circumstances different to normal use.

NOTES

Depending on the degree of exposure, periodic medical examination is indicated. If the substance is formulated with solvent(s) also consult the card(s) (ICSC) of the solvent(s). Carrier solvents used in commercial formulations may change physical and toxicological properties. Do NOT take working clothes home. Alvit, Dieldrex, Dieldrite, Illoxol, Octalox, Panoram, and Quintox are trade names. Also consult ICSC #0774, Aldrin.

Transport Emergency Card: TEC (R)-61G41b.
Card has been partially updated in August 2007: see Storage, Occupational Exposure Limits.

ADDITIONAL INFORMATION

International Chemical Safety Cards

CHROMIUM

ICSC: 0029

Chrome
Cr
Atomic mass: 52.0
(powder)

ICSC # 0029
CAS # 7440-47-3
RTECS # GB4200000
October 27, 2004 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible under specific conditions.	No open flames if in powder form.	In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION		Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		PREVENT DISPERSION OF DUST!	
•**INHALATION**	Cough.	Local exhaust or breathing protection.	Fresh air, rest.
•**SKIN**		Protective gloves.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
•**EYES**	Redness.	Safety goggles.	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.	Rinse mouth.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting. Personal protection: P2 filter respirator for harmful particles.		R: S:

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0029

International Chemical Safety Cards

CHROMIUM

ICSC: 0029

I

M

P

PHYSICAL STATE; APPEARANCE:
GREY POWDER

PHYSICAL DANGERS:
Dust explosion possible if in powder or granular form, mixed with air.

ROUTES OF EXPOSURE:

INHALATION RISK:
A harmful concentration of airborne particles can be reached quickly when dispersed.

O R T A N T D A T A	**CHEMICAL DANGERS:** Chromium is a catalytic substance and may cause reaction in contact with many organic and inorganic substances , causing fire and explosion hazard. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: (as Cr metal, Cr(III) compounds) 0.5 mg/m³ as TWA A4 (ACGIH 2004). MAK not established. OSHA PEL*: TWA 1 mg/m^3 See Appendix C *Note: The PEL also applies to insoluble chromium salts. NIOSH REL: TWA 0.5 mg/m^3 See Appendix C NIOSH IDLH: 250 mg/m^3 (as Cr) See: 7440473 **EFFECTS OF SHORT-TERM EXPOSURE:** May cause mechanical irritation tothe eyesandthe respiratory tract. **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:**
PHYSICAL PROPERTIES	Boiling point: 2642°C Melting point: 1900°C Density: 7.15 g/cm³ Solubility in water: none
ENVIRONMENTAL DATA	

N O T E S

The surface of the chromium particles is oxidized to chromium(III)oxide in air. See ICSC 1531 Chromium(III) oxide.

ADDITIONAL INFORMATION

ICSC: 0029 **CHROMIUM**

IMPORTANT LEGAL NOTICE:	Neither NIOSH, the CEC or the IPCS nor any person acting on behalf of NIOSH, 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. The only modifications made to produce the U.S. version is inclusion of the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

COPPER

ICSC: 0240

Cu
(powder)

ICSC # 0240
CAS # 7440-50-8
RTECS # GL5325000
September 24, 1993 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Special powder, dry sand, NO other agents.
EXPLOSION			
EXPOSURE		PREVENT DISPERSION OF DUST!	
•INHALATION	Cough. Headache. Shortness of breath. Sore throat.	Local exhaust or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness. Pain.	Safety goggles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Abdominal pain. Nausea. Vomiting.	Do not eat, drink, or smoke during work.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers. Carefully collect remainder. Then remove to safe place. (Extra personal protection: P2 filter respirator for harmful particles).	Separated from - See Chemical Dangers.	R: S:

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0240

International Chemical Safety Cards

COPPER

ICSC: 0240

I

M

P

PHYSICAL STATE; APPEARANCE:
RED POWDER, TURNS GREEN ON EXPOSURE TO MOIST AIR.

PHYSICAL DANGERS:

CHEMICAL DANGERS:

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation and by ingestion.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.

O **R** **T** **A** **N** **T** **D** **A** **T** **A**	Shock-sensitive compounds are formed with acetylenic compounds, ethylene oxides and azides. Reacts with strong oxidants like chlorates, bromates and iodates, causing explosion hazard. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: 0.2 mg/m³ fume (ACGIH 1992-1993). TLV (as Cu, dusts & mists): 1 mg/m³ (ACGIH 1992-1993). Intended change 0.1 mg/m³ Inhal., A4 (not classifiable as a human carcinogen); MAK: 0.1 mg/m³ (Inhalable fraction) Peak limitation category: II(2) Pregnancy risk group: D (DFG 2005). OSHA PEL*: TWA 1 mg/m^3 *Note: The PEL also applies to other copper compounds (as Cu) except copper fume. NIOSH REL*: TWA 1 mg/m^3 *Note: The REL also applies to other copper compounds (as Cu) except Copper fume. NIOSH IDLH: 100 mg/m^3 (as Cu) See: 7440508	**EFFECTS OF SHORT-TERM EXPOSURE:** Inhalation of fumes may cause metal fume fever. See Notes. **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** Repeated or prolonged contact may cause skin sensitization.

PHYSICAL PROPERTIES	Boiling point: 2595°C Melting point: 1083°C Relative density (water = 1): 8.9	Solubility in water: none
ENVIRONMENTAL DATA		

N O T E S

The symptoms of metal fume fever do not become manifest until several hours.

ADDITIONAL INFORMATION

ICSC: 0240 **COPPER**

IMPORTANT LEGAL NOTICE:	Neither NIOSH, the CEC or the IPCS nor any person acting on behalf of NIOSH, 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. The only modifications made to produce the U.S. version is inclusion of the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

LEAD

ICSC: 0052

Lead metal
Plumbum
Pb
Atomic mass: 207.2
(powder)

ICSC # 0052
CAS # 7439-92-1
RTECS # OF7525000
October 08, 2002 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Not combustible. Gives off irritating or toxic fumes (or gases) in a fire.		In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE	See EFFECTS OF LONG-TERM OR REPEATED EXPOSURE.	PREVENT DISPERSION OF DUST! AVOID EXPOSURE OF (PREGNANT) WOMEN!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Abdominal pain. Nausea. Vomiting.	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Give plenty of water to drink. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment. Personal protection: P3 filter respirator for toxic particles.	Separated from food and feedstuffs incompatible materials See Chemical Dangers.	R: S:

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0052

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

LEAD

ICSC: 0052

I M P O R T A N T D A T A

PHYSICAL STATE; APPEARANCE:
BLUISH-WHITE OR SILVERY-GREY SOLID IN VARIOUS FORMS. TURNS TARNISHED ON EXPOSURE TO AIR.

PHYSICAL DANGERS:
Dust explosion possible if in powder or granular form, mixed with air.

CHEMICAL DANGERS:
On heating, toxic fumes are formed. Reacts with oxidants. Reacts with hot concentrated nitric acid, boiling concentrated hydrochloric acid and sulfuric acid. Attacked by pure water and by weak organic acids in the presence of oxygen.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 0.05 mg/m³ A3 (confirmed animal carcinogen with unknown relevance to humans); BEI issued (ACGIH 2004).
MAK:
Carcinogen category: 3B; Germ cell mutagen group: 3A; (DFG 2004).
EU OEL: as TWA 0.15 mg/m³ (EU 2002).
OSHA PEL*: 1910.1025 TWA 0.050 mg/m^3 See Appendix C *Note: The PEL also applies to other lead compounds (as Pb) -- see Appendix C.
NIOSH REL*: TWA 0.050 mg/m^3 See Appendix C *Note: The REL also applies to other lead compounds (as Pb) -- see Appendix C.
NIOSH IDLH: 100 mg/m^3 (as Pb) See: 7439921

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation and by ingestion.

INHALATION RISK:
A harmful concentration of airborne particles can be reached quickly when dispersed, especially if powdered.

EFFECTS OF SHORT-TERM EXPOSURE:

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
The substance may have effects on the blood bone marrow central nervous system peripheral nervous system kidneys , resulting in anaemia, encephalopathy (e.g., convulsions), peripheral nerve disease, abdominal cramps and kidney impairment. Causes toxicity to human reproduction or development.

PHYSICAL PROPERTIES		
	Boiling point: 1740°C	Density: 11.34 g/cm3
	Melting point: 327.5°C	Solubility in water: none

ENVIRONMENTAL DATA	
	Bioaccumulation of this chemical may occur in plants and in mammals. It is strongly advised that this substance does not enter the environment. 

N O T E S

Depending on the degree of exposure, periodic medical examination is suggested. Do NOT take working clothes home.

Transport Emergency Card: TEC (R)-51S1872

ADDITIONAL INFORMATION

ICSC: 0052 **LEAD**

International Chemical Safety Cards

MERCURY

ICSC: 0056

Quicksilver
Liquid silver
Hg
Atomic mass: 200.6

ICSC # 0056
CAS # 7439-97-6
RTECS # OV4550000
UN # 2809
EC # 080-001-00-0
April 22, 2004 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Not combustible. Gives off irritating or toxic fumes (or gases) in a fire.		In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION	Risk of fire and explosion.		In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		STRICT HYGIENE! AVOID EXPOSURE OF (PREGNANT) WOMEN! AVOID EXPOSURE OF ADOLESCENTS AND CHILDREN!	IN ALL CASES CONSULT A DOCTOR!
•INHALATION	Abdominal pain. Cough. Diarrhoea. Shortness of breath. Vomiting. Fever or elevated body temperature.	Local exhaust or breathing protection.	Fresh air, rest. Artificial respiration if indicated. Refer for medical attention.
•SKIN	MAY BE ABSORBED! Redness.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention.
•EYES		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.	Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Evacuate danger area in case of a large spill! Consult an expert! Ventilation. Collect leaking and spilled liquid in sealable non-metallic containers as far as possible. Do NOT wash away into sewer. Do NOT let this chemical enter the environment. Chemical protection suit including self-contained breathing apparatus.	Provision to contain effluent from fire extinguishing. Separated from food and feedstuffs Well closed.	Special material. Do not transport with food and feedstuffs. T symbol N symbol R: 23-33-50/53 S: 1/2-7-45-60-61 UN Hazard Class: 8 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

MERCURY

ICSC: 0056

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
ODOURLESS, HEAVY AND MOBILE SILVERY LIQUID METAL.

PHYSICAL DANGERS:

CHEMICAL DANGERS:
Upon heating, toxic fumes are formed. Reacts violently with ammonia and halogens causing fire and explosion hazard. Attacks aluminium and many other metals forming amalgams.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 0.025 mg/m³ as TWA (skin) A4 BEI issued (ACGIH 2004).
MAK: 0.1 mg/m³ Sh
Peak limitation category: II(8) Carcinogen category: 3B (DFG 2003).
OSHA PEL†: C 0.1 mg/m^3
NIOSH REL: Hg Vapor: TWA 0.05 mg/m^3 skin
Other: C 0.1 mg/m^3 skin
NIOSH IDLH: 10 mg/m^3 (as Hg) See: 7439976

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation of its vapour and through the skin , also as a vapour!

INHALATION RISK:
A harmful contamination of the air can be reached very quickly on evaporation of this substance at 20°C.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance is irritating to the skin. Inhalation of the vapours may cause pneumonitis. The substance may cause effects on the central nervous systemandkidneys. The effects may be delayed. Medical observation is indicated.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
The substance may have effects on the central nervous system kidneys , resulting in irritability, emotional instability, tremor, mental and memory disturbances, speech disorders. Danger of cumulative effects. Animal tests show that this substance possibly causes toxic effects upon human reproduction.

PHYSICAL PROPERTIES

Boiling point: 357°C
Melting point: -39°C
Relative density (water = 1): 13.5
Solubility in water:
none

Vapour pressure, Pa at 20°C: 0.26
Relative vapour density (air = 1): 6.93
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.009

ENVIRONMENTAL DATA

The substance is very toxic to aquatic organisms. In the food chain important to humans, bioaccumulation takes place, specifically in fish.

N O T E S

Depending on the degree of exposure, periodic medical examination is indicated. No odour warning if toxic concentrations are present. Do NOT take working clothes home.

Transport Emergency Card: TEC (R)-80GC9-II+III

ADDITIONAL INFORMATION

ICSC: 0056 **MERCURY**

International Chemical Safety Cards

NICKEL

ICSC: 0062

Ni
Atomic mass: 58.7
(powder)

ICSC # 0062
CAS # 7440-02-0
RTECS # QR5950000
EC # 028-002-00-7
October 17, 2001 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Flammable as dust. Toxic fumes may be released in a fire.		Dry sand. NO carbon dioxide. NO water.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		PREVENT DISPERSION OF DUST! AVOID ALL CONTACT!	
•INHALATION	Cough. Shortness of breath.	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 spectacles, 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.	Rinse mouth.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Vacuum spilled material. Carefully collect remainder, then remove to safe place. Personal protection: P2 filter respirator for harmful particles.	Separated from strong acids.	Xn symbol R: 40-43 S: 2-22-36

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0062

International Chemical Safety Cards

NICKEL

ICSC: 0062

I

PHYSICAL STATE; APPEARANCE:
SILVERY METALLIC SOLID IN VARIOUS FORMS.

PHYSICAL DANGERS:

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation of the dust.

IMPORTANT DATA	Dust explosion possible if in powder or granular form, mixed with air. **CHEMICAL DANGERS:** Reacts violently, in powder form, with titanium powder and potassium perchlorate, and oxidants such as ammonium nitrate, causing fire and explosion hazard. Reacts slowly with non-oxidizing acids and more rapidly with oxidizing acids. Toxic gases and vapours (such as nickel carbonyl) may be released in a fire involving nickel. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: (Inhalable fraction) 1.5 mg/m³ as TWA A5 (not suspected as a human carcinogen); (ACGIH 2004). MAK: (Inhalable fraction) sensitization of respiratory tract and skin (Sah); Carcinogen category: 1; (DFG 2004). OSHA PEL*†: TWA 1 mg/m^3 *Note: The PEL does not apply to Nickel carbonyl. NIOSH REL*: Ca TWA 0.015 mg/m^3 See Appendix A *Note: The REL does not apply to Nickel carbonyl. NIOSH IDLH: Ca 10 mg/m^3 (as Ni) See: 7440020	**INHALATION RISK:** Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed. **EFFECTS OF SHORT-TERM EXPOSURE:** May cause mechanical irritation. Inhalation of fumes may cause pneumonitis. **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** Repeated or prolonged contact may cause skin sensitization. Repeated or prolonged inhalation exposure may cause asthma. Lungs may be affected by repeated or prolonged exposure. This substance is possibly carcinogenic to humans.
PHYSICAL PROPERTIES	Boiling point: 2730°C Melting point: 1455°C Density: 8.9 g/cm3	Solubility in water: none
ENVIRONMENTAL DATA		

N O T E S

At high temperatures, nickel oxide fumes will be formed. Depending on the degree of exposure, periodic medical examination is suggested. The symptoms of asthma often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential. Anyone who has shown symptoms of asthma due to this substance should avoid all further contact with this substance.

ADDITIONAL INFORMATION

ICSC: 0062 **NICKEL**

International Chemical Safety Cards

ZINC POWDER

ICSC: 1205

Blue powder
Merrillite
Zn
Atomic mass: 65.4
(powder)

ICSC # 1205
CAS # 7440-66-6
RTECS # ZG8600000
UN # 1436 (zinc powder or dust)
EC # 030-001-00-1
October 24, 1994 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Highly flammable. Many reactions may cause fire or explosion. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames, NO sparks, and NO smoking. NO contact with acid(s), base (s) and incompatible substances (see Chemical Dangers).	Special powder, dry sand, NO other agents. NO water.
EXPLOSION	Risk of fire and explosion on contact with acid(s), base(s), water and incompatible substances.	Closed system, ventilation, explosion-proof electrical equipment and lighting. Prevent build-up of electrostatic charges (e.g., by grounding). Prevent deposition of dust.	In case of fire: cool drums, etc., by spraying with water but avoid contact of the substance with water.
EXPOSURE		PREVENT DISPERSION OF DUST! STRICT HYGIENE!	
•**INHALATION**	Metallic taste and metal fume fever. Symptoms may be delayed (see Notes).	Local exhaust.	Fresh air, rest. Refer for medical attention.
•**SKIN**	Dry skin.	Protective gloves.	Rinse and then wash skin with water and soap.
•**EYES**		Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•**INGESTION**	Abdominal pain. Nausea. Vomiting.	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Extinguish or remove all ignition sources. Do NOT wash away into sewer. Sweep spilled substance into containers. then remove to safe place. Personal protection: self-contained breathing apparatus.	Fireproof. Separated from acids, bases oxidants Dry.	Airtight. F symbol N symbol R: 15-17-50/53 S: 2-7/8-43-46-60-61 UN Hazard Class: 4.3 UN Subsidiary Risks: 4.2

SEE IMPORTANT INFORMATION ON BACK

International Chemical Safety Cards

ZINC POWDER

ICSC: 1205

I M P O R T A N T D A T A

PHYSICAL STATE; APPEARANCE:
ODOURLESS GREY TO BLUE POWDER.

PHYSICAL DANGERS:
Dust explosion possible if in powder or granular form, mixed with air. If dry, it can be charged electrostatically by swirling, pneumatic transport, pouring, etc.

CHEMICAL DANGERS:
Upon heating, toxic fumes are formed. The substance is a strong reducing agent and reacts violently with oxidants. Reacts with water and reacts violently with acids and bases forming flammable/explosive gas (hydrogen - see ICSC0001) Reacts violently with sulfur, halogenated hydrocarbons and many other substances causing fire and explosion hazard.

OCCUPATIONAL EXPOSURE LIMITS:
TLV not established.

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation and by ingestion.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.

EFFECTS OF SHORT-TERM EXPOSURE:
Inhalation of fumes may cause metal fume fever. The effects may be delayed.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
Repeated or prolonged contact with skin may cause dermatitis.

PHYSICAL PROPERTIES

Boiling point: 907°C
Melting point: 419°C
Relative density (water = 1): 7.14
Solubility in water: reaction
Vapour pressure, kPa at 487°C: 0.1
Auto-ignition temperature: 460°C

ENVIRONMENTAL DATA

N O T E S

Zinc may contain trace amounts of arsenic, when forming hydrogen, may also form toxic gas arsine (see ICSC 0001 and ICSC 0222). Reacts violently with fire extinguishing agents such as water, halons, foam and carbon dioxide. The symptoms of metal fume fever do not become manifest until several hours later. Rinse contaminated clothes (fire hazard) with plenty of water.

Transport Emergency Card: TEC (R)-43GWS-II+III
NFPA Code: H0; F1; R1;

ADDITIONAL INFORMATION

ICSC: 1205 **ZINC POWDER**

APPENDIX D
HOSPITAL INFORMATION AND MAP
FIELD ACCIDENT REPORT

FIELD ACCIDENT REPORT

This report is to be filled out by the designated Site Safety Officer after EVERY accident.

PROJECT NAME _____ PROJECT. NO._____

Date of Accident _____ Time _____ Report By _____

Type of Accident (Check One):

( ) Vehicular ( ) Personal ( ) Property

Name of Injured _____ DOB or Age _____

How Long Employed _____

Names of Witnesses _____

_____

Description of Accident _____

_____

_____

Action Taken _____

_____

_____

Did the Injured Lose Any Time? _____ How Much (Days/Hrs.)? _____

Was Safety Equipment in Use at the Time of the Accident (Hard Hat, Safety Glasses, Gloves, Safety Shoes, etc.)? _____

_____

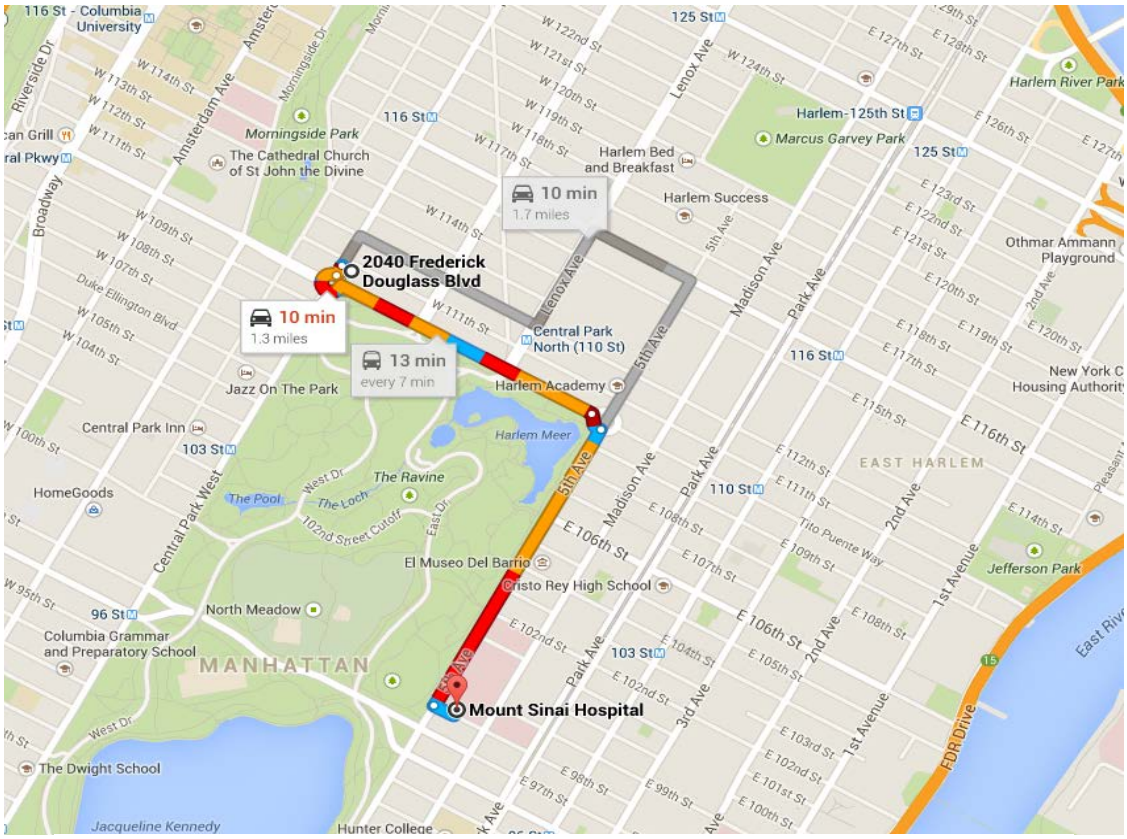
(If not, it is the EMPLOYEE'S sole responsibility to process his/her claim through his/her Health and Welfare Fund.)

INDICATE STREET NAMES, DESCRIPTION OF VEHICLES, AND NORTH ARROW

HOSPITAL INFORMATION AND MAP

The hospital nearest the site is:

MOUNT SINAI HOSPITAL
5 E. 98th Street, New York, New York 10029
212-659-9210
1.3 Miles – About 6 Minutes



2040 Frederick Douglass Blvd
New York, NY 10026

1. Head **southwest** on **Frederick Douglass Blvd** — 108 ft
2. At the traffic circle, take the **3rd** exit onto **W 110th St** — 0.6 mi
3. Turn **right** onto **Duke Ellington Circle** — 190 ft
4. Turn **right** onto **5th Ave** — 0.6 mi
5. Turn **left** onto **E 98th St/Gustave L. Levy Pl**
   Destination will be on the left — 197 ft

Mount Sinai Hospital
5 E 98th St, New York, NY 10029

ATTACHMENT H
Quality Assurance Project Plan

QUALITY ASSURANCE PROJECT PLAN
Former 110th Street Service Station
2040 Frederick Douglas Boulevard, Harlem, NY

Prepared on behalf of:

Crescent 110 Equities LLC
316 West 118th Street
New York, NY 10026

Prepared by:

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961

TABLE OF CONTENTS

QUALITY ASSURANCE PROJECT PLAN

Former 110th Street Service Station
2040 Frederick Douglas Boulevard, Harlem, NY

TABLES

1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) has been prepared in accordance with DER-10 to detail procedures to be followed during the course of the sampling and analytical portion of the project, as required by the approved work plan.

To ensure the successful completion of the project each individual responsible for a given component of the project must be aware of the quality assurance objectives of his / her particular work and of the overall project. The EBC Project Director, Charles Sosik will be directly responsible to the client for the overall project conduct and quality assurance/quality control (QA/QC) for the project. The Project Director will be responsible for overseeing all technical and administrative aspects of the project and for directing QA/QC activities. Mr. Kevin Brussee will serve as the Quality Assurance Officer (QAO) and in this role may conduct:

- conduct periodic field and sampling audits;
- interface with the analytical laboratory to resolve problems; and
- interface with the data validator and/or the preparer of the DUSR to resolve problems.

Robert Bennett will serve as the Project Manager and will be responsible for implementation of the Site Management Plan and coordination with field sampling crews and subcontractors. Reporting directly to the Project Manager will be the Field Operations Officer, Kevin Waters; who will serve as the qualified environmental professional who will schedule and direct field sampling personnel and be responsible for the collection and handling of all samples.

1.1 Organization

Project QA will be maintained under the direction of the Project Manager, in accordance with this QAPP. QC for specific tasks will be the responsibility of the individuals and organizations listed below, under the direction and coordination of the Project Manager

.

GENERAL RESPONSIBILITY	SCOPE OF WORK	RESPONSIBILITY OF QUALITY CONTROL
Field Operations	Supervision of Field Crew, sample collection and handling	K. Waters, EBC
Project Manager	Implementation of the RAWP.	Robert Bennett, EBC
Laboratory Analysis	Analysis of soil samples by NYSDEC ASP methods Laboratory	NYSDOH-Certified Laboratory
Data review	Review for completeness and compliance	3rd party validation

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

2.0 QUALITY ASSURANCE PROJECT PLAN OBJECTIVES

2.1 Overview

Overall project goals are defined through the development of Data Quality Objectives (DQOs), which are qualitative and quantitative Statements that specify the quality of the data required to support decisions; DQOs, as described in this section, are based on the end uses of the data as described in the work plan.

In this plan, Quality Assurance and Quality Control are defined as follows:

- Quality Assurance - The overall integrated program for assuring reliability of monitoring and measurement data.

- Quality Control - The routine application of procedures for obtaining prescribed standards of performance in the monitoring and measurement process.

2.2 QA / QC Requirements for Analytical Laboratory

Samples will be analyzed by a New York State Department of Health (NYSDOH) certified laboratory, certified in the appropriate categories. Data generated from the laboratory will be used to evaluate contaminants such volatile and semi-volatile organic compounds (VOCs / SVOCs) in groundwater. The QA requirements for all subcontracted analytical laboratory work performed on this project are described below. QA elements to be evaluated include accuracy, precision, sensitivity, representativeness, and completeness. The data generated by the analytical laboratory for this project are required to be sensitive enough to achieve detection levels low enough to meet required quantification limits as specified in NYSDEC Analytical Services Protocol (NYSDEC ASP, 07/2005). The analytical results meeting the required quantification limits will provide data sensitive enough to meet the data quality objectives of this remedial program as described in the work plan. Reporting of the data must be clear, concise, and comprehensive. The QC elements that are important to this project are completeness of field data, sample custody, sample holding times, sample preservation, sample storage, instrument calibration and blank contamination.

2.2.1 Instrument Calibration

Calibration curves will be developed for each of the compounds to be analyzed. Standard concentrations and a blank will be used to produce the initial curves. The development of calibration curves and initial calibration response factors must be consistent with method requirements presented in NYSDEC ASP 07/2005.

2.2.2 Continuing Instrument Calibration

The initial calibration curve will be verified every 12 hrs by analyzing one calibration standard. The standard concentration will be the midpoint concentration of the initial calibration curve. The calibration check compound must come within 25% relative percent difference (RPD) of the average response factor obtained during initial calibration. If the RPD is greater than 25%, then corrective action must be taken as provided in the specific methodology.

2.2.3 Method Blanks

Method blank or preparation blank is prepared from an analyte·free matrix which includes the same reagents, internal standards and surrogate standards as me related samples. II is carried through the

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS
1808 MIDDLE COUNTRY ROAD
RIDGE, NY 11961
PHONE 631.504.6000
FAX 631.924.2870

entire sample preparation and analytical procedure. A method blank analysis will be performed once for each 12 hr period during the analysis of samples for volatiles. An acceptable method blank will contain less than two (2) times the CRQL of methylene chloride, acetone and 2-butanone. For all other target compounds, the method blank must contain less than or equal to the CRQL of any single target compound. For non-target peaks in the method blank, the peak area must be less than 10 percent of the nearest internal standard. The method blank will be used to demonstrate the level of laboratory background and reagent contamination that might result from the analytical process itself.

2.2.4 Trip Blanks.

Trip blanks consist of a single set of sample containers filled at the laboratory with deionized. laboratory-grade water. The water used will be from the same source as that used for the laboratory method blank. The containers will be carried into the field and handled and transported in the same way as the samples collected that day. Analysis of the trip blank for VOCs is used to identify contamination from the air, shipping containers, or from other items coming in contact with the sample bottles. (The bottles holding the trip blanks will be not opened during this procedure.) A complete set of trip blanks will be provided with each shipment of samples to the certified laboratory.

2.2.5 Surrogate Spike Analysis

For organic analyses, all samples and blanks will be spiked with surrogate compounds before purging or extraction in order to monitor preparation and analyses of samples. Surrogate spike recoveries shall fall within the advisory limits in accordance with the NYSDEC ASP protocols for samples falling within the quantification limits without dilution.

2.2.6 Matrix Spike / Matrix Spike Duplicate / Matrix Spike Blank (MS/MSDIMSB) Analysis

MS, MSD and MSB analyses will be performed to evaluate the matrix effect of the sample upon the analytical methodology along with the precision of the instrument by measuring recoveries. The MS / MSD / MSB samples will be analyzed for each group of samples of a similar matrix at a rate of one for every 20 field samples. The RPD will be calculated from the difference between the MS and MSD. Matrix spike blank analysis will be performed to indicate the appropriateness of the spiking solution(s) used for the MS/MSD.

2.3 Accuracy

Accuracy is defined as the nearness of a real or the mean (x) of a set of results to the true value. Accuracy is assessed by means of reference samples and percent recoveries. Accuracy includes both precision and recovery and is expressed as percent recovery (% REC). The MS sample is used to determine the percent recovery. The matrix spike percent recovery (% REC) is calculated by the following equation:

$$\%REC = \frac{SSR - SR}{SA} \times 100$$

Where:

SSR = spike sample results
SR = sample results
SA = spike added from spiking mix

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2.4 Precision

Precision is defined as the measurement of agreement of a set of replicate results among themselves without a Precision is defined as the measurement of agreement of a set of replicate results among themselves without assumption of any prior information as to the true result. Precision is assessed by means of duplicate/replicate sample analyses.

Analytical precision is expressed in terms of RPD. The RPD is calculated using the following formula:

$$RPD = \frac{D^1 - D^2}{(D^1 + D^2)/2} \times 100$$

Where:
RPD = relative percent difference
D^1 = first sample value
D^2 = second sample value (duplicate)

2.5 Sensitivity

The sensitivity objectives for this plan require that data generated by the analytical laboratory achieve quantification levels low enough to meet the required detection limits specified by NYSDEC ASP and to meet all site-specific standards, criteria and guidance values (SGCs) established for this project.

2.6 Representativeness

Representativeness is a measure of the relationship of an individual sample taken from a particular site to the remainder of that site and the relationship of a small aliquot of the sample (i.e., the one used in the actual analysis) to the sample remaining on site. The representativeness of samples is assured by adherence to sampling procedures described in the Remedial Investigation Work Plan.

2.7 Completeness

Completeness is a measure of the quantity of data obtained from a measurement system as compared to the amount of data expected from the measurement system. Completeness is defined as the percentage of all results that are not affected by failing QC qualifiers, and should be between 70 and 100% of all analyses performed. The objective of completeness in laboratory reporting is to provide a thorough data support package. The laboratory data package provides documentation of sample analysis and results in the form of summaries, QC data, and raw analytical data. The laboratory will be required to submit data packages that follow NYSDEC ASP reporting format which, at a minimum, will include the following components:

1. All sample chain-of-custody forms.
2. The case narrative(s) presenting a discussion of any problems and/or procedural changes required during analyses. Also presented in the case narrative are sample summary forms.
3. Documentation demonstrating the laboratory's ability to attain the contract specified detection limits for all target analytes in all required matrices.
4. Tabulated target compound results and tentatively identified compounds.
5. Surrogate spike analysis results (organics).
6. Matrix spike/matrix spike duplicate/matrix spike blank results.
7. QC check sample and standard recovery results
8. Blank results (field, trip, and method).

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9. Internal standard area and RT summary.

2.8 Laboratory Custody Procedures

The following elements are important for maintaining the field custody of samples:

- Sample identification
- Sample labels
- Custody records
- Shipping records
- Packaging procedures

Sample labels will be attached to all sampling bottles before field activities begin; each label will contain an identifying number. Each number will have a suffix that identifies the site and where the sample was taken. Approximate sampling locations will be marked on a map with a description of the sample location. The number, type of sample, and sample identification will be entered into the field logbook. A chain-of-custody form, initiated at the analytical laboratory will accompany the sample bottles from the laboratory into the field. Upon receipt of the bottles and cooler, the sampler will sign and date the first received blank space. After each sample is collected and appropriately identified, entries will be made on the chain-of-custody form that will include:

- Site name and address
- Samplers' names and signatures

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3.0 ANALYTICAL PROCEDURES

3.1 Laboratory Analysis

Samples will be analyzed by the NYSDEC ASP laboratory for VOCs and SVOCs in groundwater by USEPA Method 8260C and EPA Method 8270D. If any modifications or additions to the standard procedures are anticipated. and if any nonstandard sample preparation or analytical protocol is to be used, the modifications and the nonstandard protocol will be explicitly defined and documented. Prior approval by EBC's PM will be necessary for any nonstandard analytical or sample preparation protocol used by the laboratory, i.e., dilution of samples or extracts by greater than a factor of five (5).

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4.0 DATA REDUCTION, REVIEW, AND REPORTING

4.1 Overview

The process of data reduction, review, and reporting ensures the assessments or a conclusion based on the final data accurately reflects actual site conditions. This plan presents the specific procedures, methods, and format that will be employed for data reduction, review and reporting of each measurement parameter determined in the laboratory and field. Also described in this section is the process by which all data, reports, and work plans are proofed and checked for technical and numerical errors prior to final submission.

4.2 Data Reduction

Standard methods and references will be used as guidelines for data handling, reduction, validation, and reporting. All data for the project will be compiled and summarized with an independent verification at each step in the process to prevent transcription/typographical errors. Any computerized entry of data will also undergo verification review.

Sample analysis will be provided by a New York State certified environmental laboratory. Laboratory reports will include ASP category B deliverables for use in the preparation of a data usability summary report (DUSR). All results will be provided in accordance with the NYSDEC Environmental Information Management System (EIMS) electronic data deliverable (EDD) format. Analytical results shall be presented on standard NYSDEC ASP-B forms or equivalents, and include the dates the samples were received and analyzed, and the actual methodology used. Note that field field parameters including pH by hand held meter and persufate by field titration (if collected) will be in results only format and will not be evaluated in the DUSR.

Laboratory QA/QC information required by the method protocols will be compiled, including the application of data QA/QC qualifiers as appropriate. In addition, laboratory worksheets, laboratory notebooks, chains-of-custody, instrument logs, standards records, calibration records, and maintenance records, as applicable, will be provided in the laboratory data packages to determine the validity of data. Specifics on internal laboratory data reduction protocols are identified in the laboratory's SOPs.

Following receipt of the laboratory analytical results by EBC, the data results will be compiled and presented in an appropriate tabular form. Where appropriate, the impacts of QA/QC qualifiers resulting from laboratory or external validation reviews will be assessed in terms of data usability.

4.3 Laboratory Data Reporting

All sample data packages submitted by the analytical laboratory will be required to be reported in conformance to the NYSDEC ASP (7/2005), Category B data deliverable requirements as applicable to the method utilized. All results will be provided in accordance with the NYSDEC Environmental Information Management System (EIMS) electronic data deliverable (EDD) format.

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5.0 CORRECTIVE ACTION

Review and implementation of systems and procedures may result in recommendations for corrective action. Any deviations from the specified procedures within approved project plans due to unexpected site-specific conditions shall warrant corrective action. All errors, deficiencies, or other problems shall be brought to the immediate attention of the EBC PM, who in turn shall contact the Quality Assurance/Data Quality Manager or his designee (if applicable).

Procedures have been established to ensure that conditions adverse to data quality are promptly investigated, evaluated and corrected. These procedures for review and implementation of a change are as follows:

- Define the problem.
- Investigate the cause of the problem.
- Develop a corrective action to eliminate the problem, in consultation with the personnel who defined the problem and who will implement the change.
- Complete the required form describing the change and its rationale (see below for form requirements).
- Obtain all required written approvals.
- Implement the corrective action.
- Verify that the change has eliminated the problem.

During the field investigation, all changes to the sampling program will be documented in field logs/sheets and the EBC PM advised.

If any problems occur with the laboratory or analyses, the laboratory must immediately notify the PM, who will consult with other project staff. All approved corrective actions shall be controlled and documented.

All corrective action documentation shall include an explanation of the problem and a proposed solution which will be maintained in the project file or associated logs. Each report must be approved by the necessary personnel (e.g., the PM) before implementation of the change occurs. The PM shall be responsible for controlling, tracking, implementing and distributing identified changes.

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TABLE 1
SUMMARY OF
SAMPLING PROGRAM RATIONALE AND ANALYSIS

Matrix	Location	Approximate Number of Samples	Rationale for Sampling	Laboratory Analysis
Groundwater (water table)	From four on-site and three off-site monitoring wells	7	Monitor groundwater quality over time	VOCs EPA Method 8260C, SVOCs by EPA Method 8270D
Groundwater (water table)	From four on-site and three off-site monitoring wells	7	Evaluate oxidant distribution and concentration	pH by field meter, persulfate by titration.
Total (Groundwater)		14		
MS/MSD	Matrix spike and Matrix spike duplicates at the rate 5%	1	To meet requirements of QA / QC program	1 MS/MSD for VOCs
Trip Blanks	One laboratory prepared trip blank to accompany samples each time they are delivered to the laboratory.	1	To meet requirements of QA / QC program	VOCs EPA Method 8260B
Total (QA / QC Samples)				

TABLE 2
SAMPLE COLLECTION AND ANALYSIS PROTOCOLS

Sample Type	Matrix	Sampling Device	Parameter	Sample Container	Sample Preservation	Analytical Method#	CRQL / MDLH	Holding Time
Groundwater	Water	Pump tubing	VOCs	(3) 40 ml vials	Cool to 4^{o} C 1:1 HCL	EPA Method 8260C	Compound specific (1-5 ug/L)	14 days

Notes:
All holding times listed are from Verified Time of Sample Receipt (VTSR) unless noted otherwise. * Holding time listed is from time of sample collection.
The number in parentheses in the "Sample Container" column denotes the number of containers needed.
Triple volume required when collected MS/MSD samples
The number of trip blanks are estimated.
CRQL / MDL = Contract Required Quantitation Limit / Method Detection Limit
NA = Not available or not applicable.

ATTACHMENT I
Site Inspection Checklist and Inspection Forms

SITE INSPECTION CHECKLIST

Site Inspection Checklist - Cover System
2040 Frederick Douglass Boulevard
Harlem, NY

Date: _____ Time: _____

Inspector Name/Organization: _____

Confirm Site Use: _____

VISUAL INSPECTION OF SUB-CELLAR CONCRETE SLAB

Building Interior Inspect basement concrete slab for cracks, perforations and patching

Describe General Condition of Slab _____

_____

Describe any Cracks or New Penetrations _____

_____

Describe any Patching _____

_____

VISUAL INSPECTION OF FIRST FLOOR CONCRETE SLAB

Building Exterior Inspect concrete slab for cracks, perforations and patching

Describe General Condition of Slab _____

_____

Describe any Cracks or New Penetrations _____

_____

Describe any Patching _____

_____

Repairs Needed and / or Maintenance at this time?

_____

_____

_____

_____

Any Intrusive Work Into Soil Performed?

_____

_____

SMP and EWP Followed?

_____

_____

Signature: _____ Date: _____

ATTACHMENT J
Field Sampling Plan

FORMER
110th STREET SERVICE STATION

2040 FREDERICK DOUGLAS BOULEVARD
HARLEM NEW YORK
Block 1826 Lot 1

FIELD SAMPLING PLAN

Prepared For:
Crescent 110 Equities LLC
316 West 118th Street
New York, NY 10026

Prepared by:

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS
1808 Middle Country Road
Ridge, NY 11961

NOVEMBER 2015

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FIELD SAMPLING PLAN

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1.0 INTRODUCTION

The Site is currently in the New York State (NYS) Brownfield Cleanup Program (BCP), Site No. C2231087 which is administered by New York State Department of Environmental Conservation (NYSDEC).The Site is located in Manhattan, New York County, New York and is identified as Block 1826, Lot 1 on the New York City Tax Map. The Site is an approximately 0.31-acre area and is bounded by a mixed-use building to the east, W. 11th Street to the north, Frederick Douglas Boulevard to the west and W. 110th Street to the south.

A Site Management Plan (SMP) has been prepared for the Site. This SMP was prepared to manage the remaining VOC contamination detected in on-site groundwater until the Environmental Easement is extinguished in accordance with ECL Article 71, Title 36. The SMP has been approved by the NYSDEC, and compliance with the SMP is required by the grantor of the Environmental Easement and the grantor's successors and assigns. The SMP may only be revised with the approval of the NYSDEC.

1.1 Background

A Remedial Investigation consisting of soil, groundwater and soil vapor sampling was performed at the Site in 2013.

The results of the RI identified free phase gasoline present at the water table, evident that contamination at the Site is related to an on-site release and historic use, which was not entirely remediated during excavation activities completed by the previous owner. The source areas onsite include the current and former UST areas. Although some impacted soil was removed from these areas historically when the tanks were removed/replaced, contaminated soil remained in this area.

Free phase gasoline is present primarily within the tank area but has also been observed to some degree in several other wells downgradient. Based on an 8 to 10 ft elevation difference for groundwater within the tank area and the greatest accumulation of free phase product, a perched groundwater zone is present in the UST area. During the tank replacement in 1995, it is likely that the excavation of impacted soil continued into the silty clay zone in an attempt to "dig out of" the contamination. This area would then be backfilled with sand and fill of significantly higher permeability allowing water to collect and product to accumulate within the area and resulting in a perched water condition.

Impacted groundwater was isolated to the perched water zone though impacted water (above standards) was also found to be migrating south at relatively low concentrations. Groundwater impacts were generally low outside of the tank area suggesting that groundwater outside of the localized perched zone is not in contact with contaminated soil. It also appears that minimal migration of impacted groundwater is occurring as contaminated water within the tank area perched zone is isolated from the general water table.

Remedial efforts included excavation and removal of source area soils with the exception of a small isolated area in the southeast corner of the Site. Impacted soil in this area is in a clay zone above the water table which was further stabilized with a grout injection. The remaining low level impacts to groundwater were treated with the injection of a chemical oxidant.

2.0 FIELD SAMPLING PLAN

Four on-site monitoring wells (MW1501-MW1503, MW1505) and three off-site monitoring wells (MW1504, MW1506, MW6) are located at the Site. The monitoring wells were installed to evaluate the performance of the remedial effort and monitor improvements to groundwater quality.

Each of the monitoring wells are constructed of 1-inch diameter pvc casing and 0.010 inch slotted pvc well screen. The wells have 10 feet of screen from approximately 10-20 feet below the bottom of the basement slab. A No. 00 Morie or equivalent filer sand is installed in the borehole to within 2 feet above the top of the screen. A 1-foot hydrated bentonite seal was placed on top of the filter sand and the remainder of the borehole was backfilled to grade.

2.1 Groundwater Sampling

Groundwater samples will be collected from all seven monitoring wells. Sample procurement will be achieved through the use of dedicated polyethylene tubing, and a peristaltic pump. The location of the monitoring wells is shown on **Figure 1**.

All groundwater sampling activities will be recorded in the project dedicated field book. This will include a description of:

- Date and time of sample collection
- Sample location
- Purging time, duration and volume;
- Sample appearance
- Analytical methodology:

Groundwater samples will be collected using dedicated polyethylene tubing, a persistaltic pump and check valve in accordance with standard low-flow sampling procedures as follows:

- Record pump make & model on sampling form.
- Wear appropriate health and safety equipment as outlined in the Health and Safety Plan
- Inspect each well for any damage or evidence of tampering and note condition in field logbook.
- Remove the well cap
- Lay out plastic sheeting and place the monitoring, purging and sampling equipment on the sheeting.
- To avoid cross-contamination, do not let any downhole equipment touch the ground.
- A synoptic water level measurement round should be performed (in the shortest possible time) before any purging and sampling activities begin. Measure and record the depth to water using a water level meter or interface probe to the nearest 0.01 ft. Record the measurement in the field logbook. Do not measure the depth to the bottom of the well at this time (to avoid disturbing any sediment that may have accumulated). Obtain depth to bottom information from installation information in the field logbook or soil boring logs.
- Collect samples in order from wells with lowest contaminant concentration to highest concentration based on previous results.

- Connect the polyethylene tubing to the peristaltic pump and lower the tubing into the well to approximately the middle of the screen. The tubing should be a minimum of 2 feet above the bottom of the well as this may cause mobilization of any sediment present in the bottom of the well.
- Start the pump at its lowest speed setting and slowly increase the speed until discharge occurs. Check water level. Adjust pump speed until there is little or no water level drawdown (less than 0.3 feet). If the minimal drawdown that can be achieved exceeds 0.3 feet but remains stable, continue purging until indicator field parameters stabilize.
- There should be at least 1 foot of water over the top of the pump so there is no risk of entrapment of air in the sample. Pumping rates should be reduced to the minimum capabilities of the pump, if needed, to avoid purging the well dry. However, if the recharge rate of the well is very low and the well is purged dry, then wait until the well has recharged to a sufficient level and collect the appropriate volume of sample.
- During well purging, monitor indicator field parameters (temperature, specific conductance, pH and turbidity) every three to five minutes (or less frequently, if appropriate) and record on a groundwater sampling log (Appendix A). Note: during the early phase of purging emphasis should be put on minimizing and stabilizing pumping stress, and recording those adjustments. Purging is considered complete and sampling may begin when all the above indicator field parameters have stabilized. Stabilization is considered to be achieved when three consecutive readings, taken at three (3) to five (5) minute intervals, are within the following limits:
  - specific conductance (3%),
  - temperature (3%),
  - pH (± 0.1 unit)
  - turbidity (≤50 ntu)
  - If stability is not reached within a reasonable time period purging may be stopped and the sample collected. This should be noted on the sampling log.
- VOC samples should be collected directly into pre-preserved sample containers. Fill all sample containers by allowing the pump discharge to flow gently down the inside of the container with minimal turbulence. Fill each container with sample to just overflowing so that no air bubbles are entrapped inside. Cap each bottle as it is filled.
- Label the samples, and record them on the chain of custody form (template COC provided in **Appendix B**). Place immediately into a cooler for shipment and maintain at 4^{o}C.
- Remove the tubing from the well. The polyethylene tubing must either be dedicated to each well or discarded. If dedicated the tubing should be placed in a large plastic garbage bag, sealed, and labeled with the appropriate well identification number.
- Close and lock the well.
- Decontaminate pump either by changing the surgical pump tubing between wells or as follows:
  1. Flush the equipment/pump with potable water.
  2. Flush with non-phosphate detergent solution. If the solution is recycled, the solution must be changed periodically.
  3. Flush with potable or distilled/deionized water to remove all of the detergent solution. If the water is recycled, the water must be changed periodically.
  4. Flush with isopropyl alcohol (pesticide grade). If equipment blank data from the previous sampling event show that the level of contaminants is insignificant, then this step may be skipped.
  5. Flush with distilled/deionized water. The final water rinse must not be recycled.

Samples will be collected in pre-cleaned laboratory supplied glassware, stored in a cooler with ice and submitted to a New York State ELAP certified environmental laboratory. Groundwater samples from each monitoring well will be submitted for laboratory analysis of VOCs and SVOCs.

2.2 Groundwater Sample QA/QC

Collected samples will be appropriately packaged, placed in coolers and shipped via overnight courier or delivered directly to the analytical laboratory by field personnel. Samples will be containerized in appropriate laboratory provided glassware and shipped in plastic coolers. Samples will be preserved through the use of ice or cold-pak(s) to maintain a temperature of 4oC.

Dedicated disposable sampling materials will be used for groundwater samples, eliminating the need to prepare field equipment (rinsate) blanks. However, if non-disposable equipment is used, field rinsate blanks will be prepared at the rate of 1 for every eight samples collected.

Each groundwater sample will be properly labeled and documented on the Chain of Custody and within the bound log book, placed in a zip-lock plastic bag and placed in a cooler with ice to maintain a temperature of 4^{o}C, until pickup by the sample courier. Courier service is provided by Phoenix Environmental Laboratories, Inc. Sample receipt by the laboratory (Phoenix Environmental Laboratories, Inc.) shall be considered as signed receipt by Phoenix Environmental Laboratories, Inc. courier.

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

2.3 Sampling Documentation Requirements

All sample jars will be marked and identified with a legible sample label which shall indicate (1) project address (2040 Frederick Douglas Boulevard), (2) sample location (MW1501, MW1502, etc.), (3) the date and time the sample was collected, (4) and any preservative(s) utilized (HCL/ice). Additional sample information may be marked on the sample label and/or Chain of Custody if needed. Chain of Custody shall be tracked from laboratory issuance of sample containers through laboratory receipt of the samples.

A bound sample logbook will be maintained by EBC during sampling collection activities. The following information will be recorded (at a minimum) within the log book:

a) Sample Identification Number
b) Sample Location
c) Field Observations
d) Sample type
e) Analyses
f) Date and time of collection
g) Collector's name
h) Sample procedures and equipment utilized
i) Date sent to laboratory and name of laboratory

2.4 Analytical Methodology

Sample analysis will be provided by a New York State certified environmental laboratory; Phoenix Environmental Laboratories, Inc. of Manchester, Connecticut (NYSDOH Lab I.D. No. 11301). Groundwater samples will be analyzed for the following parameters.

- Volatile organic Compounds (VOCs) by EPA Method 8260C
- Semi-Volatile organic Compounds (VOCs) by EPA Method 8270D

2.5 Investigation-Derived Waste Handling Procedure

Investigation derived wastes that will be generated during groundwater sampling at the Site will consist of the following: groundwater, decontamination fluids, PPE and other miscellaneous disposables. Groundwater purged from the monitoring wells and all decontamination fluids are to be containerized in USDOT-approved 55-gallon drums. Each drum is to be labeled with a "Non-Hazardous Waste" label **(Appendix C)** which is to be affixed to the side of the drum. The following information must be written on each label.

Shipper: Crescent 110 Equities LLC
Address: 2040 Frederick Douglas Boulevard
City, State, Zip: Brooklyn, NY 11205
Contents: Non-Hazardous, Non-RCRA Regulated Liquid
Emergency Contact: Kevin Brussee – Environmental Business Consultants – 631.504.6000

After each drum is filled or at completion of work, each drum must be securely closed and stored within the new building until waste characterization sampling has been performed. Final classification and disposal of purge water will be based on the results of this analysis and upon approval of the NYSDEC Project Manager.

All PPE and other miscellaneous sampling disposables (polyethylene tubing, plastic sheeting) shall be placed in a plastic garbage bag and disposed in the on-site dumpster.

FIGURES

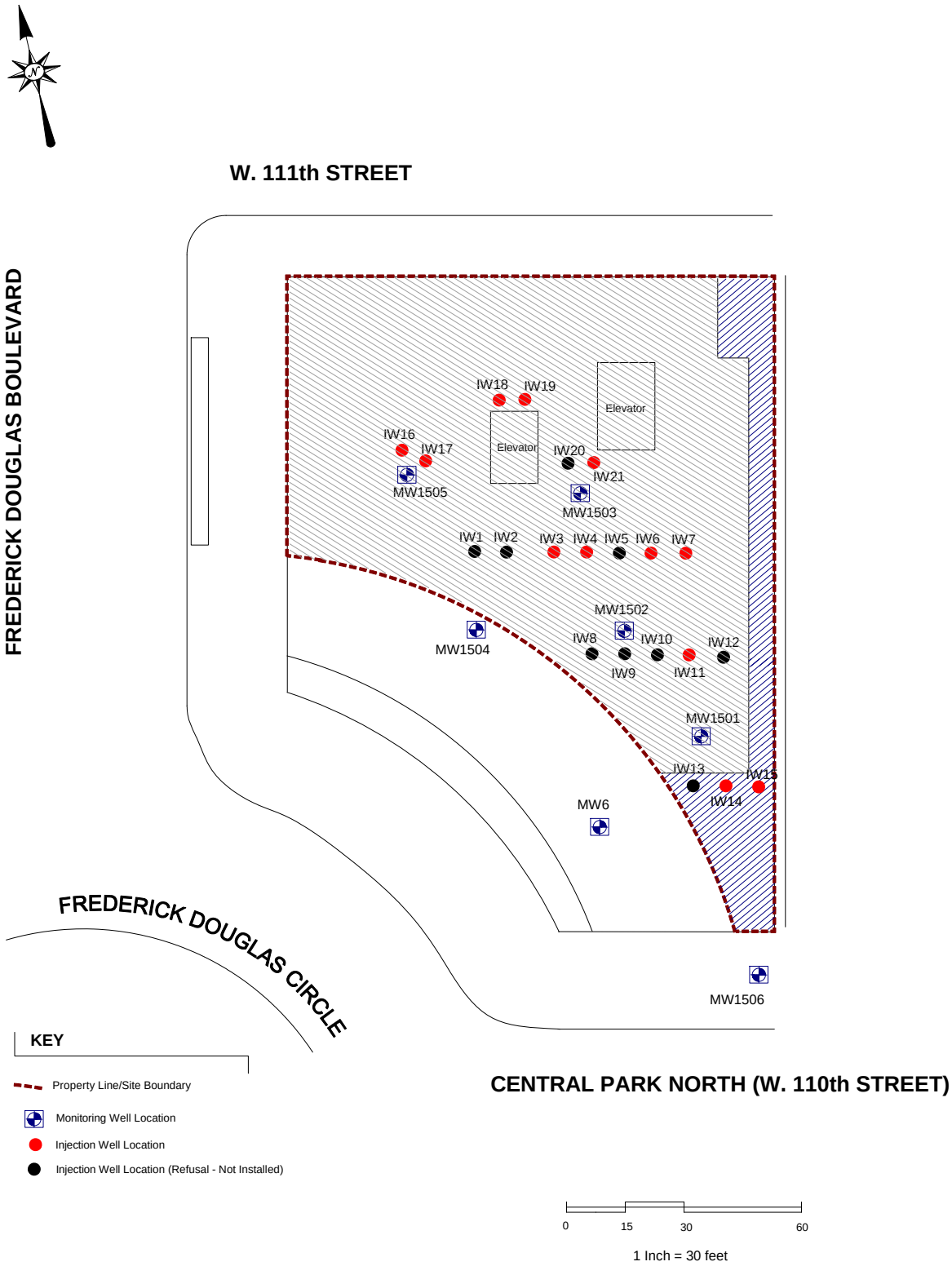

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FIGURE 1

SITE ADDRESS: FORMER 110TH STREET SERVICE STATION
2040 FREDERICK DOUGLAS BOULEVARD, HARLEM, NY

DRAWING TITLE: INJECTION WELL & MONITORING WELL LOCATIONS

APPENDIX A
SAMPLE GW SAMPLING LOG

GROUNDWATER PURGE / SAMPLE LOGS

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS

Well I.D.: _____ Date: _____

Well Depth (from TOC): _____ ft Equipment: _____

Static Water Level (from TOC): _____ ft Field Personnel: _____

Height of Water in Well: _____ ft Well Condition: _____

Gallons of Water per Well Volume: _____

Flow Rate: 200ml/min.

Time	Elapsed Time	Pump Rate	Gal. Removed	pH	Cond. (µS/cm)	Temp. (ºF)	Turbidity	Comments

Note 200 ml = 0.065 gallons

APPENDIX B
SAMPLE CHAIN OF CUSTODY

Cooler: Yes ☐ No ☐
Coolant: IPK ☐ ICE ☐ No ☐

NY/NJ CHAIN OF CUSTODY RECORD

Temp ° C Pg of

PHOENIX Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: info@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Contact Options:
☐ Fax: _____
☐ Phone: _____
☐ Email: _____

Customer: _____ Project: _____ Project P.O: _____
Address: _____ Report to: _____
_____ Invoice to: _____

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature _____ Date: _____

Matrix Code:
DW=Drinking Water **GW**=Ground Water **SW**=Surface Water **WW**=Waste Water
RW=Raw Water **SE=**Sediment **SL**=Sludge **S**=Soil **SD**=Solid **W**=Wipe
OIL=Oil **B**=Bulk **L**=Liquid

Analysis Request

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Soil VOA Vials [ ] methanol [ ] H2O	GL Soil container ( ) oz	GL Soil container ( ) oz	40 ml VOA Vial [ ] As is [ ] HCl	GL Amber 1000ml [ ] As is [ ] H2SO4	PL As is [ ] 250ml [ ] 500ml [ ] 1000ml	PL H2SO4 [ ] 250ml [ ] 500ml	PL HNO3 250ml	PL NaOH 250ml	Bacteria Bottle

Relinquished by:	Accepted by:	Date:	Time:

Comments, Special Requirements or Regulations:

Turnaround:
☐ 1 Day*
☐ 2 Days*
☐ 3 Days*
☐ 5 Days
☐ 10 Days
Other

*** SURCHARGE APPLIES**

NJ
☐ Res. Criteria
☐ Non-Res. Criteria
☐ Impact to GW Soil Cleanup Criteria
☐ GW Criteria

NY
☐ TOGS GW
☐ CP-51 SOIL
☐ 375SCO Unrestricted Soil
☐ 375SCO Residential Soil
☐ 375SCO Residential Restricted Soil
☐ 375SCO Commercial Soil
☐ 375SCO Industrial Soil

Data Format
☐ Phoenix Std Report
☐ Excel
☐ PDF
☐ GIS/Key
☐ EQuIS
☐ NJ Hazsite EDD
☐ NY EZ EDD (ASP)
☐ Other

State where samples were collected: _____

Data Package
☐ NJ Reduced Deliv. *
☐ NY Enhanced (ASP B) *
☐ Other

APPENDIX C
SAMPLE DRUM LABEL


NON-
HAZARDOUS
WASTE
GENERATOR INFORMATION (Optional)
SHIPPER
ADDRESS
CITY, STATE, ZIP
CONTENTS
NON-HAZARDOUS WASTE