FORMER MOTOR FREIGHT GARAGE SITE

832-836 LEXINGTON AVENUE
BROOKLYN, NEW YORK
Block 1628 Lot 30

SITE MANAGEMENT PLAN

NYSDEC Site Number: C224202

Prepared for:
Lexington Flats LLC
183 Wilson Street, Suite 133
Brooklyn, NY 11211

AMC Engineering PLLC
18-36 42nd Street
Astoria, NY 11105

Revisions to Final Approved Site Management Plan:

Revision #	Submitted Date	Summary of Revision	DEC Approval Date
			-

JULY 2017

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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

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	7/29/2017	
NYS Professional Engineer #	Date	Signature

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: Site No: C224202

Former Motor Freight Garage Site

832-836 Lexington Avenue, Brooklyn NY

Institutional Controls:	1. The property may be used for restricted residential use;
	2. Compliance with the Environmental Easement by the Grantee and the Grantee's successors and adherence of all elements of the SMP is required;
	3. All Engineering Controls must be operated and maintained as specified in this SMP;
	4. All Engineering Controls on the Controlled Property must be inspected and certified at a frequency and in a manner defined in the SMP;
	5. Groundwater, soil vapor, and other environmental or public health monitoring must be performed as defined in the SMP;
	6. Data and information pertinent to Site Management for the Controlled Property must be reported at the frequency and in a manner defined in the SMP;
	7. On-Site environmental monitoring devices, including but not limited to, groundwater monitor wells and soil vapor probes, must be protected and replaced as necessary to ensure proper functioning in the manner specified in the SMP;
	8. Engineering Controls may not be discontinued without an amendment or extinguishment of the Environmental Easement;
	9. Use of groundwater underlying the Controlled Property is prohibited without treatment rendering it safe for intended purpose;

Site Identification: Site No: C224202

Former Motor Freight Garage Site

832-836 Lexington Avenue, Brooklyn NY

	10. Grantor agrees to submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow. This annual statement must be certified by an expert that the NYSDEC finds acceptable.
	11. All ECs must be inspected at a frequency and in a manner defined in the SMP. This statement is to be included here if there are ECs per the site's remedial program.
Engineering Controls:	1. Soil Vapor Extraction System
	2. In-Situ Chemical Oxidation Treatment

Inspections:	Frequency
1. Soil Vapor Extraction System	Quarterly
2. Cover System	Annually
Monitoring:	
Soil Vapor Extraction System 1. PID measurements at system influent between GAC units and after GAC units 2. Air samples at system effluent	Monthly for the first 6 months, then quarterly thereafter (for both items 1 & 2)
In-Situ Chemical Oxidation Treatment 3. Monitoring Well Sampling	1 month after injection events, and quarterly thereafter

Maintenance:	
Soil Vapor Extraction System: 1. Blower Maintenance 2. Replacement of GAC units	 As needed As needed
In-Situ Chemical Oxidation Treatment: 3. Injection well and Monitoring Well Maintenance	 As needed
Reporting:	
1. Groundwater Data	Quarterly
2. SVE Discharge Monitoring and Inspection Reports	Annually
3. 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 Motor Freight Garage Site located in Brooklyn, New York (hereinafter referred to as the "Site"). The site location map can be found in **Figure 1**. The Site is currently in the New York State (NYS) Brownfield Cleanup Program (BCP) Site No. C224202, which is administered by New York State Department of Environmental Conservation (NYSDEC).

Lexington Flats LLC entered into a Brownfield Cleanup Agreement (BCA) on February 13, 2015 with the NYSDEC to remediate the site. A figure showing the site location and 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 to be provided in **Attachment C**.

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/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 was submitted to the NYSDEC, and was recorded with the Kings County Clerk (under recording number 2016000365209), which requires compliance with this SMP and all ECs and ICs placed on the site. All references to the Environmental Easement herein, refer to document recording number 2016000365209.

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 No. C224202) 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 A** of this SMP.

This SMP was prepared by AMC Engineering, PLLC (AMC), on behalf of Lexington Flats 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.

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, 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 A**.

Table 1. Notifications*

Name	**Contact Information**
NYSDEC Project Manager: Kyle Forster	(518) 402-8644;
NYSDEC Bureau Chief: Janet Brown	(518) 402-9768;

* 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 in at 832-836 Lexington Avenue, in the Bedford Stuyvesant section of Brooklyn, Kings County, New York and is identified as Block 1628 and Lot 30 on the Brooklyn Tax Map (**Figure 1**). The site is an approximately 0.229-acre area (10,000 square feet), and is bounded by Lexington Avenue to the north, Quincy Street to the south, Ralph Avenue to the east, and Patchen Avenue to the west (see **Figure 2** – Site Layout Map). Figure is to include site boundary including tax parcels. The boundaries of the site are more fully described in **Attachment C** –Environmental Easement. The owner(s) of the site parcel(s) at the time of issuance of this SMP is/are:

Lexington Flats LLC
183 Wilson Street, Suite 133
Brooklyn, NY 11211

2.2 Physical Setting

2.2.1 LAND USE

The Site consists of a one-story commercial building which occupies the entire lot. The Site is zoned R6A (residential) with a C4-4L commercial overlay. R6A districts have mandatory Quality Housing bulk regulations which limit apartment building height to 6 or 7 stories. C4-4L districts are located in regional commercial centers outside of the central business districts in more densely build areas. The proposed development is a new 6-story multi-residence building with cellar. A 40 ft x 100 ft open air parking area will be created at the rear of the property.

The properties adjoining the Site and in the neighborhood surrounding the Site primarily include commercial and residential properties. The properties immediately north of the Site, across Lexington Avenue, include mixed-use properties; the properties immediately east of the Site

include commercial properties; and the properties to the west of the Site include residential properties; the properties to the south of the Site include residential properties. There is a vacant property immediately west of the Site.

2.2.2 GEOLOGY

According to USGS geologic maps of the area, bedrock resides at a depth greater than 100 feet below ground surface (bgs). Above bedrock, unconsolidated sediments, sand, gravel, and silty clays reside which were deposited by glacial-fluvial activity. Non-native historic fill layers exist in the upper layers which were historically deposited to extend shoreline areas and improve drainage of low lying areas. During remedial investigation activities, subsurface obstructions, likely boulders and/or glacial till, were encountered at several locations at depths ranging from 3 to 15 feet bgs. Subsurface soils at the Site include historic fill materials to a depth of approximately 5 feet below grade, underlain by native brown coarse to fine sand and gravel.

Site specific boring logs are provided in **Attachment D**.

2.2.3 HYDROGEOLOGY

The property has an elevation of approximately 56 feet above the National Geodetic Vertical Datum (NGVD). The depth to groundwater beneath the Site, as determined from field measurements during the Remedial Investigation (RI), is approximately 42 feet below grade. Based on regional groundwater contour maps, groundwater flow is to the northwest. A groundwater contour map is shown in **Figure 3**. A total of six (6) monitoring wells were used as part of the chemical oxidant injection program, and their locations can be found in **Figure 6**. Groundwater monitoring well construction logs can be found 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.

2.3.1 PHASE I REPORTS

November 2014 – Phase I Environmental Site Assessment Report by EBC

A Phase I Environmental Site Assessment (ESA) report was prepared by Environmental Business Consultants (EBC) in November of 2014. EBC was able to establish a history for the property dating back to 1887. According to a review of NYC records and historic Sanborn maps the Site was occupied by single family residential homes till 1908. By 1932 the property was combined with adjacent lot 34 to the east at 844 Lexington Avenue, and used as a garage with 1 underground gasoline storage tank shown on each Lot. It remained in this configuration and use on the 1951 map. By 1965 the subject property is shown as a motor freight station and continued to be identified as such through 1987. From 1988 through 2007 the property is identified as a garage. According to the New York City Register, the property was owned by Ciliano Garage, Inc. from 1986 through 2014.

At the time of the Phase I inspection, the one-story brick building was being used for storage. A suspect gasoline tank vent line was noted along the inside north wall of the building in the area in which the UST is shown on the sanborn maps. A drainage structure full of sediment was noted beneath a steel plate in the northeast area of the building. Three hydraulic lifts were noted in the southeast corner of the building.

Based upon reconnaissance of the Site and surrounding properties, interviews and review of historical records and regulatory agency databases, EBC noted the following recognized environmental conditions for the Site.

- The use of the Site as a garage from sometime between 1908 and 1932 to sometime between 1951 and 1965 and again from 1988 to sometime between 2007 and 2014.
- Use of the property as a motor freight garage from sometime between 1951 and 1965 to 1987.
- The historic presence of underground storage tanks for gasoline as shown in Sanborn maps from 1932 and 1951.

2.3.2 REMEDIAL INVESTIGATION REPORTS

November 2014 – Remedial Investigation Report by EBC

The field work portion of the Phase II was performed on November 13, 2014 and included the installation of 5 soil borings (B1-B5) and 2 groundwater wells (MW1, MW2). Most of the borings were hitting a shallow obstruction at 5 feet and due to the minimal accessibility with in the building, could not be effectively relocated. None of the borings could be located in the vicinity of the suspect underground gasoline tank. A sediment sample was retained from a catch basin located in the floor which contained approximately three feet of sediment. A boring (B1) was also located in the general vicinity of this structure with a sample retained at 10 feet below grade. The sediment sample and the soil sample from B1 were analyzed for VOCs by USEPA 8260 and SVOCs by USEPA 8270 (CP51 list only). In addition samples of the fill materials were retained from three borings (B1, B4, B5) and analyzed for SVOCs and TAL metals.

Two 1-inch diameter PVC monitoring wells were installed to a depth of 50 feet below surface, approximately 5 feet below the water table at 42 feet below grade. Samples from the monitoring wells were submitted for analysis of VOCs by USEPA 8260.

Soil at the site is described as historic fill materials to a depth ranging from 2 to 6 feet below the surface followed by native brown coarse to fine sand and gravel.

Results indicated petroleum VOCs in sediment and soil to concentrations as high as 73,350 ug/kg in soil and 115,879 ug/kg in the sediment sample. SVOCs were reported above unrestricted SCOs in some of the fill samples and in the boring and sediment samples. Total SVOCs were highest in the sediment sample with a concentration of 87,000 ug/kg. Lead and mercury were reported in some of the fill material samples above unrestricted SCOs. VOCs were reported in groundwater at both sampling locations above standards and ranged from 3,329 ug/L to 23,717 ug/L.

2.3.3 REMEDIAL ACTION

June 2015 – Remedial Action Work Plan by AMC

In response to the findings during the RI, a Remedial Action Work Plan (RAWP) was prepared by AMC in June 2015. The proposed remedy called for the excavation of soil/fill exceeding the Track 4 alternative: removal of all materials above restricted-residential SCOs beneath the tank area to a depth of 15 feet bgs, and removal of all materials above restricted-residential SCOs throughout the rest of the site to a depth of 6 feet bgs. Endpoint samples collected for laboratory analysis revealed that this site met the Track 4 SCOs.

Addendums to the June 2015 RAWP, consisting of the ISCO design work plan and SVE design work plan, were submitted to the NYSDEC for approval. Both documents were approved by NYSDEC on September 15, 2016.

Please refer to the Final Engineering Report (FER) for the detailed explanation of endpoint sampling and the findings.

Remedial Actions Completed

A cover system was installed across the entire site. Under the new building, the cover system consists of a vapor barrier and 6" concrete slab. In the parking area, the cover system consists of a vapor barrier and 8" concrete slab.

The SVE system was installed on October 23, 2016. On January 26, 2017, communication testing was performed and once completed, the system was shut off. The system officially started on February 14, 2017, after vapor samples were collected from the treatment system influent and effluent by EBC, and will be operating at all times with the exception of routine maintenance (carbon change outs) or system repairs. During each sampling event, PID readings and air samples (as per Method TO-15) from the pre-, mid-, and post-carbon areas were collected.

Carbon drums were changed out three (3) times, on February 13, 2017, April 19, 2017, and May 30, 2017 (one day prior to each sampling event). Spent carbon was left onsite inside of the drums

until samples were obtained for disposal to appropriate disposal facilities. One carbon disposal sampling event occurred on March 27, 2017. Once an appropriate disposal facility is determined, the carbon drums will be disposed of in bulk, and copies of the receipts shall be kept by the building manager.

An attempt was made to obtain a March 2017 air sample, as per approved design document, but the carbon was spent and no new carbon drums were onsite. New carbon units were ordered on March 27, 2017, and the SVE system was temporarily shut off, until new carbon was delivered to the Site. The system resumed on April 19, 2017, after the new drums were delivered to the site and monthly sampling continued. Detailed sample collection and analytical procedures and protocols are provided in

Remediation of dissolved phase VOCs in groundwater is being accomplished through an in-situ chemical oxidant (ISCO) injection program. The area of injection is within and up gradient of the source area. Injections at these locations deliver oxidant to the subsurface allowing it to flow northwest with groundwater, treating both residual contaminants in soil and the groundwater. The chemical oxidant injection program utilizes fourteen new injections wells (IW1-IW14) for oxidant application. The injection wells are located within and up gradient of the source area as shown on **Figure 6**.

A total of four (4) chemical injections events were performed between December 2016 and March 2017. A total of 11,000 pounds of sodium persulfate (Klozur®) and 522.5 pounds of iron-EDTA (FeEDTA) were injected into the fourteen injection wells. Although a total of 10,067 lbs was calculated for injections, an additional 1,455.5 lbs was injected to accommodate for a safety factor. Injections were performed on December 13, 2016, December 19, 2016, March 17, 2017, and March 30, 2017, and a brief summary of events can be found below:

Injection Event #1 – December 13, 2016

A total of 3630 lbs of Klozur and 165 lbs of FeEDTA were injected into IWs 1-5, which are located in the area of the former UST, on the north-west section of the property. This injection event was part of the “initial application of 5,376 lbs” as per ISCO plan.

Injection Event #2 – December 19, 2016

A total of 2970 lbs of Klozur and 137.5 lbs of FeEDTA were injected into IWs 6-8 and 13-14. IWs 6-8 are located in the area of the former UST, on the north-west section of the property. IWs 13-14 are located in the area of the elevated PVOCs, on the north-east section of the property. This injection event was part of the "initial application of 5,376 lbs" as per ISCO plan.

Injection Event #3 – March 17, 2017

1925 lbs of Klozur and 96.25 lbs of FeEDTA were injected into IWs 1-4. Additionally, 1265 lbs of Klozur and 41.25 lbs of FeEDTA were injected into IWs 5-8. IWs 1-8 are located in the area of the former UST, on the north-west section of the property.

Injection Event #4 – March 30, 2017

660 lbs of Klozur and 55 lbs of FeEDTA were injected into IWs 5-8. Additionally, 550 lbs of Klozur and 27.5 lbs of FeEDTA were injected into IWs 9-12. IWs 5-8 are located in the area of the former UST, on the north-west section of the property. IWs 9-12 are located in the rear yard. This information is summarized in **Table 10**.

2.4 Remedial Action Objectives

The Remedial Action Objectives (RAOs) for the Site as listed in Decision Document dated November 25, 2013 are as follows:

2.4.1 GROUNDWATER

RAOs for Public Health Protection

- Prevent ingestion of groundwater with 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 groundwater or surface water contamination.

2.4.2 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.

2.4.3 SOIL VAPOR

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

2.5 Remaining Contamination

2.5.1 SOIL

Laboratory analysis of the end point samples revealed that the site has achieved the Track 4 SCOs. The Track 4 alternative calls for all materials to be below restricted-residential use SCOs.

There were several endpoint samples that had exceedances to the Track 4 cleanup objectives initially, but follow-up sampling demonstrated compliance to the Track 4 cleanup objectives.

These samples are summarized below:

EP 3: The "EP 3" sample, which was collected from 4' below grade, exhibited elevated levels of barium above the Restricted-Residential Use SCOs. This area was excavated one additional foot, and a follow-up sample, EP3A, was obtained and analyzed for barium. The EP3A sample did not reveal barium concentrations above the UUSCO.

TP-SSW2: The "Tank Pit South Sidewall 2" sample, which was collected along the tank pit, exhibited elevated levels of VOCs above the Protection to Groundwater SCOs. This area was excavated 5 feet further towards the interior of the Site, and three new follow-up samples were obtained (Tank Pit Exc #1-3). The new samples did not reveal any VOCs above the UUSCO.

EP-9: The "EP-9" sample, which was collected at 9' below grade, exhibited elevated levels of SVOCs above the Restricted-Residential Use SCOs. This area was excavated an additional 6" and a follow-up sample, EP #9 (6"), was obtained and analyzed for SVOCs. The EP #9 (6") sample did not reveal SVOCs concentrations above the UUSCO.

EP-10: The "EP-10" sample, which was collected at 9' below grade, exhibited elevated levels of SVOCs above the Restricted-Residential Use SCOs. This area was excavated an additional 1' and a follow-up sample, EP #10 (1'), was obtained and analyzed for SVOCs. The EP #10 (1') sample did not reveal SVOCs concentrations above the UUSCO.

Table 2 and **Figure 4** summarize the results of all soil endpoint samples collected in exceedance to the Track 4 cleanup criteria. A comparison to the Unrestricted Use SCOs is also shown in **Table** 2 and **Figure 4**.

2.5.2 GROUNDWATER

Six (6) monitoring wells (MW1501-MW1506) were utilized at the Site to determine the effectiveness of the chemical oxidant injection program. The locations of the monitoring wells are shown in **Figure 6**.

A round of pre-injection groundwater samples was obtained between November 15, 2016 and November 17, 2016 from five (5) newly installed monitoring wells (MW1501-1505) to establish the background groundwater conditions. At this time, MW1506 was yet not installed, which is located upgradient of the contamination. A second round of groundwater samples was collected on February 16, 2017 from MW1501-1506, to establish background groundwater conditions for MW1506, and also as the first post-injection sample for MW1501-1505. A third round of samples was collected on April 4, 2017 from all six wells, which marked the start of the quarterly monitoring period. Subsequent samples will be collected on a quarterly basis from each of the six monitoring wells for laboratory analysis of VOCs by EPA Method 8260 and Iron.

Tables 3A and 3B summarize the results of pre- and post-injection groundwater samples collected at the site, respectively.

2.5.3 SOIL VAPOR

Soil vapor sampling performed during the Remedial Investigation noted total petroleum related volatile organic compounds (BTEX) were generally low around the perimeter of the Site ranging from 56.26 µg/m3 in SG8 located on the southeast portion of the Site to 432.03 µg/m3 in SG5 located within the central portion of the Site. MTBE was reported at an elevated concentration (1,410 µg/m3) in SG2, near the underground storage tank.

Chlorinated VOCs (CVOCs) were reported in all soil gas samples with trichloroethylene (TCE) reported in 5 of 8 samples, and tetrachloroethylene (PCE) reported in all 9 samples. TCE ranged in concentration from 0.43 µg/m3 in SG1 located in the northwest corner of the property to 6.34 µg/m3 in SG7 located in the southwest corner of the property. PCE ranged from 1.08 µg/m3 in SG2 located in the north central area of the Site in the vicinity of the UST to 20.3 µg/m3 in SG6 located near the east central property line.

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 B**) 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 use 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 7**. 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 this SMP.
- 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 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.
- The potential for vapor intrusion must be evaluated for any buildings developed in the area within the IC boundaries noted on **Figure 7**, and any potential impacts that are identified must be monitored or mitigated; and
- Vegetable gardens and farming on the site are prohibited;

3.3 Engineering Controls

3.3.1 SOIL VAPOR EXTRACTION SYSTEM

The SVE system consists of a 1.5-hp regenerative blower with a particulate filter connected to a single 2 inch diameter PVC extraction well located in the new cellar on the northern portion of the property and installed just above the groundwater interface. The well is constructed of a 2-inch, Schedule-40 PVC pipe with 20 feet of 0.020 slotted screen from a depth of 20 feet below grade to 40 feet below grade. The effluent is treated by two, vapor-phase GAC canisters connected in series, each filled with 170 pounds of active carbon (Econosorb-V). Air removed from the soil vapor extraction well by the blower passes through vapor-phase granular activated carbon prior to its discharge at the roof. The regenerative blower operates at all times, and should be operating within an air flow rate range of 100 to 140 CFM.

Procedures for operating and maintaining the Soil Vapor Extraction system are documented in the Operation and Maintenance Plan (Section 5.0 of this SMP). As built drawings, signed and sealed by a professional engineer, are included in **Attachment I** – Operations and Maintenance Manual. **Figure 5** shows the layout of the Soil Vapor Extraction system installed at the Site.

3.3.2 IN-SITU CHEMICAL OXIDANT (ISCO) TREATMENT

Remediation of dissolved phase VOCs in groundwater is on-going through a chemical oxidant injection program. The areas of injections are around the tank area (north-west portion of the site), east of the UST, and along a line in the rear yard of the Site. Injections at these locations deliver oxidant to the subsurface allowing it to flow northwest with groundwater treating both residual contaminants in soil and the groundwater.

The ISCO treatment program utilizes fourteen new injections wells (IW1-IW14) for oxidant application. Injection wells IW1-IW8 are located around the tank area, IW13-14 are located east of IW1-8 and south of MW1505, and IW9-12 are located along a line in the rear of the Site. Each of the injection wells were constructed of 1-inch pvc with a 10 ft 0.020-inch slot screened section installed 8 ft below the water table, and 2 ft above the water table. A No. 1 morie gravel pack is

placed around the screen to a depth of approximately 1 ft above the screen followed by a 1 ft hydrated bentonite pellet seal. The injection wells are finished with an 8-inch bolt down manhole cover. Injection wells 2-4 and 6-8 were finished at approximately 15 feet below grade, which corresponds to the bottom of excavation for this area. Injection wells 1, 5, and 13-14 were finished at the top of cellar slab elevation, which is approximately 9 feet below grade. Injection wells 9-12 were finished at one ft above the surface. The locations of the injection wells were chosen as per approved ISCO design document, but the finishing elevations for IW 2-4 and 6-8 were approximately 6 feet below the original design. **Figure 6** shows the injection well locations. The (amended) as-built drawings of the ISCO well network, signed and sealed by a professional engineer, are included in **Attachment I** – Operations and Maintenance Manual.

3.3.3 SITE COVER SYSTEM

A cover system was installed across the entire site. Under the new building, the cover system consists of a vapor barrier and 6" concrete slab. In the parking area, the cover system consists of a vapor barrier and 8" concrete slab.

3.3.4 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.

Soil Vapor Extraction System (SVE)

The SVE system will not be discontinued unless prior written approval is granted by the NYSDEC. In the event that monitoring data indicates that the SVE system may no longer be required, a proposal to discontinue the system will be submitted by the remedial party. Conditions that may warrant discontinuing the SVE system include contaminant concentrations in groundwater and/or soil that: (1) reach levels that are consistently below ambient water quality standards or the site SCGs, as appropriate; (2) have become asymptotic to a low level over an

extended period of time, as accepted by the NYSDEC; or (3) the NYSDEC has determined that the SVE system has reached the limit of its effectiveness. This assessment will be based in part on post-remediation contaminant levels in groundwater collected from monitoring wells located throughout the site. Systems will remain in place and operational until permission to discontinue their use is granted in writing by the NYSDEC.

In-Situ Chemical Oxidant (ISCO) Treatment

In the event that monitoring data indicates that the in-situ chemical oxidant treatment (ISCO) may no longer be required, a proposal to discontinue ISCO treatments, including the results of an impact study, will be submitted by the remedial party. Conditions that may warrant discontinuing the ISCO treatment include contaminant concentrations in groundwater that: (1) reach levels that are consistently below ambient water quality standards or the site SCGs as appropriate, (2) have become asymptotic to a low level over an extended period of time as accepted by the NYSDEC; or (3) the NYSDEC has determined that injections of chemical oxidants has reached the limit of its effectiveness. This assessment will be based in part on post-remediation contaminant levels in groundwater collected from monitoring wells located throughout the site. Systems will remain in place and operational until permission to discontinue their use is granted in writing by the NYSDEC.

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 F**.

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

- Sampling and analysis of all appropriate media (e.g., groundwater, indoor air, soil vapor);
- Assessing compliance with applicable NYSDEC standards, criteria and guidance (SCGs), particularly groundwater standards; 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 H** – 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.

At a minimum, the site cover system will be inspected annually for cracks and defects. If the concrete slab is broken (or the vapor barrier is visibly ruptured), the owner will be notified to repair these issues. A complete list of components to be inspected is provided in the Inspection Checklist, provided in **Attachment H.**

4.3 ISCO Monitoring and Sampling

4.3.1 ISCO MONITORING

Monitoring of the ISCO treatment began one month after the final injection event, and then on a quarterly basis thereafter, as identified in **Table 4** ISCO Monitoring Requirements and Schedule (see below). Modification to the frequency or sampling requirements will require approval from the NYSDEC. A visual inspection of the injection wells and monitoring wells will be conducted during each monitoring event. Unscheduled inspections and/or sampling may take place when an emergency occurs that is deemed likely to affect the operation of the system. ISCO system components to be monitored include, but are not limited to, the components included in **Table 4** below.

Table 4 – ISCO Monitoring Requirements and Schedule

ISCO System Component	Monitoring Parameter	Monitoring Schedule
Injection Wells	Condition, PID Screen, Depth to water, depth to bottom.	Quarterly
Monitoring Wells	Condition, PID Screen, Depth to	One month after

	water, depth to bottom.	injections, and then quarterly thereafter

A complete list of components to be inspected is provided in the Inspection Checklist, provided in **Attachment H** - Site Management Forms. If the monitoring wells or injections wells have been damaged, lost, or require redevelopment, maintenance and repair, as per the Operation and Maintenance Plan, is required immediately.

4.3.2 ISCO Treatment Sampling

One month following oxidant application, groundwater samples were collected from monitoring wells MW1501-1506 to monitor effectiveness of the chemical oxidant injection(s). The quarterly groundwater sampling program will begin following collection of the one month post-injection samples. Sampling locations, required analytical parameters and schedule are provided in **Table 5** – ISCO Treatment Assessment Sampling Requirements and Schedule below. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

Table 5 – ISCO Treatment Assessment Sampling Requirements and Schedule

Sampling Location	**Analytical Parameters**		**Schedule**
	VOCs (EPA Method 8260C)	Persulfate, Fe2, pH	
MW1501	X	X	One month after injection, and every quarter thereafter
MW1502	X	X	One month after injection, and every quarter thereafter
MW1503	X	X	One month after injection, and every quarter thereafter
MW1504	X	X	One month after injection, and every quarter thereafter
MW1505	X	X	One month after injection, and every quarter thereafter
MW1506	X	X	One month after injection, and every quarter thereafter

Container	(3) 40mL VOAs preserved with HCL	-	

The results of the sampling events will be indicated in Periodic Review Reports (PRR). As part of the PRR submittal, a graph showing the change in VOCs concentrations, specifically BTEX compounds, will be attached. Detailed sample collection and analytical procedures and protocols are provided in **Attachment E** – Field Sampling Plan and **Attachment F** – Quality Assurance Project Plan.

Groundwater samples were collected approximately one month after the final chemical oxidant injection to monitor the effectiveness of the chemical oxidant injections. Modification to the frequency or sampling requirements will require approval from the NYSDEC. The network of monitoring wells has been installed immediately down-gradient of all volatile organic carbon remediation areas for the purpose of evaluation of the effectiveness of the chemical oxidant injections.

Table 6 summarizes the wells identification number, location, depths, diameter and screened intervals of the wells. As part of each groundwater monitoring event, the six monitoring wells are to be sampled to monitor groundwater quality. Monitoring well construction logs are included in **Attachment D** of this document.

Table 6 – Monitoring Well Construction Details

MW ID	Well Location	Well Diameter (inches)	Installation Depth (ft)	
			Riser Interval	Screen Interval
MW1501	On sidewalk, north-west of tank area	1	0-40	40-50ft
MW1502	On sidewalk, north of tank area	1	0-40	40-50ft

MW1503	On site, west of tank area	1	0-40	40-50ft
MW1504	On site, south-west of tank area	1	0-40	40-50ft
MW1505	On sidewalk, north-east of tank area	1	0-40	40-50ft
MW1506	On site, in the rear yard north of IW9-12	1	0-40	40-50ft

In accordance with the In-Situ Chemical Oxidation Remedial Design Work Plan (dated April 2016; revised Sept. 2016), six monitoring wells (MW1501, MW1502, MW1503, MW1504, MW1505, and MW1506) were installed at the Site. Monitoring wells MW1501, MW1502, and MW1505 were installed on the sidewalk, north of the UST. Monitoring wells MW1503 and MW1504 were installed on site, east of the UST. Monitoring well MW 1506 was installed in the rear yard, which was excavated to 6 feet below grade and backfilled. All six monitoring wells were constructed of 1 inch pvc casing with a 10 foot 0.010 screened section set to approximately 8 feet below the water table. The wells were completed with a No. 01 morie gravel pack paced to a depth of approximately 1 foot above the screen followed by a hydrated bentonite seal. Groundwater was encountered at a depth of approximately 42 feet below grade. Therefore, all six monitoring wells were installed at a depth of 50 feet, consisting of 10 feet of screen and 40 feet of riser. The monitoring well locations can be found on **Figure 6**. 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.

4.4 SVE Monitoring and Sampling

4.4.1 SVE SYSTEM MONITORING

Monitoring of the soil vapor extraction system will be performed monthly during the first six months of operation to evaluate the performance of the system, and then performed on a quarterly basis thereafter (if the NYSDEC determines that quarterly sampling will be adequate), as identified in **Table 7** – SVE Monitoring Requirements and Schedule (see below). Modification to the frequency or sampling requirements will require approval from the NYSDEC. A visual inspection of the complete SVE system will be conducted during each monitoring event and groundwater sampling event. Unscheduled inspections and/or sampling may take place when a suspected failure of the SVE system has been reported or an emergency occurs that is deemed likely to affect the operation of the system. SVE system components to be monitored include, but are not limited to, the components included in **Table 7** below.

Table 7 – SVE Monitoring Requirements and Schedule

SVE System Component	Monitoring Parameter	Operating Range	Monitoring Schedule
Regenerative Blower	Flow Rate	TBD	Quarterly
Activated Carbon Drums	Expiration date, damage, labeling	-	Quarterly

Plumbing	Cracks, damage, labeling	-	Quarterly

A complete list of components to be inspected is provided in the Inspection Checklist, provided in **Attachment H**- Site Management Forms. If any equipment readings are not within their specified operation range, any equipment is observed to be malfunctioning or the system is not performing within specifications; maintenance and repair, as per the Operation and Maintenance Plan (**Attachment I**), is required immediately.

4.4.2 SVE SYSTEM SAMPLING

Samples shall be collected from the soil vapor extraction (SVE) system on a routine basis. The SVE discharge will be field screened with a photo-ionization detector, and an SVE discharge sample will be collected after the carbon units with a 1 L tedlar bag using a vacuum or hand pump. The 1 L tedlar bag will be submitted for laboratory analysis of VOCs via Method TO-15. The sampling location, required analytical parameters and schedule are provided in **Table 8** – Remedial System Sampling Requirements and Schedule below. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

Table 8 – Remedial System Sampling Requirements and Schedule

Sampling Location	Sampling	Schedule
Pre-carbon, mid-carbon, and post-carbon locations	PID reading	Monthly for the first six months, then quarterly thereafter (unless modified with the approval of NYSDEC)
Pre-carbon, mid-carbon, and post-carbon locations	VOCs by Method TO-15 air sampling analysis (tedlar bag)	Monthly for the first six months, then quarterly thereafter (unless modified with the approval of NYSDEC)

Spent carbon	VOCs, SVOCs, pH, and ignitability by TCLP method (4 oz. and 8 oz. jars)	Monthly, or as needed dependent on the rate of carbon spent

The monthly sampling events began on February 14, 2017, and are set to continue on or around the 14th of each subsequent month unless approval of a reduced frequency is granted by the NYSDEC. An attempt was made to obtain a March 2017 air sample, but the carbon was spent. The system was temporarily shut off, until new carbon was delivered to the Site. The system resumed on April 20, 2017, after the new drums were delivered to the site and monthly sampling continued. Detailed sample collection and analytical procedures and protocols are provided in **Attachment E** – Field Sampling Plan and **Attachment F** – Quality Assurance Project Plan.

Please refer to the Operations and Maintenance Manual in **Attachment I**, for additional sampling procedures and for carbon replacement procedures. Please refer to **Attachment L** for information regarding PID data and TO-15 analysis reports for the SVE system, and purge logs for the groundwater monitoring.

4.5 Post-Remediation Groundwater Sampling

Groundwater samples will be collected from MW1501-1506 one month after the end of the chemical oxidant injection events to confirm the performance of the remedy. Additionally, the quarterly sampling/monitoring program will begin following the collection of the 1-month post-injection sampling event, until modifications to the frequency or sampling requirements are granted by the NYSDEC.

Sampling locations and required analytical parameters are provided in **Table 5** – ISCO Treatment Assessment Sampling Requirements and Schedule. Modification to the sampling requirements will require approval from the NYSDEC.

Detailed sample collection and analytical procedures and protocols are provided in **Attachment E** – Field Sampling Plan and **Attachment F** – Quality Assurance Project Plan. Please refer to **Attachment L** for purge logs during the groundwater monitoring.

4.5.1 MONITORING AND SAMPLING PROTOCOL

All sampling activities will be recorded in a field book and associated sampling log as provided in **Attachment H** - 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 Sampling Plan provided as **Attachment E** of this document.

4.6 Post-Remediation SVE Media Monitoring and Sampling

The SVE system has been designed to remediate impacted soil. When the system is no longer actively recovering significant contaminant mass, a request will be made to DEC to terminate operation. The termination of the SVE system will not occur until approval is granted by the NYSDEC.

4.6.1 MONITORING AND SAMPLING PROTOCOL

All sampling activities will be recorded in a field book and associated sampling log as provided in **Attachment H - Site Management Forms**. Other observations (e.g., 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 **Attachment F - QAPP**.

4.7 Soil Vapor Intrusion Evaluation

Since post-remedial soil vapor sampling was not completed to verify that the remedial objective for soil vapor was attained, a soil vapor intrusion evaluation will be conducted within the completed building prior occupancy. Details for this evaluation will be determined upon completion of the on-Site building.

5.0 OPERATION AND MAINTENANCE PLAN

5.1 General

The Operation and Maintenance Plan (**Attachment I**) provides a brief description of the measures necessary to operate, monitor and maintain the mechanical components of the remedy selected for the site. This Operation and Maintenance Plan:

- Includes the procedures necessary to allow individuals unfamiliar with the Site to operate and maintain the SVE system and ISCO systems;
- Will be updated periodically to reflect changes in site conditions or the manner in which the SVE system and ISCO system are operated and maintained.

Further details regarding the Operation and Maintenance of the SVE system and ISCO system is provided in **Attachment I-** Operation and Maintenance Manual. A copy of this Operation and Maintenance Manual, along with the complete SMP, is maintained at the site. This Operation and Maintenance Plan is not to be used as a stand-alone document, but as a component document of this SMP.

5.2 Remedial System (or other Engineering Control) Performance Criteria

The system blower should be operated 24 hrs a day, 7-days a week. The single extraction well should remain intact during redevelopment construction. The 1.5 HP blower is located outside the building. If occupants notice a hissing sound, a leak is possible and the building manager should be notified.

5.3 Operation and Maintenance of the Soil Vapor Extraction (SVE) System

Cut-sheets and as-built drawings for the soil vapor extraction system are provided in **Attachment I** - Operations and Maintenance Manual. The SVE system is not adjustable and the regenerative blower shall not be serviced or repaired at the Site. If the blower fails, the unit will

need to be removed and shipped out for repairs, or replaced with another 1.5-hp regenerative blower.

5.3.1 SYSTEM START-UP AND TESTING

If the system is shut down for an extended period of time (>2 weeks), the following procedure will be followed:

1. Inspect each component of the system as follows:
    a. Visual inspection the PVC extraction lines for any visible cracks or separations.
    b. Verify that the blower is attached to the PVC extraction lines and carbon canisters.
    c. Ensure that the carbon canisters are arranged in series with connections to the blower and the effluent line. If breakthrough has been reached, the canisters must be replaced before starting up the system. See below for the replacement procedure.
2. Turn on the blower located outside the building. Wait 15 minutes.
3. Using a manometer, verify that pressure readings (greater than -0.1" wc) can be achieved at all monitoring points within 30 feet of the extraction well. If there a reading cannot be obtained, turn off the blower, look for structural deficiencies, and perform repairs. If there are no structural issues, wait another 15 minutes and check for a vacuum reading again. After 30 minutes, if the monitoring points do not produce a vacuum reading, turn off the system, re-inspect the system, perform repairs (if necessary) and have qualified personnel perform a retest.
4. The vacuum readings need to be verified at the monitoring points following the repairs.

5.3.2 ROUTINE SYSTEM OPERATION AND MAINTENANCE

An inspection schedule for the SVE system is provided in Section 4. During these inspections, the qualified environmental professional will also complete a visual inspection of the SVE

system. If there are any issues with the equipment or system, the facility owner and remedial engineer will be notified.

The SVE system is meant to be maintenance-free and designed to operate 24 hours a day, 7 days per week. Periodic maintenance is not required.

The 55-gallon GAC canisters will require replacement when breakthrough occurs. It is anticipated that after the first month of continuous operation breakthrough will occur on a monthly basis. When breakthrough is reached, the time frame will be included in this SMP. A set of replacement drums will be kept on Site and labeled "New" with their date of delivery. To replace the carbon canisters, the system must be turned off. Each carbon canister has been attached with an easy-connect flexible coupling, therefore it should be easy to detach and reattach the drums. The inlet and outlets are appropriately labeled by the manufacturer. The supplier should be contacted to schedule a pick-up of the spent carbon.

Carbon drums were changed out three (3) times, on February 13, 2017, April 19, 2017, and May 30, 2017 (one day prior to each sampling event). Spent carbon was left onsite inside of the drums until samples were obtained for disposal to appropriate disposal facilities. One carbon disposal sampling event occurred on March 27, 2017. Once an appropriate disposal facility is determined, the carbon drums will be disposed of in bulk, and copies of the receipts shall be kept by the building manager.

Ametek - Rotron is the manufacturer for the 1.5 HP blower. If there are any issues with the equipment, the inspector can reach the manufacturer's technical customer service line for troubleshooting. This is included in **Attachment I** – O&M Manual.

5.3.3 NON-ROUTINE OPERATION AND MAINTENANCE

Non-routine maintenance is expected if any component of the system is damaged or fails. During each inspection, the system will be checked for structural integrity. Component damage or failure includes a broken valve, damaged pipe, or blower malfunction. Additionally, if a hissing

sound is noted in the first floor, this could be a sign of extraction line damage. In any case of component damage or failure, the system should be shut off and repairs/replacements should be made. The owner should contact the manufacturer with any issues.
The system will not be restarted until all repairs are made. When the repairs are completed, the system should be started up as listed above.

5.3.4 SYSTEM MONITORING DEVICES AND ALARMS

The soil vapor extraction system does not utilize any system monitoring devices/alarms. The 1.5-hp regenerative blower operates continuously. In the event the blower fails, applicable maintenance and repairs will be conducted, as specified in the Operation and Maintenance Plan, and the soil vapor extraction system will be restarted. Operational problems will be noted in the Periodic Review Report to be prepared for that reporting period.

5.3.5 CARBON VESSELS REPLACEMENT PROCEDURE

The vapor-phase carbon vessels of the SVE system will need to be replaced when elevated PID readings are detected in-between the vessels, or at the end of the second vessel. Operation of the system will be temporary halted until the situation is remedied by changing out the carbon or through other necessary repairs / actions (loose valve or fitting, broken pipe, etc). The procedure to change out the carbon vessels can be found below:

1) Halt SVE system operations by turning off the power to the blower.
2) Remove the first carbon vessel (lead) in series. This vessel (DOT approved 55 gallon drum) is to be shipped back to the supplier for regeneration.
3) Switch the flex hose so that the second carbon vessel (lag) in series is now the lead vessel.
4) Add a new carbon vessel in the lag position and connect the flex hose to the discharge line.
5) Restart the SVE system and measure VOC concentrations with a PID before, after and in-between the carbon vessels.

In the unlikely case both carbon vessels achieved their break though times, both vessels will need to be replaced with new drums.

6.0 PERIODIC ASSESSMENTS/EVALUATIONS

6.1 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.

6.2 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 northern portion of Brooklyn, NY. It is located at an elevation of 56 feet above the National Geodetic Vertical Datum (NGVD), or approximately 59 feet above sea level. According to the FEMA Flood Map, this site is not located within a flood hazard area. 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 considered to be vulnerable to storm events related to climate change.

6.3 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).

6.3.1 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.

6.3.2 FREQUENCY OF SYSTEM CHECKS, 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 site visits and system checks;
- Coordination/consolidation of activities to maximize foreman/labor time; and
- Use of mass transit for site visits, where available.

6.3.3 METRICS AND REPORTING

As discussed in Section 7.0 and as shown in **Attachment H** – Site Management Forms, information on energy usage, solid waste generation, transportation and shipping, water usage and land use and ecosystems will be recorded to facilitate and document consistent

implementation of green remediation during site management and to identify corresponding benefits; a set of metrics has been developed.

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 H**. 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 9** and summarized in the Periodic Review Report.

Table 9 – Schedule of Interim Monitoring/Inspection Reports

Task/Report	Reporting Frequency*
Periodic Review Report	Annually, or as otherwise determined by the Department
Inspection Report	Quarterly

* 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 (COC) is issued. After submittal of the initial Periodic Review Report, the next PRR shall be submitted every 5 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 C** – 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 Plan for the media being monitored;
  - Recommendations regarding any necessary changes to the remedy and/or Monitoring 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.

7.2.1 CERTIFICATION OF INSTITUTIONAL AND ENGINEERING CONTROLS

Following the last inspection of the reporting period, a qualified environmental professional or Professional Engineer licensed to practice in New York State 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, 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."*

If the remedy requires only an institutional control, include the following:
At the end of each certifying period, as determined by the NYSDEC, the following certification will be provided to the Department:

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

- *The institutional 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 information presented in this report is accurate and complete.*

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 or Owner's Designated Site Representative] (and if the site consists of multiple properties): [and I have been authorized and designated by all site owners to sign this certification] for the site."

For BCP projects which the Department has determined do not represent a significant threat to public health or the environment, but where contaminants in groundwater exceed drinking water standards, the following should also be included for both IC/EC and IC scenarios listed above:

- *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*

For BCP projects, every five years the following certification will be added:

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

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. A general outline for the RSO

report is provided in **Attachment J**. 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

6NYCRR Part 375, Environmental Remediation Programs. December 14, 2006.

AMC Engineering, PLLC, *Remedial Action Work Plan, Former Motor Freight Garage Site, 834 Lexington Avenue, Brooklyn NY, March 2015 (Revised June 2015)*

AMC Engineering, PLLC, *Soil Vapor Extraction Remedial Design Work Plan, Former Motor Freight Garage Site, 834 Lexington Avenue, Brooklyn NY, September 2016*

AMC Engineering, PLLC, *In-Situ Chemical Oxidation Remedial Design Work Plan, Former Motor Freight Garage Site, 834 Lexington Avenue, Brooklyn NY, September 2016*

Environmental Business Consultants, *Phase I Environmental Screening*, *November 2014*

Environmental Business Consultants, *Phase II Investigation – Data Summary, June 2014*

Environmental Business Consultants, *Remedial Investigation Report Former Motor Freight Garage Site, 834 Lexington Avenue, Brooklyn NY, April 2015*

NYSDEC DER-10 – "Technical Guidance for Site Investigation and Remediation".

NYSDEC, Division of Water, June 1998, Addendum April 2000, *Technical and Administrative Guidance Series (TOGS) 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
NYSDEC Project Manager: Kyle Forster	(518) 402-8644;
NYSDEC Bureau Chief: Janet Brown	(518) 402-9768;

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

TABLE 2
832 - 836 Lexington Avenue,
Brooklyn, New York
Soil Endpoints Analytical Results

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	14SB9				EP2		EP3		EP3A		EP7		EP10		South Sidewall 1		South Sidewall 2		Rear Slope 2	
			(2-4')		(4-6')		4'		4'		5'		9'		9'		13'		13'		4'	
			8/11/2016		8/11/2016		8/11/2016		8/11/2016		8/16/2016		11/8/2016		11/3/2016		9/19/2016		9/19/2016		9/21/2016	
			mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Barium	350	350	95.6	0.7	43	0.7	87.5	0.8	**699**	0.8	101	0.8	51.4	0.8	58	0.7	51.9	0.7	51.9	0.7	66.5	0.7
Chromium	30	180	17.7	0.36	15.6	0.34	18.9	0.38	19.6	0.38	-	-	**31.3**	0.39	18.9	0.34	51.9	0.7	51.9	0.7	13.8	0.37
Copper	50	270	36.9	0.36	11.8	0.34	23.8	0.38	62.4	0.38	-	-	20.9	0.39	15	0.34	51.9	0.7	51.9	0.7	15	0.37
Lead	63	400	**177**	7.3	26.7	0.7	55.5	0.8	359	7.6	-	-	3.5	0.8	61.8	0.7	**98.4**	0.7	**75.8**	0.7	**77.1**	0.7
Mercury	0.18	0.81	**0.34**	0.03	0.07	0.03	**0.18**	0.03	0.38	0.03	-	-	< 0.03	0.03	**0.19**	0.03	51.9	0.7	**0.22**	0.7	**0.2**	0.03
Zinc	109	2,200	**128**	0.7	35.7	0.7	43	0.8	96	0.8	-	-	47	0.8	63.1	0.7	51.9	0.7	51.9	0.7	79.7	0.7

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

No VOCs or SVOCs were found above the UUSCO Guidance Values.

TABLE 3A
832 Lexington Avenue, Brooklyn, NY
Pre-Injection Groundwater Sampling

COMPOUNDS	TAGM - GW	TOGS - WQ/GA	MW1501		MW1502		MW1503		MW1504		MW1505		MW1506		GW DUP.		TRIP BLANK		TRIP BLANK	
			11/17/2016		11/15/2016		11/15/2016		11/15/2016		11/15/2016		2/16/2017		11/15/2016		11/15/2016		11/17/2017	
			ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
1,1,1,2-Tetrachloroethane		5	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	1.0	ND	1.0
1,1,1-Trichloroethane	5	5	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0
1,1,2,2-Tetrachloroethane	5	5	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	1.0	ND	1.0
1,1,2-Trichloroethane		1	ND	5.0	ND	5.0	ND	5.0	ND	2.5	ND	2.5	ND	5.0	ND	5.0	ND	1.0	ND	1.0
1,1-Dichloroethane	5	5	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0
1,1-Dichloroethene	5	5	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	1.0	ND	1.0
1,1-Dichloropropene		5	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	1.0	ND	1.0
1,2,3-Trichlorobenzene			ND	20	ND	20	ND	20	ND	10	ND	10	ND	20	ND	20	ND	1.0	ND	1.0
1,2,3-Trichloropropane	5	0.04	ND	5.0	ND	5.0	ND	5.0	ND	2.5	ND	2.5	ND	5.0	ND	5.0	ND	0.25	ND	0.25
1,2,4-Trichlorobenzene			ND	20	ND	20	ND	20	ND	10	ND	10	ND	20	ND	20	ND	1.0	ND	1.0
1,2,4-Trimethylbenzene		5	**1,900**	100	**2,300**	100	**1,100**	50	**740**	50	**1,800**	50	**300**	5.0	**1,100**	100	ND	1.0	ND	1.0
1,2-Dibromo-3-chloropropane		0.04	ND	10	ND	10	ND	10	ND	5.0	ND	5.0	ND	10	ND	10	ND	0.50	ND	0.50
1,2-Dibromoethane		0.0006	ND	5.0	ND	5.0	ND	5.0	ND	2.5	ND	2.5	ND	5.0	ND	5.0	ND	0.25	ND	0.25
1,2-Dichlorobenzene	4.7		ND	5.0	ND	5.0	ND	5.0	ND	4.7	ND	4.7	ND	5.0	ND	5.0	ND	1.0	ND	1.0
1,2-Dichloroethane	5	0.6	ND	10	ND	10	ND	10	ND	5.0	ND	5.0	ND	10	ND	10	ND	0.60	ND	0.60
1,2-Dichloropropane		1	ND	5.0	ND	5.0	ND	5.0	ND	2.5	ND	2.5	ND	5.0	ND	5.0	ND	1.0	ND	1.0
1,3,5-Trimethylbenzene		5	**530**	5.0	**650**	100	**300**	5.0	**190**	5.0	**480**	50	**120**	5.0	**250**	5.0	ND	1.0	ND	1.0
1,3-Dichlorobenzene	5	3	ND	5.0	ND	5.0	ND	5.0	ND	3.0	ND	3.0	ND	5.0	ND	5.0	ND	1.0	ND	1.0
1,3-Dichloropropane	5	5	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	1.0	ND	1.0
1,4-Dichlorobenzene	5		ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	1.0	ND	1.0
2,2-Dichloropropane		5	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	1.0	ND	1.0
2-Chlorotoluene		5	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	1.0	ND	1.0
2-Hexanone		50	ND	50	ND	50	ND	50	ND	25	ND	25	ND	50	ND	50	ND	2.5	ND	2.5
2-Isopropyltoluene		5	ND	5.0	ND	5.0	ND	5.0	ND	5.0	**3.5**	5.0	ND	5.0	ND	5.0	ND	1.0	ND	1.0
4-Chlorotoluene		5	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	1.0	ND	1.0
4-Methyl-2-pentanone	50		ND	50	ND	50	ND	50	ND	25	ND	25	ND	50	ND	50	ND	2.5	ND	2.5
Acetone	50	50	ND	50	ND	50	ND	50	ND	50	**31**	50	ND	50	ND	50	ND	5.0	ND	5.0
Acrolein		5	ND	50	ND	50	ND	50	ND	25	ND	25	ND	50	ND	50	ND	5.0	ND	5.0
Acrylonitrile		5	ND	50	ND	50	ND	50	ND	25	ND	25	ND	50	ND	50	ND	5.0	ND	5.0
Benzene	0.7	1	ND	5.0	ND	5.0	**18**	5.0	ND	2.5	ND	2.5	ND	5.0	**16**	5.0	ND	0.70	ND	0.70
Bromobenzene		5	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	1.0	ND	1.0
Bromochloromethane		5	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	1.0	ND	1.0
Bromodichloromethane		50	ND	20	ND	20	ND	20	ND	10	ND	10	ND	20	ND	20	ND	1.0	ND	1.0
Bromoform		50	ND	50	ND	50	ND	50	ND	50	ND	50	ND	50	ND	50	ND	5.0	ND	5.0
Bromomethane		5	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0
Carbon Disulfide	50		ND	20	ND	20	ND	20	ND	10	ND	10	ND	20	ND	20	ND	1.0	ND	1.0
Carbon tetrachloride	5	5	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	1.0	ND	1.0
Chlorobenzene	5	5	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0
Chloroethane	50	5	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0
Chloroform	7	7	ND	7.0	ND	7.0	ND	7.0	ND	7.0	ND	7.0	ND	7.0	ND	7.0	ND	5.0	ND	5.0
Chloromethane		5	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0
cis-1,2-Dichloroethene		5	ND	5.0	ND	5.0	**22**	5.0	ND	5.0	ND	5.0	ND	5.0	**21**	5.0	ND	1.0	ND	1.0
cis-1,3-Dichloropropene		0.4	ND	5.0	ND	5.0	ND	5.0	ND	2.5	ND	2.5	ND	5.0	ND	5.0	ND	0.40	ND	0.40
Dibromochloromethane	50	50	ND	20	ND	20	ND	20	ND	10	ND	10	ND	20	ND	20	ND	1.0	ND	1.0
Dibromomethane		5	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	1.0	ND	1.0
Dichlorodifluoromethane		5	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	1.0	ND	1.0
Ethylbenzene	5	5	**1,700**	100	**1,650**	100	**1,200**	50	**670**	50	**1,000**	50	**58**	5.0	**1,100**	100	ND	1.0	ND	1.0
Hexachlorobutadiene		0.5	ND	4.0	ND	4.0	ND	4.0	ND	2.0	ND	2.0	ND	4.0	ND	4.0	ND	0.50	ND	0.50
Isopropylbenzene		5	**91**	5.0	**120**	5.0	**62**	5.0	**42**	5.0	**84**	5.0	**36**	5.0	**52**	5.0	ND	1.0	ND	1.0
m&p-Xylene			**5,900**	400	**6,000**	400	ND	200	**2,100**	200	**4,000**	200	**54**	20	**3,500**	400	ND	1.0	ND	1.0
Methyl ethyl ketone	50	50	ND	50	ND	50	ND	50	ND	25	ND	25	ND	50	ND	50	ND	2.5	ND	2.5
Methyl t-butyl ether (MTBE)			**22**	20	**12**	20	ND	20	ND	10	**11**	10	ND	20	**370**	20	ND	1.0	ND	1.0
Methylene chloride	5	5	ND	20	ND	20	ND	20	ND	10	ND	10	ND	20	ND	20	ND	3.0	ND	3.0
Naphthalene	5	10	**420**	20	**540**	20	**250**	20	**180**	10	**470**	200	**93**	20	**230**	20	ND	1.0	ND	1.0
n-Butylbenzene		5	**30**	5.0	**37**	5.0	**17**	5.0	**10**	5.0	**35**	5.0	**14**	5.0	**17**	5.0	ND	1.0	ND	1.0
n-Propylbenzene		5	**260**	5.0	**330**	5.0	**160**	5.0	**100**	5.0	**240**	5.0	**79**	5.0	**140**	5.0	ND	1.0	ND	1.0
o-Xylene	5	5	**2,500**	100	**2,200**	100	**1,700**	50	**880**	50	**1,500**	50	**11**	5.0	**1,600**	100	ND	1.0	ND	1.0
p-Isopropyltoluene		5	**9.1**	5.0	**8.9**	5.0	ND	5.0	**2.7**	5.0	**7.6**	5.0	**6.8**	5.0	**5.3**	5.0	ND	1.0	ND	1.0
sec-Butylbenzene		5	**17**	5.0	**17**	5.0	**10**	5.0	**6.5**	5.0	**16**	5.0	**12**	5.0	**9.2**	5.0	ND	1.0	ND	1.0
Styrene		5	**21**	5.0	**28**	5.0	**19**	5.0	**9.7**	5.0	**9.9**	5.0	ND	5.0	**14**	5.0	ND	1.0	ND	1.0
tert-Butylbenzene		5	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	1.0	ND	1.0
Tetrachloroethene	5	5	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	1.0	ND	1.0
Tetrahydrofuran (THF)		50	ND	50	ND	50	ND	50	ND	50	ND	50	ND	50	ND	50	ND	5.0	ND	5.0
Toluene	5	5	**2800**	100	**930**	100	**4,100**	50	**810**	50	**33**	5.0	ND	5.0	**3,800**	100	ND	1.0	ND	1.0
trans-1,2-Dichloroethene	5	5	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0
trans-1,3-Dichloropropene		0.4	ND	5.0	ND	5.0	ND	5.0	ND	2.5	ND	2.5	ND	5.0	ND	5.0	ND	0.40	ND	0.40
trans-1,4-dichloro-2-butene		5	ND	50	ND	50	ND	50	ND	25	ND	25	ND	50	ND	50	ND	2.5	ND	2.5
Trichloroethene	5	5	**17**	5.0	**6.7**	5.0	ND	5.0	**16**	5.0	ND	5.0	ND	5.0	ND	5.0	ND	1.0	ND	1.0
Trichlorofluoromethane		5	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	1.0	ND	1.0
Trichlorotrifluoroethane	5	5	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	1.0	ND	1.0
Vinyl chloride	2	2	ND	5.0	ND	5.0	ND	5.0	ND	2.5	ND	2.5	ND	5.0	ND	5.0	ND	1.0	ND	1.0

ND - Not-detected
RL - Reporting Limit
Bold/highlighted- Indicated exceedance of TAGM
Bold/highlighted- Indicated exceedance of TOGS

TABLE 3B
832 Lexington Avenue, Brooklyn, NY
Post-Injection Groundwater Sampling

VOLATILE ORGANIC COMPOUNDS (VOCs)	MW1501		MW1502		MW1503		MW1504		MW1505		MW1506
	2/16/2017	4/4/2017	2/16/2017	4/4/2017	2/16/2017	4/4/2017	2/16/2017	4/4/2017	2/16/2017	4/4/2017	4/4/2017
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	4,300	3,600	3,800	1,400	2,200	1,400	3,300	2,000	300	110	130
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	1,300	990	1,300	390	490	310	830	400	41	25	46
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	130	ND	ND	ND	ND	ND	ND
2-Isopropyltoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.28	2
4-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	ND	ND	ND	ND	170	ND	ND	ND	ND	6.4	ND
Acrolein	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acrylonitrile	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	29	ND	ND	42	14	ND	ND	ND	ND	ND
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.7	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND	48	14	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	3,000	3,400	2,500	890	1,900	1,200	2,800	1,500	120	68	9.9
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	190	160	190	72	89	65	140	70	18	5.6	16
m&p-Xylene	7,400	11,000	8,100	3,400	5,400	2,600	8,500	5,000	290	290	25
Methyl ethyl ketone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl t-butyl ether (MTBE)	950	96	ND	ND	1,100	410	22	5.6	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	900	1,300	1,200	450	490	450	840	570	99	37	41
n-Butylbenzene	150	42	68	17	23	20	30	17	5.5	2.9	10
n-Propylbenzene	740	480	570	200	260	180	420	210	37	13	27
o-Xylene	3,400	4,400	3,200	1,300	2,400	1,300	2,700	1,500	220	110	5.1
p-Isopropyltoluene	26	ND	ND	ND	6.7	5.4	ND	5.9	ND	0.73	3.8
sec-Butylbenzene	50	ND	35	10	13	8.9	19	12	2.8	1.5	9.4
Styrene	39	41	46	16	41	22	45	23	ND	0.68	ND
tert-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.75
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	2.1	1.6	1.7
Tetrahydrofuran (THF)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5,000	1,900	980	220	2,900	1,800	2,400	950	2.1	1.5	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,4-dichloro-2-butene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	44	31	ND	ND	27	18	44	16	2.1	2.1	0.87
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorotrifluoroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BTEX	**18,800**	**20,729**	**14,780**	**5,810**	**12,642**	**6,914**	**16,400**	**8,950**	**632**	**470**	**40**
Total VOCs	**27,489**	**27,469**	**21,989**	**8,365**	**17,730**	**9,817**	**22,090**	**12,280**	**1,140**	**678**	**329**

ND - Not-detected
Highlighted - Above Non-Detect

Table 4 – ISCO Monitoring Requirements and Schedule

ISCO System Component	Monitoring Parameter	Monitoring Schedule
Injection Wells	Condition, PID Screen, Depth to water, depth to bottom.	Quarterly
Monitoring Wells	Condition, PID Screen, Depth to water, depth to bottom.	One month after injections, and then quarterly thereafter

Table 5 – ISCO Treatment Assessment Sampling Requirements and Schedule

Sampling Location	Analytical Parameters		Schedule
	VOCs (EPA Method 8260C)	Persulfate, Fe2, pH	
MW1501	X	X	One month after injection, and every quarter thereafter
MW1502	X	X	One month after injection, and every quarter thereafter
MW1503	X	X	One month after injection, and every quarter thereafter
MW1504	X	X	One month after injection, and every quarter thereafter
MW1505	X	X	One month after injection, and every quarter thereafter
MW1506	X	X	One month after injection, and every quarter thereafter
Container	(3) 40mL VOAs preserved with HCL	-	

Table 6 – Monitoring Well Construction Details

MW ID	Well Location	Well Diameter (inches)	Installation Depth (ft)	
			Riser Interval	Screen Interval
MW1501	On sidewalk, north-west of tank area	1	0-40	40-50ft
MW1502	On sidewalk, north of tank area	1	0-40	40-50ft
MW1503	On site, west of tank area	1	0-40	40-50ft
MW1504	On site, south-west of tank area	1	0-40	40-50ft
MW1505	On sidewalk, north-east of tank area	1	0-40	40-50ft
MW1506	On site, in the rear yard north of IW9-12	1	0-40	40-50ft

Table 7 – SVE Monitoring Requirements and Schedule

SVE System Component	Monitoring Parameter	Operating Range	Monitoring Schedule
Regenerative Blower	Flow Rate	TBD	Quarterly
Activated Carbon Drums	Expiration date, damage, labeling	-	Quarterly
Plumbing	Cracks, damage, labeling	-	Quarterly

Table 8 – Remedial System Sampling Requirements and Schedule

Sampling Location	Sampling	Schedule
Pre-carbon, mid-carbon, and post-carbon locations	PID reading	Monthly for the first six months, then quarterly thereafter (unless modified with the approval of NYSDEC)
Pre-carbon, mid-carbon, and post-carbon locations	VOCs by Method TO-15 air sampling analysis (tedlar bag)	Monthly for the first six months, then quarterly thereafter (unless modified with the approval of NYSDEC)
Spent carbon	VOCs, SVOCs, pH, and ignitability by TCLP method (4 oz. and 8 oz. jars)	Monthly, or as needed dependent on the rate of carbon spent

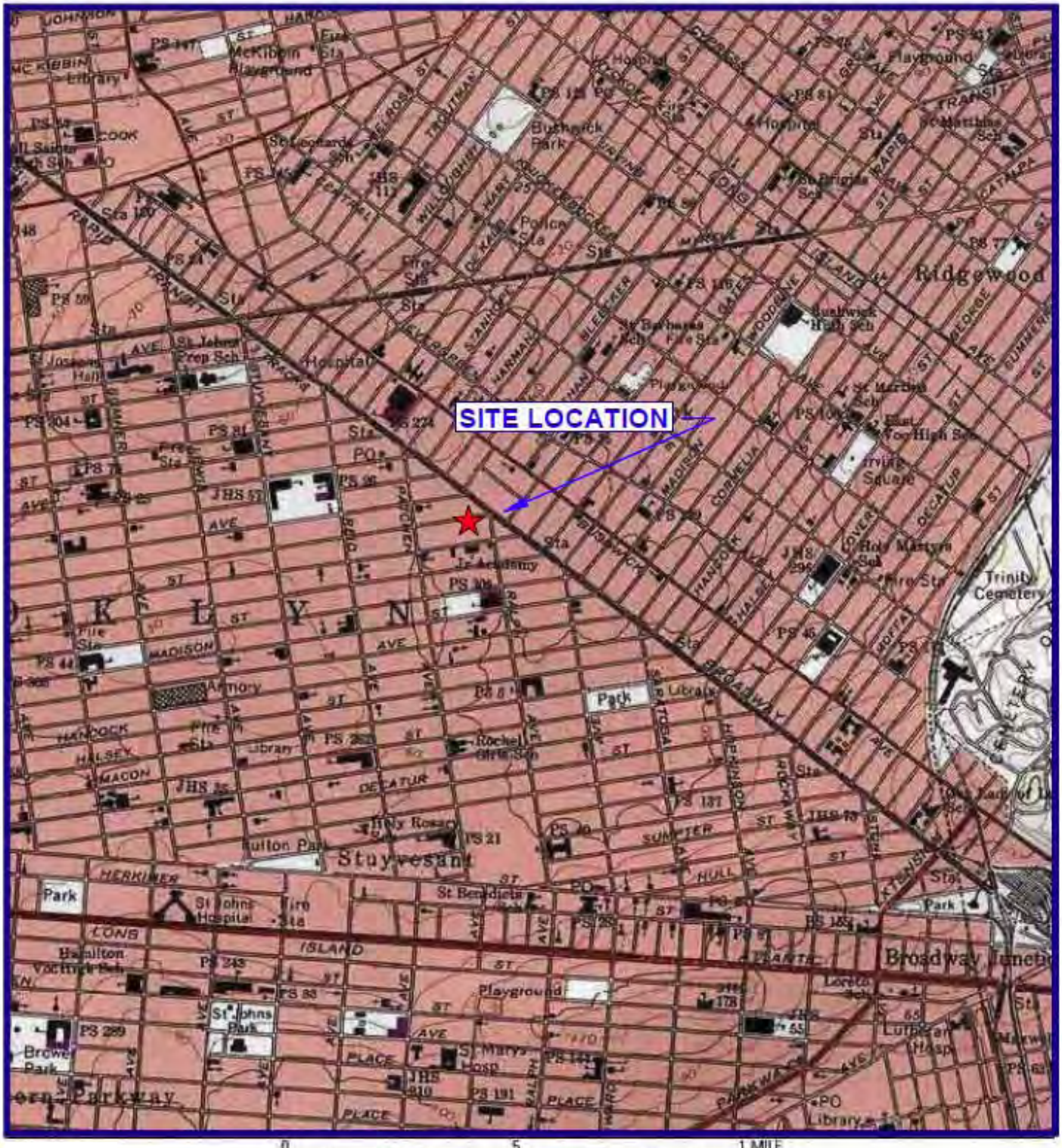
Table 9 – Schedule of Interim Monitoring/Inspection Reports

Task/Report	Reporting Frequency*
Periodic Review Report	Annually, or as otherwise determined by the Department
Inspection Report	Quarterly

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

Table 10 - ISCO Injections Schedule During Remedial Action						
Injection Area	**Injected Materials**	**Injection Day 1 12/13/2016 (lbs)**	**Injection Day 2 12/19/2016 (lbs)**	**Injection Day3 3/17/2017 (lbs)**	**Injection Day 4 3/30/2017 (lbs)**	**Injection Totals (lbs)**
IW 1, 2, 3, 4, 5	Iron	165	0	96.25	0	261.25
	Klozur	3630	0	1925	0	5555
IW 6, 7, 8, 13, 14	Iron	0	137.5	41.25	55	233.75
	Klozur	0	2970	1265	660	4895
IW 9, 10, 11, 12	Iron	0	0	0	27.5	27.5
	Klozur	0	0	0	550	550
Totals per Day		3795	3107.5	3327.5	1292.5	11522.5

FIGURES



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18-36 42nd Street
Astoria, NY 11105

718-545-0474

PROJECT
Former Motor Freight Garage Site
832-836 Lexington Avenue
Brooklyn, NY 11221
Block 1628 Lot 30

DATE: MAY 8, 2017

DRAWING BY: AS

TITLE: FIGURE 1 -
SITE LOCATION MAP

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DATE: MAY 8, 2017

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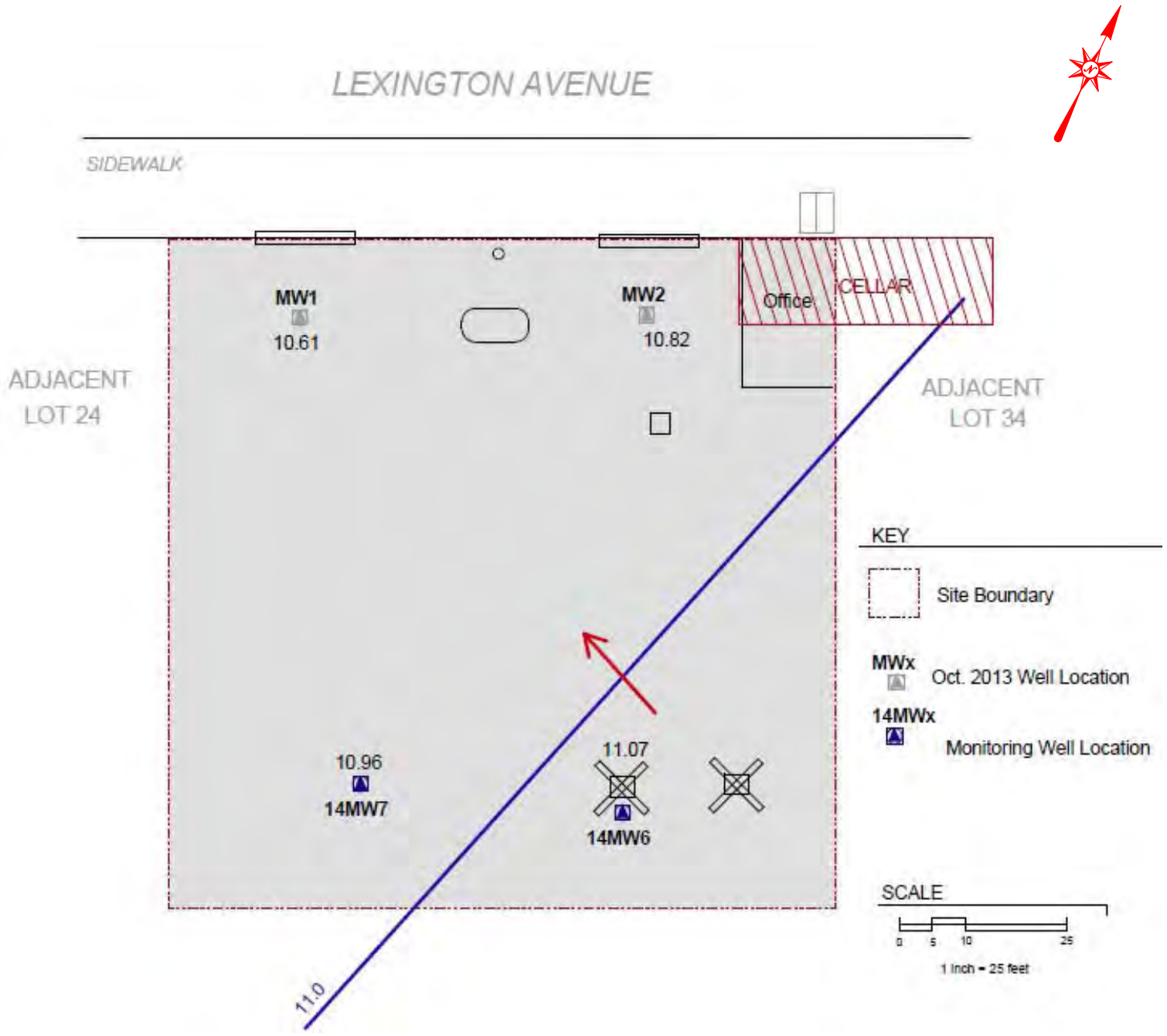
TITLE: FIGURE 2 - SITE LAYOUT MAP



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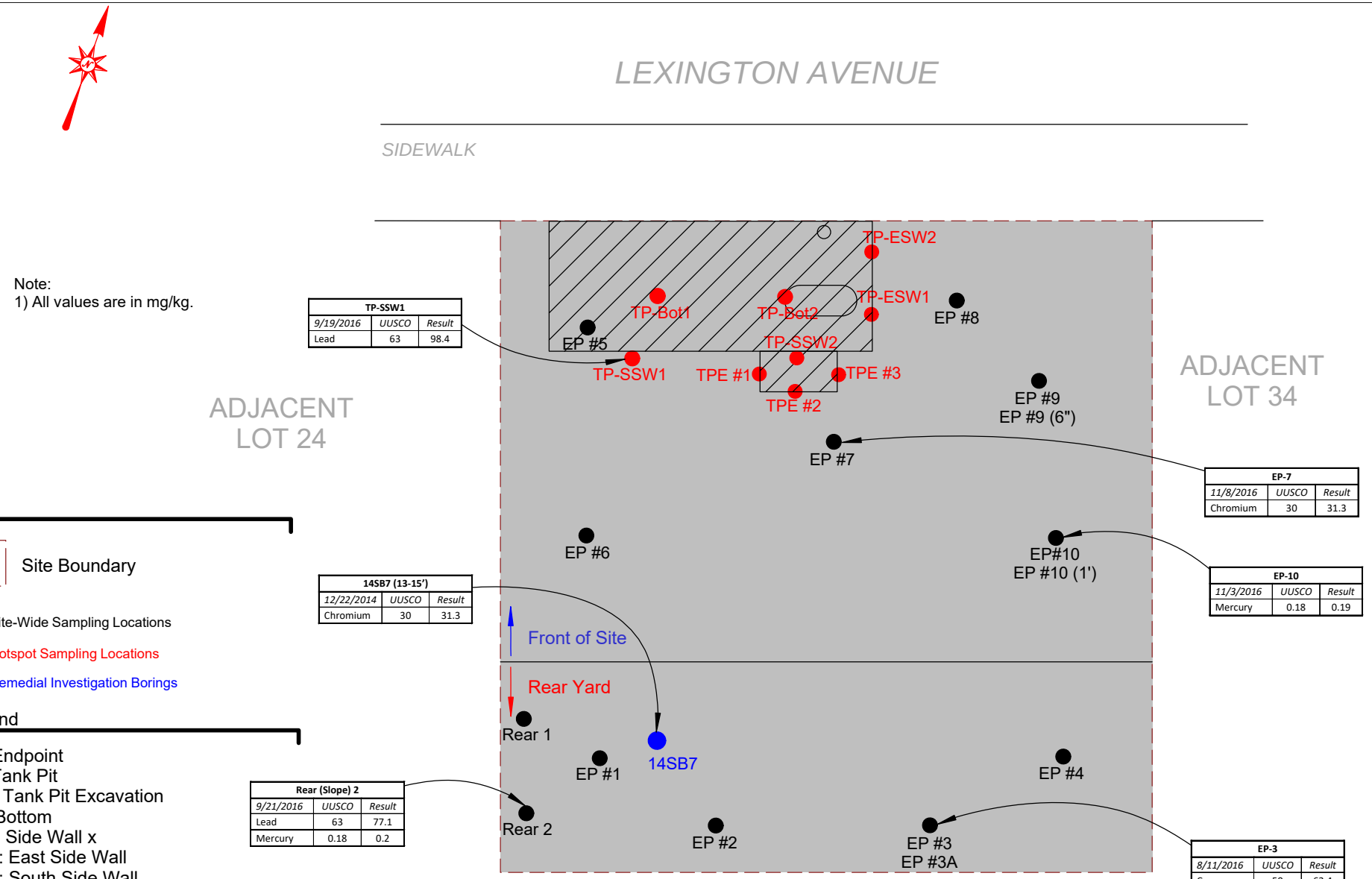
TITLE:
FIGURE 3 -
GROUNDWATER CONTOUR MAP



Note:
1) All values are in mg/kg.

TP-SSW1		
9/19/2016	*UUSCO*	*Result*
Lead	63	98.4

14SB7 (13-15')		
12/22/2014	*UUSCO*	*Result*
Chromium	30	31.3

Rear (Slope) 2		
9/21/2016	*UUSCO*	*Result*
Lead	63	77.1
Mercury	0.18	0.2

EP-7		
11/8/2016	*UUSCO*	*Result*
Chromium	30	31.3

EP-10		
11/3/2016	*UUSCO*	*Result*
Mercury	0.18	0.19

EP-3		
8/11/2016	*UUSCO*	*Result*
Copper	50	62.4
Lead	63	359
Mercury	0.18	0.38

KEY

Site Boundary

Site-Wide Sampling Locations

Hotspot Sampling Locations

Remedial Investigation Borings

Legend

EP: Endpoint
TP: Tank Pit
TPE: Tank Pit Excavation
Bot: Bottom
SWx: Side Wall x
ESW: East Side Wall
SSW: South Side Wall
UUSCO: NYSDEC Part 375 Unrestricted Use Soil Cleanup Objectives
RRSCO: NYSDEC Part 375 Restricted-Residential Use Soil Cleanup Objectives
GWP: NYSDEC Part 375 Protection of Groundwater Soil Cleanup Objectives

Notes:
1) Only values in exceedance to the UUSCOs and/or the Track 2 Cleanup Objectives are shown in this figure. Sample points without any data points indicates that the sample is compliant with the UUSCOs.
2) Sample points with multiple names indicates that follow-up endpoint samples were obtained due to exceedance(s).

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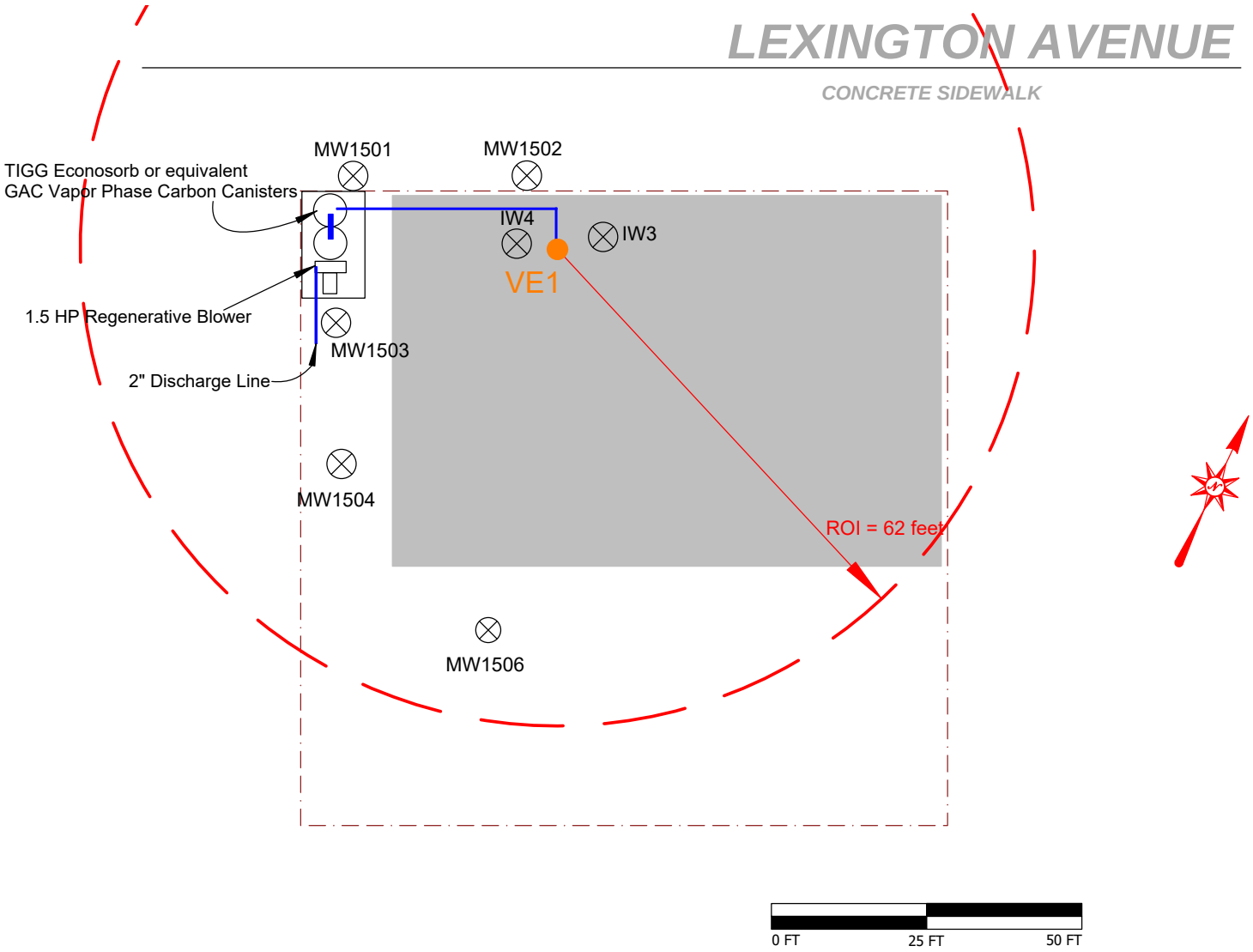
DATE: JUN 8, 2017 | DRAWING BY: AS

TITLE: FIGURE 4 -
REMAINING SOIL SAMPLE EXCEEDANCES



KEY PLAN

Site Boundary

VE1 Vapor Extraction Well

Radius of Influence

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Former Motor Freight Garage Site
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Block 1628 Lot 30

DATE: JUL 7, 2017

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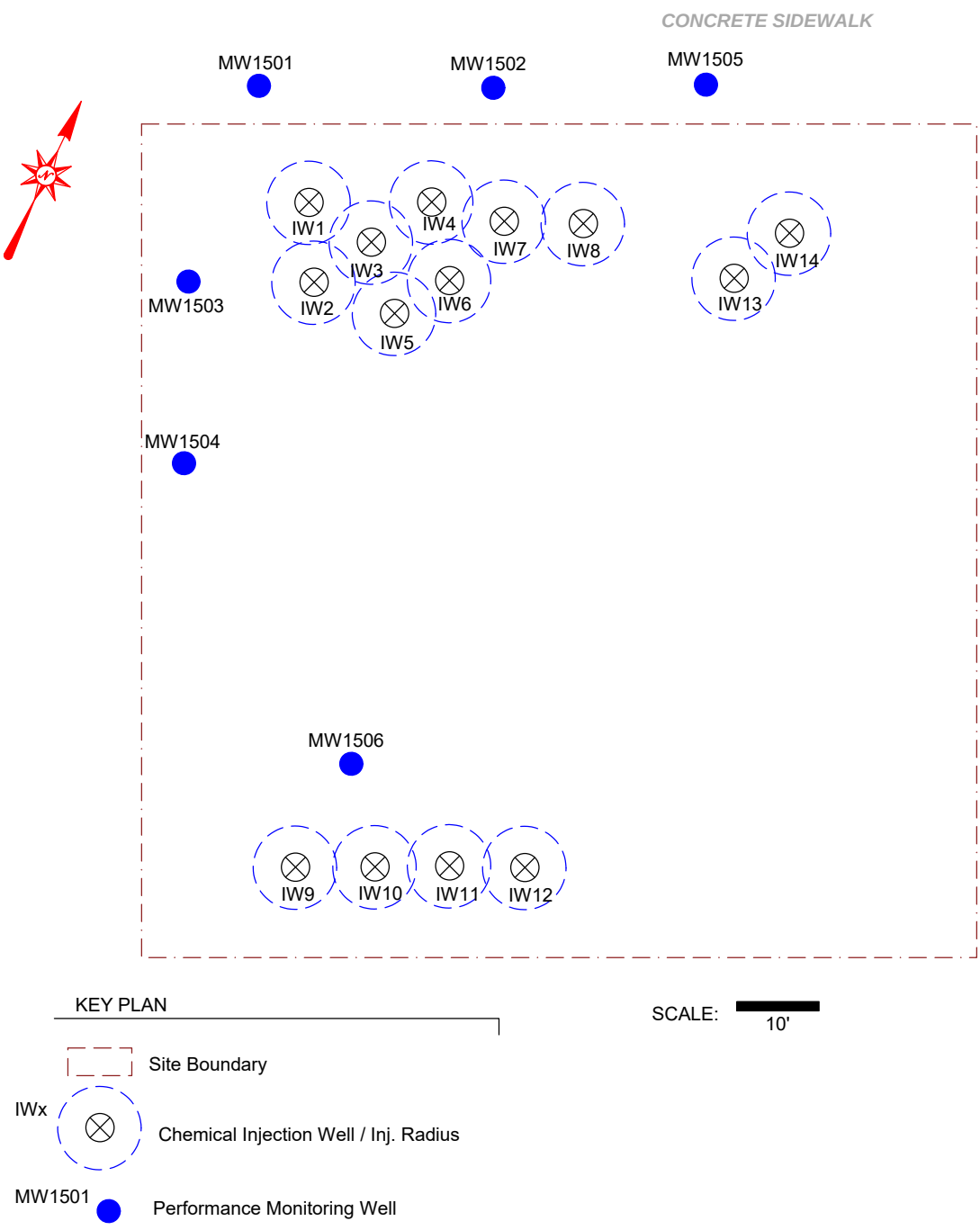
TITLE: FIGURE 5 - SVE SYSTEM LAYOUT



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DATE: MAY 8, 2017

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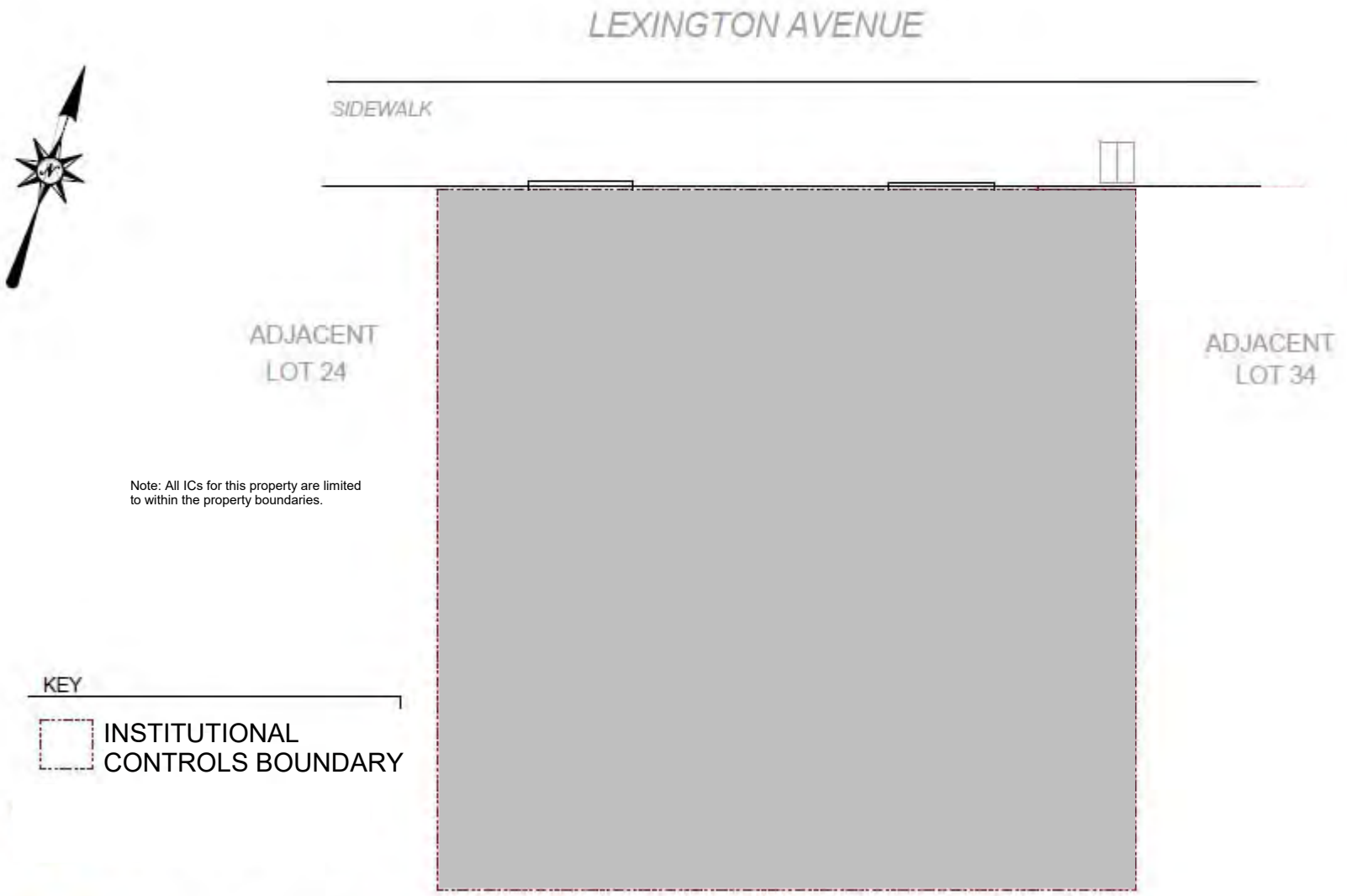
TITLE: FIGURE 6 - MONITORING WELL AND INJECTION WELL LOCATIONS



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DATE: MAY 8, 2017

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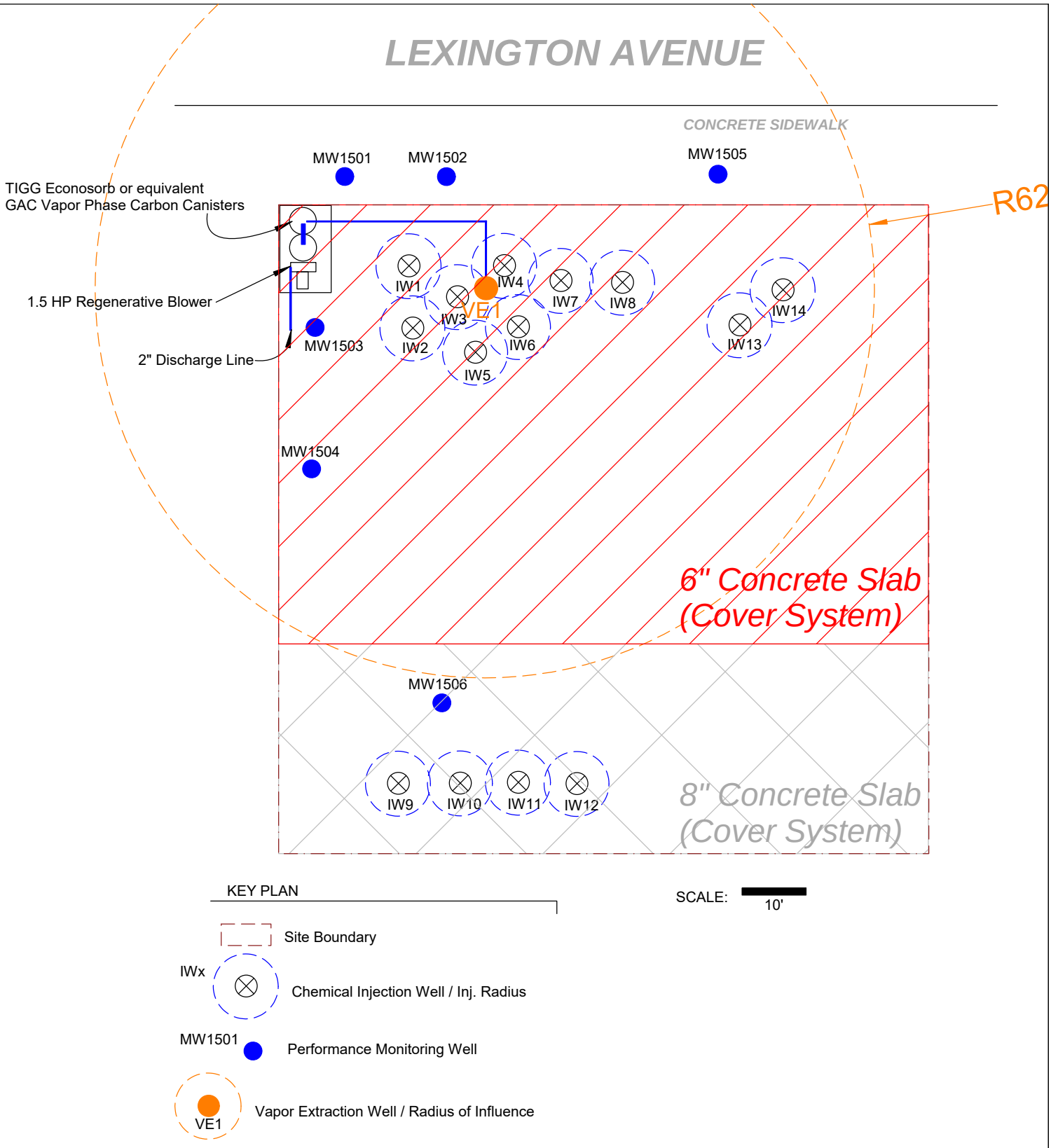
TITLE: FIGURE 7 -
ICs BOUNDARIES



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PROJECT
Former Motor Freight Garage Site
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Brooklyn, NY 11221
Block 1628 Lot 30

DATE: JUL 28, 2017

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TITLE: FIGURE 8 - ENGINEERING CONTROLS LOCATIONS

ATTACHMENT A
Site Contacts

LIST OF SITE CONTACTS

Name	Phone/Email Address
Site Owner and Remedial Party	
Lexington Flats LLC Joel Schwartz	718-599-6775 joel@southsideunits.com
Qualified Environmental Professional	
Environmental Business Consultants Charles Sosik	631.504.6000 CSosik@ebcincny.com
NYSDEC DER Project Manager	
Kyle Forster	518-402-8644 kyle.forster@dec.ny.gov
NYSDEC Bureau Chief	
Janet Brown, P.E.	518-402-9768 Janet.brown@dec.ny.gov
Remedial Party Attorney	
Schnapf LLC Lawrence Schnapf	212-876-3189 Larry@SchnapfLaw.com
NYSDOH	
Sarita Wagh	BEEI@health.ny.gov

ATTACHMENT B
Excavation Work Plan

EXCAVATION WORK PLAN (EWP)

B-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 NYSDEC. Table B-1 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 A**.

Table B-1: Notifications*

Name	Contact Information
Kyle Forster	518-402-8644, kyle.forster@dec.ny.gov
Janet Brown	518-402-9768, Janet.brown@dec.ny.gov

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

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent of excavation, plans/drawings 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 to be encountered 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 (HASP), in electronic format, if it differs from the HASP provided in **Attachment G** of this SMP;

- Identification of disposal facilities for potential waste streams; and
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

B-2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based (e.g. photoionization detector) soil screening will be performed by a qualified environmental professional during all excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed when 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 and material that requires testing to determine if the material can be reused on-site as soil beneath a cover or if the material can be used as cover soil. Further discussion of off-site disposal of materials and on-site reuse is provided in Section B-5 of this Attachment.

B-3 SOIL STAGING 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 the NYSDEC.

B-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 remedial party (if applicable) and its contractors are 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).

A truck wash will be operated on-site, as appropriate. The qualified environmental professional will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the site until the activities performed under this section are complete Truck wash waters will be collected and disposed of off-site in an appropriate manner.

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.

B-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 tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

Truck transport routes are as follows:

ENTERING SITE - from the Brooklyn Queens Expressway heading south; take the Kent Avenue Exit and turn left heading south on Kent Avenue to Myrtle Avenue. Turn left, heading east on Myrtle Avenue to Lewis Avenue. Turn right heading south on Lewis Avenue to Greene Avenue. Turn left on Greene Avenue heading east to Broadway. Turn right heading southeast on Broadway one block to Lexington Avenue. Turn Right on Lexington Avenue to the Site entrance on the left (0.25 blocks).

EXITING SITE – Turn left onto Lexington Avenue heading west to Lewis Avenue. Make a right heading north on Lewis Avenue to Myrtle Avenue. Turn left heading west on Myrtle Avenue to Bedford Avenue. Make a right on Bedford Avenue heading north to Flushing Avenue. Make a left on Flushing Avenue heading west to Kent Avenue. Make a right on Kent Avenue heading north to Williamsburg Street East. Make a right on Williamsburg Street East heading north and continue to the on-ramp (bearing left) for the Brooklyn-Queens Expressway.

All trucks loaded with site materials will exit the vicinity of the Site using only these approved truck routes. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport.

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.

B-6 MATERIALS DISPOSAL OFF-SITE

All material 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 material 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 Unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

B-7 MATERIALS REUSE ON-SITE

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 reuse 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. This soil will undergo a testing program to confirm that it meets unrestricted SCOs prior to unregulated disposal or reuse on-site. Confirmation testing of clean soils will be in accordance with DER-10 as follows:

Contaminant	**VOCs**	**SVOCs, Inorganics & PCBs/Pesticides**	
Soil Quantity (cubic yards)	**Discrete Samples**	**Composite**	**Discrete Samples/Composite**
0-50	1	1	Each composite sample for analysis is created from 3-5 discrete samples from
50-100	2	1	
100-200	3	1	
200-300	4	1	

300-400	4	2	representative locations in the fill.
400-500	5	2	
500-800	6	2	
800-1000	7	2	
1000	Add an additional 2 VOC and 1 composite for each additional 1000 Cubic yards or consult with DER		

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.

B-8 FLUIDS MANAGEMENT

All liquids to be removed from the Site, including but not limited to, excavation dewatering, decontamination waters 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, and will be managed off-site, unless prior approval is obtained from NYSDEC.

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.

B-9 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. A Request to Import/Reuse Fill or Soil form, which can be found at http://www.dec.ny.gov/regulations/67386.html, will be prepared and submitted to the NYSDEC project manager allowing a minimum of 5 business days for review.

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 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.

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

B-10 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 the 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.

B-11 EXCAVATION 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 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 Review Report.

B-12 OTHER NUISANCES

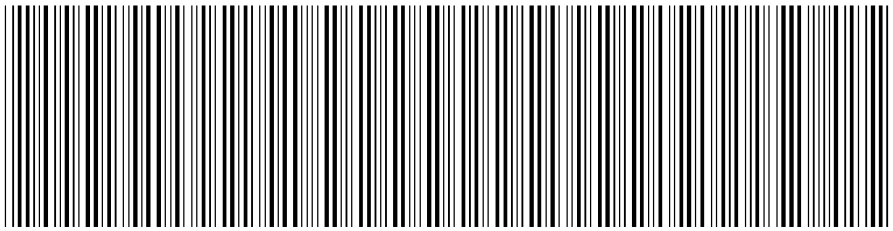
A plan for rodent control will be developed and utilized by the contractor prior to and during site clearing and site grubbing, and during all remedial work.

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

ATTACHMENT C
Environmental Easement / Notice / Deed Restriction

NYC DEPARTMENT OF FINANCE
OFFICE OF THE CITY REGISTER

This page is part of the instrument. The City Register will rely on the information provided by you on this page for purposes of indexing this instrument.The information on this page will control for indexing purposes in the event of any conflict with the rest of the document.



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RECORDING AND ENDORSEMENT COVER PAGE **PAGE 1 OF 10**

Document ID: 2016101600004001 Document Date: 09-12-2016 Preparation Date: 10-16-2016
Document Type: EASEMENT
Document Page Count: 9

PRESENTER:
AFFILIATED ABSTRACT LLC
119 SOUTH THIRD STREET
CTSY-198
BROOKLYN, NY 11249
718-799-5010
RECORDINGS@AFFABSTRACT.COM

RETURN TO:
AFFILIATED ABSTRACT LLC
119 SOUTH THIRD STREET
CTSY-198
BROOKLYN, NY 11249
718-799-5010
RECORDINGS@AFFABSTRACT.COM

PROPERTY DATA

Borough	Block	Lot	Unit	Address
BROOKLYN	1628	30	Entire Lot	834 LEXINGTON AVENUE

Property Type: COMMERCIAL REAL ESTATE

CROSS REFERENCE DATA

CRFN_____ *or* DocumentID_____ *or* _____ Year_____ Reel____ Page_____ *or* File Number_____

PARTIES

GRANTOR/SELLER:
LEXINGTON FLATS LLC
183 WILSON STREET, SUITE 133
BROOOKLYN, NY 11211

GRANTEE/BUYER:
THE PEOPLE OF THE STATE OF NEW YORK
625 BROADWAY
ALBANY, NY 12233

FEES AND TAXES

Mortgage :

Mortgage Amount:	$	0.00
Taxable Mortgage Amount:	$	0.00
Exemption:		
TAXES: County (Basic):	$	0.00
City (Additional):	$	0.00
Spec (Additional):	$	0.00
TASF:	$	0.00
MTA:	$	0.00
NYCTA:	$	0.00
Additional MRT:	$	0.00
TOTAL:	$	0.00
Recording Fee:	$	82.00
Affidavit Fee:	$	0.00

Filing Fee: $ 250.00

NYC Real Property Transfer Tax: $ 0.00

NYS Real Estate Transfer Tax: $ 0.00

RECORDED OR FILED IN THE OFFICE OF THE CITY REGISTER OF THE CITY OF NEW YORK
Recorded/Filed 10-18-2016 11:28
City Register File No.(CRFN): **2016000365209**

City Register Official Signature

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

THIS INDENTURE made this 12th day of September, 2016 between Owner(s) Lexington Flats LLC, having an office at 183 Wilson Street, Suite 133, Brooklyn, New York 11211, County of Kings, 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 832-834 Lexington Avenue in the City of New York, County of Kings 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 1628 Lot 30, being the same as that property conveyed to Grantor by deed dated October 29, 2014 and recorded in the City Register of the City of New York as CRFN #201400397496. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately 0.2295684 +/- acres, and is hereinafter more fully described in the Land Title Survey dated August 10, 2016 prepared by Vincent Teutonico, L.L.S. of Apple Surveying, 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: C224202-02-15, 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: C224202
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.

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

Lexington Flats LLC:

By: _____

Print Name: Shaindy Schwartz

Title: Manager Date: August 17, 2016

Grantor's Acknowledgment

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

On the 17th day of August, in the year 2016, before me, the undersigned, personally appeared Shaindy Schwartz, 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

MARK SCHLANGER
NOTARY PUBLIC-STATE OF NEW YORK
No. 02SC6201308
Qualified in Kings County
My Commission Expires February 17, 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 12th day of September, in the year 2016, 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

David J. Chiusano
Notary Public, State of New York
No. 01CH5032146
Qualified in Schenectady County
Commission Expires August 22, 2018

SCHEDULE "A" PROPERTY DESCRIPTION

ALL that certain plot, piece or parcel of land, with the buildings and improvements theron erected, situate, lying and being in the Borough of Brooklyn, County of Kings, City and State of New York, bounded and described as follows:

BEGINNING at a point on the southerly side of Lexington Avenue distant 250 feet westerly from the corner formed by the intersection of the southerly side of Lexington Avenue with the westerly side of Ralph Avenue;

THENCE southerly parallel with Ralph Avenue, and part of the distance through a party wall, 100 feet;

THENCE westerly parallel with Lexington Avenue, 100 feet;

THENCE northerly parallel with Ralph Avenue 100 feet to the southerly side of Lexington Avenue;

THENCE easterly along the southerly side of Lexington Avenue 100 feet to the point or place of BEGINNING.

CONTAINING an area of approximately 10,000 square feet or 0.2295684 acres.

FOR INFORMATION ONLY: Said premises designated as Block 1628, Lot 30 and commonly known as 832-834 Lexington Avenue, Brooklyn, New York.

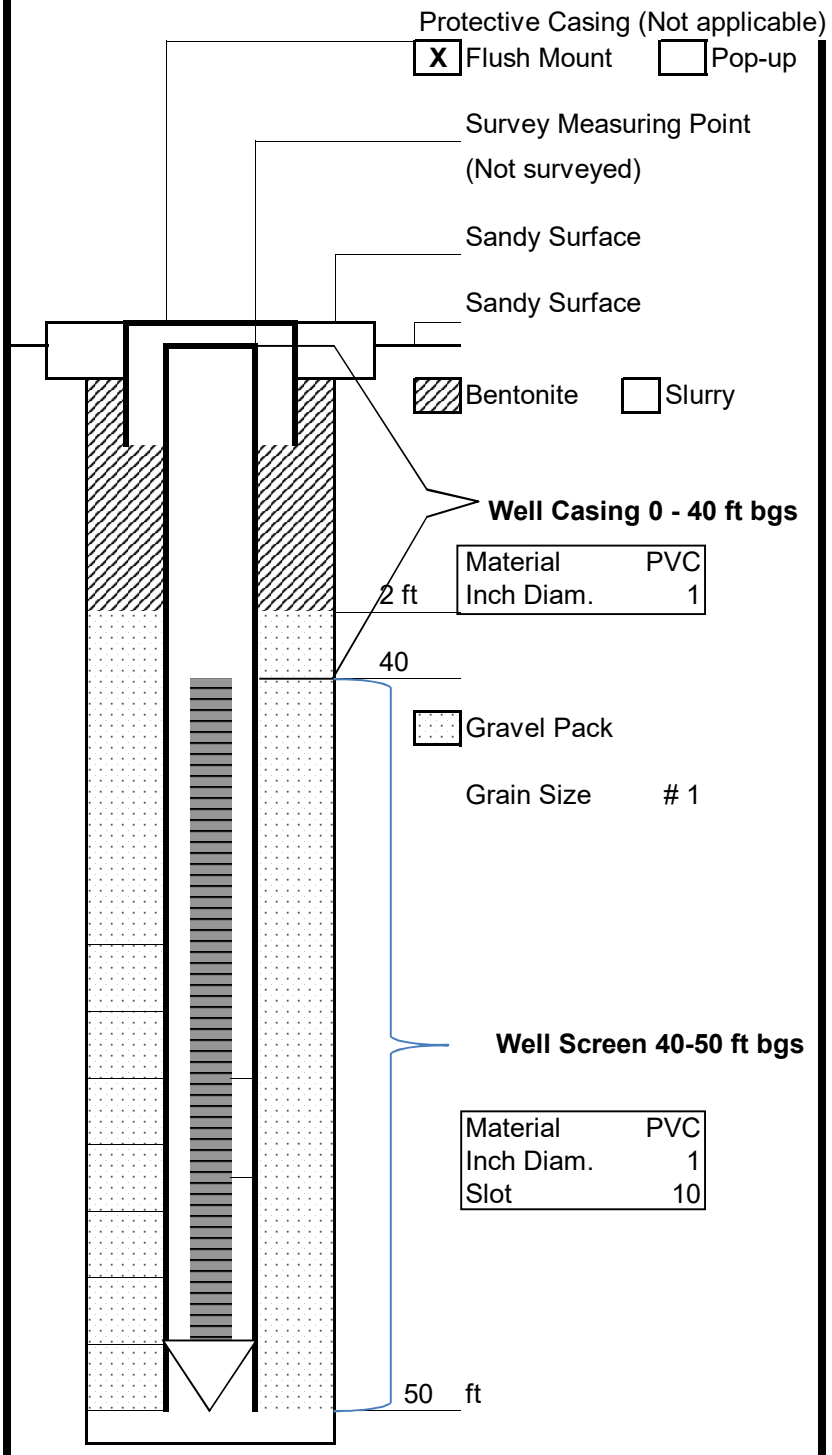
ATTACHMENT D
Monitoring Well Boring and Construction Logs

GROUNDWATER MONITORING WELL

AMC Engineering PLLC

CONSTRUCTION LOG

MW1501



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

Monitoring Well No.: MW1501

NYSDEC Permit No. BCP # C224202

Project: 832 Lexington Avenue
Brooklyn, NY

Depth to Groundwater: 42' Date: 1/6/2017

Installation Depth: 50 ft bgs

Survey Point Elevation: NA

Installation Date: 1/6/2017

Drilling Contractor: C2 Environmental Corp

Installation Method: Geoprobe

Water Removed During Development: ~5 gallons

Engineer Ariel Czemerinski, PE

Company Name: AMC Engineering PLLC

Soil Characteristics

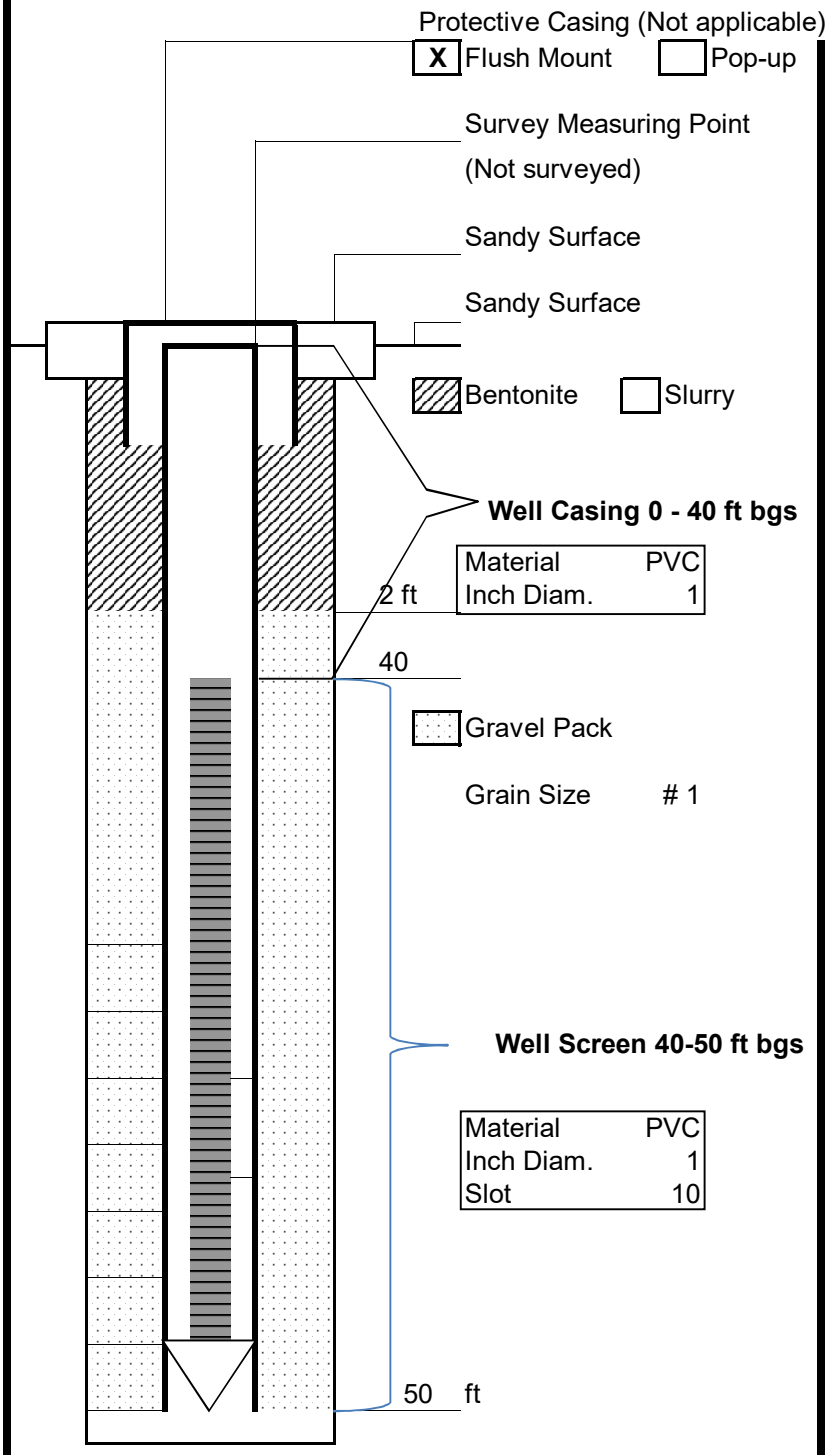
0-5 ft	Historic Fill (mainly sandy material)
5-50 ft	Clean Native Sand (medium, brown sand)

GROUNDWATER MONITORING WELL

AMC Engineering PLLC

CONSTRUCTION LOG

MW1502



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

Monitoring Well No.:	MW1502
NYSDEC Permit No.	BCP # C224202
Project:	832 Lexington Avenue Brooklyn, NY
Depth to Groundwater:	42' Date: 9/30/2016
Installation Depth:	50 ft bgs
Survey Point Elevation:	NA
Installation Date:	9/30/2016
Drilling Contractor:	C2 Environmental Corp
Installation Method:	Geoprobe
Water Removed During Developmen	~5 gallons
Engineer	Ariel Czemerinski, PE
Company Name:	AMC Engineering PLLC

Soil Characteristics

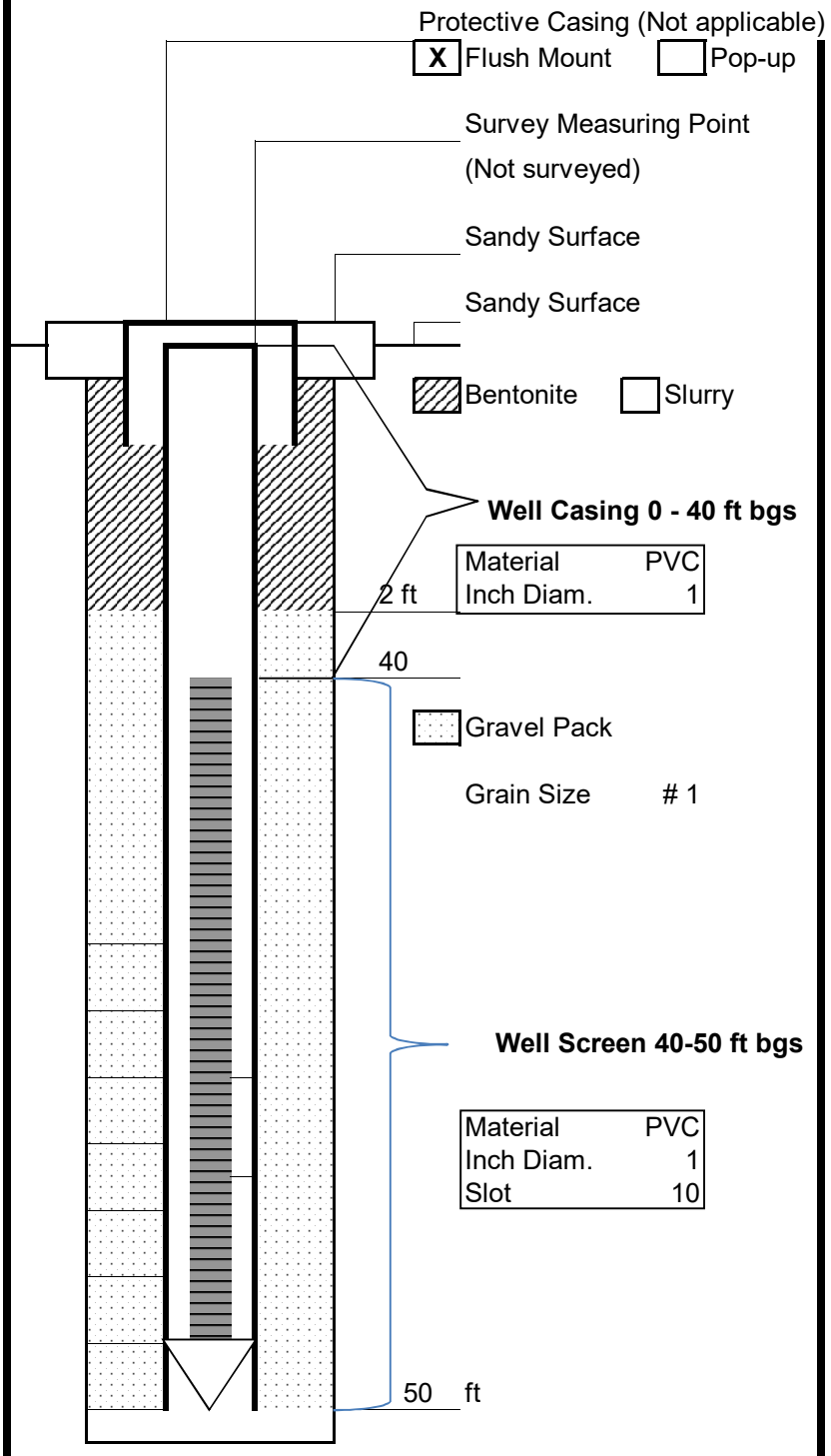
0-5 ft	Historic Fill (mainly sandy material)
5-50 ft	Clean Native Sand (medium, brown sand)

GROUNDWATER MONITORING WELL

AMC Engineering PLLC

CONSTRUCTION LOG

MW1503



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

Monitoring Well No.: MW1503

NYSDEC Permit No. BCP # C224202

Project: 832 Lexington Avenue
Brooklyn, NY

Depth to Groundwater: 42' Date: 1/6/2017

Installation Depth: 50 ft bgs

Survey Point Elevation: NA

Installation Date: 1/6/2017

Drilling Contractor: C2 Environmental Corp

Installation Method: Geoprobe

Water Removed During Development: ~5 gallons

Engineer Ariel Czemerinski, PE

Company Name: AMC Engineering PLLC

Soil Characteristics

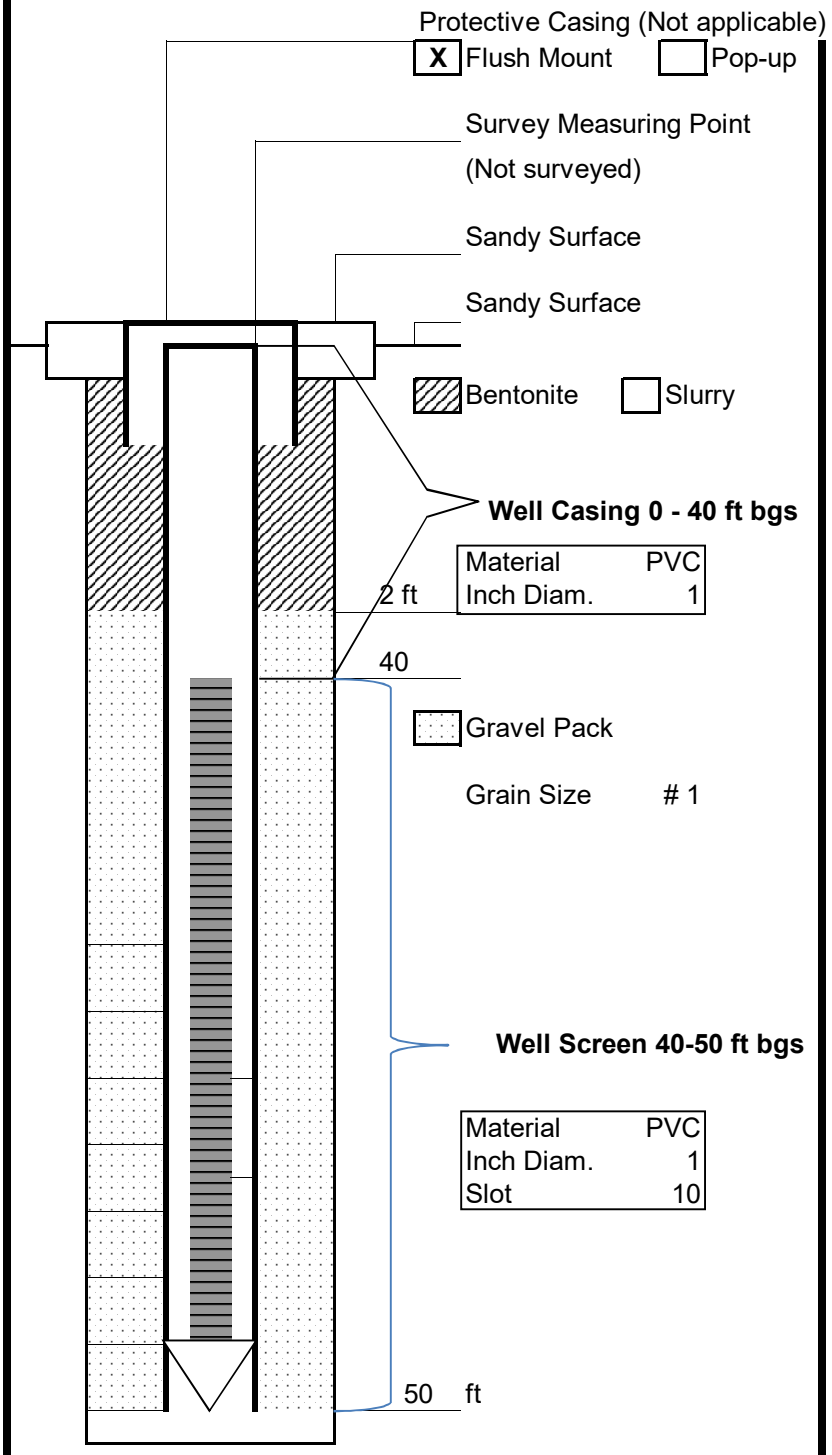
0-5 ft	Historic Fill (mainly sandy material)
5-50 ft	Clean Native Sand (medium, brown sand)

GROUNDWATER MONITORING WELL

AMC Engineering PLLC

CONSTRUCTION LOG

MW1504



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

Monitoring Well No.: MW1504

NYSDEC Permit No. BCP # C224202

Project: 832 Lexington Avenue
Brooklyn, NY

Depth to Groundwater: 42' Date: 1/6/2017

Installation Depth: 50 ft bgs

Survey Point Elevation: NA

Installation Date: 1/6/2017

Drilling Contractor: C2 Environmental Corp

Installation Method: Geoprobe

Water Removed During Development: ~5 gallons

Engineer Ariel Czemerinski, PE

Company Name: AMC Engineering PLLC

Soil Characteristics

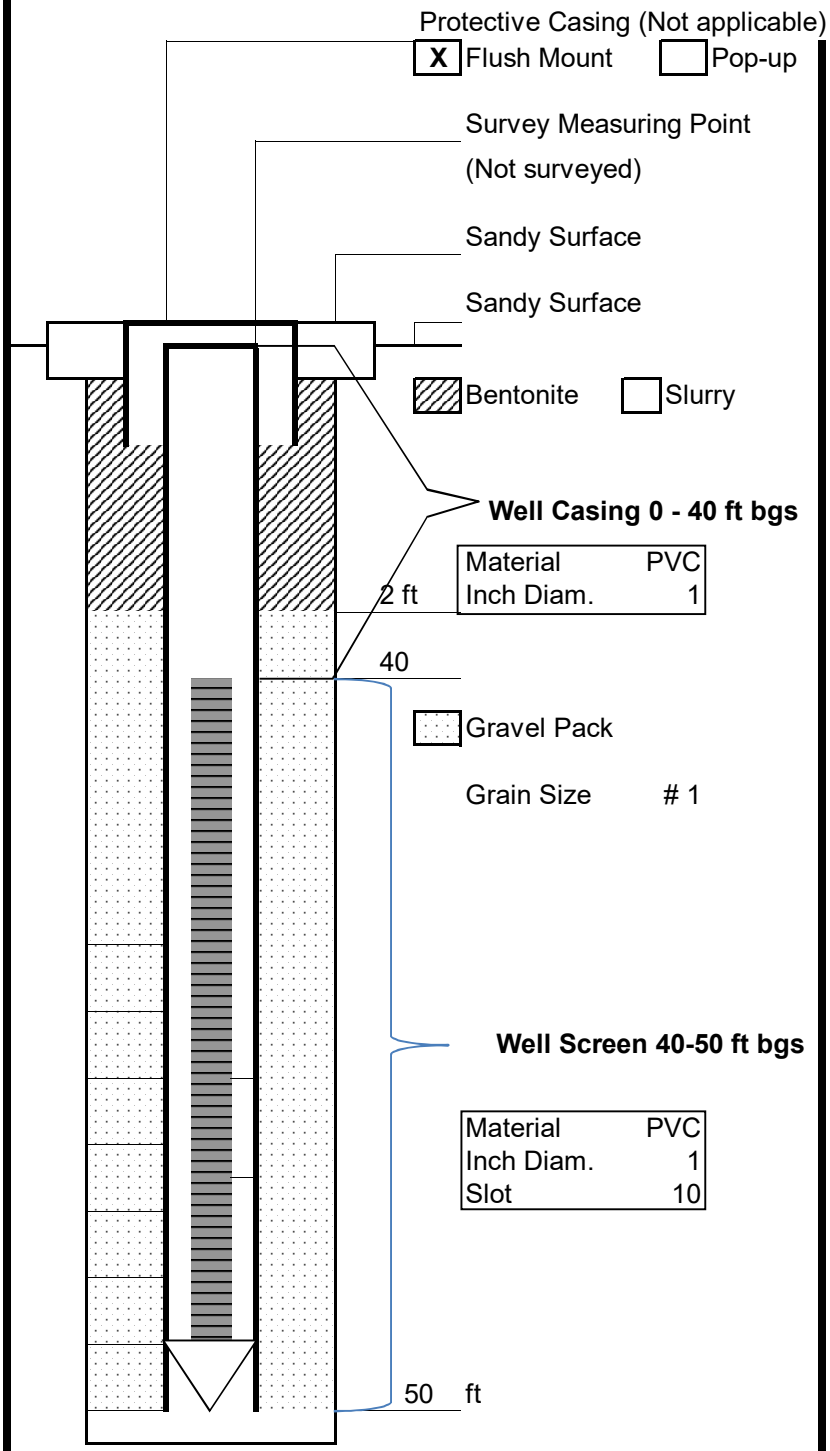
0-5 ft	Historic Fill (mainly sandy material)
5-50 ft	Clean Native Sand (medium, brown sand)

GROUNDWATER MONITORING WELL

AMC Engineering PLLC

CONSTRUCTION LOG

MW1505



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

Monitoring Well No.:	MW1505
NYSDEC Permit No.	BCP # C224202
Project:	832 Lexington Avenue Brooklyn, NY
Depth to Groundwater:	42' Date: 9/30/2016
Installation Depth:	50 ft bgs
Survey Point Elevation:	NA
Installation Date:	9/30/2016
Drilling Contractor:	C2 Environmental Corp
Installation Method:	Geoprobe
Water Removed During Developmen	~5 gallons
Engineer	Ariel Czemerinski, PE
Company Name:	AMC Engineering PLLC

Soil Characteristics

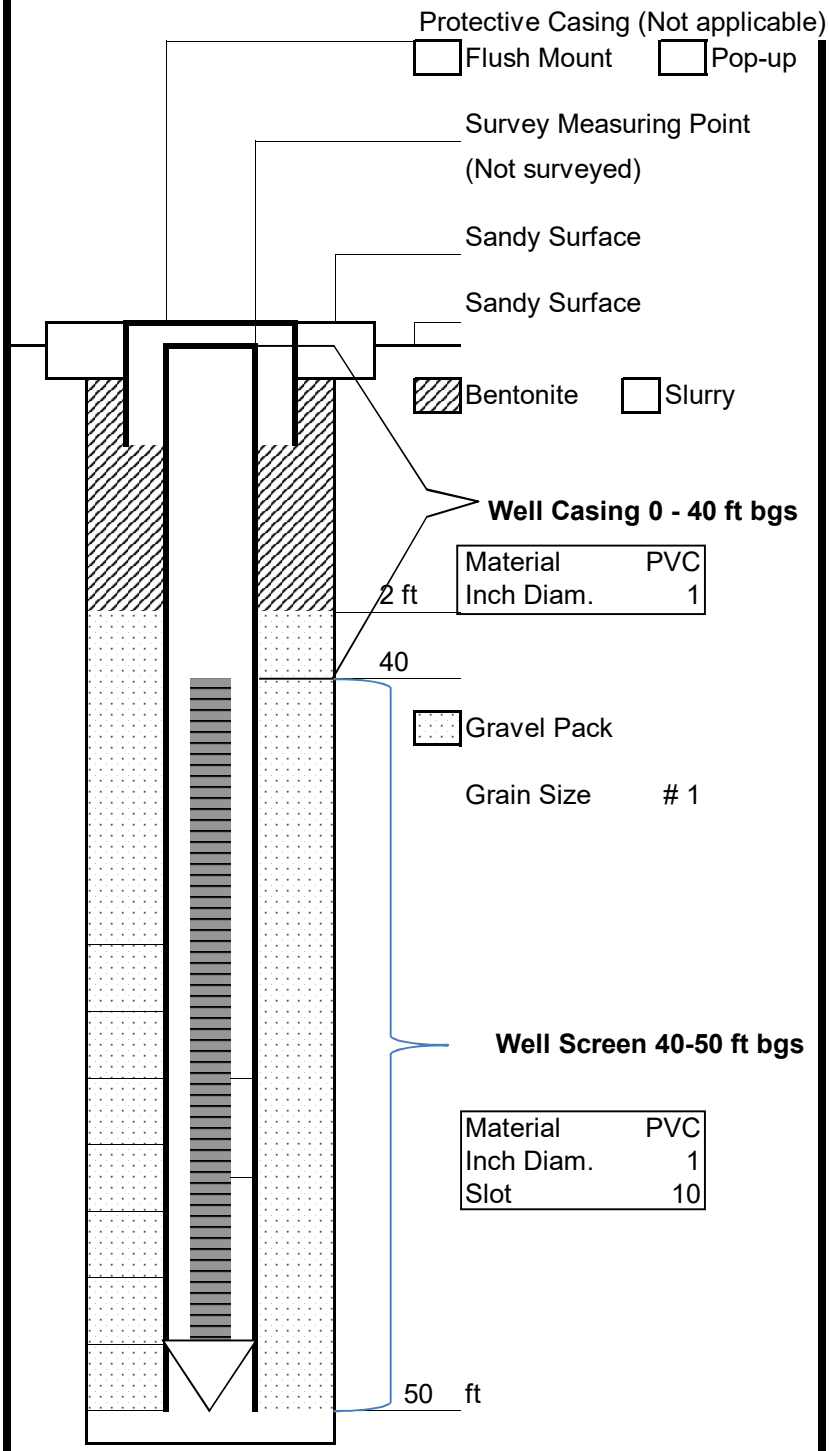
0-5 ft	Historic Fill (mainly sandy material)
5-50 ft	Clean Native Sand (medium, brown sand)

GROUNDWATER MONITORING WELL

AMC Engineering PLLC

CONSTRUCTION LOG

MW1506



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

Monitoring Well No.:	MW1506
NYSDEC Permit No.	BCP # C224202
Project:	832 Lexington Avenue Brooklyn, NY
Depth to Groundwater:	42' Date: 1/5/2017
Installation Depth:	50 ft bgs
Survey Point Elevation:	NA
Installation Date:	1/5/2017
Drilling Contractor:	C2 Environmental Corp
Installation Method:	Geoprobe
Water Removed During Developmen	~5 gallons
Engineer	Ariel Czemerinski, PE
Company Name:	AMC Engineering PLLC

Soil Characteristics

0-9 ft	Backfilled Materials (Clean Native Sand)
9-50 ft	Clean Native Sand (medium, brown sand)

Geologic Boring Log Details

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

B1 Boring Log

Location: Performed in the northwestern corner of the site.			Depth to Water (ft. from grade.)	Site Elevation Datum
Site Name: SSU1401	Address: 832 Lexington Avenue, Brooklyn, NY		Date / DTW	Ground Elevation
			Groundwater depth	
Drilling Company: C^2 Environmental	Method: Geoprobe		Not Detected	Well Specifications
Date Started: 12/22/2014	Date Completed: 12/22/2014			None
Completion Depth: 15 Feet	Geologist Reuben Levinton			

B1 (NTS)	DEPTH (ft below grade)	SAMPLES Recovery (in.)	SAMPLES Blow per 6 in.	SAMPLES PID (ppm)	SOIL DESCRIPTION
	0 to 5	21		~8	4"- Concrete rock 17"- Brown sand with rock **faint odor at bottom*
	5 to 10	46		1500	46"- Brown sand **Strong odor, PID increases in depth*
	10 to 15	46		>3,100	46"- Brown sand **Strong odor* **Retained soil sample B1(13-15)*

Geologic Boring Log Details

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

B2 Boring Log

Location: Performed on the northern side of the Site, towards the center of the Site.			Depth to Water (ft. from grade.)	Site Elevation Datum
Site Name: SSU1401	Address: 832 Lexington Avenue, Brooklyn, NY		Date / DTW	Ground Elevation
			Groundwater depth	
Drilling Company: C^2 Environmental	Method: Geoprobe		Not Detected	Well Specifications
Date Started: 12/22/2014	Date Completed: 12/22/2014			None
Completion Depth: 15 Feet	Geologist Reuben Levinton			

B2 (NTS)	DEPTH (ft below grade)	SAMPLES Recovery (in.)	SAMPLES Blow per 6 in.	SAMPLES PID (ppm)	SOIL DESCRIPTION
	0 to 5	12		0.0	5"- Concrete rock (fill material) 5"- Black gravely sand with rock (fill material) 2"- Brown sand (fill material)
	5 to 10	23		0.0	9"- Brown gravely sand (fill material) 14"- Black/brown sand
	10 to 15	60		3.0	60"- Brown sand with rocks **Weak odor, Low PID 1-3* **Retained soil sample B2(13-15)*

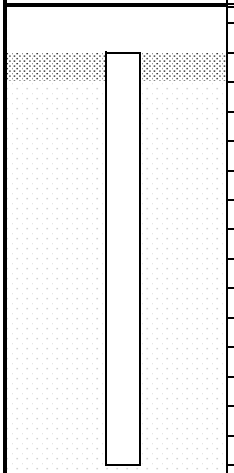
Geologic Boring Log Details

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

B3 Boring Log

Location: Performed to the southwest of B2, towards the center of the Site.			Depth to Water (ft. from grade.)	Site Elevation Datum
Site Name: SSU1401	Address: 832 Lexington Avenue, Brooklyn, NY		Date / DTW	Ground Elevation
			Groundwater depth	
Drilling Company: C^2 Environmental	Method: Geoprobe		Not Detected	Well Specifications
Date Started: 12/22/2014	Date Completed: 12/22/2014			None
Completion Depth: 15 Feet	Geologist Reuben Levinton			

B3 (NTS)	DEPTH (ft below grade)	SAMPLES Recovery (in.)	SAMPLES Blow per 6 in.	SAMPLES PID (ppm)	SOIL DESCRIPTION
	0 to 5	16		0.0	4"- Concrete rock 12"- Brown sand with rock
	5 to 10	21		0.0	3"- Brown gravely sand 18"- Brown sand
	10 to 13	41		0.0	41"- Brown sand with rocks **Retained soil sample B3(11-13)*

Geologic Boring Log Details

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

B4 Boring Log

Location: Performed on the western side of the Site, to the south of B1.			Depth to Water (ft. from grade.)	Site Elevation Datum
Site Name: SSU1401	Address: 832 Lexington Avenue, Brooklyn, NY		Date / DTW	Ground Elevation
			Groundwater depth	
Drilling Company: C^2 Environmental	Method: Geoprobe		Not Detected	Well Specifications
Date Started: 12/22/2014	Date Completed: 12/22/2014			None
Completion Depth: 15 Feet	Geologist Reuben Levinton			

B4 (NTS)	DEPTH (ft below grade)	SAMPLES Recovery (in.)	SAMPLES Blow per 6 in.	SAMPLES PID (ppm)	SOIL DESCRIPTION
	0 to 5	27		0.0	3"- Concrete rock 24"- Brown sand with rock
	5 to 10	40		0.0	40"- Brown sand w/ rock
	10 to 15	23		0.0	23"- Brown silty sand **Retained soil sample B4(10-12)*

Geologic Boring Log Details

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

B5 Boring Log

Location: Performed along the eastern side of the Site, towards the middle of the Site.			Depth to Water (ft. from grade.)	Site Elevation Datum
Site Name: SSU1401	Address: 832 Lexington Avenue, Brooklyn, NY		Date / DTW	Ground Elevation
			Groundwater depth	
Drilling Company: C^2 Environmental	Method: Geoprobe		Not Detected	Well Specifications
Date Started: 12/23/2014	Date Completed: 12/23/2014			None
Completion Depth: 15 Feet	Geologist Reuben Levinton			

B5 (NTS)	DEPTH (ft below grade)	SAMPLES Recovery (in.)	SAMPLES Blow per 6 in.	SAMPLES PID (ppm)	SOIL DESCRIPTION
	0				
	to 5	17		0.0	6"- Concrete 11"- Brown sand
	to 10	30		0.0	30"- Brown sand
	to 15	43		0.0	43"- Brown sand **Retained soil sample B5(13-15')*

Geologic Boring Log Details

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

B6 Boring Log

Location: Performed towards the middle of the Site.			Depth to Water (ft. from grade.)	Site Elevation Datum
Site Name: SSU1401	Address: 832 Lexington Avenue, Brooklyn, NY		Date / DTW	Ground Elevation
			Groundwater depth	
Drilling Company: C^2 Environmental	Method: Geoprobe		Not Detected	Well Specifications
Date Started: 12/23/2014	Date Completed: 12/23/2014			None
Completion Depth: 15 Feet	Geologist Reuben Levinton			

B6 (NTS)	DEPTH (ft below grade)	SAMPLES Recovery (in.)	SAMPLES Blow per 6 in.	SAMPLES PID (ppm)	SOIL DESCRIPTION
	0 to 5	24		0.0	2"- Concrete 22"- Brown sand
	5 to 10	35		0.0	35"- Brown sand
	10 to 15	51		0.0	51"- Brown sand **Retained soil sample B6(13-15')*

Geologic Boring Log Details

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

B7 Boring Log

Location: Performed in the southwestern corner of the Site.			Depth to Water (ft. from grade.)	Site Elevation Datum
Site Name: SSU1401	Address: 832 Lexington Avenue, Brooklyn, NY		Date / DTW	Ground Elevation
			Groundwater depth	
Drilling Company: C^2 Environmental	Method: Geoprobe		Not Detected	Well Specifications
Date Started: 12/23/2014	Date Completed: 12/23/2014			None
Completion Depth: 15 Feet	Geologist Reuben Levinton			

B7 (NTS)	DEPTH (ft below grade)	SAMPLES Recovery (in.)	SAMPLES Blow per 6 in.	SAMPLES PID (ppm)	SOIL DESCRIPTION
	0 to 5	27		0.0	4"- Concrete 19"- Brown sand 4"- Concrete **Retained soil sample B7(3-5')*
	5 to 10	38		0.0	38"- Brown sand
	10 to 15	51		0.0	51"- Brown sand **Retained soil sample B7(13-15')*

Geologic Boring Log Details

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

B8 Boring Log

Location: Performed in the southeastern corner of the site, to the west of B9.			Depth to Water (ft. from grade.)	Site Elevation Datum
Site Name: SSU1401	Address: 832 Lexington Avenue, Brooklyn, NY		Date / DTW	Ground Elevation
			Groundwater depth	
Drilling Company: C^2 Environmental	Method: Geoprobe		Not Detected	Well Specifications
Date Started: 12/23/2014	Date Completed: 12/23/2014			None
Completion Depth: 14 Feet	Geologist Reuben Levinton			

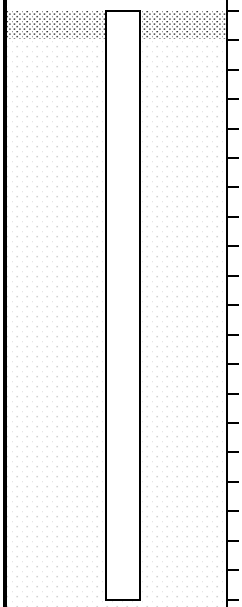
B8 (NTS)	DEPTH (ft below grade)	SAMPLES Recovery (in.)	SAMPLES Blow per 6 in.	SAMPLES PID (ppm)	SOIL DESCRIPTION
	0				
	to 4	19		0.0	4"- Concrete 15"- Brown sand with rock **Retained soil sample B8(3-5')*
	to 8	32		0.0	32"- Brown sand with brick at top.
	to 12	32		0.0	32"- Brown sand with rock at bottom
	to 14	38		0.0	38"- Brown sand *Refusal hit at 14' **Retained soil sample B8(12-14)*

Geologic Boring Log Details

ENVIRONMENTAL BUSINESS CONSULTANTS

B9 Boring Log

Location: Performed in the southeastern corner of the Site to the east of B8.			Depth to Water (ft. from grade.)	Site Elevation Datum
Site Name: SSU1401	Address: 832 Lexington Avenue, Brooklyn, NY		Date / DTW	Ground Elevation
			Groundwater depth	
Drilling Company: C^2 Environmental	Method: Geoprobe		Not Detected	Well Specifications
Date Started: 12/23/2014	Date Completed: 12/23/2014			None
Completion Depth: 15 Feet	Geologist Reuben Levinton			

B9 (NTS)	DEPTH (ft below grade)	SAMPLES Recovery (in.)	SAMPLES Blow per 6 in.	SAMPLES PID (ppm)	SOIL DESCRIPTION
	0 to 4	21		0.0	6"- Concrete 7"- Brown sand 8"- Brown/black gravely sand with glass and brick **Retained soil sample B9(3-5')*
	4 to 8	21		0.0	21"- Brown sand with brick at top.
	8 to 12	42		0.0	42"- Brown sand, moist at bottom
	12 to 16	48		0.0	48"- Brown sand with rocks **Retained soil sample B9(13-15')*

ATTACHMENT E
Field Sampling Plan

Former Motor Freight Garage Site
832-836 Lexington Avenue
Brooklyn, NEW YORK
Block 1628 Lot 30

FIELD SAMPLING PLAN

***NYSDEC Site Number:* C224202**

Prepared for:
Lexington Flats LLC
183 Wilson Avenue, Suite 133
Brooklyn, NY 11211

Prepared by:
AMC Engineering PLLC
18-36 42nd Street
Astoria, NY 11105
Phone: (718) 545-0474

APRIL 2017

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832-836 Lexington Avenue, Brooklyn NY

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Former Motor Freight Garage Site
832-836 Lexington Avenue, Brooklyn NY

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APPENDICES

Appendix A	Inspection Form
Appendix B	Sample Chain of Custody

List of Acronyms

AS	Air Sparging
ASP	Analytical Services Protocol
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CAMP	Community Air Monitoring Plan
C/D	Construction and Demolition
CFR	Code of Federal Regulation
CLP	Contract Laboratory Program
COC	Certificate of Completion
CO2	Carbon Dioxide
CP	Commissioner Policy
DER	Division of Environmental Remediation
EC	Engineering Control
ECL	Environmental Conservation Law
ELAP	Environmental Laboratory Approval Program
ERP	Environmental Restoration Program
EWP	Excavation Work Plan
GHG	Green House Gas
GWE&T	Groundwater Extraction and Treatment
HASP	Health and Safety Plan
IC	Institutional Control
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYCRR	New York Codes, Rules and Regulations
O&M	Operation and Maintenance
OM&M	Operation, Maintenance and Monitoring
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PID	Photoionization Detector
PRP	Potentially Responsible Party
PRR	Periodic Review Report
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act

RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RP	Remedial Party
RSO	Remedial System Optimization
SAC	State Assistance Contract
SCG	Standards, Criteria and Guidelines
SCO	Soil Cleanup Objective
SMP	Site Management Plan
SOP	Standard Operating Procedures
SOW	Statement of Work
SPDES	State Pollutant Discharge Elimination System
SSD	Sub-slab Depressurization
SVE	Soil Vapor Extraction
SVI	Soil Vapor Intrusion
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leachate Procedure
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VCA	Voluntary Cleanup Agreement
VCP	Voluntary Cleanup Program

1.0 INTRODUCTION

1.1 General

This Field Sampling Plan is a part of the Site Management Plan for the Former Motor Freight Garage Site located at 832-836 Lexington Avenue, Brooklyn, New York (hereinafter referred to as the "Site").

Lexington Flats LLC (the Volunteer) entered into a Brownfield Cleanup Agreement with the New York State Department of Environmental Conservation (NYSDEC) in February of 2015 to remediate a 0.229-acre (10,000 sf) property located in Brooklyn, Kings County, New York (Site No. C224202). The Site was remediated to restricted residential use and will be used for restricted residential use.

The Site is located on the south side of Lexington Avenue, between Ralph Street and Patchen Avenue, and is designated as Section 1900, Block 1628, Lot 30 on the Brooklyn Tax Map. The site is an approximately 0.229-acre area (10,000 square feet), and is bounded by Lexington Avenue to the north, a series of residential homes to the south (Block 1628 Lots 58-62), a 1-story commercial building to the east (Block 1628 Lot 34), and vacant property to the west (Block 1628 Lot 24). The lot is currently developed with a one-story brick building.

After completion of the remedial work, some contamination was left at this site, which is hereafter referred to as "remaining contamination". The Site will be limited to restricted residential use, groundwater use is prohibited, and future excavation will be handled as per SMP. A soil vapor extraction system has been installed to control exposure to remaining contamination to ensure protection of public health and the environment. Additionally, an in-situ chemical oxidation (ISCO) program utilizing chemical injections has been prepared for this site. This Field Sampling Plan outlines the necessary methods to monitor the installed SVE system and the groundwater conditions as per ISCO plan. This 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.

2.0 SUMMARY OF REMEDIAL ACTIONS

2.1 Remedial Actions Taken

An investigation of the underground storage tank, including sidewall sampling, was completed by EBC in September 2016. The sampling event confirmed that the tank has been properly removed and all of the contaminated soils have been removed. Endpoint samples across the site have confirmed that all soils at the Site met the Track 2 Restricted-Residential Use Soil Cleanup Objectives.

A Soil Vapor Extraction Design Document (SVE DD) was submitted the NYSDEC and approved in September 2016. As per the approved SVE DD, the SVE extraction well was installed during October 2016 by C Squared Environmental Corp. EBC oversaw and completed the soil vapor sampling during this time. AMC completed a communication / start-up test on January 26, 2017, to verify the adequacy of the SVE design. The system began operation on February 14, 2017, after EBC personnel obtained pre-, mid-, and post-carbon samples. The SVE system consists of one (1) extraction well installed to 40' below grade. A 1.5 HP Ametek blower connects the extraction wells to two, 55-gallon GAC drums arranged in series. This system achieves a radius of influence of 62 feet, which was calculated during the start-up test.

An In-Situ Chemical Oxidant Design Document (ISCO DD) was submitted the NYSDEC and approved in September 2016. As per the approved ISCO DD, fourteen (14) injection wells and six (6) monitoring wells were installed between September 2016 and January 2017 by C Squared Environmental Corporation. EBC oversaw the wells installation. Chemical injections were performed between December 2016 and March 2017. A round of pre-injection groundwater samples were obtained from the monitoring wells. Post-injection groundwater samples were obtained one month after the final injection, and then quarterly thereafter. Additional samples will be obtained in the future to assess the effectiveness of the treatment process.

2.2 Remedial Action Objectives

The Remedial Action Work Plan identified the following Remedial Action Objectives (RAOs):

2.2.1 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, surface water, or sediment contamination.

2.2.2 Soil Vapor

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

2.2.3 Groundwater

RAOs for Public Health Protection

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

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable (if found to be related to an on-site release).
- Remove the source of ground or surface water contamination (if found to be related to an on-site release).

2.3 Remaining Contamination

2.3.1 Soil

Based on the endpoint samples obtained across the Site, this site met the Track 4 Cleanup SCOs.

2.3.2 Groundwater

Groundwater contamination was noted during the remedial investigation to a depth of 45' below grade. As part of the groundwater remediation, an ISCO injection plan was implemented to treat the elevated VOCs present in the groundwater. Samples were obtained one month after injections, and quarterly thereafter.

2.3.3 Surface Water

There is no surface water located on site. No remedial actions were undertaken for this media.

2.3.4 Soil Vapor

A soil vapor extraction system was installed to mitigate soil vapor intrusion within the building.

2.4 Engineering Controls

2.4.1 Soil Vapor Extraction System (SVE)

The SVE system was installed as follows:

- One extraction well (VE1) system to 40' below grade.
- An extraction line consisting of 2-inch diameter PVC with 20 feet of 0.020-slotted screen and 20 feet of riser, embedded in approximately 6 inches of bentonite grout;
- Extraction well equipped with vacuum gauge, sampling port, and flow controller;
- 1.5 HP regenerative blower (Ametek Model 515254) with particulate filter and vapor trap located outside the room;
- A 2-cannister, discharge treatment with vapor-phase granular activated carbon arranged in parallel (General Carbon Corporation).

2.4.2 In-Situ Chemical Oxidation (ISCO) Injections Plan

The ISCO design was as follows:

- Fourteen 1-inch injection wells (IW1-14) consisting of 10 feet of 0.010-slotted screen and 40 feet of riser installed to 50' below grade (or 39' below cellar slab);
- Six 1-inch monitoring wells (MW1501-1506) consisting of 10 feet of 0.010-slotted screen and 40 feet of riser installed to 50' below grade;

AMC and EBC field inspectors (under the direct supervision of the Remedial Engineer) inspected and photographed the injection procedures. C Squared Environmental Corporation performed the chemical injections.

A total of four (4) chemical injections events were performed between December 2016 and March 2017. A total of 11,000 pounds of sodium persulfate (Klozur®) and 522.5 pounds of iron-EDTA (FeEDTA) were injected into the fourteen injection wells. Although a total of 10,067 lbs was calculated for injections, an additional 1,455.5 lbs was injected to accommodate for a safety factor. Injections were performed on December 13,

2016, December 19, 2016, March 17, 2017, and March 30, 2017, and a brief summary of events can be found below:

Injection Event #1 – December 13, 2016

A total of 3630 lbs of Klozur and 165 lbs of FeEDTA were injected into IWs 1-5, which are located in the area of the former UST, on the north-west section of the property. This injection event was part of the "initial application of 5,376 lbs" as per ISCO plan.

Injection Event #2 – December 19, 2016

A total of 2970 lbs of Klozur and 137.5 lbs of FeEDTA were injected into IWs 6-8 and 13-14. IWs 6-8 are located in the area of the former UST, on the north-west section of the property. IWs 13-14 are located in the area of the elevated PVOCs, on the north-east section of the property. This injection event was part of the "initial application of 5,376 lbs" as per ISCO plan.

Injection Event #3 – March 17, 2017

1925 lbs of Klozur and 96.25 lbs of FeEDTA were injected into IWs 1-4. Additionally, 1265 lbs of Klozur and 41.25 lbs of FeEDTA were injected into IWs 5-8. IWs 1-8 are located in the area of the former UST, on the north-west section of the property.

Injection Event #4 – March 30, 2017

660 lbs of Klozur and 55 lbs of FeEDTA were injected into IWs 5-8. Additionally, 550 lbs of Klozur and 27.5 lbs of FeEDTA were injected into IWs 9-12. IWs 5-8 are located in the area of the former UST, on the north-west section of the property. IWs 9-12 are located in the rear yard.

3.0 MONITORING PLAN

3.1 Treatment System Monitoring and Sampling

3.1.1 SVE System Monitoring

Monitoring of the SVE system will be performed on a routine basis, as identified in Table 2: Remedial System Monitoring Requirements and Schedule (see below). Modification to the frequency or sampling requirements will require approval from the NYSDEC. A visual inspection of the complete system will be conducted during each monitoring event. Unscheduled inspections and/or sampling may take place when a suspected failure of the SVE system has been reported or an emergency occurs that is deemed likely to affect the operation of the system. SVE system components to be monitored include, but are not limited to, the components included in Table 1 below.

Table 1 – Remedial System Monitoring Requirements and Schedule

Remedial System Component	Monitoring Parameter	Operation Range	Monitoring Schedule
Extraction Well	Vacuum reading	Typically -20 to -14 "wc	Quarterly
Regenerative Blower	Flow Rate	TBD	Quarterly
Activated Carbon Drums	Expiration date, damage, labeling	-	Quarterly
Plumbing	Cracks, damage, labeling	-	Quarterly

A complete list of components to be inspected is provided in the Inspection Checklist, provided in Attachment H of the SMP. If any readings are not within their specified operation range, any equipment is observed to be malfunctioning or the system is not performing within specifications; maintenance and repair is required immediately.

3.1.2 SVE System Sampling

Samples shall be collected from the SVE system on a variable schedule. Sampling locations, required analytical parameters, and schedule are provided in Table 2 – Remedial System Sampling Requirements and Schedule below. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

Table 2– Remedial System Sampling Requirements and Schedule

Sampling Location	Sampling	Schedule
Pre-carbon, mid-carbon, and post-carbon locations	PID reading (tedlar bag)	Monthly for the first six months and then quarterly thereafter
Pre-carbon, mid-carbon, and post-carbon locations	VOCs by Method TO-15 (tedlar bag)	Monthly for the first six months and then quarterly thereafter
Spent carbon	VOCs, SVOCs, pH, and ignitability by TCLP method (4 oz. and 8 oz. jars)	As needed, based on breakthrough times

3.1.3 ISCO Treatment Monitoring

Monitoring of the ISCO treatment will be performed one month after the final injection event, and then on a quarterly basis thereafter, as identified in Table 3 ISCO Monitoring Requirements and Schedule (see below). Modification to the frequency or sampling requirements will require approval from the NYSDEC. A visual inspection of the injection wells and monitoring wells will be conducted during each monitoring event. Unscheduled inspections and/or sampling may take place when an emergency occurs that is deemed likely to affect the operation of the system. ISCO system components to be monitored include, but are not limited to, the components included in **Table 3**.

Table 3 – ISCO Monitoring Requirements and Schedule

ISCO System Component	Monitoring Parameter	Monitoring Schedule
Injection Wells	Condition, PID Screen, Depth to water, depth to bottom.	Quarterly
Monitoring Wells	Condition, PID Screen, Depth to water, depth to bottom.	One month after injections, and then quarterly thereafter

A complete list of components to be inspected is provided in the Inspection Checklist, provided in the SMP as Attachment H - Site Management Forms. If the monitoring wells or injections wells have been damaged, lost, or require redevelopment, maintenance and repair, as per the Operation and Maintenance Plan, is required immediately.

3.1.4 ISCO Treatment Sampling

One month following oxidant application, groundwater samples will be collected from monitoring wells MW1501-1506 to monitor effectiveness of the chemical oxidant injection(s). The quarterly groundwater sampling program will begin following collection of the one month post-injection samples. Sampling locations, required analytical parameters and schedule are provided in **Table 4** – ISCO Treatment Assessment Sampling Requirements and Schedule below. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

Table 4 – ISCO Treatment Assessment Sampling Requirements and Schedule

Sampling Location	Analytical Parameters		Schedule
	VOCs (EPA Method 8260C)	Persulfate, Fe2, pH	
MW1501	X	X	One month after injection, and every quarter thereafter
MW1502	X	X	One month after injection, and every quarter thereafter
MW1503	X	X	One month after injection, and every quarter thereafter
MW1504	X	X	One month after injection, and every quarter thereafter
MW1505	X	X	One month after injection, and every quarter thereafter
MW1506	X	X	One month after injection, and every quarter thereafter
Container	(3) 40mL VOAs preserved with HCL	-	

The results of the sampling events will be indicated in Periodic Review Reports (PRR). As part of the PRR submittal, a graph showing the change in VOCs concentrations, specifically BTEX compounds, will be attached.

Groundwater samples were collected approximately one month after each chemical oxidant injection to monitor the effectiveness of the chemical oxidant injections. Modification to the frequency or sampling requirements will require approval from the NYSDEC. The network of monitoring wells has been installed immediately down-gradient of all volatile organic carbon remediation areas for the purpose of evaluation of the effectiveness of the chemical oxidant injections.

Table 5 summarizes the wells identification number, location, depths, diameter and screened intervals of the wells. As part of each groundwater monitoring event, the six monitoring wells are to be sampled to monitor groundwater quality.

Table 5 – Monitoring Well Construction Details

MW ID	Well Location	Well Diameter (inches)	Installation Depth (ft)	
			Riser Interval	Screen Interval
MW1501	On sidewalk, north-west of tank area	1	0-40	40-50ft
MW1502	On sidewalk, north of tank area	1	0-40	40-50ft
MW1503	On site, west of tank area	1	0-40	40-50ft
MW1504	On site, south-west of tank area	1	0-40	40-50ft
MW1505	On sidewalk, north-east of tank area	1	0-40	40-50ft
MW1506	On site, in the rear yard north of IW9-12	1	0-40	40-50ft

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.

3.2 Post-Remediation SVE Media Monitoring and Sampling

The SVE system has been designed to mitigate soil vapor and limit intrusion. When the system is no longer actively recovering significant contaminant mass, a request will be made to DEC to terminate operation. Follow-up subslab or indoor air sampling may be required before granting this request. Consideration may also be given to converting the system to operate as a subslab depressurization system. A plan for such post-remedial sampling, if required will be made to DEC in a separate submittal.

3.3 Post-Remediation Groundwater Sampling

Groundwater samples will be collected from MW1501-1506 one month after the end of the chemical oxidant injection events to confirm the performance of the remedy. Additionally, the quarterly sampling/monitoring program will begin following the collection of the 1-month post-injection sampling event, until modifications to the frequency or sampling requirements are granted by the NYSDEC.

Sampling locations and required analytical parameters are provided in Table 4 – ISCO Treatment Assessment Sampling Requirements and Schedule, above. Modification to the sampling requirements will require approval from the NYSDEC.

All sampling activities will be recorded in a field book and associated sampling log as provided in **Attachment H** - 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.

4.0 SVE SAMPLING PROTOCOL

4.1 Monitoring Procedure

An inspection form has been attached that details the information to be collected during each monitoring event. The following list is followed by environmental professionals where monitoring the SVE System at this Site:

1. Verify that the system is operating.
2. Visually inspect all PVC pipes, connections, wellheads, carbon canisters, and the blower. If there are any critical issues with the integrity of the system, shut off the blower and notify the site operator and remedial engineer.
3. Record the pressure at each extraction well (4 total) as indicated on the vacuum gauge at each wellhead.
4. Record the pressure at the blower and carbon canisters as indicated on the vacuum gauge.
5. Using a peristaltic pump (or equivalent), collect a soil vapor sample at each extraction well. Attach the peristaltic pump to each brass sampling port (on each wellhead) and connect a tedlar bag. Fill the tedlar bag with as much air as possible. Insert the PID in the tedlar bag to collect a VOC reading. Record.
6. Using the PID and available sampling locations, collect VOC measurements at the pre-carbon and post-carbon locations. The pre- and post-carbon do not need the use of the peristaltic pump due to the positive pressure that is created after the pump.

4.2 Sampling Procedure

Indoor ambient air quality samples are required to be collected quarterly. Six liter summa canisters will be installed onsite during these sampling events to collect ambient air for 8 hours.

The summa canister will be placed at a height of 3-4 feet above the floor to be within the breathing zone. The ambient air samples will be collected in 6-Liter summa canisters

fitted with 8 hour laboratory calibrated regulators. The sample identification, date, start time, start vacuum, end time and end vacuum must be recorded on the tags attached to each canister and on the chain of custody. All samples will be submitted to Phoenix Environmental Laboratories (Phoenix) of 587 East Middle Turnpike, Manchester, CT 06040, a New York State ELAP certified environmental laboratory (ELAP Certification No. 11301). Transport to the laboratory will be through a Phoenix courier under strict chain-of custody documentation. The samples are undergo laboratory analysis of VOCs by EPA Method TO-15. See Appendix B for a sample chain of custody.

4.3 Standard Protocol

All sampling activities will be recorded in a field book and will be documented with photos. Other observations (e.g., well integrity, etc.) will be noted on the sampling log. The sampling log will serve as the inspection form for the monitoring network. The field sampler is expected to report on the entire site and take immediate action if necessary.

APPENDIX A

Inspection Forms

Refer to attachment H of the SMP

APPENDIX B

Sample Chain of Custody

ATTACHMENT F
Quality Assurance Project Plan

QUALITY ASSURANCE PROJECT PLAN
FORMER MOTOR FREIGHT GARAGE
832-836 Lexington Avenue, Brooklyn, NY

Prepared on behalf of:

Lexington Flats LLC
183 Wilson Avenue Suite 133
Brooklyn, NY 11211

Prepared by:

EBC
Environmental Business Consultants
1808 Middle Country Road
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832-836 Lexington Avenue, Brooklyn, NY

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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. As Project Director Mr. Sosik will also 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 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 on-Site qualified environmental professional who will record observations, direct the remediation team 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 RA according to the RAWP.	Robert Bennett
Laboratory Analysis	Analysis of soil samples by NYSDEC ASP methods Laboratory	NYSDOH-Certified Laboratory
Data review	Review for completeness and compliance	3rd party validation

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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. Data generated from the laboratory will be used to evaluate contaminants such as metals, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and pesticides / PCBs in both historic fills and native soils and volatile organic compounds (VOCs) in soil gas. 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 the most recent version of 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.

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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 the related samples and is carried through the 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 NY5DEC 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 5% (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.

2.2.6 Duplicate Samples

Duplicate samples will be obtained at a rate of 5% (one duplicate sample for every 20 field samples), in accordance to the DER-10 requirements.

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:

$$\%REC = \frac{SSR - SR}{SA} \times 100$$

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Where:
SSR = spike sample results
SR = sample results
SA = spike added from spiking mix

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.

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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).
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 NYSDOH ELAP laboratory for one or more of the following parameters: VOCs in soil / groundwater by USEPA Method 8260, SVOCs in soil / groundwater by USEPA Method 8270, Target Analyte List (TAL) Metals in soil and groundwater, pesticides / PCBs by USEPA Method 8081/8082 and VOCs in air by USEPA Method TO15. 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 if waste characterization samples are analyzed they 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 (EQuIS). Note that waste characterization samples, if analyzed, will be in results only format and will not be evaluated in the DUSR or uploaded to the EIMS.

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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	Frequency	Rationale for Sampling	Laboratory Analysis	Duplicates	Matrix Spikes	Spike Duplicates	Trip Blanks
Soil	Tank Pit Excavation	5	4 sidewalls and base	Endpoint verification	VOCs / SVOCs by 8260C / 8270D,	1 per 20 samples	1 per 20 samples	1 per 20 samples	1 per trip
Soil	Excavation Bottom	11	1 per 900 square feet	Endpoint verification	VOCs / SVOCs by 8260C / 8270D, pesticides by 8081, PCBs by 8082 and TAL Metals 6010C	1 per 20 samples	1 per 20 samples	1 per 20 samples	1 per trip
Groundwater	6 monitoring wells (MW1501-1506)	6	Quarterly	ISCO Performance Monitoring	VOCs by 8260C.	1 per 20 samples	1 per 20 samples	1 per 20 samples	1 per trip
Air	SVE System	3 (before carbon, between carbon, after carbon)	Monthly for first 6 months Quarterly Thereafter	Evaluate SVE Performance and to Determine Carbon breakthrough	TO15	N/A	N/A	N/A	N/A

TABLE 2
SAMPLE COLLECTION AND ANALYSIS PROTOCOLS

Sample Type	Matrix	Sampling Device	Parameter	Sample Container	Sample Preservation	Analytical Method#	CRQL / MDLH	Holding Time
Soil	Soil	Scoop Direct into Jar	VOCs	(1) 2 oz Jar	Cool to 4^{o} C	EPA Method 8260C	Compound specific (1-5 ug/kg)	14 days*
			SVOCs	(1) 8 oz jar	Cool to 4^{o} C	EPA Method 8270D	Compound specific (1-5 ug/kg)	14 day ext/40 days*
			Pest/PCBs	from 8oz jar above	Cool to 4^{o} C	EPA Method 8081B/8082A	Compound specific (1-5 ug/kg)	14 day ext/40 days*
			Metals	from above	Cool to 4^{o} C	TAL Metals 6010C	Compound specific (01-1 mg/kg)	6 months*

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.
MCAWW = Methods for Chemical Analysis of Water and Wastes.
NA = Not available or not applicable.
* = all collection and holding times will be as be the ASP

ATTACHMENT G
Health and Safety Plan

FORMER MOTOR FREIGHT GARAGE SITE
832 LEXINGTON AVENUE
BROOKLYN, NEW YORK

CONSTRUCTION HEALTH AND SAFETY PLAN

JULY 2016

Prepared By:

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

1808 Middle Country Road
Ridge, NY 11961

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FORMER MOTOR FREIGHT GARAGE SITE

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FIGURES

Figure 1 Route to Hospital (Appendix D)

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APPENDIX B SITE SAFETY PLAN AMENDMENTS
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APPENDIX D HOSPITAL INFORMATION, MAP AND FIELD ACCIDENT REPORT

STATEMENT OF COMMITMENT

This Construction Health and Safety Plan (CHASP) has been prepared to ensure that workers are not exposed to risks from hazardous materials during the Remedial Action at the Former Motor Freight Garage Site located at 832-836 Lexington Avenue, Brooklyn, NY.

This CHASP, 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 CHASP 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 the Former Motor Freight Garage Site located at 832-836 Lexington Avenue, Brooklyn, NY, to protect on-site personnel, visitors, and the public from physical harm and exposure to hazardous materials or wastes during remedial 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 developer 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 CHASP. 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
Mr. Robert Bennett	EBC – Project Manager	1808 Middle Country Rd Ridge, NY 11961	(631) 504-6000
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 project manager is responsible for overall project administration and, with guidance from the site safety officer, for supervising the implementation of this CHASP. 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.

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 subject property is located at 832-836 Lexington Avenue, in the Bedford Stuyvesant section of Brooklyn NY. The Site is comprised of a single tax parcel covering 10,000 square feet (0.229 acres). The subject property is located in the City of New York and Borough of Brooklyn (Kings County) and is identified as Block 1628 Lot 30 on the NY City tax map. The lot is located on the south side of Lexington Avenue between Patchen Avenue and Broadway. Lot 30 has 100 feet of street frontage on Lexington Avenue and is approximately 100 feet deep. Currently the property is developed with a one-story commercial building which occupies the entire lot.

The elevation of the Site is approximately 56 feet above the National Geodetic Vertical Datum (NGVD). Based upon regional groundwater contour maps, and measurements made at the Site, the depth to groundwater beneath the Site is approximately 45 feet below grade and flows northwest toward the East River.

The area surrounding the property is highly urbanized and predominantly consists of multi-family residential buildings with mixed-use buildings (residential w/ first floor retail) along main arterial corridors such as Broadway located just 500 feet to the northeast. Commercial / industrial properties, equipment yards and warehouses are interspersed with the residential properties as are institutions such as parks, schools, churches and playgrounds within a quarter mile of the Site in all directions.

2.1 Previous Investigations

2.1.1 Remedial Investigation Report (EBC March 2015)

A Remedial Investigation was completed at the Site in December 2014 and documented in a Remedial Investigation Report dated February 2015. The goals of the Remedial Investigation were to define the nature and extent of contamination in soil, groundwater and any other impacted media; to identify the source(s) of the contamination; to assess the impact of the contamination on public health and/or the environment; and to provide information to support the development of a Remedial Work Plan to address the contamination.

Activities completed under the RI:

- Soil borings were installed and soil samples were collected at varying depths throughout the site and analyzed for the full suite of compounds on the Target Compound List/Target Analyte List (TCL/TAL);
- The installation of groundwater monitoring wells;
- The collection and analysis of groundwater samples the full suite of TCL/TAL compounds; and,
- The collection of analysis via TO-15 of soil gas samples for VOCs from soil gas sampling locations.

The results of sampling performed during the RI and a previous due diligence investigation, identified petroleum VOC impacted soil in the vicinity of UST area located in the north-central area of the site. Elevated levels of petroleum VOCs were also reported in sediment within a

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surface drain located in the northeast area of the Site. SVOC contamination was reported in the vicinity of B7 to a depth of 5 ft below grade. Releases have likely occurred from components of the UST system and from surface spills during the use of the Site as a motor freight garage. Historic fill material has been identified across the Site to depths as great as 6 feet below grade. The historic fill material contains metals including chromium, lead and mercury above unrestricted use SCOs.

Petroleum related VOCs were detected in all groundwater samples collected. The concentrations of petroleum related VOCs were highest at well location, MW1, in the northwest corner of the Site which is generally downgradient of the identified source area. No CVOC impacts were detected in groundwater above standards. The SVOCs 2,4-Dimethylphenol, methylnaphthalene and naphthalene were detected in three of the four groundwater samples and are attributable to background conditions.

Soil gas sampling identified generally low levels of petroleum related volatile organic compounds (BTEX). Low levels of chlorinated VOCs (CVOCs) were also reported in almost all of the soil gas samples. CVOC concentrations were generally low and do not represent a potential vapor intrusion concern. TCE, however, was detected in soil vapor at one location at a level which may require future monitoring.

2.2 Redevelopment Plans

The site is to be redeveloped through the new construction of a new 7-story residential building which will cover the entire Site. Plans include a full height basement level covering an approximate 60 ft by 70 ft area in the northeastern corner of the property. This area will require excavation to a depth of 12 ft below grade. The remainder of the property will be excavated to a minimum of 2 feet below grade.

2.3 Description of Remedial Action

Site activities included within the Remedial Action that are included within the scope of this HASP include the following:

The remedy recommended for the site is a Track 2 alternative (Alternative 2) which consists of the removal of soils as needed to meet restricted residential criteria to a depth of 15 feet below grade. It is expected that a Track 2 alternative will require excavation to a minimum depth of 6 feet across the Site with excavation of petroleum contaminated soil present beneath the tanks to a depth of 15 feet below grade. The Track 2 alternative also includes remediation of deeper soils through soil vapor extraction and groundwater through chemical oxidant injection following completion of redevelopment activities. Over-excavated areas will be backfilled with either virgin mined materials, recycled materials or certified fill which meets restricted residential SCOs.

The remedy will include the following items:

1. Removal of underground storage tanks;
2. Excavation of soil/fill exceeding Track 2 restricted residential SCOs as listed in Table 1 to a depth as great as 15 feet below grade;

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3. Treatment of residual groundwater contamination via injection of chemical oxidants;
4. Treatment of residual soil contamination in the former tank field area as well as hot spot areas via Soil Vapor Extraction;
5. Screening for indications of contamination (by visual means, odor, and monitoring with PID) of all excavated soil during any intrusive Site work;
6. Collection and analysis of end-point soil samples and post-remedial groundwater samples to evaluate the performance of the remedy with respect to attainment of unrestricted SCOs and groundwater standards;
7. Appropriate off-Site disposal of all material removed from the Site in accordance with all Federal, State and local rules and regulations for handling, transport, and disposal;
8. Import of materials to be used for backfill and cover in compliance with: (1) chemical limits and other specifications included in Table 1, (2) all Federal, State and local rules and regulations for handling and transport of material;
9. Installation of a site cover system consisting of the concrete building slab and paved outdoor recreation area;
10. Implementation of a Site Management Plan (SMP) for long term maintenance of the Engineering Controls;
11. An Environmental Easement will be filed against the Site to ensure implementation of the SMP.

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3.0 HAZ ARD 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 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.

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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 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.

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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), and heavy metals such as chromium, lead, copper, mercury and 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.

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3.3.3 Organic Vapors

Elevated levels of VOCs were detected in both soil and soil vapor 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).

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS
1808 MIDDLE COUNTRY ROAD
RIDGE, NY 11961
PHONE 631.504.6000
FAX 631.924.2870

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.

Due to the dimensions of the S ite and the w ork area, it is expected that an exclusion z one will include the entir e fenced area w ith the exception of the constr uction entr ance area, which w ill serve as th e decontamination z one. A support z one if needed w ill be loca ted outside of the fenced area. All onsite workers engaged in the excavation of hazardous or contaminated materials must provide evidence of OSHA 24 or 40-hour Hazardous Waste Operations and Emergency Response Operations training to conduct work within the exclusion zone established by the site safety officer. 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.

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

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
New York City Police	911
Woodhull Medical Center	1-718-963-8000
Brooklyn Hospital Center	1-718-250-8000
NYSDEC Spills Division	1-800-457-7362
NYSDEC Hazardous Waste Division	1-718-482-4994
NYSDEC DER Bureau B	1-518-402-9768
NYCDEP	1-718-699-9811
NYC Department of Health	1-212-788-4711
NYC Fire Department	911
National Response Center	1-800-424-8802
Poison Control	1-212-340-4494
Site Safety Officer	1-631-504-6000
Alternate 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;

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 — Mr. Robert Bennett (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

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

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

1,2,4-TRIMETHYLBENZENE

ICSC: 1433

Pseudocumene

C_9H_{12}

Molecular mass: 120,2

ICSC # 1433
CAS # 95-63-6
RTECS # DC3325000
UN # 1993
EC # 601-043-00-3
March 06, 2002 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Flammable.	NO open flames, NO sparks, and NO smoking.	Alcohol-resistant foam, dry powder, carbon dioxide.
EXPLOSION	Above 44°C explosive vapour/air mixtures may be formed.	Above 44°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		PREVENT GENERATION OF MISTS!	
•INHALATION	Confusion. Cough. Dizziness. Drowsiness. Headache. Sore throat. Vomiting.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	Redness. Dry skin.	Protective gloves.	Rinse skin with plenty of water or shower.
•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	(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
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: filter respirator for organic gases and vapours.	Fireproof. Separated from strong oxidants. Well closed. Keep in a well-ventilated room.	Xn symbol N symbol R: 10-20-36/37/38-51/53 S: 2-26-61 UN Hazard Class: 3 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

ICSC: 1433

International Chemical Safety Cards

1,2,4-TRIMETHYLBENZENE

ICSC: 1433

IMPORTANT DATA	**PHYSICAL STATE; APPEARANCE:** COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR. **PHYSICAL DANGERS:** **CHEMICAL DANGERS:** The substance decomposes on burning producing toxic and irritating fumes Reacts violently with strong oxidants causing fire and explosion hazard. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: (as mixed isomers) 25 ppm as TWA (ACGIH 2004). MAK: (as mixed isomers) 20 ppm 100 mg/m³ Peak limitation category: II(2) Pregnancy risk group: C (DFG 2004). OSHA PEL†: none NIOSH REL: TWA 25 ppm (125 mg/m^3) NIOSH IDLH: N.D. See: IDLH INDEX	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation. **INHALATION RISK:** A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C; on spraying or dispersing, however, much faster. **EFFECTS OF SHORT-TERM EXPOSURE:** The substance is irritating to the eyes the skin and the respiratory tract If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis. The substance may cause effects on the central nervous system **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** The liquid defats the skin. Lungs may be affected by repeated or prolonged exposure , resulting in chronic bronchitis The substance may have effects on the central nervous system blood See Notes.
PHYSICAL PROPERTIES	Boiling point: 169°C Melting point: -44°C Relative density (water = 1): 0.88 Solubility in water: very poor Relative vapour density (air = 1): 4.1	Relative density of the vapour/air-mixture at 20°C (air = 1): 1.01 Flash point: 44°C c.c. Auto-ignition temperature: 500°C Explosive limits, vol% in air: 0.9-6.4 Octanol/water partition coefficient as log Pow: 3.8
ENVIRONMENTAL DATA	The substance is toxic to aquatic organisms. Bioaccumulation of this chemical may occur in fish. 	

N O T E S

Use of alcoholic beverages enhances the harmful effect. Depending on the degree of exposure, periodic medical examination is suggested. See also ICSC 1155 1,3,5-Trimethylbenzene (Mesitylene), ICSC 1362 1,2,3-Trimethylbenzene (Hemimellitene), ICSC 1389 Trimethyl benzene (mixed isomers). 1,3,5-Trimethylbenzene (Mesitylene) is classified as a marine pollutant.

Transport Emergency Card: TEC (R)-30GF1-III
NFPA Code: H0; F2; R0;

ADDITIONAL INFORMATION

International Chemical Safety Cards

1,3,5-TRIMETHYLBENZENE

ICSC: 1155

Mesitylene
C_9H_{12}
Molecular mass: 120.2

ICSC # 1155
CAS # 108-67-8
RTECS # OX6825000
UN # 2325
EC # 601-025-00-5
March 06, 2002 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Flammable.	NO open flames, NO sparks, and NO smoking.	Alcohol-resistant foam, dry powder, carbon dioxide.
EXPLOSION	Above 50°C explosive vapour/air mixtures may be formed.	Above 50°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		PREVENT GENERATION OF MISTS!	
•INHALATION	Confusion. Cough. Dizziness. Drowsiness. Headache. Sore throat. Vomiting.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	Redness. Dry skin.	Protective gloves.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
•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	(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
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. (Extra personal protection: filter respirator for organic gases and vapours.)	Fireproof. Separated from strong oxidants. Well closed. Keep in a well-ventilated room.	Marine pollutant. Xi symbol N symbol R: 10-37-51/53 S: 2-61 UN Hazard Class: 3 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

ICSC: 1155

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

1,3,5-TRIMETHYLBENZENE

ICSC: 1155

IMPORTANT DATA	**PHYSICAL STATE; APPEARANCE:** COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR. **PHYSICAL DANGERS:** **CHEMICAL DANGERS:** The substance decomposes on burning producing toxic and irritating fumes. Reacts violently with strong oxidants causing fire and explosion hazard. **OCCUPATIONAL EXPOSURE LIMITS:** TLV (as mixed isomers): 25 ppm; (ACGIH 2001). MAK (all isomers): 20 ppm; 100 mg/m^3; class II 1 © (2001) OSHA PEL†: none NIOSH REL: TWA 25 ppm (125 mg/m^3) NIOSH IDLH: N.D. See: IDLH INDEX	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation. **INHALATION RISK:** A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C; on spraying or dispersing, however, much faster. **EFFECTS OF SHORT-TERM EXPOSURE:** The substance is irritating to the eyes the skin and the respiratory tract If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis. The substance may cause effects on the central nervous system. **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** The liquid defats the skin. Lungs may be affected by repeated or prolonged exposure, resulting in chronic bronchitis. The substance may have effects on the central nervous system blood See Notes.
PHYSICAL PROPERTIES	Boiling point: 165°C Melting point: -45°C Relative density (water = 1): 0.86 Solubility in water: very poor Vapour pressure, kPa at 20°C: 0.25	Relative vapour density (air = 1): 4.1 Relative density of the vapour/air-mixture at 20°C (air = 1): 1.01 Flash point: 50°C (c.c.) Auto-ignition temperature: 550°C Octanol/water partition coefficient as log Pow: 3.42
ENVIRONMENTAL DATA	The substance is harmful to aquatic organisms. Bioaccumulation of this chemical may occur in fish. 	

N O T E S

Use of alcoholic beverages enhances the harmful effect. Depending on the degree of exposure, periodic medical examination is indicated. See ICSC 1433 1,2,4-Trimethylbenzene (Pseudocumene), ICSC 1362 1,2,3-Trimethylbenzene (Hemimellitene), ICSC 1389 Trimethyl benzene (mixed isomers).

Transport Emergency Card: TEC (R)-30S2325
NFPA Code: H0; F2; R0

ADDITIONAL INFORMATION

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

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

IMPORTANT DATA

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.

NOTES

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

ETHYLBENZENE

ICSC: 0268

Ethylbenzol
Phenylethane
EB
C_8H_{10} / $C_6H_5C_2H_5$
Molecular mass: 106.2

ICSC # 0268
CAS # 100-41-4
RTECS # DA0700000
UN # 1175
EC # 601-023-00-4
March 13, 1995 Validated

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. Do NOT use compressed air for filling, discharging, or handling.	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		PREVENT GENERATION OF MISTS!	
•INHALATION	Cough. Dizziness. Drowsiness. Headache.	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. Blurred vision.	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	(Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Give a slurry of activated charcoal in water to drink. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Ventilation. Collect leaking liquid in covered containers. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT wash away into sewer. Personal protection: A filter respirator for organic gases and vapours.	Fireproof. Separated from strong oxidants.	F symbol Xn symbol R: 11-20 S: 2-16-24/25-29 UN Hazard Class: 3 UN Packing Group: II

SEE IMPORTANT INFORMATION ON BACK

International Chemical Safety Cards

ETHYLBENZENE

ICSC: 0268

I M P O R T A N T D A T A	**PHYSICAL STATE; APPEARANCE:** COLOURLESS LIQUID , WITH AROMATIC ODOUR. **PHYSICAL DANGERS:** The vapour mixes well with air, explosive mixtures are easily formed. **CHEMICAL DANGERS:** Reacts with strong oxidants. Attacks plastic and rubber. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: 100 ppm as TWA 125 ppm as STEL A3 (confirmed animal carcinogen with unknown relevance to humans); BEI issued (ACGIH 2005). MAK: skin absorption (H); Carcinogen category: 3A; (DFG 2004). OSHA PEL†: TWA 100 ppm (435 mg/m^3) NIOSH REL: TWA 100 ppm (435 mg/m^3) ST 125 ppm (545 mg/m^3) NIOSH IDLH: 800 ppm 10%LEL See: 100414 **ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation of its vapour, 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 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 Exposure far above the OEL could cause lowering of consciousness. **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** Repeated or prolonged contact with skin may cause dermatitis.
PHYSICAL PROPERTIES	Boiling point: 136°C Melting point: -95°C Relative density (water = 1): 0.9 Solubility in water, g/100 ml at 20°C: 0.015 Vapour pressure, kPa at 20°C: 0.9 Relative vapour density (air = 1): 3.7 Relative density of the vapour/air-mixture at 20°C (air = 1): 1.02 Flash point: 18°C c.c. Auto-ignition temperature: 432°C Explosive limits, vol% in air: 1.0-6.7 Octanol/water partition coefficient as log Pow: 3.2
ENVIRONMENTAL DATA	The substance is harmful to aquatic organisms. 

N O T E S

The odour warning when the exposure limit value is exceeded is insufficient.

Transport Emergency Card: TEC (R)-30S1175 or 30GF1-I+II
NFPA Code: H2; F3; R0

ADDITIONAL INFORMATION

International Chemical Safety Cards

CUMENE

ICSC: 0170

(1-Methylethyl)benzene
2-Phenylpropane
Isopropylbenzene
C_9H_{12} / $C_6H_5CH(CH_3)_2$
Molecular mass: 120.2

ICSC # 0170
CAS # 98-82-8
RTECS # GR8575000
UN # 1918
EC # 601-024-00-X
April 13, 2000 Peer reviewed


TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Flammable.	NO open flames, NO sparks, and NO smoking.	Powder, AFFF, foam, carbon dioxide.
EXPLOSION	Above 31°C explosive vapour/air mixtures may be formed.	Above 31°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		PREVENT GENERATION OF MISTS!	
•INHALATION	Dizziness. Ataxia. Drowsiness. Headache. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	Dry skin.	Protective gloves. Protective clothing.	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	(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
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. Personal protection: filter respirator for organic gases and vapours.	Fireproof. Separated from strong oxidants, acids. Cool. Keep in the dark. Store only if stabilized.	Marine pollutant. Note: C Xn symbol N symbol R: 10-37-51/53-65 S: 2-24-37-61-62 UN Hazard Class: 3 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

International Chemical Safety Cards

CUMENE

ICSC: 0170

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 violently with acids and strong oxidants causing fire and explosion hazard. The substance can form explosive peroxides.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 50 ppm as TWA (ACGIH 2004).
MAK: 50 ppm 250 mg/m³
Peak limitation category: II(4);
skin absorption (H);
Pregnancy risk group: C;
(DFG 2004).
OSHA PEL: TWA 50 ppm (245 mg/m^3) skin
NIOSH REL: TWA 50 ppm (245 mg/m^3) skin
NIOSH IDLH: 900 ppm 10%LEL See: 98828

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

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 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 Exposure far above the OEL may result in unconsciousness.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
Repeated or prolonged contact with skin may cause dermatitis.

PHYSICAL PROPERTIES

Boiling point: 152°C
Melting point: -96°C
Relative density (water = 1): 0.90
Solubility in water:
none
Vapour pressure, Pa at 20°C: 427
Relative vapour density (air = 1): 4.2
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.01
Flash point:
31°C c.c.
Auto-ignition temperature: 420°C
Explosive limits, vol% in air: 0.9-6.5
Octanol/water partition coefficient as log Pow: 3.66

ENVIRONMENTAL DATA

The substance is toxic to aquatic organisms.

NOTES

Check for peroxides prior to distillation; eliminate if found.

Transport Emergency Card: TEC (R)-30S1918 or 30GF1-III
NFPA Code: H2; F3; R1

ADDITIONAL INFORMATION

International Chemical Safety Cards

NAPHTHALENE

ICSC: 0667

Naphthene
$C_{10}H_8$
Molecular mass: 128.18

ICSC # 0667
CAS # 91-20-3
RTECS # QJ0525000
UN # 1334 (solid); 2304 (molten)
EC # 601-052-00-2
April 21, 2005 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Powder, water spray, foam, carbon dioxide.
EXPLOSION	Above 80°C explosive vapour/air mixtures may be formed. 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!	
•INHALATION	Headache. Weakness. Nausea. Vomiting. Sweating. Confusion. Jaundice. Dark urine.	Ventilation (not if powder), local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	MAY BE ABSORBED! (Further see Inhalation).	Protective gloves.	Rinse skin with plenty of water or shower.
•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. Diarrhoea. Convulsions. Unconsciousness. (Further see Inhalation).	Do not eat, drink, or smoke during work. Wash hands before eating.	Rest. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Personal protection: filter respirator for organic gases and vapours. Do NOT let this chemical enter the environment. Sweep spilled substance into covered containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place.	Separated from strong oxidants, food and feedstuffs . Store in an area without drain or sewer access.	Do not transport with food and feedstuffs. Marine pollutant. Xn symbol N symbol R: 22-40-50/53 S: 2-36/37-46-60-61 UN Hazard Class: 4.1 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0667

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

NAPHTHALENE

ICSC: 0667

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
WHITE SOLID IN VARIOUS FORMS , WITH CHARACTERISTIC ODOUR.

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

CHEMICAL DANGERS:
On combustion, forms irritating and toxic gases. Reacts with strong oxidants .

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 10 ppm as TWA; 15 ppm as STEL; (skin); A4 (not classifiable as a human carcinogen); (ACGIH 2005).
MAK: skin absorption (H);
Carcinogen category: 2; Germ cell mutagen group: 3B; (DFG 2004).
OSHA PEL†: TWA 10 ppm (50 mg/m^3)
NIOSH REL: TWA 10 ppm (50 mg/m^3) ST 15 ppm (75 mg/m^3)
NIOSH IDLH: 250 ppm See: 91203

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. See Notes.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance may cause effects on the blood , resulting in lesions of blood cells (haemolysis) . See Notes. The effects may be delayed. Exposure by ingestion may result in death. Medical observation is indicated.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
The substance may have effects on the blood , resulting in chronic haemolytic anaemia. The substance may have effects on the eyes , resulting in the development of cataract. This substance is possibly carcinogenic to humans.

PHYSICAL PROPERTIES

Boiling point: 218°C

Sublimation slowly at room temperature
Melting point: 80°C
Density: 1.16
g/cm³
Solubility in water, g/100 ml at 25°C:
none

Vapour pressure, Pa at 25°C: 11
Relative vapour density (air = 1): 4.42
Flash point:
80°C c.c.
Auto-ignition temperature: 540°C
Explosive limits, vol% in air: 0.9-5.9
Octanol/water partition coefficient as log Pow: 3.3

ENVIRONMENTAL DATA

The substance is very toxic to aquatic organisms. The substance may cause long-term effects in the aquatic environment.

NOTES

Some individuals may be more sensitive to the effect of naphthalene on blood cells.

Transport Emergency Card: TEC (R)-41S1334 (solid); 41GF1-II+III (solid); 41S2304 (molten)

NFPA Code: H2; F2; R0;

ADDITIONAL INFORMATION

ICSC: 0667 **NAPHTHALENE**

IMPORTANT LEGAL NOTICE:

Material Safety Data Sheet

Normal-Butylbenzene, 99+%

ACC# 55434

Section 1 - Chemical Product and Company Identification

MSDS Name: Normal-Butylbenzene, 99+%
Catalog Numbers: AC107850000, AC107850050, AC107850250, AC107850500, AC107851000, AC107852500 AC107852500
Synonyms: 1-Phenylbutane
Company Identification:

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

For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
104-51-8	n-Butylbenzene	>99	203-209-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless liquid. Flash Point: 59 deg C.
Warning! Flammable liquid and vapor. May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.
Target Organs: Liver, nervous system.

Potential Health Effects

Eye: May cause eye irritation. The toxicological properties of this material have not been fully investigated.
Skin: May cause skin irritation. The toxicological properties of this material have not been fully investigated.
Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.
Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated. Vapors may cause dizziness or suffocation.
Chronic: No information found.

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 immediately.
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: Never give anything by mouth to an unconscious person. Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.
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. Vapors may form an explosive mixture with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Will burn if involved in a fire. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire. Flammable liquid and vapor. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.
Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. For large fires, use water spray, fog, or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Water may be ineffective. Use agent most appropriate to extinguish fire. Do NOT use straight streams of water.
Flash Point: 59 deg C (138.20 deg F)
Autoignition Temperature: 412 deg C (773.60 deg F)
Explosion Limits, Lower:.80 vol %
Upper: 5.80 vol %
NFPA Rating: (estimated) Health: 1; Flammability: 2; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation. A vapor suppressing foam may be used to reduce vapors.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Keep away from heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.
Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low. Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
n-Butylbenzene	none listed	none listed	none listed

OSHA Vacated PELs: n-Butylbenzene: No OSHA Vacated PELs are listed for this chemical.
Personal Protective Equipment
Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: Wear a NIOSH/MSHA or European Standard EN 149 approved full-facepiece airline respirator in the positive pressure mode with emergency escape provisions. Follow the OSHA respirator regulations found in 29

CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: clear, colorless
Odor: None reported.
pH: Not available.
Vapor Pressure: 1.33 hPa @ 23 C
Vapor Density: 4.6
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 183 deg C @ 760.00mm Hg
Freezing/Melting Point:-88 deg C
Decomposition Temperature:> 183 deg C
Solubility: insoluble
Specific Gravity/Density:.8600g/cm3
Molecular Formula:C10H14
Molecular Weight:134.22

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, ignition sources, excess heat, strong oxidants.
Incompatibilities with Other Materials: Oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 104-51-8: CY9070000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 104-51-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: No information available.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.
Environmental: Rapidly volatilizes into the atmosphere where it is photochemically degraded by hydroxyl radicals.

Physical: No information available.
Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	BUTYL BENZENES	No information available.
Hazard Class:	3	
UN Number:	UN2709	
Packing Group:	III	

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 104-51-8 is listed on the TSCA inventory.
Health & Safety Reporting List
CAS# 104-51-8: Effective 6/1/87, Sunset 12/19/95
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous Substances and corresponding RQs
None of the chemicals in this material have an RQ.
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 104-51-8: immediate, fire.
Section 313 No chemicals are reportable under Section 313.
Clean Air Act:
This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
CAS# 104-51-8 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European / International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

R 10 Flammable.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.
S 24/25 Avoid contact with skin and eyes.
S 33 Take precautionary measures against static discharges.
S 37 Wear suitable gloves.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 9 Keep container in a well-ventilated place.
S 28A After contact with skin, wash immediately with plenty of water
.

WGK (Water Danger/Protection)

CAS# 104-51-8: 1

Canada - DSL/NDSL

CAS# 104-51-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B3, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Section 16 - Additional Information

MSDS Creation Date: 4/15/1998
Revision #4 Date: 3/16/2007

Material Safety Data Sheet

Version 4.0
Revision Date 07/28/2010
Print Date 12/07/2011

1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	Propylbenzene
Product Number	:	P52407
Brand	:	Aldrich
Company	:	Sigma-Aldrich 3050 Spruce Street SAINT LOUIS MO 63103 USA
Telephone	:	+1 800-325-5832
Fax	:	+1 800-325-5052
Emergency Phone #	:	(314) 776-6555

2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards
Combustible Liquid

Target Organs

Lungs, Eyes, Kidney

GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H226	Flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H335	May cause respiratory irritation.
H401	Toxic to aquatic life.

Precautionary statement(s)

P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.
P331	Do NOT induce vomiting.

HMIS Classification

Health hazard:	0
Chronic Health Hazard:	*
Flammability:	2
Physical hazards:	0

NFPA Rating

Health hazard:	1
Fire:	2
Reactivity Hazard:	0

Potential Health Effects

Inhalation	May be harmful if inhaled. May cause respiratory tract irritation.
Skin	May be harmful if absorbed through skin. May cause skin irritation.
Eyes	May cause eye irritation.

Ingestion Aspiration hazard if swallowed - can enter lungs and cause damage. May be harmful if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms : 1-Phenylpropane

Formula : C_9H_{12}
Molecular Weight : 120.19 g/mol

CAS-No.	EC-No.	Index-No.	Concentration
Propylbenzene			
103-65-1	203-132-9	601-024-00-X	-

4. FIRST AID MEASURES

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing give artificial respiration Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media
For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

Special protective equipment for fire-fighters
Wear self contained breathing apparatus for fire fighting if necessary.

Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up
Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid inhalation of vapour or mist.

Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Store in cool place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Contains no substances with occupational exposure limit values.

Personal protective equipment

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
For prolonged or repeated contact use protective gloves.

Eye protection
Face shield and safety glasses

Skin and body protection
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	liquid, clear
Colour	colourless

Safety data

pH	no data available
Melting point	-99 °C (-146 °F) - lit.
Boiling point	159 °C (318 °F) - lit.
Flash point	42.0 °C (107.6 °F) - closed cup
Ignition temperature	450 °C (842 °F)
Lower explosion limit	0.8 %(V)
Upper explosion limit	6 %(V)
Density	0.862 g/cm3 at 25 °C (77 °F)
Water solubility	slightly soluble

10. STABILITY AND REACTIVITY

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
Vapours may form explosive mixture with air.

Conditions to avoid
Heat, flames and sparks.

Materials to avoid
Strong oxidizing agents

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides

11. TOXICOLOGICAL INFORMATION

Acute toxicity
LD50 Oral - rat - 6,040 mg/kg
Remarks: Behavioral:Somnolence (general depressed activity).

LC50 Inhalation - rat - 2 h - 65000 ppm

Skin corrosion/irritation
no data available

Serious eye damage/eye irritation
no data available

Respiratory or skin sensitization
no data available

Germ cell mutagenicity
no data available

Carcinogenicity

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
no data available

Specific target organ toxicity - single exposure (Globally Harmonized System)
May cause respiratory irritation.

Specific target organ toxicity - repeated exposure (Globally Harmonized System)
no data available

Aspiration hazard
May be fatal if swallowed and enters airways.

Potential health effects

Inhalation	May be harmful if inhaled. May cause respiratory tract irritation.
Ingestion	Aspiration hazard if swallowed - can enter lungs and cause damage. May be harmful if swallowed.
Skin	May be harmful if absorbed through skin. May cause skin irritation.
Eyes	May cause eye irritation.

Signs and Symptoms of Exposure
Damage to the lungs., To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Additional Information
RTECS: DA8750000

12. ECOLOGICAL INFORMATION

Toxicity

Toxicity to fish	LC50 - Oncorhynchus mykiss (rainbow trout) - 1.55 mg/l - 96.0 h

Toxicity to daphnia and other aquatic invertebrates.	Immobilization EC50 - Daphnia magna (Water flea) - 2 mg/l - 24 h

Persistence and degradability
no data available

Bioaccumulative potential
no data available

Mobility in soil
no data available

PBT and vPvB assessment
no data available

Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Avoid release to the environment.

13. DISPOSAL CONSIDERATIONS

Product
This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN-Number: 2364 Class: 3 Packing group: III
Proper shipping name: n-Propyl benzene
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN-Number: 2364 Class: 3 Packing group: III EMS-No: F-E, S-D
Proper shipping name: PROPYLBENZENE
Marine pollutant: No

IATA
UN-Number: 2364 Class: 3 Packing group: III
Proper shipping name: n-Propylbenzene

15. REGULATORY INFORMATION

OSHA Hazards
Combustible Liquid

DSL Status
All components of this product are on the Canadian DSL list.

SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Fire Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Propylbenzene	103-65-1	2007-03-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Propylbenzene	103-65-1	2007-03-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Propylbenzene	103-65-1	2007-03-01

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Co., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.

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 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: 0084

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

o-XYLENE

ICSC: 0084

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. 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;

ADDITIONAL INFORMATION

ICSC: 0084 **o-XYLENE**

International Chemical Safety Cards

p-XYLENE

ICSC: 0086

para-Xylene
1,4-Dimethylbenzene
p-Xylol
$C_6H_4(CH_3)_2$ / C_8H_{10}
Molecular mass: 106.2

ICSC # 0086
CAS # 106-42-3
RTECS # ZE2625000
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! 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, 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: 0086

International Chemical Safety Cards

p-XYLENE

ICSC: 0086

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: 138°C Melting point: 13°C Relative density (water = 1): 0.86 Solubility in water: none Vapour pressure, kPa at 20°C: 0.9 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: 528°C Explosive limits, vol% in air: 1.1-7.0 Octanol/water partition coefficient as log Pow: 3.15
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 0085 m-Xylene.

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

ADDITIONAL INFORMATION

ICSC: 0086 **p-XYLENE**

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

International Chemical Safety Cards

m-XYLENE

ICSC: 0085

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 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

STYRENE

ICSC: 0073

Vinylbenzene
Phenylethylene
Ethenylbenzene
C_8H_8 / $C_6H_5CHCH_2$
Molecular mass: 104.2

ICSC # 0073
CAS # 100-42-5
RTECS # WL3675000
UN # 2055
EC # 601-026-00-0
April 04, 2006 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Flammable. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames, NO sparks, and NO smoking.	Dry powder. Foam. Carbon dioxide.
EXPLOSION	Above 31°C explosive vapour/air mixtures may be formed. See Notes.	Above 31°C use a closed system, ventilation, and explosion-proof electrical equipment.	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		STRICT HYGIENE!	
•INHALATION	Dizziness. Drowsiness. Headache. Nausea. Vomiting. Weakness. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	Redness. Pain.	Protective clothing. Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness. Pain.	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	Nausea. Vomiting.	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Give plenty of water to drink. Rest.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Remove all ignition sources. Personal protection: chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Do NOT wash away into sewer. Collect leaking liquid in covered containers. Absorb remaining liquid in sand or inert absorbent and remove to safe place.	Fireproof. Separated from incompatible materials See Chemical Dangers. Cool. Keep in the dark. Store only if stabilized. Store in an area without drain or sewer access.	Airtight. Marine pollutant. Note: D Xn symbol R: 10-20-36/38 S: 2-23 UN Hazard Class: 3 UN Packing Group: III Signal: Danger Flame-Excl mark-Health haz Flammable liquid and vapour Harmful if inhaled vapour Causes skin irritation

		Causes eye irritation Suspected of causing cancer Causes damage to central nervous system and liver through prolonged or repeated exposure Toxic to aquatic life

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0073

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

STYRENE

ICSC: 0073

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
COLOURLESS TO YELLOW OILY LIQUID .

PHYSICAL DANGERS:

CHEMICAL DANGERS:
The substance can form explosive peroxides. The substance may polymerize due to warming, under the influence of light , oxidants oxygen , and peroxides , causing fire and explosion hazard. Reacts violently with strong acids , strong oxidants causing fire and explosion hazard. Attacks rubber, copper and copper alloys.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 20 ppm as TWA; 40 ppm as STEL; A4 (not classifiable as a human carcinogen); BEI issued (ACGIH 2005).
MAK: 20 ppm, 86 mg/m³;
Peak limitation category: II(2); Carcinogen category: 5; Pregnancy risk group: C; BAT issued;
(DFG 2006).
OSHA PEL†: TWA 100 ppm C 200 ppm 600 ppm (5-minute maximum peak in any 3 hours)
NIOSH REL: TWA 50 ppm (215 mg/m^3) ST 100 ppm (425 mg/m^3)
NIOSH IDLH: 700 ppm See: 100425

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation of its vapour.

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, 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. Exposure at high levels may result in unconsciousness.

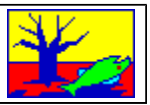
EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
The liquid defats the skin. The substance may have effects on the central nervous system. Exposure to the substance may enhance hearing damage caused by exposure to noise. This substance is possibly carcinogenic to humans. See Notes.

PHYSICAL PROPERTIES

Boiling point: 145°C
Melting point: -30.6°C
Relative density (water = 1): 0.91
Solubility in water, g/100 ml at 20°C: 0.03
Vapour pressure, kPa at 20°C: 0.67
Relative vapour density (air = 1): 3.6
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.02
Flash point: 31°C c.c.
Auto-ignition temperature: 490°C
Explosive limits, vol% in air: 0.9-6.8
Octanol/water partition coefficient as log Pow: 3.0

ENVIRONMENTAL DATA

The substance is toxic to aquatic organisms. It is strongly advised that this substance does not enter the environment.



NOTES

Depending on the degree of exposure, periodic medical examination is indicated. Check for peroxides prior to distillation; eliminate if found. Styrene monomer vapours are uninhibited and may form polymers in vents or flame arresters of storage tanks, resulting in blockage of vents. Do NOT take working clothes home.

Transport Emergency Card: TEC (R)-30S2055; 30GF1-III-9
NFPA Code: H 2; F 3; R 2;
Card has been partially updated in 2007: see Occupational Exposure Limits, Fire fighting.

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

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 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

BENZ(a)ANTHRACENE

IMPORTANT DATA

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.

NOTES

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

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.

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**

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

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

DIBENZO(a,h)ANTHRACENE

ICSC: 0431

1,25,6-Dibenzanthracene
$C_{22}H_{14}$
Molecular mass: 278.4

ICSC # 0431
CAS # 53-70-3
RTECS # HN2625000
EC # 601-041-00-2
October 23, 1995 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Water spray, powder.
EXPLOSION			
EXPOSURE		AVOID ALL CONTACT!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN	Redness. Swelling. Itching.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness.	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: P3 filter respirator for toxic particles.	Well closed.	T symbol N symbol R: 45-50/53 S: 53-45-60-61

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0431

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

DIBENZO(a,h)ANTHRACENE

ICSC: 0431

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PHYSICAL STATE; APPEARANCE:
COLOURLESS CRYSTALLINE POWDER.

PHYSICAL DANGERS:

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

R T A N T D A T A	**CHEMICAL DANGERS:** **OCCUPATIONAL EXPOSURE LIMITS:** TLV not established.	of airborne particles can, however, be reached quickly. **EFFECTS OF SHORT-TERM EXPOSURE:** **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** The substance may have effects on the skin , resulting in photosensitization. This substance is probably carcinogenic to humans.
PHYSICAL PROPERTIES	Boiling point: 524°C Melting point: 267°C Relative density (water = 1): 1.28	Solubility in water: none Octanol/water partition coefficient as log Pow: 6.5
ENVIRONMENTAL DATA	Bioaccumulation of this chemical may occur in seafood.	

N O T E S

This 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. DBA is a commonly used name. This substance is one of many polycyclic aromatic hydrocarbons (PAH).

ADDITIONAL INFORMATION

ICSC: 0431 **DIBENZO(a,h)ANTHRACENE**

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**

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

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

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

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

IMPORTANT DATA

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

NOTES

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

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

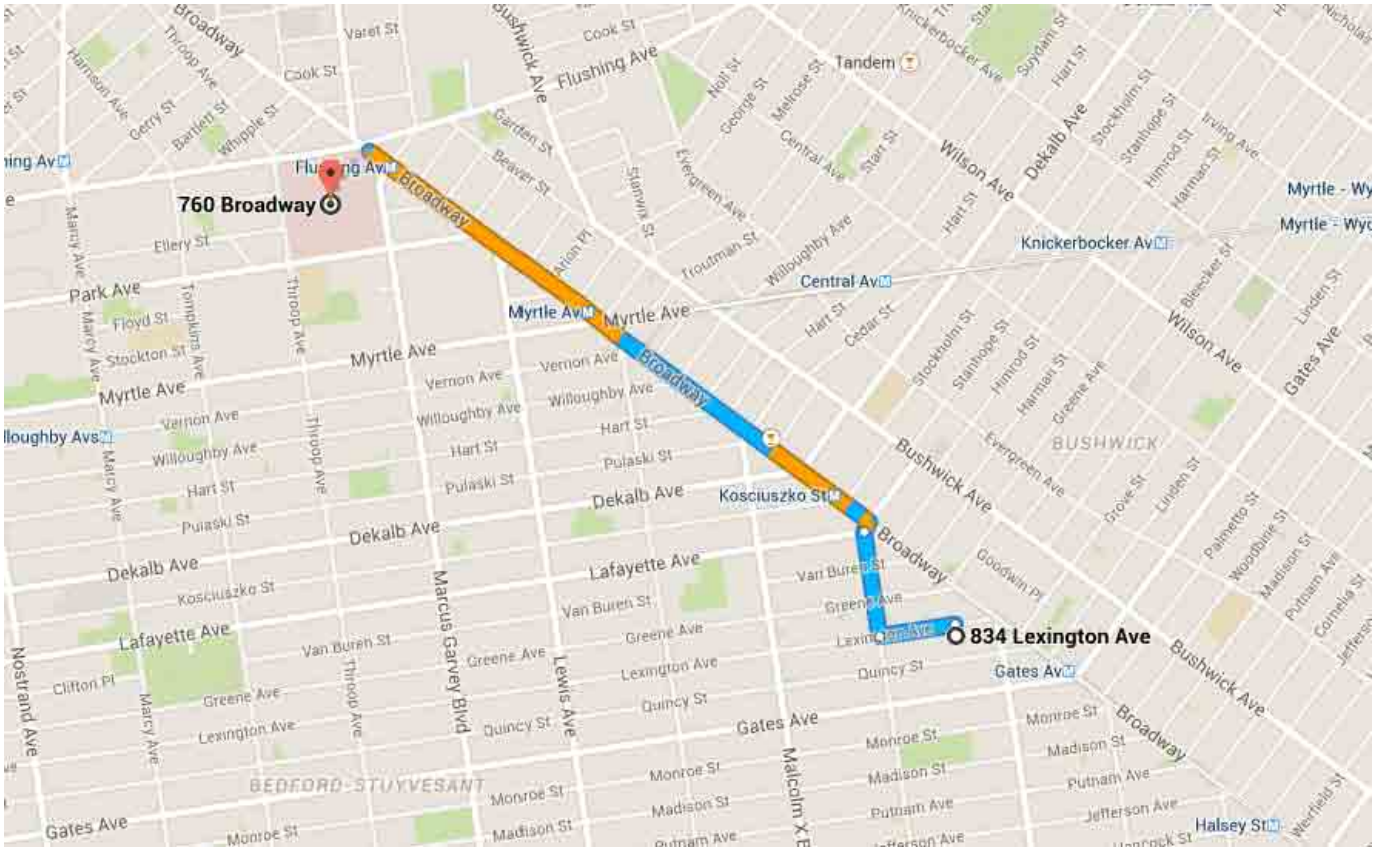
The hospital nearest the site is:

WOODHUL MEDICAL CENTER
760 Broadway, Brooklyn, New York 11206
718-963-8000
1.2 Miles – About 5 Minutes

○ 834 Lexington Ave Brooklyn, NY 11221
Head west on Lexington Ave toward Patchen Ave
0.1 mi

Take the 1st right onto Patchen Ave
0.2 mi

Turn left at the 3rd cross street onto Broadway
Destination will be on the left
0.9 mi
◉ 760 Broadway Brooklyn, NY 11206



ATTACHMENT H
Site Management Forms

GROUNDWATER PURGE / SAMPLE LOGS

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

Well I.D.: _____ Date:

Well Depth (from TOC): _____ Equipment:

Static Water Level (from TOC): _____

Height of Water in Well: _____

Gallons of Water per Well Volume: _____

Flow Rate: 400ml/min.

Time	Pump Rate	Gal. Removed	pH	Cond. (mS/cm)	Temp. (deg. C)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	TDS	Comments

Note 400 ml = 0.11 gallons

Former Motor Freight Site
832-836 Lexington Avenue, Brooklyn, NY
SITE COVER AND SVE SYSTEM INSPECTION FORM

Date: _____ Weather: _____

Time: _____ Inspector: _____

Cover System	Condition (Good/Need Repair)	Comments
Building Slab (6")		
Parking Slab (8")		

Extraction Point	Vacuum (iwc)	PID Reading (ppb)
VE-1		
Blower Inlet		
Before Carbon		
Between Carbon		
After Carbon		

Inspection:	Yes / No	Comments
Blower Operating?		
Spare Carbon Drums?		
System Integrity?		

Other Comments AND/OR ACTIONS TAKEN:

Former Motor Freight Site
832-836 Lexington Avenue, Brooklyn, NY
ISCO Monitoring Form

Date / Time : _____ Technician Name: _____

Injection Wells	Condition*	PID SCREENING	DTW	DTB
IW1				
IW2				
IW3				
IW4				
IW5				
IW6				
IW7				
IW8				
IW9				
IW10				
IW11				
IW12				
IW13				
IW14				

Monitoring Wells	Condition*	PID SCREENING	DTW	DTB
MW1501				
MW1502				
MW1503				
MW1504				
MW1505				
MW1506				

Legend:

DTB: Depth to Bottom

DTW: Depth to Water

*Conditions:

- Good (no repairs)
- Needs Repair
- Cannot Be Found

Needed Repairs And/or Other Comments (Specify):

ATTACHMENT I
O&M MANUAL

AMC Engineering PLLC
18-36 42nd Street
Astoria, NY 11105
718.545.0474
Fax 516 706-3214

OPERATION AND MAINTENANCE PLAN

1.0 INTRODUCTION

This Operation and Maintenance Plan describes the measures necessary to operate, monitor and maintain the mechanical components of the remedy selected for the site. This Operation and Maintenance Plan:

- Includes the steps necessary to allow individuals unfamiliar with the site to operate and maintain the SVE system;
- Includes an operation and maintenance contingency plan; and,
- Will be updated periodically to reflect changes in site conditions or the manner in which the SVE systems are operated and maintained.

A copy of this Operation and Maintenance Plan will be kept at the site.

1.1 SVE System Scope

The SVE systems at the site will operate 24/7 with no maintenance requirements. Periodic inspections will be performed to assure that the system is continuing to operate properly.

1.2 SVE System Start-Up and Testing

The start-up test has already been completed by the remedial engineer. If the system is shut down, the following procedure will be followed:

1. Inspect each component of the system as follows:
    a. Visual inspection the PVC extraction line for any visible cracks or separations.
    b. Verify that the blower is attached to the PVC extraction line and carbon canisters.
    c. Ensure that the carbon canisters are arranged in series with connections to the blower and the effluent line. If there are any obvious odors from the canisters, the carbon may be spent and requires replacement. Additionally, an environmental professional will be estimating breakthrough from their records. See below for the replacement procedure.

If there are any structural issues with the SVE system, repairs must be performed before the system can be started up.

2. Turn on the Rotron blower located outside the building. Wait 15 minutes.
3. Using a manometer, check the monitoring wells for a vacuum reading. There is a gauge attached to each wellhead for easy monitoring. If vacuum is not produced at the wellhead, inspect the extraction line again. If there are any structural deficiencies, turn off the blower and perform repairs. If there are no structural issues, wait another 15 minutes and check for a vacuum reading again. After 30 minutes, if the monitoring wells do not produce a vacuum reading, turn off the system and contact AMC Engineering., PLLC
4. The vacuum readings need to be verified at the the following day.

1.3 SVE System Operation: Non-Routine Equipment Maintenance

Non-routine maintenance is expected if any component of the system is damaged or fails. During each inspection, the system will be checked for structural integrity. Component damage or failure includes a broken valve, damaged pipe, or blower malfunction. Additionally, if a hissing sound is noted in the first floor, this could be a sign of extraction line damage. In any case of component damage or failure, the system should be shut off and repairs/replacements should be made. The owner should contact AMC Engineering with any issues.

The system will not be restarted until all repairs are made. When the repairs are completed, the system should be started up as listed above.

2.0 SVE SYSTEM PERFORMANCE MONITORING

An SVE system has been installed to remediate impacted soils within the source area. A cut sheet with details of the SVE system can be found in **Figures SVE01** and **SVE02.**

2.1 SVE Monitoring Schedule

The components of the SVE system will be inspected by a qualified environmental professional or technician on a quarterly basis to assure that the system is functioning properly.

Unscheduled inspections and/or sampling may take place when a suspected failure of the SVE system has been reported or an emergency occurs that is deemed likely to affect the operation of the system.

2.2 SVE General Equipment Monitoring

A visual inspection of the complete system will be conducted during the monitoring event. SVE system components to be monitored include, but are not limited to, the following:

- Vacuum blower;
- General system piping;
- Vacuum gauges;
- Control switches and system alarms;
- PID Readings from influent line, between carbon drums, and at the discharge stack.

A complete list of components to be checked is provided in the Inspection Checklist (attached in the SVE Remedial Design Work Plan). If any equipment is observed to be malfunctioning or the system is not performing within specifications, maintenance and repairs must be performed immediately. After the repairs are completed, the SVE system can be restarted as outlined in Section 1.2.

Rotron is the manufacturer for the 1.5 HP blower. If there are any issues with the equipment, the inspector can reach the manufacturer's technical customer service line for troubleshooting. In any case, repairs should be performed when the SVE system has been shut off. Once the repairs are completed, the start-up process must be followed.

2.3 SVE Sampling Event Protocol

Air samples will be collected on a monthly basis for the first six (6) months to evaluate the performance of the system. Air samples will be collected quarterly thereafter. Samples will be collected from three locations: system influent (before carbon), between the carbon canisters, and from the system discharge (after carbon). Air samples will be submitted to a NYSDOH certified environmental laboratory for analysis of VOCs by USEPA method TO15. Once enough air sampling data demonstrates the relationships between the PID and TO-15 data, EBC/AMC will petition to the DEC to substitute TO-15 air samples with PID readings.

2.4 SVE Carbon Vessels Replacement Procedure

The vapor-phase carbon vessels of the SVE system will need to be replaced when they reach their break through times, or when elevated PID readings are detected in-between the vessels, or at the end of the second vessel. Operation of the system will be temporarily halted until situation is remediated by changing out the carbon or through other necessary repairs / actions (loose valve or fitting, broken pipe, etc.). The procedure to change out the carbon vessels can be found below:

1. Halt SVE system operations by turning off the power to the blower.
2. Open the first carbon vessel (lead) in series, and remove the carbon. This material is to be shipped back to the supplier for regeneration.
3. Open the second carbon vessel (lag) in series, and remove the carbon.
4. Add the carbon from the lag vessel into the lead vessel.
5. Close the lead vessel.
6. Add fresh / new carbon to the lag vessel.
7. Close the lag vessel.
8. Restart the SVE system and measure concentrations with a PID.

In the unlikely case both carbon vessels achieved their break though times, both vessels will need to be supplied with fresh carbon.

3.0 IN-SITU CHEMICAL OXIDATION (ISCO) PERFORMANCE MONITORING

A network of injections wells has been installed as part of the ISCO system to remediate impacted soils within the source area and in the rear yard. A total of fourteen (14) injection wells (IWs) have been installed:

- IW1-8 were installed in the tank source area;
- IW9-12 were installed in the rear yard; and
- IW13-14 were installed east of IW1-8 and south of MW1505.

Additionally, a total of six (6) monitoring wells (MWs) have been installed to determine the effectiveness of the chemical oxidant injection program.

A cut sheet with details of the injection wells can be found in **Figures CO1, CO2, and CO3**.

3.1 Additional Injections and Future Operations

The injection wells (IW1-14) are constructed out of 1" PVC pipes to a depth of 50' below grade. IWs 1, 5, and 13-14 were finished at top of cellar slab elevation with an 8-inch bolt-down manhole cover. IWs 2-4, and 6-8 were finished at approximately 15 feet below grade, which is roughly 6 feet below the cellar slab elevation and corresponds to the bottom of excavation for this area. The locations of the injection wells do not deviate from the approved ISCO design document. Additional ISCO treatment will be achieved through the use of these injection wells. The post construction ISCO plan can be found in **Figure CO2**.

Future injection events will occur on an as-needed basis, dependent on the analytical results from MW1501-1506. The monitoring wells with stagnant, elevated VOCs concentrations will require additional injections at the injection wells immediately upstream as part of remediation.

A mixing tank (approx. 300 gallons), injection manifold, and appropriate hoses will be utilized for additional injection events. This equipment will be set up outside of the building, and hoses will be connected to the injection points through a 1" PVC coupler. The number of hoses used will depend on the number of injection wells that require additional treatment. The iron and Klozur solutions will be mixed with water inside of the mixing tank, before they are pumped into the wells via submersible

pump.

3.2 ISCO Sampling Event Protocol

Groundwater samples will be collected from MW1501-1506 one month after the end of the chemical oxidant injection events to confirm the performance of the remedy. Samples will be collected on a quarterly basis thereafter, until modifications to the frequency or sampling requirements are granted by the NYSDEC. Groundwater samples will be submitted to an ELAP certified environmental laboratory for analysis of VOCs by EPA Method 8260, Iron 2+, and Persulfate.

All sampling activities will be recorded in a field book and associated sampling log as provided in **Attachment H** - 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 Sampling Plan provided as **Attachment E** of the SMP.

4.0 MAINTENANCE AND PERFORMANCE MONITORING REPORTING REQUIREMENTS

Maintenance reports and any other information generated during regular operations at the site will be kept on-file.

4.1 Routine Maintenance Reports

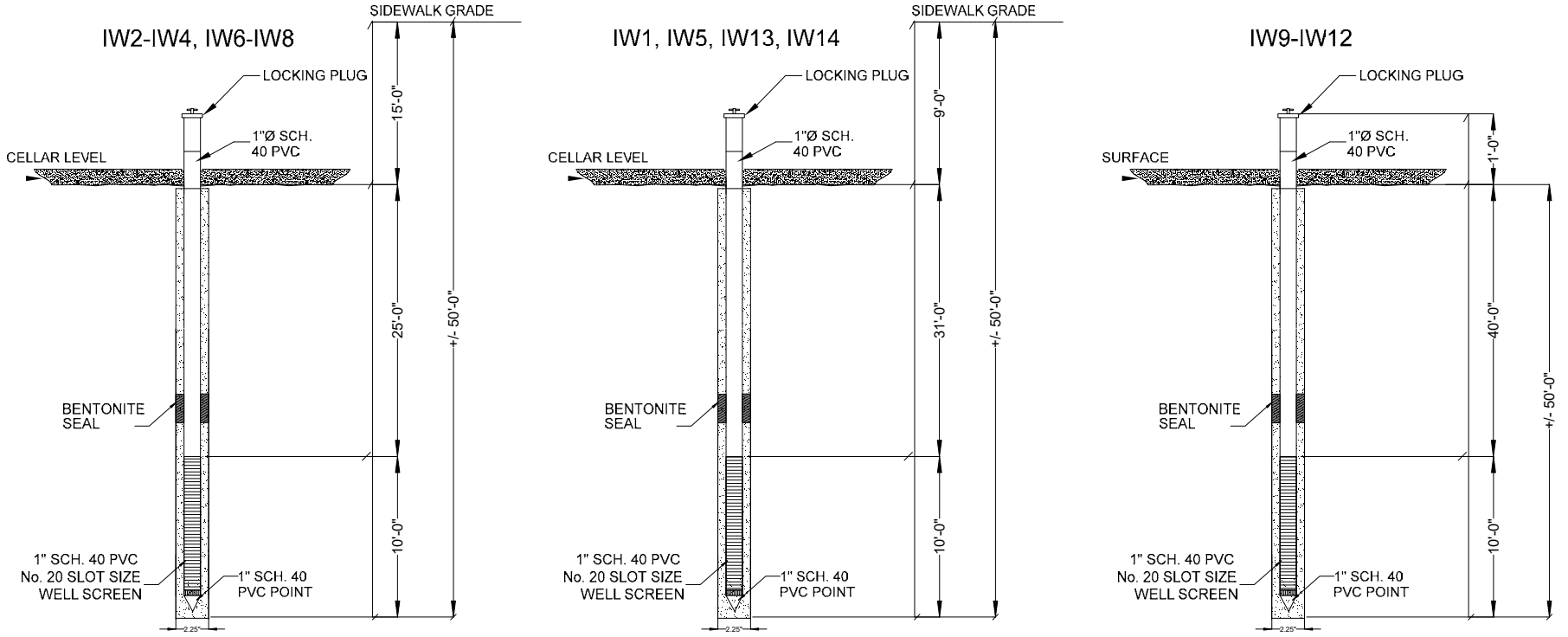
Checklists or forms (attached) will be completed during each routine maintenance event. Checklists/forms will include, but not be limited to the following information:

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

4.2 Non-Routine Maintenance Reports

During each non-routine maintenance event, a form will be completed which will include, but not be limited to, the following information:

- Date;
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Presence of leaks;
- Repairs or adjustments made to the system;
- 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).



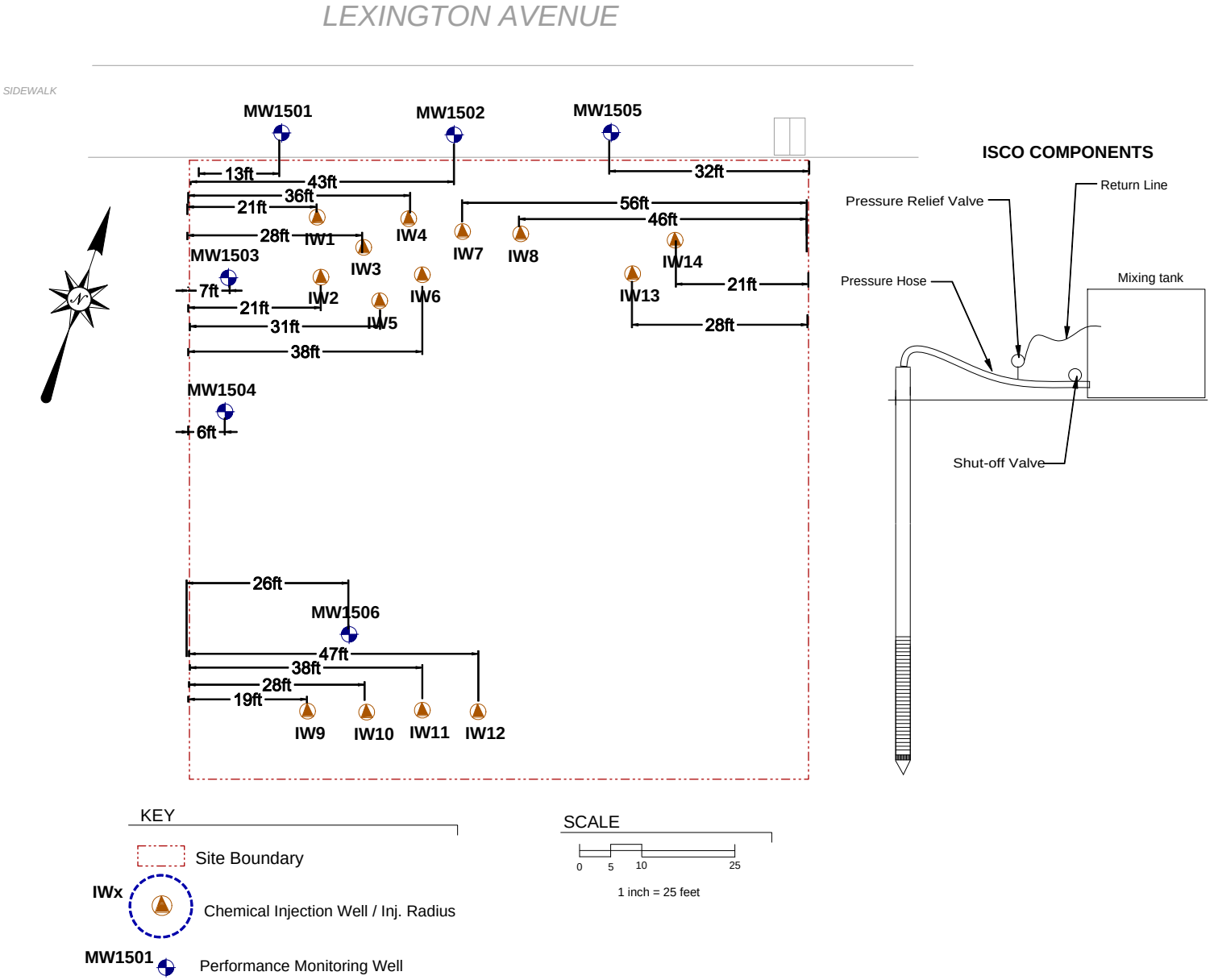
CONSTRUCTION DETAIL

N.T.S.

AMC Engineering PLLC
18-36 42nd Street
Astoria, NY 11105

Figure No.
CO1

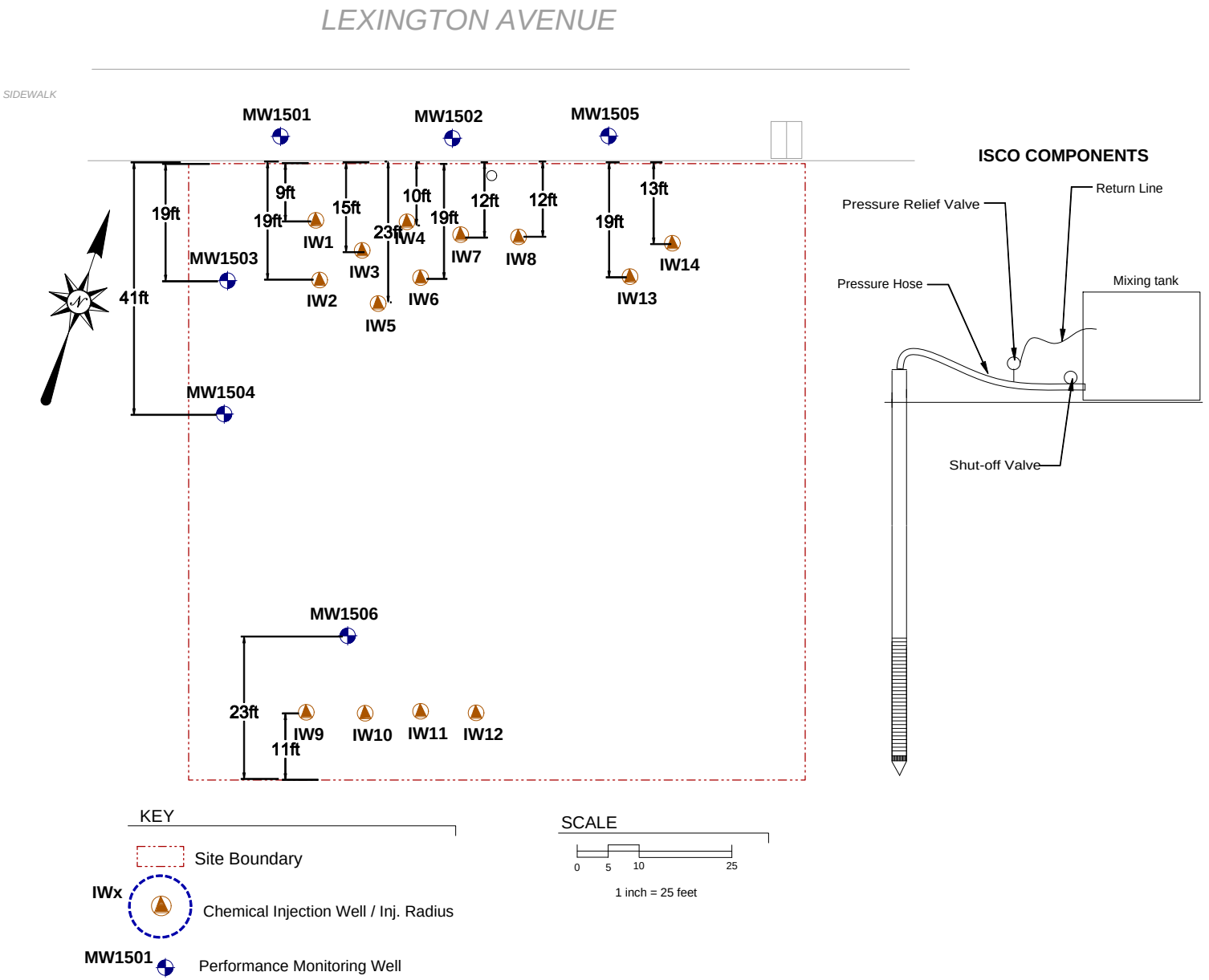
Site Name: Former Motor Freight Garage
Site Address: 832 Lexington Avenue, Brooklyn, NY
Drawing Title: Injection Well Details



AMC Engineering
99 Jericho Turnpike, Suite 300J
Jericho, NY 11 753
Phone: (516) 417 -8588

Figure No.
CO2

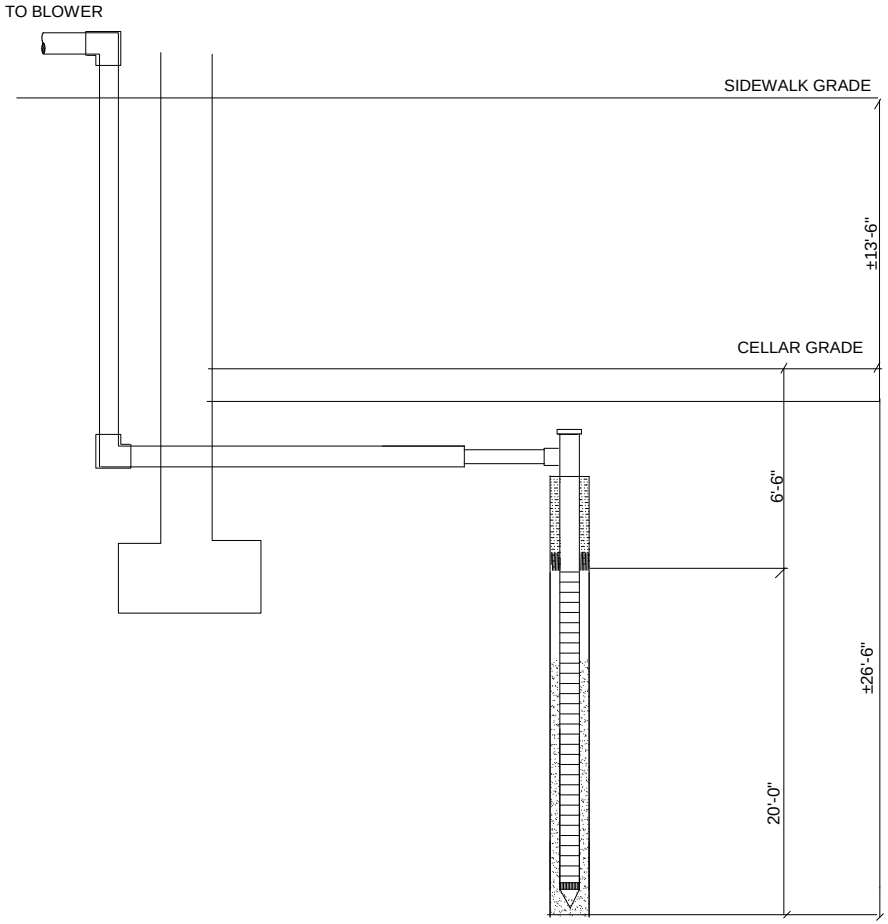
Site Name: FORMER MOTOR FREIGHT GARAGE
Site Address: 834 LEXINGTON AVENUE, BROOKLYN, NY
Drawing Title: CHEMICAL OXIDANT INJECTION PLAN



AMC Engineering
99 Jericho Turnpike, Suite 300J
Jericho, NY 11 753
Phone: (516) 417 -8588

Figure No.
CO3

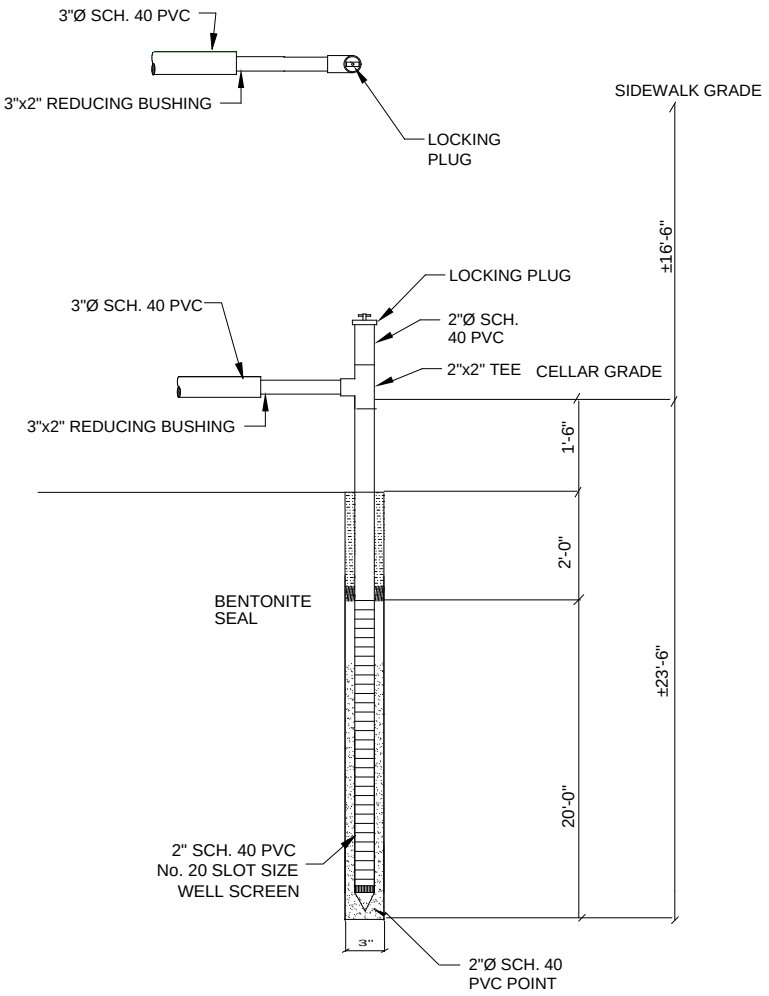
Site Name: FORMER MOTOR FREIGHT GARAGE
Site Address: 834 LEXINGTON AVENUE, BROOKLYN, NY
Drawing Title: CHEMICAL OXIDANT INJECTION PLAN



CONCEPTUAL POST CONSTRUCTION
PIPING DESIGN

N.T.S.

PLAN VIEW



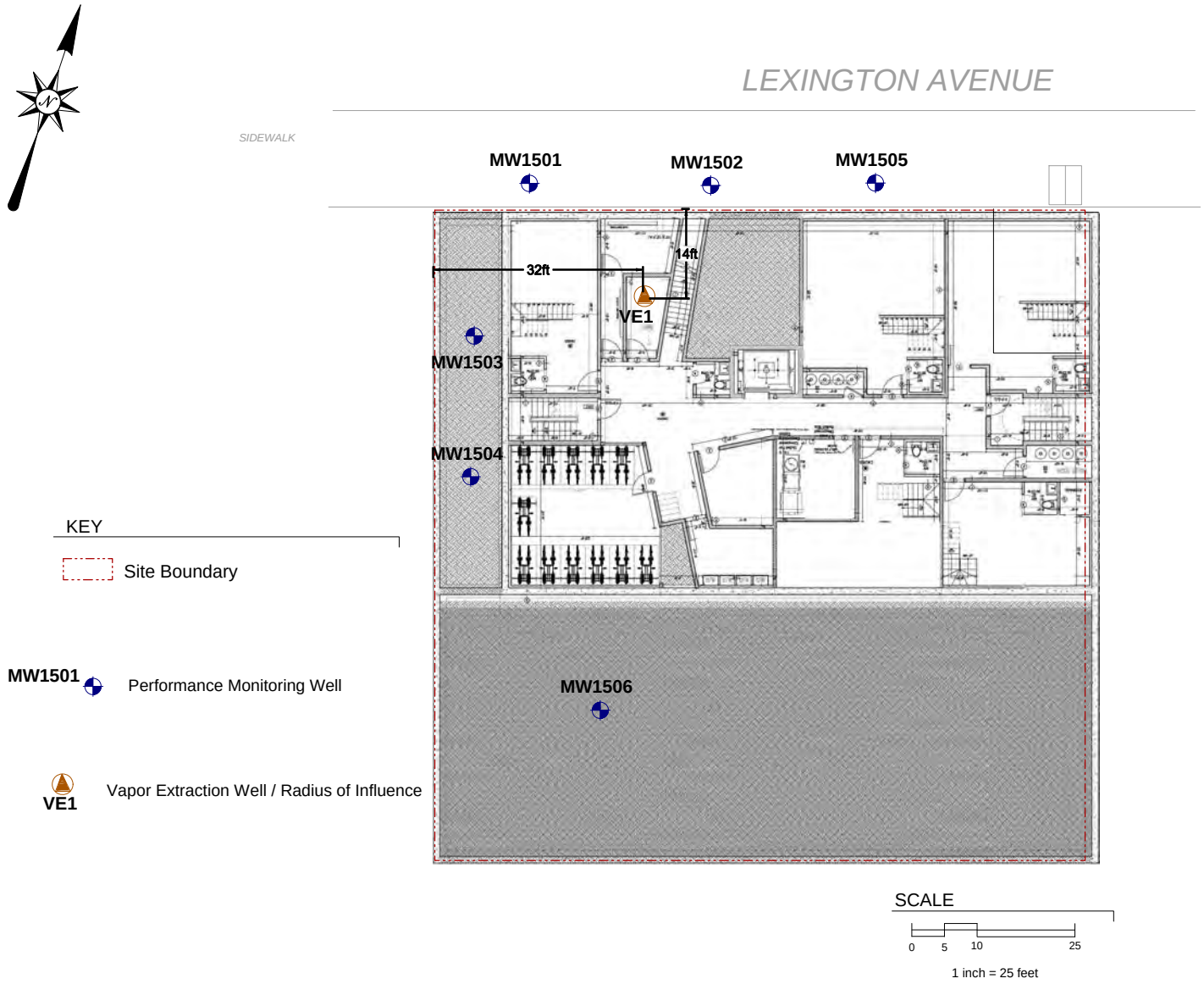
VAPOR EXTRACTION WELL
CONSTRUCTION DETAIL

N.T.S.

AMC Engineering
99 Jericho Turnpike, Suite 300J
Jericho, NY 11 753
Phone: (516) 417 -8588

Figure No.
SVE01

Site Name: FORMER MOTOR FREIGHT GARAGE
Site Address: 832 LEXINGTON AVENUE, BROOKLYN, NY
Drawing Title: SVE WELL DETAIL



AMC Engineering
99 Jericho Turnpike, Suite 300J
Jericho, NY 11 753
Phone: (516) 417 -8588

Figure No.
SVE02

Site Name: FORMER MOTOR FREIGHT GARAGE
Site Address: 834 LEXINGTON AVENUE, BROOKLYN, NY
Drawing Title: SOIL VAPOR EXTRACTION SYSTEM

ATTACHMENT J
Remedial System Optimization
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- 1.3 REPORT OVERVIEW

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ATTACHMENT K
Community Air Monitoring Plan

FORMER MOTOR FREIGHT GARAGE SITE

COMMUNITY AIR MONITORING PLAN
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Appendix A Action Limit Report

1.0 INTRODUCTION

This Community Air Monitoring Plan (CAMP) has been prepared for use during activities that disturb the building slab/foundation, rear cellar level courtyard slab or at-grade concrete slab around the cellar level rear courtyard. The CAMP provides measures for protection for the on-site works and building occupants and 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 investigative activities at the site.

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

Chlorinated volatile organic compounds (VOCs) and petroleum 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 drilling 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 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 within the work area and 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 drill cuttings in drums or covering with plastic

4.0 PARTICULATE MONITORING

Air monitoring for particulates (i.e., dust) will be performed continuously during drilling 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 drill cuttings in drums or covering stockpiles with plastic;
- Misting of the drilling 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 drilling 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.

Monitoring Log

Project Name: Former Bennett Trucking Corp. Site Date: _____

Project Location: 3845 Grand Street, Brooklyn, NY BCP No: C224181

Temperature:_____ Wind Speed:_____ Wind Direction:_____

Background Data: Upwind - PID _____ppm Dust Meter 1 - _____mg/m^3

Downwind - PID _____ppm Dust Meter 2 - _____mg/m^3

Time	Work Zone		Upwind		Downwind	
	PID - ppm	Dust - mg/m^3	PID - ppm	Dust - mg/m^3	PID - ppm	Dust - mg/m^3

Activities Performed:

ATTACHMENT L
SVE System Monitoring Data (Lab Reports, Purge Logs, Inspection Forms)

PHOENIX
Environmental Laboratories, Inc.

Friday, March 10, 2017

Attn: Mr. Charles B. Sosik, P.G.
Environmental Business Consultants
1808 Middle Country Rd
Ridge NY 11961-2406

Project ID: 832 LEXINGTON AVE BROOKLYN
Sample ID#s: BX63325 - BX63327

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

Enclosed are revised Analysis Report pages. Please replace and discard the original pages. If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #MA-CT-007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

NY ANALYTICAL SERVICES PROTOCOL
DATA PACKAGE

Client: Environmental Business Consultants

Project: 832 LEXINGTON AVE BROOKLYN

Laboratory Project: GBX63325

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06040
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

NY Analytical Services Protocol Format

March 10, 2017 **SDG I.D.: GBX63325**

Environmental Business Consultants 832 LEXINGTON AVE BROOKLYN

Methodology Summary

Volatiles in Air

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air: Method TO-15, Second Edition, U. S. Environmental Protection Agency, January 1999.

Sample Id Cross Reference

Client Id	Lab Id	Matrix
SVE PRE GAC	BX63325	AIR
SVE MID GAC	BX63326	AIR
SVE POST GAC	BX63327	AIR

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06040
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

NY Analytical Services Protocol Format

March 10, 2017 **SDG I.D.: GBX63325**

Environmental Business Consultants 832 LEXINGTON AVE BROOKLYN

Laboratory Chronicle

Sample	Analysis	Collection Date	Prep Date	Analysis Date	Analyst	Hold Time Met
BX63325	Volatiles (TO15)	02/14/17	02/16/17	02/16/17	KCA	Y
BX63326	Volatiles (TO15)	02/14/17	02/16/17	02/16/17	KCA	Y
BX63327	Volatiles (TO15)	02/14/17	02/16/17	02/16/17	KCA	Y

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

NY # 11301

SDG Comments

March 10, 2017

SDG I.D.: GBX63325

Any compound that is not detected above the MDL/LOD is reported as ND on the report and is reported in the electronic deliverables (EDD) as <RL or U at the RL per state and EPA guidance.

Version 1: Analysis results minus raw data.

Version 2: Complete report with raw data.

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

March 10, 2017

FOR: Attn: Mr. Charles B. Sosik, P.G.
Environmental Business Consultants
1808 Middle Country Rd
Ridge NY 11961-2406

Sample Information		Custody Information		Date	Time
Matrix:	AIR	Collected by:		02/14/17	
Location Code:	EBC	Received by:	SW	02/15/17	15:28
Rush Request:	72 Hour	Analyzed by:	see "By" below		
P.O.#:					
Canister Id:	UNKNOWN				

Laboratory Data

SDG ID: GBX63325
Phoenix ID: BX63325

Project ID: 832 LEXINGTON AVE BROOKLYN
Client ID: SVE PRE GAC

Parameter	ppbv Result		ppbv RL	LOD/ MDL	ug/m3 Result	ug/m3 RL	LOD/ MDL	Date/Time	By	Dilution	
Volatiles (TO15)											
1,1,1,2-Tetrachloroethane	ND		*0.146*	0.146	ND	*1.00*	1.00	02/17/17	KCA	1	1
1,1,1-Trichloroethane	ND		*0.183*	0.183	ND	*1.00*	1.00	02/17/17	KCA	1	
1,1,2,2-Tetrachloroethane	ND		*0.146*	0.146	ND	*1.00*	1.00	02/17/17	KCA	1	
1,1,2-Trichloroethane	ND		*0.183*	0.183	ND	*1.00*	1.00	02/17/17	KCA	1	
1,1-Dichloroethane	ND		*0.247*	0.247	ND	*1.00*	1.00	02/17/17	KCA	1	
1,1-Dichloroethene	ND		*0.252*	0.252	ND	*1.00*	1.00	02/17/17	KCA	1	
1,2,4-Trichlorobenzene	0.320		*0.135*	0.135	2.37	*1.00*	1.00	02/17/17	KCA	1	
1,2,4-Trimethylbenzene	2.51		*0.204*	0.204	12.3	*1.00*	1.00	02/17/17	KCA	1	
1,2-Dibromoethane(EDB)	ND		*0.130*	0.130	ND	*1.00*	1.00	02/17/17	KCA	1	
1,2-Dichlorobenzene	ND		*0.166*	0.166	ND	*1.00*	1.00	02/17/17	KCA	1	
1,2-Dichloroethane	ND		*0.247*	0.247	ND	*1.00*	1.00	02/17/17	KCA	1	
1,2-dichloropropane	ND		*0.217*	0.217	ND	*1.00*	1.00	02/17/17	KCA	1	
1,2-Dichlorotetrafluoroethane	ND		*0.143*	0.143	ND	*1.00*	1.00	02/17/17	KCA	1	
1,3,5-Trimethylbenzene	0.838		*0.204*	0.204	4.12	*1.00*	1.00	02/17/17	KCA	1	
1,3-Butadiene	ND		*0.452*	0.452	ND	*1.00*	1.00	02/17/17	KCA	1	
1,3-Dichlorobenzene	50.4	D	*0.832*	0.832	303	*5.00*	5.00	02/16/17	KCA	5	
1,4-Dichlorobenzene	ND		*0.166*	0.166	ND	*1.00*	1.00	02/17/17	KCA	1	
1,4-Dioxane	ND		*0.278*	0.278	ND	*1.00*	1.00	02/17/17	KCA	1	
2-Hexanone(MBK)	ND		*0.244*	0.244	ND	*1.00*	1.00	02/17/17	KCA	1	1
4-Ethyltoluene	0.792		*0.204*	0.204	3.89	*1.00*	1.00	02/17/17	KCA	1	1
4-Isopropyltoluene	ND		*0.182*	0.182	ND	*1.00*	1.00	02/17/17	KCA	1	1
4-Methyl-2-pentanone(MIBK)	ND		*0.244*	0.244	ND	*1.00*	1.00	02/17/17	KCA	1	
Acetone	81.7	D	*2.11*	2.11	194	*5.01*	5.01	02/16/17	KCA	5	
Acrylonitrile	ND		*0.461*	0.461	ND	*1.00*	1.00	02/17/17	KCA	1	
Benzene	1.37		*0.313*	0.313	4.37	*1.00*	1.00	02/17/17	KCA	1	
Benzyl chloride	ND		*0.193*	0.193	ND	*1.00*	1.00	02/17/17	KCA	1	

Project ID: 832 LEXINGTON AVE BROOKLYN
Client ID: SVE PRE GAC

Phoenix I.D.: BX63325

Parameter	ppbv Result		ppbv RL	LOD/ MDL	ug/m3 Result	ug/m3 RL	LOD/ MDL	Date/Time	By	Dilution	
Bromodichloromethane	ND		*0.149*	0.149	ND	*1.00*	1.00	02/17/17	KCA	1	
Bromoform	ND		*0.097*	0.097	ND	*1.00*	1.00	02/17/17	KCA	1	
Bromomethane	ND		*0.258*	0.258	ND	*1.00*	1.00	02/17/17	KCA	1	
Carbon Disulfide	1.28		*0.321*	0.321	3.98	*1.00*	1.00	02/17/17	KCA	1	
Carbon Tetrachloride	0.058		*0.040*	0.040	0.36	*0.25*	0.25	02/17/17	KCA	1	
Chlorobenzene	ND		*0.217*	0.217	ND	*1.00*	1.00	02/17/17	KCA	1	
Chloroethane	0.477		*0.379*	0.379	1.26	*1.00*	1.00	02/17/17	KCA	1	
Chloroform	ND		*0.205*	0.205	ND	*1.00*	1.00	02/17/17	KCA	1	
Chloromethane	0.850		*0.485*	0.485	1.75	*1.00*	1.00	02/17/17	KCA	1	
Cis-1,2-Dichloroethene	ND		*0.252*	0.252	ND	*1.00*	1.00	02/17/17	KCA	1	
cis-1,3-Dichloropropene	ND		*0.221*	0.221	ND	*1.00*	1.00	02/17/17	KCA	1	
Cyclohexane	12.4		*0.291*	0.291	42.7	*1.00*	1.00	02/17/17	KCA	1	
Dibromochloromethane	ND		*0.118*	0.118	ND	*1.00*	1.00	02/17/17	KCA	1	
Dichlorodifluoromethane	0.446		*0.202*	0.202	2.20	*1.00*	1.00	02/17/17	KCA	1	
Ethanol	27.6		*0.531*	0.531	52.0	*1.00*	1.00	02/17/17	KCA	1	1
Ethyl acetate	ND		*0.278*	0.278	ND	*1.00*	1.00	02/17/17	KCA	1	1
Ethylbenzene	2.21		*0.230*	0.230	9.6	*1.00*	1.00	02/17/17	KCA	1	
Heptane	19.0		*0.244*	0.244	77.8	*1.00*	1.00	02/17/17	KCA	1	
Hexachlorobutadiene	ND		*0.094*	0.094	ND	*1.00*	1.00	02/17/17	KCA	1	
Hexane	117	D	*1.42*	1.42	412	*5.00*	5.00	02/16/17	KCA	5	
Isopropylalcohol	ND		*0.407*	0.407	ND	*1.00*	1.00	02/17/17	KCA	1	
Isopropylbenzene	ND		*0.204*	0.204	ND	*1.00*	1.00	02/17/17	KCA	1	
m,p-Xylene	11.3		*0.230*	0.230	49.0	*1.00*	1.00	02/17/17	KCA	1	
Methyl Ethyl Ketone	ND		*0.339*	0.339	ND	*1.00*	1.00	02/17/17	KCA	1	
Methyl tert-butyl ether(MTBE)	ND		*0.278*	0.278	ND	*1.00*	1.00	02/17/17	KCA	1	
Methylene Chloride	3.22		*0.288*	0.288	11.2	*1.00*	1.00	02/17/17	KCA	1	
n-Butylbenzene	ND		*0.182*	0.182	ND	*1.00*	1.00	02/17/17	KCA	1	1
o-Xylene	5.89		*0.230*	0.230	25.6	*1.00*	1.00	02/17/17	KCA	1	
Propylene	11.2		*0.581*	0.581	19.3	*1.00*	1.00	02/17/17	KCA	1	1
sec-Butylbenzene	ND		*0.182*	0.182	ND	*1.00*	1.00	02/17/17	KCA	1	1
Styrene	0.353		*0.235*	0.235	1.50	*1.00*	1.00	02/17/17	KCA	1	
Tetrachloroethene	0.156		*0.037*	0.037	1.06	*0.25*	0.25	02/17/17	KCA	1	
Tetrahydrofuran	ND		*0.339*	0.339	ND	*1.00*	1.00	02/17/17	KCA	1	1
Toluene	11.4		*0.266*	0.266	42.9	*1.00*	1.00	02/17/17	KCA	1	
Trans-1,2-Dichloroethene	ND		*0.252*	0.252	ND	*1.00*	1.00	02/17/17	KCA	1	
trans-1,3-Dichloropropene	ND		*0.221*	0.221	ND	*1.00*	1.00	02/17/17	KCA	1	
Trichloroethene	0.384		*0.047*	0.047	2.06	*0.25*	0.25	02/17/17	KCA	1	
Trichlorofluoromethane	0.193		*0.178*	0.178	1.08	*1.00*	1.00	02/17/17	KCA	1	
Trichlorotrifluoroethane	ND		*0.131*	0.131	ND	*1.00*	1.00	02/17/17	KCA	1	
Vinyl Chloride	ND		*0.098*	0.098	ND	*0.25*	0.25	02/17/17	KCA	1	
QA/QC Surrogates											
% Bromofluorobenzene	111		*%*	%	111	*%*	%	02/17/17	KCA	1	

Ver 2

Project ID: 832 LEXINGTON AVE BROOKLYN
Client ID: SVE PRE GAC

Phoenix I.D.: BX63325

Parameter	ppbv Result	ppbv RL	LOD/ MDL	ug/m3 Result	ug/m3 RL	LOD/ MDL	Date/Time	By	Dilution

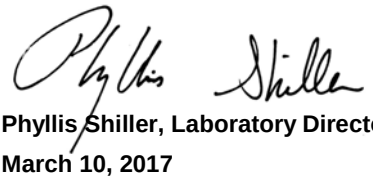
1 = This parameter is not certified by NY NELAC for this matrix. NY NELAC does not offer certification for all parameters at this time.

RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected BRL=Below Reporting Level LOD=Limit of Detection MDL=Method Detection Limit1
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

This sample was sampled using a Tedlar airbag.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
This report must not be reproduced except in full as defined by the attached chain of custody.



Phyllis Shiller, Laboratory Director
March 10, 2017
Reviewed and Released by: Jon Carlson, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

March 10, 2017

FOR: Attn: Mr. Charles B. Sosik, P.G.
Environmental Business Consultants
1808 Middle Country Rd
Ridge NY 11961-2406

Sample Information		Custody Information		Date	Time
Matrix:	AIR	Collected by:		02/14/17	
Location Code:	EBC	Received by:	SW	02/15/17	15:28
Rush Request:	72 Hour	Analyzed by:	see "By" below		
P.O.#:					
Canister Id:	UNKNOWN				

Laboratory Data

SDG ID: GBX63325
Phoenix ID: BX63326

Project ID: 832 LEXINGTON AVE BROOKLYN
Client ID: SVE MID GAC

Parameter	ppbv Result		ppbv RL	LOD/ MDL	ug/m3 Result	ug/m3 RL	LOD/ MDL	Date/Time	By	Dilution	
Volatiles (TO15)											
1,1,1,2-Tetrachloroethane	ND		*0.146*	0.146	ND	*1.00*	1.00	02/17/17	KCA	1	1
1,1,1-Trichloroethane	ND		*0.183*	0.183	ND	*1.00*	1.00	02/17/17	KCA	1	
1,1,2,2-Tetrachloroethane	ND		*0.146*	0.146	ND	*1.00*	1.00	02/17/17	KCA	1	
1,1,2-Trichloroethane	ND		*0.183*	0.183	ND	*1.00*	1.00	02/17/17	KCA	1	
1,1-Dichloroethane	ND		*0.247*	0.247	ND	*1.00*	1.00	02/17/17	KCA	1	
1,1-Dichloroethene	ND		*0.252*	0.252	ND	*1.00*	1.00	02/17/17	KCA	1	
1,2,4-Trichlorobenzene	0.977		*0.135*	0.135	7.25	*1.00*	1.00	02/17/17	KCA	1	
1,2,4-Trimethylbenzene	3.72		*0.204*	0.204	18.3	*1.00*	1.00	02/17/17	KCA	1	
1,2-Dibromoethane(EDB)	ND		*0.130*	0.130	ND	*1.00*	1.00	02/17/17	KCA	1	
1,2-Dichlorobenzene	ND		*0.166*	0.166	ND	*1.00*	1.00	02/17/17	KCA	1	
1,2-Dichloroethane	ND		*0.247*	0.247	ND	*1.00*	1.00	02/17/17	KCA	1	
1,2-dichloropropane	ND		*0.217*	0.217	ND	*1.00*	1.00	02/17/17	KCA	1	
1,2-Dichlorotetrafluoroethane	ND		*0.143*	0.143	ND	*1.00*	1.00	02/17/17	KCA	1	
1,3,5-Trimethylbenzene	1.16		*0.204*	0.204	5.70	*1.00*	1.00	02/17/17	KCA	1	
1,3-Butadiene	ND		*0.452*	0.452	ND	*1.00*	1.00	02/17/17	KCA	1	
1,3-Dichlorobenzene	83.7	D	*0.832*	0.832	503	*5.00*	5.00	02/16/17	KCA	5	
1,4-Dichlorobenzene	ND		*0.166*	0.166	ND	*1.00*	1.00	02/17/17	KCA	1	
1,4-Dioxane	ND		*0.278*	0.278	ND	*1.00*	1.00	02/17/17	KCA	1	
2-Hexanone(MBK)	ND		*0.244*	0.244	ND	*1.00*	1.00	02/17/17	KCA	1	1
4-Ethyltoluene	1.14		*0.204*	0.204	5.60	*1.00*	1.00	02/17/17	KCA	1	1
4-Isopropyltoluene	0.203		*0.182*	0.182	1.11	*1.00*	1.00	02/17/17	KCA	1	1
4-Methyl-2-pentanone(MIBK)	ND		*0.244*	0.244	ND	*1.00*	1.00	02/17/17	KCA	1	
Acetone	19.9		*0.421*	0.421	47.2	*1.00*	1.00	02/17/17	KCA	1	
Acrylonitrile	ND		*0.461*	0.461	ND	*1.00*	1.00	02/17/17	KCA	1	
Benzene	0.363		*0.313*	0.313	1.16	*1.00*	1.00	02/17/17	KCA	1	
Benzyl chloride	ND		*0.193*	0.193	ND	*1.00*	1.00	02/17/17	KCA	1	

Project ID: 832 LEXINGTON AVE BROOKLYN
Client ID: SVE MID GAC

Phoenix I.D.: BX63326

Parameter	ppbv Result		ppbv RL	LOD/ MDL	ug/m3 Result	ug/m3 RL	LOD/ MDL	Date/Time	By	Dilution	
Bromodichloromethane	ND		*0.149*	0.149	ND	*1.00*	1.00	02/17/17	KCA	1	
Bromoform	ND		*0.097*	0.097	ND	*1.00*	1.00	02/17/17	KCA	1	
Bromomethane	ND		*0.258*	0.258	ND	*1.00*	1.00	02/17/17	KCA	1	
Carbon Disulfide	0.678		*0.321*	0.321	2.11	*1.00*	1.00	02/17/17	KCA	1	
Carbon Tetrachloride	ND		*0.040*	0.040	ND	*0.25*	0.25	02/17/17	KCA	1	
Chlorobenzene	ND		*0.217*	0.217	ND	*1.00*	1.00	02/17/17	KCA	1	
Chloroethane	ND		*0.379*	0.379	ND	*1.00*	1.00	02/17/17	KCA	1	
Chloroform	ND		*0.205*	0.205	ND	*1.00*	1.00	02/17/17	KCA	1	
Chloromethane	ND		*0.485*	0.485	ND	*1.00*	1.00	02/17/17	KCA	1	
Cis-1,2-Dichloroethene	ND		*0.252*	0.252	ND	*1.00*	1.00	02/17/17	KCA	1	
cis-1,3-Dichloropropene	ND		*0.221*	0.221	ND	*1.00*	1.00	02/17/17	KCA	1	
Cyclohexane	ND		*0.291*	0.291	ND	*1.00*	1.00	02/17/17	KCA	1	
Dibromochloromethane	ND		*0.118*	0.118	ND	*1.00*	1.00	02/17/17	KCA	1	
Dichlorodifluoromethane	ND		*0.202*	0.202	ND	*1.00*	1.00	02/17/17	KCA	1	
Ethanol	28.6		*0.531*	0.531	53.9	*1.00*	1.00	02/17/17	KCA	1	1
Ethyl acetate	3.65		*0.278*	0.278	13.1	*1.00*	1.00	02/17/17	KCA	1	1
Ethylbenzene	1.86		*0.230*	0.230	8.07	*1.00*	1.00	02/17/17	KCA	1	
Heptane	ND		*0.244*	0.244	ND	*1.00*	1.00	02/17/17	KCA	1	
Hexachlorobutadiene	ND		*0.094*	0.094	ND	*1.00*	1.00	02/17/17	KCA	1	
Hexane	0.906	S	*0.284*	0.284	3.19	*1.00*	1.00	02/17/17	KCA	1	
Isopropylalcohol	8.26		*0.407*	0.407	20.3	*1.00*	1.00	02/17/17	KCA	1	
Isopropylbenzene	0.212		*0.204*	0.204	1.04	*1.00*	1.00	02/17/17	KCA	1	
m,p-Xylene	7.73		*0.230*	0.230	33.5	*1.00*	1.00	02/17/17	KCA	1	
Methyl Ethyl Ketone	1.00		*0.339*	0.339	2.95	*1.00*	1.00	02/17/17	KCA	1	
Methyl tert-butyl ether(MTBE)	ND		*0.278*	0.278	ND	*1.00*	1.00	02/17/17	KCA	1	
Methylene Chloride	2.38	S	*0.288*	0.288	8.26	*1.00*	1.00	02/17/17	KCA	1	
n-Butylbenzene	0.287		*0.182*	0.182	1.57	*1.00*	1.00	02/17/17	KCA	1	1
o-Xylene	4.89		*0.230*	0.230	21.2	*1.00*	1.00	02/17/17	KCA	1	
Propylene	4.41		*0.581*	0.581	7.59	*1.00*	1.00	02/17/17	KCA	1	1
sec-Butylbenzene	ND		*0.182*	0.182	ND	*1.00*	1.00	02/17/17	KCA	1	1
Styrene	0.441		*0.235*	0.235	1.88	*1.00*	1.00	02/17/17	KCA	1	
Tetrachloroethene	0.107		*0.037*	0.037	0.73	*0.25*	0.25	02/17/17	KCA	1	
Tetrahydrofuran	2.99		*0.339*	0.339	8.81	*1.00*	1.00	02/17/17	KCA	1	1
Toluene	5.72		*0.266*	0.266	21.5	*1.00*	1.00	02/17/17	KCA	1	
Trans-1,2-Dichloroethene	ND		*0.252*	0.252	ND	*1.00*	1.00	02/17/17	KCA	1	
trans-1,3-Dichloropropene	ND		*0.221*	0.221	ND	*1.00*	1.00	02/17/17	KCA	1	
Trichloroethene	0.082		*0.047*	0.047	0.44	*0.25*	0.25	02/17/17	KCA	1	
Trichlorofluoromethane	ND		*0.178*	0.178	ND	*1.00*	1.00	02/17/17	KCA	1	
Trichlorotrifluoroethane	ND		*0.131*	0.131	ND	*1.00*	1.00	02/17/17	KCA	1	
Vinyl Chloride	ND		*0.098*	0.098	ND	*0.25*	0.25	02/17/17	KCA	1	
QA/QC Surrogates											
% Bromofluorobenzene	106		*%*	%	106	*%*	%	02/17/17	KCA	1	

Ver 2

Project ID: 832 LEXINGTON AVE BROOKLYN
Client ID: SVE MID GAC

Phoenix I.D.: BX63326

Parameter	ppbv Result	ppbv RL	LOD/ MDL	ug/m3 Result	ug/m3 RL	LOD/ MDL	Date/Time	By	Dilution

1 = This parameter is not certified by NY NELAC for this matrix. NY NELAC does not offer certification for all parameters at this time.

RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected BRL=Below Reporting Level LOD=Limit of Detection MDL=Method Detection Limit1
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

This sample was sampled using a Tedlar airbag.

S - Laboratory solvent, contamination is possible.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

Phyllis Shiller, Laboratory Director
March 10, 2017
Reviewed and Released by: Jon Carlson, Project Manager

PHOENIX

Environmental Laboratories, Inc.
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ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

March 10, 2017

FOR: Attn: Mr. Charles B. Sosik, P.G.
Environmental Business Consultants
1808 Middle Country Rd
Ridge NY 11961-2406

Sample Information		Custody Information		Date	Time
Matrix:	AIR	Collected by:		02/14/17	
Location Code:	EBC	Received by:	SW	02/15/17	15:28
Rush Request:	72 Hour	Analyzed by:	see "By" below		
P.O.#:					
Canister Id:	UNKNOWN				

Laboratory Data

SDG ID: GBX63325
Phoenix ID: BX63327

Project ID: 832 LEXINGTON AVE BROOKLYN
Client ID: SVE POST GAC

Parameter	ppbv Result		ppbv RL	LOD/ MDL	ug/m3 Result	ug/m3 RL	LOD/ MDL	Date/Time	By	Dilution	
Volatiles (TO15)											
1,1,1,2-Tetrachloroethane	ND		*0.146*	0.146	ND	*1.00*	1.00	02/16/17	KCA	1	1
1,1,1-Trichloroethane	ND		*0.183*	0.183	ND	*1.00*	1.00	02/16/17	KCA	1	
1,1,2,2-Tetrachloroethane	ND		*0.146*	0.146	ND	*1.00*	1.00	02/16/17	KCA	1	
1,1,2-Trichloroethane	ND		*0.183*	0.183	ND	*1.00*	1.00	02/16/17	KCA	1	
1,1-Dichloroethane	ND		*0.247*	0.247	ND	*1.00*	1.00	02/16/17	KCA	1	
1,1-Dichloroethene	ND		*0.252*	0.252	ND	*1.00*	1.00	02/16/17	KCA	1	
1,2,4-Trichlorobenzene	0.394		*0.135*	0.135	2.92	*1.00*	1.00	02/16/17	KCA	1	
1,2,4-Trimethylbenzene	2.33		*0.204*	0.204	11.4	*1.00*	1.00	02/16/17	KCA	1	
1,2-Dibromoethane(EDB)	ND		*0.130*	0.130	ND	*1.00*	1.00	02/16/17	KCA	1	
1,2-Dichlorobenzene	ND		*0.166*	0.166	ND	*1.00*	1.00	02/16/17	KCA	1	
1,2-Dichloroethane	ND		*0.247*	0.247	ND	*1.00*	1.00	02/16/17	KCA	1	
1,2-dichloropropane	ND		*0.217*	0.217	ND	*1.00*	1.00	02/16/17	KCA	1	
1,2-Dichlorotetrafluoroethane	ND		*0.143*	0.143	ND	*1.00*	1.00	02/16/17	KCA	1	
1,3,5-Trimethylbenzene	0.628		*0.204*	0.204	3.09	*1.00*	1.00	02/16/17	KCA	1	
1,3-Butadiene	ND		*0.452*	0.452	ND	*1.00*	1.00	02/16/17	KCA	1	
1,3-Dichlorobenzene	66.0	D	*0.832*	0.832	397	*5.00*	5.00	02/16/17	KCA	5	
1,4-Dichlorobenzene	ND		*0.166*	0.166	ND	*1.00*	1.00	02/16/17	KCA	1	
1,4-Dioxane	ND		*0.278*	0.278	ND	*1.00*	1.00	02/16/17	KCA	1	
2-Hexanone(MBK)	ND		*0.244*	0.244	ND	*1.00*	1.00	02/16/17	KCA	1	1
4-Ethyltoluene	0.543		*0.204*	0.204	2.67	*1.00*	1.00	02/16/17	KCA	1	1
4-Isopropyltoluene	ND		*0.182*	0.182	ND	*1.00*	1.00	02/16/17	KCA	1	1
4-Methyl-2-pentanone(MIBK)	ND		*0.244*	0.244	ND	*1.00*	1.00	02/16/17	KCA	1	
Acetone	17.6		*0.421*	0.421	41.8	*1.00*	1.00	02/16/17	KCA	1	
Acrylonitrile	ND		*0.461*	0.461	ND	*1.00*	1.00	02/16/17	KCA	1	
Benzene	0.360		*0.313*	0.313	1.15	*1.00*	1.00	02/16/17	KCA	1	
Benzyl chloride	ND		*0.193*	0.193	ND	*1.00*	1.00	02/16/17	KCA	1	

Project ID: 832 LEXINGTON AVE BROOKLYN
Client ID: SVE POST GAC

Phoenix I.D.: BX63327

Parameter	ppbv Result		ppbv RL	LOD/ MDL	ug/m3 Result	ug/m3 RL	LOD/ MDL	Date/Time	By	Dilution	
Bromodichloromethane	ND		*0.149*	0.149	ND	*1.00*	1.00	02/16/17	KCA	1	
Bromoform	ND		*0.097*	0.097	ND	*1.00*	1.00	02/16/17	KCA	1	
Bromomethane	ND		*0.258*	0.258	ND	*1.00*	1.00	02/16/17	KCA	1	
Carbon Disulfide	0.634		*0.321*	0.321	1.97	*1.00*	1.00	02/16/17	KCA	1	
Carbon Tetrachloride	ND		*0.040*	0.040	ND	*0.25*	0.25	02/16/17	KCA	1	
Chlorobenzene	ND		*0.217*	0.217	ND	*1.00*	1.00	02/16/17	KCA	1	
Chloroethane	ND		*0.379*	0.379	ND	*1.00*	1.00	02/16/17	KCA	1	
Chloroform	ND		*0.205*	0.205	ND	*1.00*	1.00	02/16/17	KCA	1	
Chloromethane	ND		*0.485*	0.485	ND	*1.00*	1.00	02/16/17	KCA	1	
Cis-1,2-Dichloroethene	ND		*0.252*	0.252	ND	*1.00*	1.00	02/16/17	KCA	1	
cis-1,3-Dichloropropene	ND		*0.221*	0.221	ND	*1.00*	1.00	02/16/17	KCA	1	
Cyclohexane	ND		*0.291*	0.291	ND	*1.00*	1.00	02/16/17	KCA	1	
Dibromochloromethane	ND		*0.118*	0.118	ND	*1.00*	1.00	02/16/17	KCA	1	
Dichlorodifluoromethane	ND		*0.202*	0.202	ND	*1.00*	1.00	02/16/17	KCA	1	
Ethanol	19.3		*0.531*	0.531	36.3	*1.00*	1.00	02/16/17	KCA	1	1
Ethyl acetate	2.94		*0.278*	0.278	10.6	*1.00*	1.00	02/16/17	KCA	1	1
Ethylbenzene	1.77		*0.230*	0.230	7.68	*1.00*	1.00	02/16/17	KCA	1	
Heptane	0.378		*0.244*	0.244	1.55	*1.00*	1.00	02/16/17	KCA	1	
Hexachlorobutadiene	ND		*0.094*	0.094	ND	*1.00*	1.00	02/16/17	KCA	1	
Hexane	0.742	S	*0.284*	0.284	2.61	*1.00*	1.00	02/16/17	KCA	1	
Isopropylalcohol	6.07		*0.407*	0.407	14.9	*1.00*	1.00	02/16/17	KCA	1	
Isopropylbenzene	ND		*0.204*	0.204	ND	*1.00*	1.00	02/16/17	KCA	1	
m,p-Xylene	7.16		*0.230*	0.230	31.1	*1.00*	1.00	02/16/17	KCA	1	
Methyl Ethyl Ketone	0.597		*0.339*	0.339	1.76	*1.00*	1.00	02/16/17	KCA	1	
Methyl tert-butyl ether(MTBE)	ND		*0.278*	0.278	ND	*1.00*	1.00	02/16/17	KCA	1	
Methylene Chloride	1.95	S	*0.288*	0.288	6.77	*1.00*	1.00	02/16/17	KCA	1	
n-Butylbenzene	ND		*0.182*	0.182	ND	*1.00*	1.00	02/16/17	KCA	1	1
o-Xylene	4.21		*0.230*	0.230	18.3	*1.00*	1.00	02/16/17	KCA	1	
Propylene	0.998		*0.581*	0.581	1.72	*1.00*	1.00	02/16/17	KCA	1	1
sec-Butylbenzene	ND		*0.182*	0.182	ND	*1.00*	1.00	02/16/17	KCA	1	1
Styrene	0.276		*0.235*	0.235	1.17	*1.00*	1.00	02/16/17	KCA	1	
Tetrachloroethene	0.220		*0.037*	0.037	1.49	*0.25*	0.25	02/16/17	KCA	1	
Tetrahydrofuran	0.859		*0.339*	0.339	2.53	*1.00*	1.00	02/16/17	KCA	1	1
Toluene	5.67		*0.266*	0.266	21.4	*1.00*	1.00	02/16/17	KCA	1	
Trans-1,2-Dichloroethene	ND		*0.252*	0.252	ND	*1.00*	1.00	02/16/17	KCA	1	
trans-1,3-Dichloropropene	ND		*0.221*	0.221	ND	*1.00*	1.00	02/16/17	KCA	1	
Trichloroethene	0.160		*0.047*	0.047	0.86	*0.25*	0.25	02/16/17	KCA	1	
Trichlorofluoromethane	ND		*0.178*	0.178	ND	*1.00*	1.00	02/16/17	KCA	1	
Trichlorotrifluoroethane	ND		*0.131*	0.131	ND	*1.00*	1.00	02/16/17	KCA	1	
Vinyl Chloride	ND		*0.098*	0.098	ND	*0.25*	0.25	02/16/17	KCA	1	
QA/QC Surrogates											
% Bromofluorobenzene	109		*%*	%	109	*%*	%	02/16/17	KCA	1	

Ver 2

Project ID: 832 LEXINGTON AVE BROOKLYN
Client ID: SVE POST GAC

Phoenix I.D.: BX63327

Parameter	ppbv Result	ppbv RL	LOD/ MDL	ug/m3 Result	ug/m3 RL	LOD/ MDL	Date/Time	By	Dilution

1 = This parameter is not certified by NY NELAC for this matrix. NY NELAC does not offer certification for all parameters at this time.

RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected BRL=Below Reporting Level LOD=Limit of Detection MDL=Method Detection Limit1
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

This sample was sampled using a Tedlar airbag.

S - Laboratory solvent, contamination is possible.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

Phyllis Shiller, Laboratory Director
March 10, 2017
Reviewed and Released by: Jon Carlson, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

QA/QC Report

March 10, 2017

QA/QC Data

SDG I.D.: GBX63325

Parameter	Blk ppbv	Blk RL ppbv	Blk ug/m3	Blk RL ug/m3	LCS %	Sample Result ug/m3	Sample Dup ug/m3	Sample Result ppbv	Sample Dup ppbv	DUP RPD	% Rec Limits	% RPD Limits
QA/QC Batch 378011 (ppbv), QC Sample No: BX63321 (BX63325 (5X) , BX63326 (5X) , BX63327 (1X, 5X))												
Volatiles												
1,1,1,2-Tetrachloroethane	ND	0.146	ND	1.00	114	ND	ND	ND	ND	NC	70 - 130	25
1,1,1-Trichloroethane	ND	0.183	ND	1.00	101	ND	ND	ND	ND	NC	70 - 130	25
1,1,2,2-Tetrachloroethane	ND	0.146	ND	1.00	109	ND	ND	ND	ND	NC	70 - 130	25
1,1,2-Trichloroethane	ND	0.183	ND	1.00	116	ND	ND	ND	ND	NC	70 - 130	25
1,1-Dichloroethane	ND	0.247	ND	1.00	104	ND	ND	ND	ND	NC	70 - 130	25
1,1-Dichloroethene	ND	0.252	ND	1.00	98	ND	ND	ND	ND	NC	70 - 130	25
1,2,4-Trichlorobenzene	ND	0.135	ND	1.00	88	27.0	26.9	3.64	3.63	0.3	70 - 130	25
1,2,4-Trimethylbenzene	ND	0.204	ND	1.00	104	19.8	19.8	4.02	4.02	0.0	70 - 130	25
1,2-Dibromoethane(EDB)	ND	0.130	ND	1.00	116	ND	ND	ND	ND	NC	70 - 130	25
1,2-Dichlorobenzene	ND	0.166	ND	1.00	96	ND	ND	ND	ND	NC	70 - 130	25
1,2-Dichloroethane	ND	0.247	ND	1.00	98	ND	ND	ND	ND	NC	70 - 130	25
1,2-dichloropropane	ND	0.216	ND	1.00	106	ND	ND	ND	ND	NC	70 - 130	25
1,2-Dichlorotetrafluoroethane	ND	0.143	ND	1.00	111	ND	ND	ND	ND	NC	70 - 130	25
1,3,5-Trimethylbenzene	ND	0.204	ND	1.00	103	6.53	7.03	1.33	1.43	7.2	70 - 130	25
1,3-Butadiene	ND	0.452	ND	1.00	99	ND	ND	ND	ND	NC	70 - 130	25
1,3-Dichlorobenzene	ND	0.166	ND	1.00	99	955	871	159	145	9.2	70 - 130	25
1,4-Dichlorobenzene	ND	0.166	ND	1.00	99	ND	ND	ND	ND	NC	70 - 130	25
1,4-Dioxane	ND	0.278	ND	1.00	132	ND	ND	ND	ND	NC	70 - 130	25
2-Hexanone(MBK)	ND	0.244	ND	1.00	122	10.4	9.7	2.54	2.37	6.9	70 - 130	25
4-Ethyltoluene	ND	0.204	ND	1.00	110	7.22	7.52	1.47	1.53	4.0	70 - 130	25
4-Isopropyltoluene	ND	0.182	ND	1.00	95	1.25	1.27	0.227	0.231	NC	70 - 130	25
4-Methyl-2-pentanone(MIBK)	ND	0.244	ND	1.00	123	86.8	80.7	21.2	19.7	7.3	70 - 130	25
Acetone	ND	0.421	ND	1.00	98	610	598	257	252	2.0	70 - 130	25
Acrylonitrile	ND	0.461	ND	1.00	114	ND	ND	ND	ND	NC	70 - 130	25
Benzene	ND	0.313	ND	1.00	106	6.45	6.80	2.02	2.13	5.3	70 - 130	25
Benzyl chloride	ND	0.193	ND	1.00	109	ND	ND	ND	ND	NC	70 - 130	25
Bromodichloromethane	ND	0.149	ND	1.00	111	ND	ND	ND	ND	NC	70 - 130	25
Bromoform	ND	0.097	ND	1.00	112	ND	ND	ND	ND	NC	70 - 130	25
Bromomethane	ND	0.257	ND	1.00	101	ND	ND	ND	ND	NC	70 - 130	25
Carbon Disulfide	ND	0.321	ND	1.00	100	10.8	10.6	3.47	3.42	1.5	70 - 130	25
Carbon Tetrachloride	ND	0.040	ND	0.25	99	0.52	0.52	0.083	0.082	NC	70 - 130	25
Chlorobenzene	ND	0.217	ND	1.00	115	ND	ND	ND	ND	NC	70 - 130	25
Chloroethane	ND	0.379	ND	1.00	94	ND	ND	ND	ND	NC	70 - 130	25
Chloroform	ND	0.205	ND	1.00	101	10.9	10.7	2.24	2.20	1.8	70 - 130	25
Chloromethane	ND	0.484	ND	1.00	107	1.73	1.57	0.838	0.762	NC	70 - 130	25
Cis-1,2-Dichloroethene	ND	0.256	ND	1.01	104	ND	ND	ND	ND	NC	70 - 130	25
cis-1,3-Dichloropropene	ND	0.220	ND	1.00	122	ND	ND	ND	ND	NC	70 - 130	25
Cyclohexane	ND	0.291	ND	1.00	113	ND	ND	ND	ND	NC	70 - 130	25
Dibromochloromethane	ND	0.117	ND	1.00	117	ND	ND	ND	ND	NC	70 - 130	25
Dichlorodifluoromethane	ND	0.202	ND	1.00	105	2.37	2.27	0.479	0.460	NC	70 - 130	25
Ethanol	ND	0.531	ND	1.00	104	118	115	62.7	61.2	2.4	70 - 130	25

QA/QC Data

SDG I.D.: GBX63325

Parameter	Blk ppbv	Blk RL ppbv	Blk ug/m3	Blk RL ug/m3	LCS %	Sample Result ug/m3	Sample Dup ug/m3	Sample Result ppbv	Sample Dup ppbv	DUP RPD	% Rec Limits	% RPD Limits
Ethyl acetate	ND	0.278	ND	1.00	114	46.5	46.5	12.9	12.9	0.0	70 - 130	25
Ethylbenzene	ND	0.230	ND	1.00	124	23.7	22.7	5.45	5.22	4.3	70 - 130	25
Heptane	ND	0.244	ND	1.00	117	12.2	13.4	2.99	3.26	8.6	70 - 130	25
Hexachlorobutadiene	ND	0.094	ND	1.00	83	ND	ND	ND	ND	NC	70 - 130	25
Hexane	ND	0.284	ND	1.00	104	9.5 S	9.7 S	2.70 S	2.75 S	1.8	70 - 130	25
Isopropylalcohol	ND	0.407	ND	1.00	106	19.7	19.1	8.00	7.79	2.7	70 - 130	25
Isopropylbenzene	ND	0.204	ND	1.00	116	1.75	1.82	0.356	0.370	NC	70 - 130	25
m,p-Xylene	ND	0.230	ND	1.00	120	80.7	75.1	18.6	17.3	7.2	70 - 130	25
Methyl Ethyl Ketone	ND	0.339	ND	1.00	109	78.7	79.9	26.7	27.1	1.5	70 - 130	25
Methyl tert-butyl ether(MTBE)	ND	0.277	ND	1.00	116	ND	ND	ND	ND	NC	70 - 130	25
Methylene Chloride	ND	0.288	ND	1.00	93	2.28 S	2.03 S	0.656 S	0.584 S	NC	70 - 130	25
n-Butylbenzene	ND	0.182	ND	1.00	101	1.43	1.44	0.260	0.262	NC	70 - 130	25
o-Xylene	ND	0.230	ND	1.00	120	49.0	47.7	11.3	11.0	2.7	70 - 130	25
Propylene	ND	0.581	ND	1.00	111	ND	ND	ND	ND	NC	70 - 130	25
sec-Butylbenzene	ND	0.182	ND	1.00	103	ND	ND	ND	ND	NC	70 - 130	25
Styrene	ND	0.235	ND	1.00	128	3.64	3.59	0.856	0.843	NC	70 - 130	25
Tetrachloroethene	ND	0.037	ND	0.25	113	1.44	1.76	0.213	0.259	19.5	70 - 130	25
Tetrahydrofuran	ND	0.339	ND	1.00	122	37.4	37.7	12.7	12.8	0.8	70 - 130	25
Toluene	ND	0.266	ND	1.00	119	31.2	30.4	8.29	8.07	2.7	70 - 130	25
Trans-1,2-Dichloroethene	ND	0.252	ND	1.00	100	ND	ND	ND	ND	NC	70 - 130	25
trans-1,3-Dichloropropene	ND	0.220	ND	1.00	122	ND	ND	ND	ND	NC	70 - 130	25
Trichloroethene	ND	0.047	ND	0.25	113	0.48	0.50	0.089	0.093	NC	70 - 130	25
Trichlorofluoromethane	ND	0.178	ND	1.00	102	1.19	1.16	0.212	0.207	NC	70 - 130	25
Trichlorotrifluoroethane	ND	0.131	ND	1.00	99	ND	ND	ND	ND	NC	70 - 130	25
Vinyl Chloride	ND	0.098	ND	0.25	105	ND	ND	ND	ND	NC	70 - 130	25
% Bromofluorobenzene	120	%	120	%	98	109	110	109	110	NC	70 - 130	25
QA/QC Batch 376854 (ppbv), QC Sample No: BX63325 (BX63325, BX63326)												
Volatiles												
1,1,1,2-Tetrachloroethane	ND	0.146	ND	1.00	112						70 - 130	25
1,1,1-Trichloroethane	ND	0.183	ND	1.00	94						70 - 130	25
1,1,2,2-Tetrachloroethane	ND	0.146	ND	1.00	109						70 - 130	25
1,1,2-Trichloroethane	ND	0.183	ND	1.00	112						70 - 130	25
1,1-Dichloroethane	ND	0.247	ND	1.00	98						70 - 130	25
1,1-Dichloroethene	ND	0.252	ND	1.00	94						70 - 130	25
1,2,4-Trichlorobenzene	ND	0.135	ND	1.00	90						70 - 130	25
1,2,4-Trimethylbenzene	ND	0.204	ND	1.00	106						70 - 130	25
1,2-Dibromoethane(EDB)	ND	0.130	ND	1.00	110						70 - 130	25
1,2-Dichlorobenzene	ND	0.166	ND	1.00	101						70 - 130	25
1,2-Dichloroethane	ND	0.247	ND	1.00	93						70 - 130	25
1,2-dichloropropane	ND	0.216	ND	1.00	106						70 - 130	25
1,2-Dichlorotetrafluoroethane	ND	0.143	ND	1.00	104						70 - 130	25
1,3,5-Trimethylbenzene	ND	0.204	ND	1.00	108						70 - 130	25
1,3-Butadiene	ND	0.452	ND	1.00	94						70 - 130	25
1,4-Dichlorobenzene	ND	0.166	ND	1.00	106						70 - 130	25
1,4-Dioxane	ND	0.278	ND	1.00	128						70 - 130	25
2-Hexanone(MBK)	ND	0.244	ND	1.00	108						70 - 130	25
4-Ethyltoluene	ND	0.204	ND	1.00	118						70 - 130	25
4-Isopropyltoluene	ND	0.182	ND	1.00	101						70 - 130	25
4-Methyl-2-pentanone(MIBK)	ND	0.244	ND	1.00	115						70 - 130	25
Acetone	ND	0.421	ND	1.00	88						70 - 130	25
Acrylonitrile	ND	0.461	ND	1.00	107						70 - 130	25
Benzene	ND	0.313	ND	1.00	108						70 - 130	25

QA/QC Data

SDG I.D.: GBX63325

Parameter	Blk ppbv	Blk RL ppbv	Blk ug/m3	Blk RL ug/m3	LCS %	Sample Result ug/m3	Sample Dup ug/m3	Sample Result ppbv	Sample Dup ppbv	DUP RPD	% Rec Limits	% RPD Limits	
Benzyl chloride	ND	0.193	ND	1.00	110						70 - 130	25	
Bromodichloromethane	ND	0.149	ND	1.00	102						70 - 130	25	
Bromoform	ND	0.097	ND	1.00	110						70 - 130	25	
Bromomethane	ND	0.257	ND	1.00	97						70 - 130	25	
Carbon Disulfide	ND	0.321	ND	1.00	100						70 - 130	25	
Carbon Tetrachloride	ND	0.040	ND	0.25	91						70 - 130	25	
Chlorobenzene	ND	0.217	ND	1.00	117						70 - 130	25	
Chloroethane	ND	0.379	ND	1.00	93						70 - 130	25	
Chloroform	ND	0.205	ND	1.00	92						70 - 130	25	
Chloromethane	ND	0.484	ND	1.00	97						70 - 130	25	
Cis-1,2-Dichloroethene	ND	0.256	ND	1.01	98						70 - 130	25	
cis-1,3-Dichloropropene	ND	0.220	ND	1.00	117						70 - 130	25	
Cyclohexane	ND	0.291	ND	1.00	109						70 - 130	25	
Dibromochloromethane	ND	0.117	ND	1.00	109						70 - 130	25	
Dichlorodifluoromethane	ND	0.202	ND	1.00	95						70 - 130	25	
Ethanol	ND	0.531	ND	1.00	97						70 - 130	25	
Ethyl acetate	ND	0.278	ND	1.00	102						70 - 130	25	
Ethylbenzene	ND	0.230	ND	1.00	128						70 - 130	25	
Heptane	ND	0.244	ND	1.00	114						70 - 130	25	
Hexachlorobutadiene	ND	0.094	ND	1.00	84						70 - 130	25	
Hexane	ND	0.284	ND	1.00	106						70 - 130	25	
Isopropylalcohol	ND	0.407	ND	1.00	101						70 - 130	25	
Isopropylbenzene	ND	0.204	ND	1.00	117						70 - 130	25	
m,p-Xylene	ND	0.230	ND	1.00	120						70 - 130	25	
Methyl Ethyl Ketone	ND	0.339	ND	1.00	101						70 - 130	25	
Methyl tert-butyl ether(MTBE)	ND	0.277	ND	1.00	111						70 - 130	25	
Methylene Chloride	ND	0.288	ND	1.00	84						70 - 130	25	
n-Butylbenzene	ND	0.182	ND	1.00	104						70 - 130	25	
o-Xylene	ND	0.230	ND	1.00	121						70 - 130	25	
Propylene	ND	0.581	ND	1.00	102						70 - 130	25	
sec-Butylbenzene	ND	0.182	ND	1.00	107						70 - 130	25	
Styrene	ND	0.235	ND	1.00	130						70 - 130	25	
Tetrachloroethene	ND	0.037	ND	0.25	115						70 - 130	25	
Tetrahydrofuran	ND	0.339	ND	1.00	105						70 - 130	25	
Toluene	ND	0.266	ND	1.00	114						70 - 130	25	
Trans-1,2-Dichloroethene	ND	0.252	ND	1.00	99						70 - 130	25	
trans-1,3-Dichloropropene	ND	0.220	ND	1.00	113						70 - 130	25	
Trichloroethene	ND	0.047	ND	0.25	110						70 - 130	25	
Trichlorofluoromethane	ND	0.178	ND	1.00	89						70 - 130	25	
Trichlorotrifluoroethane	ND	0.131	ND	1.00	98						70 - 130	25	
Vinyl Chloride	ND	0.098	ND	0.25	97						70 - 130	25	
% Bromofluorobenzene	132	%	132	%	99						70 - 130	25	s

l = This parameter is outside laboratory LCS/LCSD specified recovery limits.
s = This parameter is outside laboratory Blank Surrogate specified recovery limits.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
March 10, 2017

Friday, March 10, 2017

Criteria: None

State: NY

Sample Criteria Exceedances Report

GBX63325 - EBC

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

Cooler: Yes ☐ No ☐
Coolant: IPK ☐ ICE ☐ No ☐

NY/NJ CHAIN OF CUSTODY RECORD

Temp °C Pg 1 of 1

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: 631-504-6000
☒ Email: File.

Customer: Environmental Business Consultants
Address: 1808 Middle Country Road
Ridge, NY 11961

Project: 832 Lexington Ave, Brooklyn, NY
Report to: Environmental Business Consultants
Invoice to: Environmental Business Consultants

Project P.O:

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature: Hongpong Lau Date: 2-14-17

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	TO-15	Tedlar Bag	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
63325	SVE Pre GAC	Air	2-14-17		X	1										
63326	SVE Mid GAC	Air	2-14-17		X	1										
63327	SVE Post GAC	Air	2-14-17		X	1										

Relinquished by:	Accepted by:	Date:	Time:
		2-15-17	11:30
	Caroline	2-15-17	1528

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
☐ NY 375 GWP
☐ NY375 Unrestricted Use Soil
☐ NY375 Residential Soil
☐ Restricted/Residential
☐ Commercial
☐ Industrial

Data Format
☐ Phoenix Std Report
☒ Excel
☒ PDF
☐ GIS/Key
☒ EQuIS
☐ NJ Hazsite EDD
☐ NY EZ EDD (ASP)
☐ Other

Data Package
☐ NJ Reduced Deliv.*
☒ NY Enhanced (ASP B)*
☐ Other

State where samples were collected: NY

PHOENIX
Environmental Laboratories, Inc.

Tuesday, April 04, 2017

Attn: Mr. Charles B. Sosik, P.G.
Environmental Business Consultants
1808 Middle Country Rd
Ridge NY 11961-2406

Project ID: 832 LEXINGTON AVE BROOKLYN NY
Sample ID#s: BX95628 - BX95629

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #MA-CT-007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

NY # 11301

SDG Comments

April 04, 2017

SDG I.D.: GBX95628

Any compound that is not detected above the MDL/LOD is reported as ND on the report and is reported in the electronic deliverables (EDD) as <RL or U at the RL per state and EPA guidance.

Version 1: Analysis results minus raw data.

Version 2: Complete report with raw data.

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

April 04, 2017

FOR: Attn: Mr. Charles B. Sosik, P.G.
Environmental Business Consultants
1808 Middle Country Rd
Ridge NY 11961-2406

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:	HL	03/27/17	13:05
Location Code:	EBC	Received by:	SW	03/29/17	14:54
Rush Request:	72 Hour	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBX95628
Phoenix ID: BX95628

Project ID: 832 LEXINGTON AVE BROOKLYN NY
Client ID: CARBON DRUM

Parameter	Result		RL/ PQL	LOD/ MDL	Units	Dilution	Date/Time	By	Reference	
Percent Solid	89				%		03/29/17	Q	SW846-%Solid	
Flash Point	131		200	200	Degree F	1	03/30/17	Y	SW1010A	
Ignitability	Failed		140	140	degree F	1	03/30/17	Y	SW846-Ignit	1
TCLP Extraction for Organics	Completed						03/29/17	W	SW1311	
TCLP Semi-Volatile Extraction	Completed						03/30/17	TB	SW3510C	
TCLP Extraction Volatiles	Completed						03/29/17	Y	SW1311	
TCLP Final PH	-				pH Units	1	03/29/17	Y	SM423/E150.1	
TCLP Volatiles										
1,1-Dichloroethene	ND		25	2.5	ug/L	5	03/31/17	HM	SW8260C	
1,2-Dichloroethane	ND		25	2.5	ug/L	5	03/31/17	HM	SW8260C	
Benzene	70		25	2.5	ug/L	5	03/31/17	HM	SW8260C	
Carbon tetrachloride	ND		25	2.5	ug/L	5	03/31/17	HM	SW8260C	
Chlorobenzene	ND		25	2.5	ug/L	5	03/31/17	HM	SW8260C	
Chloroform	ND		25	2.5	ug/L	5	03/31/17	HM	SW8260C	
Methyl ethyl ketone	160		25	25	ug/L	5	03/31/17	HM	SW8260C	
Tetrachloroethene	ND		25	2.5	ug/L	5	03/31/17	HM	SW8260C	
Trichloroethene	7.9	J	25	2.5	ug/L	5	03/31/17	HM	SW8260C	
Vinyl chloride	ND		25	2.5	ug/L	5	03/31/17	HM	SW8260C	
QA/QC Surrogates										
% 1,2-dichlorobenzene-d4	100				%	5	03/31/17	HM	70 - 130 %	
% Bromofluorobenzene	98				%	5	03/31/17	HM	70 - 130 %	
% Dibromofluoromethane	101				%	5	03/31/17	HM	70 - 130 %	
% Toluene-d8	101				%	5	03/31/17	HM	70 - 130 %	
TCLP Acid/Base-Neutral										
1,4-Dichlorobenzene	ND		83	83	ug/L	1	03/31/17	DD	SW8270D	
2,4,5-Trichlorophenol	ND		83	83	ug/L	1	03/31/17	DD	SW8270D	

Project ID: 832 LEXINGTON AVE BROOKLYN NY
Client ID: CARBON DRUM

Phoenix I.D.: BX95628

Parameter	Result	RL/ PQL	LOD/ MDL	Units	Dilution	Date/Time	By	Reference	
2,4,6-Trichlorophenol	ND	83	83	ug/L	1	03/31/17	DD	SW8270D	
2,4-Dinitrotoluene	ND	83	83	ug/L	1	03/31/17	DD	SW8270D	
2-Methylphenol (o-cresol)	ND	83	83	ug/L	1	03/31/17	DD	SW8270D	
3&4-Methylphenol (m&p-Cresol)	ND	83	83	ug/L	1	03/31/17	DD	SW8270D	
Hexachlorobenzene	ND	83	83	ug/L	1	03/31/17	DD	SW8270D	
Hexachlorobutadiene	ND	83	83	ug/L	1	03/31/17	DD	SW8270D	
Hexachloroethane	ND	83	83	ug/L	1	03/31/17	DD	SW8270D	
Nitrobenzene	ND	83	83	ug/L	1	03/31/17	DD	SW8270D	
Pentachlorophenol	ND	83	83	ug/L	1	03/31/17	DD	SW8270D	
Pyridine	ND	83	83	ug/L	1	03/31/17	DD	SW8270D	
QA/QC Surrogates									
% 2,4,6-Tribromophenol	117			%	1	03/31/17	DD	15 - 110 %	3
% 2-Fluorobiphenyl	98			%	1	03/31/17	DD	30 - 130 %	
% 2-Fluorophenol	87			%	1	03/31/17	DD	15 - 110 %	
% Nitrobenzene-d5	108			%	1	03/31/17	DD	30 - 130 %	
% Phenol-d5	88			%	1	03/31/17	DD	15 - 110 %	
% Terphenyl-d14	110			%	1	03/31/17	DD	30 - 130 %	

1 = This parameter is not certified by NY NELAC for this matrix. NY NELAC does not offer certification for all parameters at this time.
3 = This parameter exceeds laboratory specified limits.

RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected BRL=Below Reporting Level J=Estimated Below RL LOD=Limit of Detection MDL=Method Detection Limit1
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

Semi-Volatile Comment:
One of the surrogate recoveries was above the upper range due to sample matrix interference. The other surrogates associated with this sample were within QA/QC criteria. No significant bias is suspected.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

Phyllis Shiller, Laboratory Director
April 04, 2017
Reviewed and Released by: Ethan Lee, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

April 04, 2017

FOR: Attn: Mr. Charles B. Sosik, P.G.
Environmental Business Consultants
1808 Middle Country Rd
Ridge NY 11961-2406

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:	HL	03/27/17	13:10
Location Code:	EBC	Received by:	SW	03/29/17	14:54
Rush Request:	72 Hour	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBX95628
Phoenix ID: BX95629

Project ID: 832 LEXINGTON AVE BROOKLYN NY
Client ID: CARBON DRUM GRAB

Parameter	Result		RL/ PQL	LOD/ MDL	Units	Dilution	Date/Time	By	Reference	
Percent Solid	87				%		03/29/17	Q	SW846-%Solid	
Flash Point	117		200	200	Degree F	1	03/30/17	Y	SW1010A	
Ignitability	Failed		140	140	degree F	1	03/30/17	Y	SW846-Ignit	1
TCLP Extraction for Organics	Completed						03/29/17	W	SW1311	
TCLP Semi-Volatile Extraction	Completed						03/30/17	TB	SW3510C	
TCLP Extraction Volatiles	Completed						03/29/17	Y	SW1311	
TCLP Final PH	-				pH Units	1	03/29/17	Y	SM423/E150.1	
TCLP Volatiles										
1,1-Dichloroethene	ND		50	5.0	ug/L	10	03/31/17	HM	SW8260C	
1,2-Dichloroethane	ND		50	5.0	ug/L	10	03/31/17	HM	SW8260C	
Benzene	79		50	5.0	ug/L	10	03/31/17	HM	SW8260C	
Carbon tetrachloride	ND		50	5.0	ug/L	10	03/31/17	HM	SW8260C	
Chlorobenzene	ND		50	5.0	ug/L	10	03/31/17	HM	SW8260C	
Chloroform	ND		50	5.0	ug/L	10	03/31/17	HM	SW8260C	
Methyl ethyl ketone	160		50	50	ug/L	10	03/31/17	HM	SW8260C	
Tetrachloroethene	ND		50	5.0	ug/L	10	03/31/17	HM	SW8260C	
Trichloroethene	9.6	J	50	5.0	ug/L	10	03/31/17	HM	SW8260C	
Vinyl chloride	ND		50	5.0	ug/L	10	03/31/17	HM	SW8260C	
QA/QC Surrogates										
% 1,2-dichlorobenzene-d4	101				%	10	03/31/17	HM	70 - 130 %	
% Bromofluorobenzene	101				%	10	03/31/17	HM	70 - 130 %	
% Dibromofluoromethane	100				%	10	03/31/17	HM	70 - 130 %	
% Toluene-d8	101				%	10	03/31/17	HM	70 - 130 %	
TCLP Acid/Base-Neutral										
1,4-Dichlorobenzene	ND		83	83	ug/L	1	03/31/17	DD	SW8270D	
2,4,5-Trichlorophenol	ND		83	83	ug/L	1	03/31/17	DD	SW8270D	

Project ID: 832 LEXINGTON AVE BROOKLYN NY
Client ID: CARBON DRUM GRAB

Phoenix I.D.: BX95629

Parameter	Result	RL/ PQL	LOD/ MDL	Units	Dilution	Date/Time	By	Reference	
2,4,6-Trichlorophenol	ND	83	83	ug/L	1	03/31/17	DD	SW8270D	
2,4-Dinitrotoluene	ND	83	83	ug/L	1	03/31/17	DD	SW8270D	
2-Methylphenol (o-cresol)	ND	83	83	ug/L	1	03/31/17	DD	SW8270D	
3&4-Methylphenol (m&p-Cresol)	ND	83	83	ug/L	1	03/31/17	DD	SW8270D	
Hexachlorobenzene	ND	83	83	ug/L	1	03/31/17	DD	SW8270D	
Hexachlorobutadiene	ND	83	83	ug/L	1	03/31/17	DD	SW8270D	
Hexachloroethane	ND	83	83	ug/L	1	03/31/17	DD	SW8270D	
Nitrobenzene	ND	83	83	ug/L	1	03/31/17	DD	SW8270D	
Pentachlorophenol	ND	83	83	ug/L	1	03/31/17	DD	SW8270D	
Pyridine	ND	83	83	ug/L	1	03/31/17	DD	SW8270D	
QA/QC Surrogates									
% 2,4,6-Tribromophenol	126			%	1	03/31/17	DD	15 - 110 %	3
% 2-Fluorobiphenyl	104			%	1	03/31/17	DD	30 - 130 %	
% 2-Fluorophenol	93			%	1	03/31/17	DD	15 - 110 %	
% Nitrobenzene-d5	113			%	1	03/31/17	DD	30 - 130 %	
% Phenol-d5	89			%	1	03/31/17	DD	15 - 110 %	
% Terphenyl-d14	118			%	1	03/31/17	DD	30 - 130 %	

1 = This parameter is not certified by NY NELAC for this matrix. NY NELAC does not offer certification for all parameters at this time.
3 = This parameter exceeds laboratory specified limits.

RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected BRL=Below Reporting Level J=Estimated Below RL LOD=Limit of Detection MDL=Method Detection Limit1
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

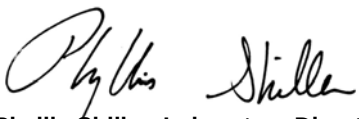
Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

Volatile Comment:
Elevated reporting limits for volatiles due to the presence of target and/or non-target compounds.

Semi-Volatile Comment:
One of the surrogate recoveries was above the upper range due to sample matrix interference. The other surrogates associated with this sample were within QA/QC criteria. No significant bias is suspected.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.



Phyllis Shiller, Laboratory Director
April 04, 2017
Reviewed and Released by: Ethan Lee, Project Manager

Tuesday, April 04, 2017

Criteria: NY: 375, 375GWP, 375RRS, 375RS

State: NY

Sample Criteria Exceedances Report

GBX95628 - EBC

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

NY Temperature Narration

April 04, 2017

SDG I.D.: GBX95628

The samples in this delivery group were received at 2.1°C.
(Note acceptance criteria is above freezing up to 6°C)

Cooler: Yes [X] No [ ]
Coolant: IPK [ ] ICE [X] No [ ]

PHOENIX
Environmental Laboratories, Inc.

NY/NJ CHAIN OF CUSTODY RECORD

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: info@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Temp 20.1 °C Pg 1 of 1

Contact Options:
[ ] Fax:
[ ] Phone: 631-504-6000
[X] Email: File

Customer: Environmental Business Consultants
Address: 1808 Middle Country Road
Ridge, NY 11961

Project: 832 Lexington Ave, Brooklyn, NY
Report to: Environmental Business Consultants
Invoice to: Environmental Business Consultants

Project P.O:

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature: Hongpong Lau Date: 3/27/17

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	TCLP VOCs	TCLP SVOCs	Ignitability	extractable pH testing	Soil VOA Vials [ ] methanol [ ] H2O	GL Soil container (8 oz)	GL Soil container (4 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
95628	Carbon drum	SD	3-27-17	1:05	X	X	X	X		1								
95629	Carbon drum Grab	SD	3-27-17	1:10	X	X	X	X			1							

Relinquished by:	Accepted by:	Date:	Time:
		3-29-17	9:00
	Krystal Bruce	3-29	14:54

Comments, Special Requirements or Regulations:

Turnaround:
[ ] 1 Day*
[ ] 2 Days*
[ ] 3 Days*
[X] 5 Days
[ ] 10 Days
[ ] Other
* SURCHARGE APPLIES

NJ
[ ] Res. Criteria
[ ] Non-Res. Criteria
[ ] Impact to GW Soil Cleanup Criteria
[ ] GW Criteria

NY
[ ] NY 375 GWP
[X] NY375 Unrestricted Use Soil
[X] NY375 Residential Soil
[X] Restricted/Residential
[ ] Commercial
[ ] Industrial

Data Format
[ ] Phoenix Std Report
[X] Excel
[X] PDF
[ ] GIS/Key
[X] EQuIS
[ ] NJ Hazsite EDD
[X] NY EZ EDD (ASP)
[ ] Other

Data Package
[ ] NJ Reduced Deliv. *
[X] NY Enhanced (ASP B) *
[ ] Other

State where samples were collected: NY

PHOENIX
Environmental Laboratories, Inc.

Thursday, May 11, 2017

Attn: Mr. Charles B. Sosik, P.G.
Environmental Business Consultants
1808 Middle Country Rd
Ridge NY 11961-2406

Project ID: 832 LEXINGTON AVE., BROOKLYN
Sample ID#s: BY08158 - BY08160

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

Enclosed are revised Analysis Report pages. Please replace and discard the original pages. If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #MA-CT-007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

NY ANALYTICAL SERVICES PROTOCOL
DATA PACKAGE

Client: Environmental Business Consultants

Project: 832 LEXINGTON AVE., BROOKLYN

Laboratory Project: GBY08158

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06040
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

NY Analytical Services Protocol Format

May 11, 2017 **SDG I.D.: GBY08158**

Environmental Business Consultants 832 LEXINGTON AVE., BROOKLYN

Methodology Summary

Volatiles in Air

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air: Method TO-15, Second Edition, U. S. Environmental Protection Agency, January 1999.

Sample Id Cross Reference

Client Id	Lab Id	Matrix
PRE-GAC	BY08158	AIR
MID GAC	BY08159	AIR
POST GAC	BY08160	AIR

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06040
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

NY Analytical Services Protocol Format

May 11, 2017 **SDG I.D.: GBY08158**

Environmental Business Consultants 832 LEXINGTON AVE., BROOKLYN

Laboratory Chronicle

Sample	Analysis	Collection Date	Prep Date	Analysis Date	Analyst	Hold Time Met
BY08158	Volatiles (TO15)	04/20/17	05/01/17	05/01/17	KCA	Y
BY08159	Volatiles (TO15)	04/20/17	04/25/17	04/25/17	KCA	Y
BY08160	Volatiles (TO15)	04/20/17	04/25/17	04/25/17	KCA	Y

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

NY # 11301

SDG Comments

May 11, 2017

SDG I.D.: GBY08158

Any compound that is not detected above the MDL/LOD is reported as ND on the report and is reported in the electronic deliverables (EDD) as <RL or U at the RL per state and EPA guidance.

Version 1: Analysis results minus raw data.

Version 2: Complete report with raw data.

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

May 11, 2017

FOR: Attn: Mr. Charles B. Sosik, P.G.
Environmental Business Consultants
1808 Middle Country Rd
Ridge NY 11961-2406

Sample Information		Custody Information		Date	Time
Matrix:	AIR	Collected by:	HL	04/20/17	11:25
Location Code:	EBC	Received by:	LB	04/21/17	16:53
Rush Request:	72 Hour	Analyzed by:	see "By" below		
P.O.#:					
Canister Id:	AIR BAG				

Laboratory Data

SDG ID: GBY08158
Phoenix ID: BY08158

Project ID: 832 LEXINGTON AVE., BROOKLYN
Client ID: PRE-GAC

Parameter	ppbv Result		ppbv RL	LOD/ MDL	ug/m3 Result	ug/m3 RL	LOD/ MDL	Date/Time	By	Dilution	
Volatiles (TO15)											
1,1,1,2-Tetrachloroethane	ND		*7.29*	7.29	ND	*50.0*	50.0	04/28/17	KCA	50	1
1,1,1-Trichloroethane	ND		*9.17*	9.17	ND	*50.0*	50.0	04/28/17	KCA	50	
1,1,2,2-Tetrachloroethane	ND		*7.29*	7.29	ND	*50.0*	50.0	04/28/17	KCA	50	
1,1,2-Trichloroethane	ND		*9.17*	9.17	ND	*50.0*	50.0	04/28/17	KCA	50	
1,1-Dichloroethane	ND		*12.4*	12.4	ND	*50.2*	50.2	04/28/17	KCA	50	
1,1-Dichloroethene	ND		*12.6*	12.6	ND	*49.9*	49.9	04/28/17	KCA	50	
1,2,4-Trichlorobenzene	ND		*6.74*	6.74	ND	*50.0*	50.0	04/28/17	KCA	50	
1,2,4-Trimethylbenzene	11700	D	*204*	204	57500	*1000*	1000	05/01/17	KCA	1000	
1,2-Dibromoethane(EDB)	ND		*6.51*	6.51	ND	*50.0*	50.0	04/28/17	KCA	50	
1,2-Dichlorobenzene	ND		*8.32*	8.32	ND	*50.0*	50.0	04/28/17	KCA	50	
1,2-Dichloroethane	ND		*12.4*	12.4	ND	*50.2*	50.2	04/28/17	KCA	50	
1,2-dichloropropane	ND		*10.8*	10.8	ND	*49.9*	49.9	04/28/17	KCA	50	
1,2-Dichlorotetrafluoroethane	ND		*7.16*	7.16	ND	*50.0*	50.0	04/28/17	KCA	50	
1,3,5-Trimethylbenzene	5580	D	*204*	204	27400	*1000*	1000	05/01/17	KCA	1000	
1,3-Butadiene	ND		*22.6*	22.6	ND	*50.0*	50.0	04/28/17	KCA	50	
1,3-Dichlorobenzene	ND		*8.32*	8.32	ND	*50.0*	50.0	04/28/17	KCA	50	
1,4-Dichlorobenzene	ND		*8.32*	8.32	ND	*50.0*	50.0	04/28/17	KCA	50	
1,4-Dioxane	ND		*13.9*	13.9	ND	*50.1*	50.1	04/28/17	KCA	50	
2-Hexanone(MBK)	ND		*12.2*	12.2	ND	*49.9*	49.9	04/28/17	KCA	50	1
4-Ethyltoluene	3860	D	*204*	204	19000	*1000*	1000	05/01/17	KCA	1000	1
4-Isopropyltoluene	ND		*9.11*	9.11	ND	*50.0*	50.0	04/28/17	KCA	50	1
4-Methyl-2-pentanone(MIBK)	ND		*12.2*	12.2	ND	*49.9*	49.9	04/28/17	KCA	50	
Acetone	ND		*21.1*	21.1	ND	*50.1*	50.1	04/28/17	KCA	50	
Acrylonitrile	ND		*23.1*	23.1	ND	*50.1*	50.1	04/28/17	KCA	50	
Benzene	46.6		*15.7*	15.7	149	*50.1*	50.1	04/28/17	KCA	50	
Benzyl chloride	ND		*9.66*	9.66	ND	*50.0*	50.0	04/28/17	KCA	50	

Project ID: 832 LEXINGTON AVE., BROOKLYN

Phoenix I.D.: BY08158

Client ID: PRE-GAC

Parameter	ppbv Result		ppbv RL	LOD/ MDL	ug/m3 Result	ug/m3 RL	LOD/ MDL	Date/Time	By	Dilution	
Bromodichloromethane	ND		*7.47*	7.47	ND	*50.0*	50.0	04/28/17	KCA	50	
Bromoform	ND		*4.84*	4.84	ND	*50.0*	50.0	04/28/17	KCA	50	
Bromomethane	ND		*12.9*	12.9	ND	*50.1*	50.1	04/28/17	KCA	50	
Carbon Disulfide	28.1		*16.1*	16.1	87.4	*50.1*	50.1	04/28/17	KCA	50	
Carbon Tetrachloride	ND		*1.98*	1.98	ND	*12.4*	12.4	04/28/17	KCA	50	
Chlorobenzene	ND		*10.9*	10.9	ND	*50.1*	50.1	04/28/17	KCA	50	
Chloroethane	34.8		*19.0*	19.0	91.8	*50.1*	50.1	04/28/17	KCA	50	
Chloroform	ND		*10.2*	10.2	ND	*49.8*	49.8	04/28/17	KCA	50	
Chloromethane	117		*24.2*	24.2	241	*49.9*	49.9	04/28/17	KCA	50	
Cis-1,2-Dichloroethene	ND		*12.6*	12.6	ND	*49.9*	49.9	04/28/17	KCA	50	
cis-1,3-Dichloropropene	ND		*11.0*	11.0	ND	*49.9*	49.9	04/28/17	KCA	50	
Cyclohexane	1310		*14.5*	14.5	4510	*49.9*	49.9	04/28/17	KCA	50	
Dibromochloromethane	ND		*5.87*	5.87	ND	*50.0*	50.0	04/28/17	KCA	50	
Dichlorodifluoromethane	ND		*10.1*	10.1	ND	*49.9*	49.9	04/28/17	KCA	50	
Ethanol	33.3		*26.6*	26.6	62.7	*50.1*	50.1	04/28/17	KCA	50	1
Ethyl acetate	ND		*13.9*	13.9	ND	*50.1*	50.1	04/28/17	KCA	50	1
Ethylbenzene	701		*11.5*	11.5	3040	*49.9*	49.9	04/28/17	KCA	50	
Heptane	7260	D	*244*	244	29700	*999*	999	05/01/17	KCA	1000	
Hexachlorobutadiene	ND		*4.69*	4.69	ND	*50.0*	50.0	04/28/17	KCA	50	
Hexane	10200	D	*284*	284	35900	*1000*	1000	05/01/17	KCA	1000	
Isopropylalcohol	ND		*20.4*	20.4	ND	*50.1*	50.1	04/28/17	KCA	50	
Isopropylbenzene	356		*10.2*	10.2	1750	*50.1*	50.1	04/28/17	KCA	50	
m,p-Xylene	19800	D	*230*	230	85900	*998*	998	05/01/17	KCA	1000	
Methyl Ethyl Ketone	ND		*17.0*	17.0	ND	*50.1*	50.1	04/28/17	KCA	50	
Methyl tert-butyl ether(MTBE)	ND		*13.9*	13.9	ND	*50.1*	50.1	04/28/17	KCA	50	
Methylene Chloride	ND		*14.4*	14.4	ND	*50.0*	50.0	04/28/17	KCA	50	
n-Butylbenzene	ND		*9.11*	9.11	ND	*50.0*	50.0	04/28/17	KCA	50	1
o-Xylene	9880	D	*230*	230	42900	*998*	998	05/01/17	KCA	1000	
Propylene	224		*29.1*	29.1	385	*50.1*	50.1	04/28/17	KCA	50	1
sec-Butylbenzene	148		*9.11*	9.11	812	*50.0*	50.0	04/28/17	KCA	50	1
Styrene	ND		*11.7*	11.7	ND	*49.8*	49.8	04/28/17	KCA	50	
Tetrachloroethene	48.3		*1.84*	1.84	327	*12.5*	12.5	04/28/17	KCA	50	
Tetrahydrofuran	ND		*17.0*	17.0	ND	*50.1*	50.1	04/28/17	KCA	50	1
Toluene	2770	D	*266*	266	10400	*1000*	1000	05/01/17	KCA	1000	
Trans-1,2-Dichloroethene	ND		*12.6*	12.6	ND	*49.9*	49.9	04/28/17	KCA	50	
trans-1,3-Dichloropropene	ND		*11.0*	11.0	ND	*49.9*	49.9	04/28/17	KCA	50	
Trichloroethene	83.0		*2.33*	2.33	446	*12.5*	12.5	04/28/17	KCA	50	
Trichlorofluoromethane	ND		*8.90*	8.90	ND	*50.0*	50.0	04/28/17	KCA	50	
Trichlorotrifluoroethane	ND		*6.53*	6.53	ND	*50.0*	50.0	04/28/17	KCA	50	
Vinyl Chloride	ND		*4.89*	4.89	ND	*12.5*	12.5	04/28/17	KCA	50	
QA/QC Surrogates											
% Bromofluorobenzene	*227		*%*	%	*227	*%*	%	04/28/17	KCA	50	

Project ID: 832 LEXINGTON AVE., BROOKLYN
Client ID: PRE-GAC

Phoenix I.D.: BY08158

Parameter	ppbv Result	ppbv RL	LOD/ MDL	ug/m3 Result	ug/m3 RL	LOD/ MDL	Date/Time	By	Dilution

1 = This parameter is not certified by NY NELAC for this matrix. NY NELAC does not offer certification for all parameters at this time.

RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected BRL=Below Reporting Level LOD=Limit of Detection MDL=Method Detection Limit1
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

This sample was sampled using a Tedlar airbag. The proper sampling device is a summa canister as use of a Tedlar airbag is not certified under ELAP. Some compounds may be biased low., Air Analysis:
*Surrogate criteria exceeded method criteria due to a matrix interference.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
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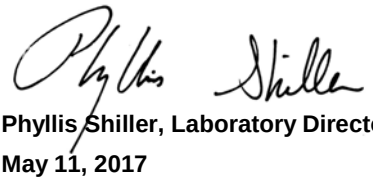

Phyllis Shiller, Laboratory Director
May 11, 2017
Reviewed and Released by: Jon Carlson, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

May 11, 2017

FOR: Attn: Mr. Charles B. Sosik, P.G.
Environmental Business Consultants
1808 Middle Country Rd
Ridge NY 11961-2406

Sample Information		Custody Information		Date	Time
Matrix:	AIR	Collected by:	HL	04/20/17	11:27
Location Code:	EBC	Received by:	LB	04/21/17	16:53
Rush Request:	72 Hour	Analyzed by:	see "By" below		
P.O.#:					
Canister Id:	AIR BAG				

Laboratory Data

SDG ID: GBY08158
Phoenix ID: BY08159

Project ID: 832 LEXINGTON AVE., BROOKLYN
Client ID: MID GAC

Parameter	ppbv Result	ppbv RL	LOD/ MDL	ug/m3 Result	ug/m3 RL	LOD/ MDL	Date/Time	By	Dilution	
Volatiles (TO15)										
1,1,1,2-Tetrachloroethane	ND	*0.146*	0.146	ND	*1.00*	1.00	04/25/17	KCA	1	1
1,1,1-Trichloroethane	ND	*0.183*	0.183	ND	*1.00*	1.00	04/25/17	KCA	1	
1,1,2,2-Tetrachloroethane	ND	*0.146*	0.146	ND	*1.00*	1.00	04/25/17	KCA	1	
1,1,2-Trichloroethane	ND	*0.183*	0.183	ND	*1.00*	1.00	04/25/17	KCA	1	
1,1-Dichloroethane	ND	*0.247*	0.247	ND	*1.00*	1.00	04/25/17	KCA	1	
1,1-Dichloroethene	ND	*0.252*	0.252	ND	*1.00*	1.00	04/25/17	KCA	1	
1,2,4-Trichlorobenzene	ND	*0.135*	0.135	ND	*1.00*	1.00	04/25/17	KCA	1	
1,2,4-Trimethylbenzene	2.24	*0.204*	0.204	11.0	*1.00*	1.00	04/25/17	KCA	1	
1,2-Dibromoethane(EDB)	ND	*0.130*	0.130	ND	*1.00*	1.00	04/25/17	KCA	1	
1,2-Dichlorobenzene	ND	*0.166*	0.166	ND	*1.00*	1.00	04/25/17	KCA	1	
1,2-Dichloroethane	ND	*0.247*	0.247	ND	*1.00*	1.00	04/25/17	KCA	1	
1,2-dichloropropane	ND	*0.217*	0.217	ND	*1.00*	1.00	04/25/17	KCA	1	
1,2-Dichlorotetrafluoroethane	ND	*0.143*	0.143	ND	*1.00*	1.00	04/25/17	KCA	1	
1,3,5-Trimethylbenzene	0.701	*0.204*	0.204	3.44	*1.00*	1.00	04/25/17	KCA	1	
1,3-Butadiene	ND	*0.452*	0.452	ND	*1.00*	1.00	04/25/17	KCA	1	
1,3-Dichlorobenzene	0.902	*0.166*	0.166	5.42	*1.00*	1.00	04/25/17	KCA	1	
1,4-Dichlorobenzene	ND	*0.166*	0.166	ND	*1.00*	1.00	04/25/17	KCA	1	
1,4-Dioxane	ND	*0.278*	0.278	ND	*1.00*	1.00	04/25/17	KCA	1	
2-Hexanone(MBK)	ND	*0.244*	0.244	ND	*1.00*	1.00	04/25/17	KCA	1	1
4-Ethyltoluene	0.700	*0.204*	0.204	3.44	*1.00*	1.00	04/25/17	KCA	1	1
4-Isopropyltoluene	ND	*0.182*	0.182	ND	*1.00*	1.00	04/25/17	KCA	1	1
4-Methyl-2-pentanone(MIBK)	ND	*0.244*	0.244	ND	*1.00*	1.00	04/25/17	KCA	1	
Acetone	9.91	*0.421*	0.421	23.5	*1.00*	1.00	04/25/17	KCA	1	
Acrylonitrile	ND	*0.461*	0.461	ND	*1.00*	1.00	04/25/17	KCA	1	
Benzene	0.334	*0.313*	0.313	1.07	*1.00*	1.00	04/25/17	KCA	1	
Benzyl chloride	ND	*0.193*	0.193	ND	*1.00*	1.00	04/25/17	KCA	1	

Project ID: 832 LEXINGTON AVE., BROOKLYN
Client ID: MID GAC

Phoenix I.D.: BY08159

Parameter	ppbv Result		ppbv RL	LOD/ MDL	ug/m3 Result	ug/m3 RL	LOD/ MDL	Date/Time	By	Dilution	
Bromodichloromethane	ND		*0.149*	0.149	ND	*1.00*	1.00	04/25/17	KCA	1	
Bromoform	ND		*0.097*	0.097	ND	*1.00*	1.00	04/25/17	KCA	1	
Bromomethane	ND		*0.258*	0.258	ND	*1.00*	1.00	04/25/17	KCA	1	
Carbon Disulfide	ND		*0.321*	0.321	ND	*1.00*	1.00	04/25/17	KCA	1	
Carbon Tetrachloride	ND		*0.040*	0.040	ND	*0.25*	0.25	04/25/17	KCA	1	
Chlorobenzene	ND		*0.217*	0.217	ND	*1.00*	1.00	04/25/17	KCA	1	
Chloroethane	ND		*0.379*	0.379	ND	*1.00*	1.00	04/25/17	KCA	1	
Chloroform	ND		*0.205*	0.205	ND	*1.00*	1.00	04/25/17	KCA	1	
Chloromethane	0.935		*0.485*	0.485	1.93	*1.00*	1.00	04/25/17	KCA	1	
Cis-1,2-Dichloroethene	ND		*0.252*	0.252	ND	*1.00*	1.00	04/25/17	KCA	1	
cis-1,3-Dichloropropene	ND		*0.221*	0.221	ND	*1.00*	1.00	04/25/17	KCA	1	
Cyclohexane	ND		*0.291*	0.291	ND	*1.00*	1.00	04/25/17	KCA	1	
Dibromochloromethane	ND		*0.118*	0.118	ND	*1.00*	1.00	04/25/17	KCA	1	
Dichlorodifluoromethane	ND		*0.202*	0.202	ND	*1.00*	1.00	04/25/17	KCA	1	
Ethanol	21.4		*0.531*	0.531	40.3	*1.00*	1.00	04/25/17	KCA	1	1
Ethyl acetate	ND		*0.278*	0.278	ND	*1.00*	1.00	04/25/17	KCA	1	1
Ethylbenzene	1.01		*0.230*	0.230	4.38	*1.00*	1.00	04/25/17	KCA	1	
Heptane	ND		*0.244*	0.244	ND	*1.00*	1.00	04/25/17	KCA	1	
Hexachlorobutadiene	ND		*0.094*	0.094	ND	*1.00*	1.00	04/25/17	KCA	1	
Hexane	1.14	S	*0.284*	0.284	4.02	*1.00*	1.00	04/25/17	KCA	1	
Isopropylalcohol	16.6		*0.407*	0.407	40.8	*1.00*	1.00	04/25/17	KCA	1	
Isopropylbenzene	ND		*0.204*	0.204	ND	*1.00*	1.00	04/25/17	KCA	1	
m,p-Xylene	4.92		*0.230*	0.230	21.4	*1.00*	1.00	04/25/17	KCA	1	
Methyl Ethyl Ketone	1.20		*0.339*	0.339	3.54	*1.00*	1.00	04/25/17	KCA	1	
Methyl tert-butyl ether(MTBE)	ND		*0.278*	0.278	ND	*1.00*	1.00	04/25/17	KCA	1	
Methylene Chloride	1.31	S	*0.288*	0.288	4.55	*1.00*	1.00	04/25/17	KCA	1	
n-Butylbenzene	0.184		*0.182*	0.182	1.01	*1.00*	1.00	04/25/17	KCA	1	1
o-Xylene	3.67		*0.230*	0.230	15.9	*1.00*	1.00	04/25/17	KCA	1	
Propylene	ND		*0.581*	0.581	ND	*1.00*	1.00	04/25/17	KCA	1	1
sec-Butylbenzene	ND		*0.182*	0.182	ND	*1.00*	1.00	04/25/17	KCA	1	1
Styrene	0.348		*0.235*	0.235	1.48	*1.00*	1.00	04/25/17	KCA	1	
Tetrachloroethene	0.095		*0.037*	0.037	0.64	*0.25*	0.25	04/25/17	KCA	1	
Tetrahydrofuran	1.70		*0.339*	0.339	5.01	*1.00*	1.00	04/25/17	KCA	1	1
Toluene	4.73		*0.266*	0.266	17.8	*1.00*	1.00	04/25/17	KCA	1	
Trans-1,2-Dichloroethene	ND		*0.252*	0.252	ND	*1.00*	1.00	04/25/17	KCA	1	
trans-1,3-Dichloropropene	ND		*0.221*	0.221	ND	*1.00*	1.00	04/25/17	KCA	1	
Trichloroethene	0.058		*0.047*	0.047	0.31	*0.25*	0.25	04/25/17	KCA	1	
Trichlorofluoromethane	ND		*0.178*	0.178	ND	*1.00*	1.00	04/25/17	KCA	1	
Trichlorotrifluoroethane	ND		*0.131*	0.131	ND	*1.00*	1.00	04/25/17	KCA	1	
Vinyl Chloride	ND		*0.098*	0.098	ND	*0.25*	0.25	04/25/17	KCA	1	
QA/QC Surrogates											
% Bromofluorobenzene	102		*%*	%	102	*%*	%	04/25/17	KCA	1	

Ver 2

Project ID: 832 LEXINGTON AVE., BROOKLYN
Client ID: MID GAC

Phoenix I.D.: BY08159

Parameter	ppbv Result	ppbv RL	LOD/ MDL	ug/m3 Result	ug/m3 RL	LOD/ MDL	Date/Time	By	Dilution

1 = This parameter is not certified by NY NELAC for this matrix. NY NELAC does not offer certification for all parameters at this time.

RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected BRL=Below Reporting Level LOD=Limit of Detection MDL=Method Detection Limit1
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

This sample was sampled using a Tedlar airbag. The proper sampling device is a summa canister as use of a Tedlar airbag is not certified under ELAP. Some compounds may be biased low.

S - Laboratory solvent, contamination is possible.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
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Phyllis Shiller, Laboratory Director
May 11, 2017
Reviewed and Released by: Jon Carlson, Project Manager

Environmental Laboratories, Inc.
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Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

May 11, 2017

FOR: Attn: Mr. Charles B. Sosik, P.G.
Environmental Business Consultants
1808 Middle Country Rd
Ridge NY 11961-2406

Sample Information		Custody Information		Date	Time
Matrix:	AIR	Collected by:	HL	04/20/17	11:30
Location Code:	EBC	Received by:	LB	04/21/17	16:53
Rush Request:	72 Hour	Analyzed by:	see "By" below		
P.O.#:					
Canister Id:	AIR BAG				

Laboratory Data

SDG ID: GBY08158
Phoenix ID: BY08160

Project ID: 832 LEXINGTON AVE., BROOKLYN
Client ID: POST GAC

Parameter	ppbv Result	ppbv RL	LOD/ MDL	ug/m3 Result	ug/m3 RL	LOD/ MDL	Date/Time	By	Dilution	
Volatiles (TO15)										
1,1,1,2-Tetrachloroethane	ND	*0.146*	0.146	ND	*1.00*	1.00	04/25/17	KCA	1	1
1,1,1-Trichloroethane	ND	*0.183*	0.183	ND	*1.00*	1.00	04/25/17	KCA	1	
1,1,2,2-Tetrachloroethane	ND	*0.146*	0.146	ND	*1.00*	1.00	04/25/17	KCA	1	
1,1,2-Trichloroethane	ND	*0.183*	0.183	ND	*1.00*	1.00	04/25/17	KCA	1	
1,1-Dichloroethane	ND	*0.247*	0.247	ND	*1.00*	1.00	04/25/17	KCA	1	
1,1-Dichloroethene	ND	*0.252*	0.252	ND	*1.00*	1.00	04/25/17	KCA	1	
1,2,4-Trichlorobenzene	ND	*0.135*	0.135	ND	*1.00*	1.00	04/25/17	KCA	1	
1,2,4-Trimethylbenzene	2.20	*0.204*	0.204	10.8	*1.00*	1.00	04/25/17	KCA	1	
1,2-Dibromoethane(EDB)	ND	*0.130*	0.130	ND	*1.00*	1.00	04/25/17	KCA	1	
1,2-Dichlorobenzene	ND	*0.166*	0.166	ND	*1.00*	1.00	04/25/17	KCA	1	
1,2-Dichloroethane	0.318	*0.247*	0.247	1.29	*1.00*	1.00	04/25/17	KCA	1	
1,2-dichloropropane	ND	*0.217*	0.217	ND	*1.00*	1.00	04/25/17	KCA	1	
1,2-Dichlorotetrafluoroethane	ND	*0.143*	0.143	ND	*1.00*	1.00	04/25/17	KCA	1	
1,3,5-Trimethylbenzene	0.689	*0.204*	0.204	3.39	*1.00*	1.00	04/25/17	KCA	1	
1,3-Butadiene	ND	*0.452*	0.452	ND	*1.00*	1.00	04/25/17	KCA	1	
1,3-Dichlorobenzene	0.902	*0.166*	0.166	5.42	*1.00*	1.00	04/25/17	KCA	1	
1,4-Dichlorobenzene	ND	*0.166*	0.166	ND	*1.00*	1.00	04/25/17	KCA	1	
1,4-Dioxane	ND	*0.278*	0.278	ND	*1.00*	1.00	04/25/17	KCA	1	
2-Hexanone(MBK)	ND	*0.244*	0.244	ND	*1.00*	1.00	04/25/17	KCA	1	1
4-Ethyltoluene	0.544	*0.204*	0.204	2.67	*1.00*	1.00	04/25/17	KCA	1	1
4-Isopropyltoluene	ND	*0.182*	0.182	ND	*1.00*	1.00	04/25/17	KCA	1	1
4-Methyl-2-pentanone(MIBK)	ND	*0.244*	0.244	ND	*1.00*	1.00	04/25/17	KCA	1	
Acetone	10.5	*0.421*	0.421	24.9	*1.00*	1.00	04/25/17	KCA	1	
Acrylonitrile	ND	*0.461*	0.461	ND	*1.00*	1.00	04/25/17	KCA	1	
Benzene	0.377	*0.313*	0.313	1.20	*1.00*	1.00	04/25/17	KCA	1	
Benzyl chloride	ND	*0.193*	0.193	ND	*1.00*	1.00	04/25/17	KCA	1	

Project ID: 832 LEXINGTON AVE., BROOKLYN
Client ID: POST GAC

Phoenix I.D.: BY08160

Parameter	ppbv Result		ppbv RL	LOD/ MDL	ug/m3 Result	ug/m3 RL	LOD/ MDL	Date/Time	By	Dilution	
Bromodichloromethane	ND		*0.149*	0.149	ND	*1.00*	1.00	04/25/17	KCA	1	
Bromoform	ND		*0.097*	0.097	ND	*1.00*	1.00	04/25/17	KCA	1	
Bromomethane	ND		*0.258*	0.258	ND	*1.00*	1.00	04/25/17	KCA	1	
Carbon Disulfide	ND		*0.321*	0.321	ND	*1.00*	1.00	04/25/17	KCA	1	
Carbon Tetrachloride	ND		*0.040*	0.040	ND	*0.25*	0.25	04/25/17	KCA	1	
Chlorobenzene	ND		*0.217*	0.217	ND	*1.00*	1.00	04/25/17	KCA	1	
Chloroethane	ND		*0.379*	0.379	ND	*1.00*	1.00	04/25/17	KCA	1	
Chloroform	ND		*0.205*	0.205	ND	*1.00*	1.00	04/25/17	KCA	1	
Chloromethane	ND		*0.485*	0.485	ND	*1.00*	1.00	04/25/17	KCA	1	
Cis-1,2-Dichloroethene	ND		*0.252*	0.252	ND	*1.00*	1.00	04/25/17	KCA	1	
cis-1,3-Dichloropropene	ND		*0.221*	0.221	ND	*1.00*	1.00	04/25/17	KCA	1	
Cyclohexane	ND		*0.291*	0.291	ND	*1.00*	1.00	04/25/17	KCA	1	
Dibromochloromethane	ND		*0.118*	0.118	ND	*1.00*	1.00	04/25/17	KCA	1	
Dichlorodifluoromethane	ND		*0.202*	0.202	ND	*1.00*	1.00	04/25/17	KCA	1	
Ethanol	24.3		*0.531*	0.531	45.8	*1.00*	1.00	04/25/17	KCA	1	1
Ethyl acetate	0.288		*0.278*	0.278	1.04	*1.00*	1.00	04/25/17	KCA	1	1
Ethylbenzene	1.12		*0.230*	0.230	4.86	*1.00*	1.00	04/25/17	KCA	1	
Heptane	ND		*0.244*	0.244	ND	*1.00*	1.00	04/25/17	KCA	1	
Hexachlorobutadiene	ND		*0.094*	0.094	ND	*1.00*	1.00	04/25/17	KCA	1	
Hexane	0.830	S	*0.284*	0.284	2.92	*1.00*	1.00	04/25/17	KCA	1	
Isopropylalcohol	12.7		*0.407*	0.407	31.2	*1.00*	1.00	04/25/17	KCA	1	
Isopropylbenzene	ND		*0.204*	0.204	ND	*1.00*	1.00	04/25/17	KCA	1	
m,p-Xylene	5.41		*0.230*	0.230	23.5	*1.00*	1.00	04/25/17	KCA	1	
Methyl Ethyl Ketone	1.23		*0.339*	0.339	3.63	*1.00*	1.00	04/25/17	KCA	1	
Methyl tert-butyl ether(MTBE)	ND		*0.278*	0.278	ND	*1.00*	1.00	04/25/17	KCA	1	
Methylene Chloride	1.33	S	*0.288*	0.288	4.62	*1.00*	1.00	04/25/17	KCA	1	
n-Butylbenzene	ND		*0.182*	0.182	ND	*1.00*	1.00	04/25/17	KCA	1	1
o-Xylene	4.09		*0.230*	0.230	17.7	*1.00*	1.00	04/25/17	KCA	1	
Propylene	ND		*0.581*	0.581	ND	*1.00*	1.00	04/25/17	KCA	1	1
sec-Butylbenzene	ND		*0.182*	0.182	ND	*1.00*	1.00	04/25/17	KCA	1	1
Styrene	0.364		*0.235*	0.235	1.55	*1.00*	1.00	04/25/17	KCA	1	
Tetrachloroethene	0.136		*0.037*	0.037	0.92	*0.25*	0.25	04/25/17	KCA	1	
Tetrahydrofuran	1.62		*0.339*	0.339	4.77	*1.00*	1.00	04/25/17	KCA	1	1
Toluene	6.42		*0.266*	0.266	24.2	*1.00*	1.00	04/25/17	KCA	1	
Trans-1,2-Dichloroethene	ND		*0.252*	0.252	ND	*1.00*	1.00	04/25/17	KCA	1	
trans-1,3-Dichloropropene	ND		*0.221*	0.221	ND	*1.00*	1.00	04/25/17	KCA	1	
Trichloroethene	0.092		*0.047*	0.047	0.49	*0.25*	0.25	04/25/17	KCA	1	
Trichlorofluoromethane	ND		*0.178*	0.178	ND	*1.00*	1.00	04/25/17	KCA	1	
Trichlorotrifluoroethane	ND		*0.131*	0.131	ND	*1.00*	1.00	04/25/17	KCA	1	
Vinyl Chloride	ND		*0.098*	0.098	ND	*0.25*	0.25	04/25/17	KCA	1	
QA/QC Surrogates											
% Bromofluorobenzene	103		*%*	%	103	*%*	%	04/25/17	KCA	1	

Ver 2

Project ID: 832 LEXINGTON AVE., BROOKLYN
Client ID: POST GAC

Phoenix I.D.: BY08160

Parameter	ppbv Result	ppbv RL	LOD/ MDL	ug/m3 Result	ug/m3 RL	LOD/ MDL	Date/Time	By	Dilution

1 = This parameter is not certified by NY NELAC for this matrix. NY NELAC does not offer certification for all parameters at this time.

RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected BRL=Below Reporting Level LOD=Limit of Detection MDL=Method Detection Limit1
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

This sample was sampled using a Tedlar airbag. The proper sampling device is a summa canister as use of a Tedlar airbag is not certified under ELAP. Some compounds may be biased low.

S - Laboratory solvent, contamination is possible.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
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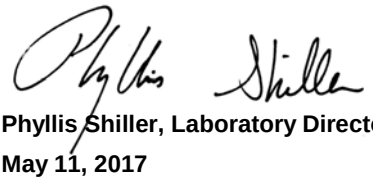

Phyllis Shiller, Laboratory Director
May 11, 2017
Reviewed and Released by: Jon Carlson, Project Manager

PHOENIX

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ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

QA/QC Report

May 11, 2017

QA/QC Data

SDG I.D.: GBY08158

Parameter	Blk ppbv	Blk RL ppbv	Blk ug/m3	Blk RL ug/m3	LCS %	Sample Result ug/m3	Sample Dup ug/m3	Sample Result ppbv	Sample Dup ppbv	DUP RPD	% Rec Limits	% RPD Limits
QA/QC Batch 384217 (ppbv), QC Sample No: BY08431 (BY08159, BY08160)												
Volatiles												
1,1,1,2-Tetrachloroethane	ND	0.146	ND	1.00	106	ND	ND	ND	ND	NC	70 - 130	25
1,1,1-Trichloroethane	ND	0.183	ND	1.00	98	ND	ND	ND	ND	NC	70 - 130	25
1,1,2,2-Tetrachloroethane	ND	0.146	ND	1.00	96	ND	ND	ND	ND	NC	70 - 130	25
1,1,2-Trichloroethane	ND	0.183	ND	1.00	103	ND	ND	ND	ND	NC	70 - 130	25
1,1-Dichloroethane	ND	0.247	ND	1.00	97	ND	ND	ND	ND	NC	70 - 130	25
1,1-Dichloroethene	ND	0.252	ND	1.00	94	ND	ND	ND	ND	NC	70 - 130	25
1,2,4-Trichlorobenzene	ND	0.135	ND	1.00	122	ND	ND	ND	ND	NC	70 - 130	25
1,2,4-Trimethylbenzene	ND	0.204	ND	1.00	97	5.21	5.50	1.06	1.12	5.5	70 - 130	25
1,2-Dibromoethane(EDB)	ND	0.130	ND	1.00	103	ND	ND	ND	ND	NC	70 - 130	25
1,2-Dichlorobenzene	ND	0.166	ND	1.00	98	ND	ND	ND	ND	NC	70 - 130	25
1,2-Dichloroethane	ND	0.247	ND	1.00	96	ND	ND	ND	ND	NC	70 - 130	25
1,2-dichloropropane	ND	0.216	ND	1.00	73	ND	ND	ND	ND	NC	70 - 130	25
1,2-Dichlorotetrafluoroethane	ND	0.143	ND	1.00	106	ND	ND	ND	ND	NC	70 - 130	25
1,3,5-Trimethylbenzene	ND	0.204	ND	1.00	97	1.39	1.37	0.282	0.279	NC	70 - 130	25
1,3-Butadiene	ND	0.452	ND	1.00	91	ND	ND	ND	ND	NC	70 - 130	25
1,3-Dichlorobenzene	ND	0.166	ND	1.00	102	ND	ND	ND	ND	NC	70 - 130	25
1,4-Dichlorobenzene	ND	0.166	ND	1.00	108	ND	ND	ND	ND	NC	70 - 130	25
1,4-Dioxane	ND	0.278	ND	1.00	110	ND	ND	ND	ND	NC	70 - 130	25
2-Hexanone(MBK)	ND	0.244	ND	1.00	118	ND	ND	ND	ND	NC	70 - 130	25
4-Ethyltoluene	ND	0.204	ND	1.00	102	1.11	1.18	0.226	0.240	NC	70 - 130	25
4-Isopropyltoluene	ND	0.182	ND	1.00	96	ND	ND	ND	ND	NC	70 - 130	25
4-Methyl-2-pentanone(MIBK)	ND	0.244	ND	1.00	112	ND	ND	ND	ND	NC	70 - 130	25
Acetone	ND	0.421	ND	1.00	96	33.5 S	32.8 S	14.1 S	13.8 S	NC	70 - 130	25
Acrylonitrile	ND	0.461	ND	1.00	97	ND	ND	ND	ND	NC	70 - 130	25
Benzene	ND	0.313	ND	1.00	96	ND	ND	ND	ND	NC	70 - 130	25
Benzyl chloride	ND	0.193	ND	1.00	106	ND	ND	ND	ND	NC	70 - 130	25
Bromodichloromethane	ND	0.149	ND	1.00	104	ND	ND	ND	ND	NC	70 - 130	25
Bromoform	ND	0.097	ND	1.00	104	ND	ND	ND	ND	NC	70 - 130	25
Bromomethane	ND	0.257	ND	1.00	94	ND	ND	ND	ND	NC	70 - 130	25
Carbon Disulfide	ND	0.321	ND	1.00	98	ND	ND	ND	ND	NC	70 - 130	25
Carbon Tetrachloride	ND	0.040	ND	0.25	100	ND	ND	ND	ND	NC	70 - 130	25
Chlorobenzene	ND	0.217	ND	1.00	97	ND	ND	ND	ND	NC	70 - 130	25
Chloroethane	ND	0.379	ND	1.00	93	ND	ND	ND	ND	NC	70 - 130	25
Chloroform	ND	0.205	ND	1.00	97	ND	ND	ND	ND	NC	70 - 130	25
Chloromethane	ND	0.484	ND	1.00	102	1.09	1.19	0.527	0.578	NC	70 - 130	25
Cis-1,2-Dichloroethene	ND	0.256	ND	1.01	95	ND	ND	ND	ND	NC	70 - 130	25
cis-1,3-Dichloropropene	ND	0.220	ND	1.00	106	ND	ND	ND	ND	NC	70 - 130	25
Cyclohexane	ND	0.291	ND	1.00	94	ND	ND	ND	ND	NC	70 - 130	25
Dibromochloromethane	ND	0.117	ND	1.00	107	ND	ND	ND	ND	NC	70 - 130	25
Dichlorodifluoromethane	ND	0.202	ND	1.00	102	ND	ND	ND	ND	NC	70 - 130	25
Ethanol	ND	0.531	ND	1.00	105	331	331	176	176	0.0	70 - 130	25

QA/QC Data

SDG I.D.: GBY08158

Parameter	Blk ppbv	Blk RL ppbv	Blk ug/m3	Blk RL ug/m3	LCS %	Sample Result ug/m3	Sample Dup ug/m3	Sample Result ppbv	Sample Dup ppbv	DUP RPD	% Rec Limits	% RPD Limits
Ethyl acetate	ND	0.278	ND	1.00	145	8.25	8.79	2.29	2.44	6.3	70 - 130	25
Ethylbenzene	ND	0.230	ND	1.00	101	3.15	3.15	0.727	0.726	NC	70 - 130	25
Heptane	ND	0.244	ND	1.00	102	ND	ND	ND	ND	NC	70 - 130	25
Hexachlorobutadiene	ND	0.094	ND	1.00	105	ND	ND	ND	ND	NC	70 - 130	25
Hexane	ND	0.284	ND	1.00	98	0.76 S	0.81 S	0.215 S	0.230 S	NC	70 - 130	25
Isopropylalcohol	ND	0.407	ND	1.00	93	29.0	28.7	11.8	11.7	NC	70 - 130	25
Isopropylbenzene	ND	0.204	ND	1.00	105	ND	ND	ND	ND	NC	70 - 130	25
m,p-Xylene	ND	0.230	ND	1.00	99	15.8	16.3	3.64	3.76	3.2	70 - 130	25
Methyl Ethyl Ketone	ND	0.339	ND	1.00	100	8.31	8.34	2.82	2.83	0.4	70 - 130	25
Methyl tert-butyl ether(MTBE)	ND	0.277	ND	1.00	103	ND	ND	ND	ND	NC	70 - 130	25
Methylene Chloride	ND	0.288	ND	1.00	89	7.53 S	7.67 S	2.17 S	2.21 S	NC	70 - 130	25
n-Butylbenzene	ND	0.182	ND	1.00	99	ND	ND	ND	ND	NC	70 - 130	25
o-Xylene	ND	0.230	ND	1.00	97	7.90	7.81	1.82	1.80	1.1	70 - 130	25
Propylene	ND	0.581	ND	1.00	99	ND	ND	ND	ND	NC	70 - 130	25
sec-Butylbenzene	ND	0.182	ND	1.00	98	ND	ND	ND	ND	NC	70 - 130	25
Styrene	ND	0.235	ND	1.00	108	ND	ND	ND	ND	NC	70 - 130	25
Tetrachloroethene	ND	0.037	ND	0.25	105	ND	ND	ND	ND	NC	70 - 130	25
Tetrahydrofuran	ND	0.339	ND	1.00	108	ND	ND	ND	ND	NC	70 - 130	25
Toluene	ND	0.266	ND	1.00	102	10.4	10.4	2.77	2.77	0.0	70 - 130	25
Trans-1,2-Dichloroethene	ND	0.252	ND	1.00	100	ND	ND	ND	ND	NC	70 - 130	25
trans-1,3-Dichloropropene	ND	0.220	ND	1.00	105	ND	ND	ND	ND	NC	70 - 130	25
Trichloroethene	ND	0.047	ND	0.25	99	ND	ND	ND	ND	NC	70 - 130	25
Trichlorofluoromethane	ND	0.178	ND	1.00	99	1.57	1.50	0.280	0.267	NC	70 - 130	25
Trichlorotrifluoroethane	ND	0.131	ND	1.00	95	ND	ND	ND	ND	NC	70 - 130	25
Vinyl Chloride	ND	0.098	ND	0.25	94	ND	ND	ND	ND	NC	70 - 130	25
% Bromofluorobenzene	122	%	122	%	97	102	102	102	102	NC	70 - 130	25
QA/QC Batch 384735 (ppbv), QC Sample No: BY11685 (BY08158 (50X))												
Volatiles												
1,1,1,2-Tetrachloroethane	ND	0.146	ND	1.00	109	ND	ND	ND	ND	NC	70 - 130	25
1,1,1-Trichloroethane	ND	0.183	ND	1.00	95	ND	ND	ND	ND	NC	70 - 130	25
1,1,2,2-Tetrachloroethane	ND	0.146	ND	1.00	102	ND	ND	ND	ND	NC	70 - 130	25
1,1,2-Trichloroethane	ND	0.183	ND	1.00	105	ND	ND	ND	ND	NC	70 - 130	25
1,1-Dichloroethane	ND	0.247	ND	1.00	97	ND	ND	ND	ND	NC	70 - 130	25
1,1-Dichloroethene	ND	0.252	ND	1.00	94	ND	ND	ND	ND	NC	70 - 130	25
1,2,4-Trichlorobenzene	ND	0.135	ND	1.00	130	ND	ND	ND	ND	NC	70 - 130	25
1,2-Dibromoethane(EDB)	ND	0.130	ND	1.00	106	ND	ND	ND	ND	NC	70 - 130	25
1,2-Dichlorobenzene	ND	0.166	ND	1.00	104	ND	ND	ND	ND	NC	70 - 130	25
1,2-Dichloroethane	ND	0.247	ND	1.00	92	ND	ND	ND	ND	NC	70 - 130	25
1,2-dichloropropane	ND	0.216	ND	1.00	71	ND	ND	ND	ND	NC	70 - 130	25
1,2-Dichlorotetrafluoroethane	ND	0.143	ND	1.00	107	ND	ND	ND	ND	NC	70 - 130	25
1,3-Butadiene	ND	0.452	ND	1.00	90	ND	ND	ND	ND	NC	70 - 130	25
1,3-Dichlorobenzene	ND	0.166	ND	1.00	108	ND	ND	ND	ND	NC	70 - 130	25
1,4-Dichlorobenzene	ND	0.166	ND	1.00	111	ND	ND	ND	ND	NC	70 - 130	25
1,4-Dioxane	ND	0.278	ND	1.00	115	ND	ND	ND	ND	NC	70 - 130	25
2-Hexanone(MBK)	ND	0.244	ND	1.00	118	ND	ND	ND	ND	NC	70 - 130	25
4-Isopropyltoluene	ND	0.182	ND	1.00	99	ND	ND	ND	ND	NC	70 - 130	25
4-Methyl-2-pentanone(MIBK)	ND	0.244	ND	1.00	110	3.60	3.75	0.880	0.915	NC	70 - 130	25
Acetone	ND	0.421	ND	1.00	96	21.0	19.9	8.85	8.39	5.3	70 - 130	25
Acrylonitrile	ND	0.461	ND	1.00	96	ND	ND	ND	ND	NC	70 - 130	25
Benzene	ND	0.313	ND	1.00	96	ND	ND	ND	ND	NC	70 - 130	25
Benzyl chloride	ND	0.193	ND	1.00	110	ND	ND	ND	ND	NC	70 - 130	25
Bromodichloromethane	ND	0.149	ND	1.00	101	ND	ND	ND	ND	NC	70 - 130	25

QA/QC Data

SDG I.D.: GBY08158

Parameter	Blk ppbv	Blk RL ppbv	Blk ug/m3	Blk RL ug/m3	LCS %	Sample Result ug/m3	Sample Dup ug/m3	Sample Result ppbv	Sample Dup ppbv	DUP RPD	% Rec Limits	% RPD Limits	
Bromoform	ND	0.097	ND	1.00	107	ND	ND	ND	ND	NC	70 - 130	25	
Bromomethane	ND	0.257	ND	1.00	92	ND	ND	ND	ND	NC	70 - 130	25	
Carbon Disulfide	ND	0.321	ND	1.00	94	ND	ND	ND	ND	NC	70 - 130	25	
Carbon Tetrachloride	ND	0.040	ND	0.25	97	ND	ND	ND	ND	NC	70 - 130	25	
Chlorobenzene	ND	0.217	ND	1.00	101	ND	ND	ND	ND	NC	70 - 130	25	
Chloroethane	ND	0.379	ND	1.00	95	ND	ND	ND	ND	NC	70 - 130	25	
Chloroform	ND	0.205	ND	1.00	97	ND	ND	ND	ND	NC	70 - 130	25	
Chloromethane	ND	0.484	ND	1.00	103	1.29	1.37	0.626	0.664	NC	70 - 130	25	
Cis-1,2-Dichloroethene	ND	0.256	ND	1.01	95	ND	ND	ND	ND	NC	70 - 130	25	
cis-1,3-Dichloropropene	ND	0.220	ND	1.00	104	ND	ND	ND	ND	NC	70 - 130	25	
Cyclohexane	ND	0.291	ND	1.00	98	ND	ND	ND	ND	NC	70 - 130	25	
Dibromochloromethane	ND	0.117	ND	1.00	104	ND	ND	ND	ND	NC	70 - 130	25	
Dichlorodifluoromethane	ND	0.202	ND	1.00	102	ND	ND	ND	ND	NC	70 - 130	25	
Ethanol	ND	0.531	ND	1.00	105	439	429	233	228	2.2	70 - 130	25	
Ethyl acetate	ND	0.278	ND	1.00	145	ND	ND	ND	ND	NC	70 - 130	25	I
Ethylbenzene	ND	0.230	ND	1.00	106	3.87	3.87	0.891	0.891	NC	70 - 130	25	
Hexachlorobutadiene	ND	0.094	ND	1.00	106	ND	ND	ND	ND	NC	70 - 130	25	
Isopropylalcohol	ND	0.407	ND	1.00	93	27.5	27.3	11.2	11.1	0.9	70 - 130	25	
Isopropylbenzene	ND	0.204	ND	1.00	110	ND	ND	ND	ND	NC	70 - 130	25	
Methyl Ethyl Ketone	ND	0.339	ND	1.00	100	2.14	1.51	0.725	0.511	NC	70 - 130	25	
Methyl tert-butyl ether(MTBE)	ND	0.277	ND	1.00	102	ND	ND	ND	ND	NC	70 - 130	25	
Methylene Chloride	ND	0.288	ND	1.00	89	ND	ND	ND	ND	NC	70 - 130	25	
n-Butylbenzene	ND	0.182	ND	1.00	106	ND	ND	ND	ND	NC	70 - 130	25	
Propylene	ND	0.581	ND	1.00	100	ND	ND	ND	ND	NC	70 - 130	25	
sec-Butylbenzene	ND	0.182	ND	1.00	102	ND	ND	ND	ND	NC	70 - 130	25	
Styrene	ND	0.235	ND	1.00	112	ND	ND	ND	ND	NC	70 - 130	25	
Tetrachloroethene	ND	0.037	ND	0.25	102	ND	ND	ND	ND	NC	70 - 130	25	
Tetrahydrofuran	ND	0.339	ND	1.00	106	ND	ND	ND	ND	NC	70 - 130	25	
Trans-1,2-Dichloroethene	ND	0.252	ND	1.00	99	ND	ND	ND	ND	NC	70 - 130	25	
trans-1,3-Dichloropropene	ND	0.220	ND	1.00	98	ND	ND	ND	ND	NC	70 - 130	25	
Trichloroethene	ND	0.047	ND	0.25	102	ND	ND	ND	ND	NC	70 - 130	25	
Trichlorofluoromethane	ND	0.178	ND	1.00	95	ND	ND	ND	ND	NC	70 - 130	25	
Trichlorotrifluoroethane	ND	0.131	ND	1.00	96	ND	ND	ND	ND	NC	70 - 130	25	
Vinyl Chloride	ND	0.098	ND	0.25	97	ND	ND	ND	ND	NC	70 - 130	25	
% Bromofluorobenzene	122	%	122	%	100	103	100	103	100	NC	70 - 130	25	
QA/QC Batch 384789 (ppbv), QC Sample No: BY11865 (BY08158 (1000X))													
Volatiles													
1,2,4-Trimethylbenzene	ND	0.204	ND	1.00	104	5.16	5.36	1.05	1.09	3.7	70 - 130	25	
1,3,5-Trimethylbenzene	ND	0.204	ND	1.00	97	1.22	1.21	0.249	0.247	NC	70 - 130	25	
4-Ethyltoluene	ND	0.204	ND	1.00	102	ND	ND	ND	ND	NC	70 - 130	25	
Heptane	ND	0.244	ND	1.00	103	ND	ND	ND	ND	NC	70 - 130	25	
Hexane	ND	0.284	ND	1.00	98	ND	ND	ND	ND	NC	70 - 130	25	
m,p-Xylene	ND	0.230	ND	1.00	105	2.62	2.61	0.604	0.602	NC	70 - 130	25	
o-Xylene	ND	0.230	ND	1.00	102	1.67	1.69	0.384	0.389	NC	70 - 130	25	
Toluene	ND	0.266	ND	1.00	102	1.89	2.03	0.503	0.538	NC	70 - 130	25	

I = This parameter is outside laboratory LCS/LCSD specified recovery limits.

QA/QC Data

SDG I.D.: GBY08158

Parameter	Blk ppbv	Blk RL ppbv	Blk ug/m3	Blk RL ug/m3	LCS %	Sample Result ug/m3	Sample Dup ug/m3	Sample Result ppbv	Sample Dup ppbv	DUP RPD	% Rec Limits	% RPD Limits

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
May 11, 2017

Thursday, May 11, 2017

Criteria: NY: 375, 375RRS, 375RS

State: NY

Sample Criteria Exceedances Report

GBY08158 - EBC

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

Cooler: / Yes [✓] No [ ]
Coolant: IPK [✓] ICE [ ] No [ ]

PHOENIX
Environmental Laboratories, Inc.

NY/NJ CHAIN OF CUSTODY RECORD

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: info@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Temp 4.6°C Pg 1 of 1

Contact Options:
[ ] Fax:
[ ] Phone: 631-504-6000
[X] Email: File

Customer: Environmental Business Consultants
Address: 1808 Middle Country Road
Ridge, NY 11961

Project: 832 Lexington Ave, Brooklyn, NY
Report to: Environmental Business Consultants
Invoice to: Environmental Business Consultants

Project P.O:

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature: Hongpong Lau Date: 4-20-17

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	TO-15	Ladder Bag	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 [ ]1000ml	PL HNO3 250ml	PL NaOH 250ml	Bacteria Bottle
08158	Pre-GAC		4-20-17	11:25	X		1									
08159	MID-GAC		4-20-17	11:27	X		1									
08160	Post-GAC		4-20-17	11:30	X		1									

Relinquished by:	Accepted by:	Date:	Time:
		4-21-17	11:10
		4-21	16:53

Comments, Special Requirements or Regulations:

Turnaround:
[ ] 1 Day*
[ ] 2 Days*
[ ] 3 Days*
[X] 5 Days
[ ] 10 Days
[ ] Other
* SURCHARGE APPLIES

NJ
[ ] Res. Criteria
[ ] Non-Res. Criteria
[ ] Impact to GW Soil Cleanup Criteria
[ ] GW Criteria

NY
[ ] NY 375 GWP
[X] NY375 Unrestricted Use Soil
[X] NY375 Residential Soil
[X] Restricted/Residential
[ ] Commercial
[ ] Industrial

Data Format
[ ] Phoenix Std Report
[X] Excel
[ ] PDF
[X] GIS/Key
[X] EQuIS
[ ] NJ Hazsite EDD
[X] NY EZ EDD (ASP)
[ ] Other

Data Package
[ ] NJ Reduced Deliv.*
[X] NY Enhanced (ASP B)*
[ ] Other

State where samples were collected: NY

832 Lexington Ave

GROUNDWATER PURGE / SAMPLE LOGS

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

Well I.D.: MW1501

Well Depth (from TOC): 50

Static Water Level (from TOC): 42.95

Height of Water in Well: 7.05

Gallons of Water per Well Volume: x3: 0.71

Flow Rate: 400ml/min.

Date: 2-16-17

Equipment: ~~[illegible]~~

Time	Pump Rate	Gal. Removed	pH	Cond. (mS/cm)	Temp. (deg. C)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	TDS	Comments
0		0	6.57	0.764	13.61	3.71	-115	647	0.489	turbid
+3		0.4	6.72	0.758	15.07	5.20	-131		0.483	
+5		1.0	6.77	0.762	15.35	4.88	-127		0.488	
+5		1.6	6.78	0.759	15.37	4.80	-121		0.484	
+5		2.2	6.79	0.759	15.38	4.71	-130		0.485	

Note 400 ml = 0.11 gallons

832 Lexington Avenue

GROUNDWATER PURGE / SAMPLE LOGS

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

Well I.D.: MW1502

Date: 2-16-17

Well Depth (from TOC): 50ft

Static Water Level (from TOC): 43.49

Height of Water in Well: 6.51

Gallons of Water per Well Volume: x3 = 0.65

Equipment:

Flow Rate: 400ml/min.

Time	Pump Rate	Gal. Removed	pH	Cond. (mS/cm)	Temp. (deg. C)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	TDS	Comments
0		0	6.96	0.749	11.35	1.91	-78	0.0	0.475	clear
+3		0.4	6.74	0.719	13.78	0.41	-46	0.0	0.454	clear
+5		1	6.60	0.706	14.88	0.42	-43		0.453	clear
+5		1.6	6.58	0.708	15.19	0.46	-41		0.452	clear
+5		2.2	6.57	0.705	15.14	0.56	-39		0.449	clear

Note 400 ml = 0.11 gallons

832 Lexington Avenue
Brooklyn NY

GROUNDWATER PURGE / SAMPLE LOGS

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

Well I.D.: MW1503

Date: 2-16-17

Well Depth (from TOC): 50ft.

Equipment:

Static Water Level (from TOC): 43.84ft.

Height of Water in Well: 6.16 ft.

Gallons of Water per Well Volume: (X3) 0.616.

Flow Rate: 400ml/min.

Time	Pump Rate	Gal. Removed	pH	Cond. (mS/cm)	Temp. (deg. C)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	TDS	Comments
0		0.0	6.70	1.10	12.70	3.24	-86	800	0.744	turbid w/ petrol odor
+3		0.4	6.68	1.60	14.99	6.10	-105	600	1.04	turbid w/ petrol odor
+5		1	6.74	1.65	15.08	4.47	-110	200	1.06	light turbidity
+5		1.6	6.73	1.65	15.31	4.20	-108	00	1.06	
+5		2.2	6.72	1.65	15.40	4.06	-98		1.05	
+5		2.8	6.71	1.63	15.38	4.00	-96		1.04	

Note 400 ml = 0.11 gallons

832 Lexington Ave

GROUNDWATER PURGE / SAMPLE LOGS

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

Well I.D.: MW1504

Date: 2-16-17

Well Depth (from TOC): 50

Equipment:

Static Water Level (from TOC): 43.45

Height of Water in Well: 6.55

Gallons of Water per Well Volume: 0.65

Flow Rate: 400ml/min.

Time	Pump Rate	Gal. Removed	pH	Cond. (mS/cm)	Temp. (deg. C)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	TDS	Comments
0		0	6.71	0.751	11.45	1.51	-79		0.479	Turbid
+3		0.4	6.74	0.742	13.57	0.97	-52		0.465	slightly Turbid
+5		1.0	6.73	0.721	14.59	0.85	-41		0.454	"
+5		1.6	6.74	0.720	15.07	0.84	-42		0.451	"
+5		2.2	6.74	0.718	15.11	0.82	-40		0.449	clear

Note 400 ml = 0.11 gallons

832 Lexington Avenue

GROUNDWATER PURGE / SAMPLE LOGS

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

Well I.D.: MW1505

Date: 2-16-17

Well Depth (from TOC): 50ft.

Equipment:

Static Water Level (from TOC): 42.91 ft

Height of Water in Well: 7.09ft.

Gallons of Water per Well Volume: (x3) 0.709

Flow Rate: 400ml/min.

Time	Pump Rate	Gal. Removed	pH	Cond. (mS/cm)	Temp. (deg. C)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	TDS	Comments
0		0	6.53	0.736	13.03	1.38	-30		0.471	brown, turbid
+3		0.4	6.49	0.741	14.63	2.43	-21			
+5		1	6.46	0.750	15.11	3.36	-8		0.479	
+5		1.6	6.44	0.744	15.32	2.45	-10		0.476	
+5		2.2	6.44	0.739	15.17	2.40	-15			
~~+5~~		2.14	6.45	0.738	15.16	2.38	-18		0.475	

Note 400 ml = 0.11 gallons

GROUNDWATER PURGE / SAMPLE LOGS

832 Lexington Avenue Brooklyn NY

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

Well I.D.: MW150 |

Date: 4/4/2017

Well Depth (from TOC): 50

Equipment: Check valve

Static Water Level (from TOC): 43.15

Height of Water in Well: 6.85

Gallons of Water per Well Volume: x3 = 0.68.

Flow Rate: ~~400ml/min.~~ Manual

Time	Pump Rate	Gal. Removed	pH	Cond. (mS/cm)	Temp. (deg. C)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	TDS	Comments
	Manual (check valve)	0	8.46	112	52.9			709		Turbid
	↓	0.5	8.47	112	53.8			150		Light turbidity
		1	8.47	111	55.5			98.3		" "
		1.5	8.46	110	56.2			68.1		" "
	↓	2	8.46	110	56.6			45.8		clear

Note 400 ml = 0.11 gallons

GROUNDWATER PURGE / SAMPLE LOGS

832 Lexington Avenue Brooklyn NY

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

Well I.D.: MW150~~3~~

Date: 4/4/2017

Well Depth (from TOC): 50

Equipment: Check valve

Static Water Level (from TOC): 43.54

Height of Water in Well: 6.46

Gallons of Water per Well Volume: 0.65

Flow Rate: ~~400ml/min~~ manual

Time	Pump Rate	Gal. Removed	pH	Cond. (mS/cm)	Temp. (deg. C)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	TDS	Comments
	Manual (check valve)	0	8.53	112	54.8			413		Turbid
	↓	0.5	8.54	111	55.0			206		Turbid
		1	8.56	111	55.7			115		Light turbidity
		1.5	8.52	113	56.2			81.1		Light turbidity
		2	8.52	111	57.0			46.3		clear

Note 400 ml = 0.11 gallons

GROUNDWATER PURGE / SAMPLE LOGS

832 Lexington Avenue Brooklyn NY

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

Well I.D.: MW1503

Date: 4/4/2017

Well Depth (from TOC): 50

Equipment: Check valve

Static Water Level (from TOC): 43.87

Height of Water in Well: 6.13

Gallons of Water per Well Volume: 0.61

Flow Rate: ~~400ml/min~~ manual

Time	Pump Rate	Gal. Removed	pH	Cond. (µS/cm)	Temp. (deg. C)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	TDS	Comments
	Manual (check valve)	0	8.03	88	56.4			1000+		Turbid
	↓	0.5	8.17	90	56.6			763		Turbid
		1	8.28	94	56.8			402		Turbid
		1.5	8:30	95	57.5			163		light turbidity
	↓	2	8.35	96	58.0			91.4		light turbidity
		2.5	8.40	99	58.5			48.6		clear

Note 400 ml = 0.11 gallons

GROUNDWATER PURGE / SAMPLE LOGS

832 Lexington Avenue Brooklyn NY

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

Well I.D.: MW150 4

Date: 4/4/2017

Well Depth (from TOC): 50

Equipment: Check valve

Static Water Level (from TOC): 43.42

Height of Water in Well: 6.58

Gallons of Water per Well Volume: 0.66

Flow Rate: ~~400ml/min~~ manual

Time	Pump Rate	Gal. Removed	pH	Cond. (mS/cm)	Temp. (deg. C)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	TDS	Comments
	Manual (check valve)	0	8.58	92	57.2			503		Turbid
	↓	0.5	8.56	92	57.7			380		Light turbidity
		1	8.52	91	57.9			101		Light turbidity
		1.5	8.50	92	56.9			82.7		clear
	↓	2	8.47	93	56.7			40.1		clear

Note 400 ml = 0.11 gallons

GROUNDWATER PURGE / SAMPLE LOGS

832 Lexington Avenue Brooklyn NY

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

Well I.D.: MW150~~5~~

Date: 4/4/2017

Well Depth (from TOC): 50

Equipment: Check valve

Static Water Level (from TOC): 43.02

Height of Water in Well: 6.98

Gallons of Water per Well Volume: 0.69

Flow Rate: ~~400ml/min~~ mg/ml.

Time	Pump Rate	Gal. Removed	pH	Cond. (µS/cm)	Temp. (deg. C)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	TDS	Comments
	Manual (check valve)	0	8.63	125	55.1			655		Turbid
	↓	0.5	8.60	124	57.0			501		Turbid
		1	8.47	124	57.7			210		Light turbidity
		1.5	8.48	125	57.9			68.1		Light turbidity
	↓	2	8.43	123	58.1			48.3		clear

Note 400 ml = 0.11 gallons

GROUNDWATER PURGE / SAMPLE LOGS

832 Lexington Avenue Brooklyn NY

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

Well I.D.: MW150C

Date: 4/4/2017

Well Depth (from TOC): 50

Equipment: Check valve

Static Water Level (from TOC): 43.21

Height of Water in Well: 6.79

Gallons of Water per Well Volume: ~~6.~~ 0.68

Flow Rate: manual. ~~400ml/min.~~

Time	Pump Rate	Gal. Removed	pH	Cond. (mS/cm)	Temp. (deg. C)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	TDS	Comments
	Manual (check valve)	0	7.91	49	59.3			1000		Turbid
	↓	0.5	7.94	51	58.5			803		Turbid
		1	8.07	52	58.1			129		Turbid
		1.5	8.13	53	57.9			83		Light turbidity
		2	8.05	55	57.7			41.5		Light turbidity
	↓	2.5	7.97	58	57.5			19.4		clear

Note 400 ml = 0.11 gallons

832 Lexington Ave, Brookjlyn, NY
SVE System Monitoring Form

Date / Time: 2-14-17 / 2:00pm
Technician: Houpong Lau

System Operating (Yes) / No)

System Parameters

Influent Flow Meter	_____	SCFM
Influent Vacuum	_____	"H2O
Bleed valve position	_____	

Sample Ports

	PID (ppm)	Sampled	Analysis / Comments
Pre-GAC	130.0	Y / 2:10pm	
Mid-GAC	0.0	Y / 2:18pm	
Post-GAC	0.0	Y / 2:24pm	

Repairs / Modifications / Comments

832 Lexington Ave, Brookjlyn, NY
SVE System Monitoring Form

Date / Time: 4-20-2017 / 11:20am
Technician: Hongpong Lau

System Operating (Yes / No)

System Parameters

Influent Flow Meter	_____	SCFM
Influent Vacuum	_____	"H2O
Bleed valve position	_____	

Sample Ports

	PID (ppm)	Sampled	Analysis / Comments
Pre-GAC	1918	Y / 11:25am	
Mid-GAC	0.0	Y / 11:27am	
Post-GAC	0.0	Y / 11:30am	

Repairs / Modifications / Comments

832 Lexington Ave, Brookjlyn, NY
SVE System Monitoring Form

Date / Time: 5.31.17 1245
Technician: Kevin Waters

System Operating (Yes / No)

System Parameters

Influent Flow Meter		SCFM
Influent Vacuum		"H2O
Bleed valve position		

Sample Ports

	(*) PID (ppm)	Sampled	Analysis / Comments
Pre-GAC	0.0	yes	
Mid-GAC	0.0	yes	
Post-GAC	0.0	yes	

Repairs / Modifications / Comments

Switched out both Carbon drums
Sampled system AFter Switched out (*)