SITE MANAGEMENT PLAN

September 2017
Revised: November 23, 2021

Submitted for:

Former Union Wire Die Corp.
39-40 30th Street
Queens, New York
Block 399, Lot 34
NYSDEC BCP Site Number: C241163

Submitted to:

New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 12th Floor
Albany, New York 12233

Prepared for:

LIC Owner, LLC
5-26 46th Avenue, 2A
Long Island City, New York 11101

Submitted by:

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IEC Project Number:

12930

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39-40 30th Street, Queens, NY 11101

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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
DUSR	Data Usability Summary Report
EC	Engineering Control
ECL	Environmental Conservation Law
ELAP	Environmental Laboratory Approval Program
ERP	Environmental Restoration Program
EWP	Excavation Work Plan
GHG	Greenhouse 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
P.E. or PE	Professional Engineer
PFAS	Per- and Polyfluoroalkyl Substances
PID	Photoionization Detector
PRP	Potentially Responsible Party
PRR	Periodic Review Report
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
QEP	Qualified Environmental Professional
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

CERTIFICATION STATEMENT

I, Xin Yuan, certify that I am currently a NYS registered professional engineer as in defined in 6 NYCRR Part 375 and that this Site Management Plan was revised in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

096444	11/23/2021	
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 Identification No. C241163 Former Union Wire Die Corp. 39-40 30th Street, Queens, New York 11101
Institutional Controls:	1. The property may be used for restricted residential; commercial, and industrial uses;
	2. Listed ICs Include: 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)
	All Engineering Controls must be operated and maintained as specified in the Revised Site Management Plan(SMP)
	All Engineering Controls must be inspected at a frequency and in a manner defined in the SMP
	The use of groundwater underlying the property is prohibited without necessary water quality treatment (as determined by the NYSDOH or the 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
	Groundwater and other environmental or public health monitoring must be performed as defined in the SMP
	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
	Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP
	All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP.

	Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy shall be performed as defined in the SMP reporting of any mechanical or physical components of the remedy shall be performed as defined in the 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 this Environmental Easement	
Engineering Controls:	1. Cover system	
	2. Active sub-slab depressurization system (SSDS)	
Inspections:		Frequency
Cover inspection		Annually
Active SSDS		Annually
Monitoring:		
Vapor Point Vacuum Measurements		Annually
Soil Vapor, Indoor Air and OAI Locations		Once during the 2021-22 or 2022-23 heating season.
Maintenance:		
1. Active SSDS		As needed
Reporting:		
1. Inspection Report		Annually
2. Periodic Review Report		Annually

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

1.0 INTRODUCTION

1.1 General

This Site Management Plan (SMP) is a required element for the post remediation management of the Former Union Wire Die Corp. property located at 39-40 30th Street, Long Island City, Queens, New York (See **Figure** 1 for location) (hereinafter referred to as the "Site"). The Site was accepted into the New York State (NYS) Brownfield Cleanup Program (BCP), Site No. C241163, as administered by New York State Department of Environmental Conservation (NYSDEC or Department). The NYSDEC issued the Notice of Completion to Ganesh Management, LLC for the Site on January 2, 2018. Ganesh Management, LLC operated the Site in accordance with the September 2017 SMP prepared by AMC Engineering PLLC of Astoria, New York. The Environmental Easement for the Site was filed with the NYSDEC and Queens County Clerk in compliance with this SMP and the Institutional and engineering Controls (ICs and ECs).

Ganesh Management, LLC transferred ownership of the property to LIC Owner, LLC in a deed dated March 18, 2019. LIC Owner, LLC initiated redevelopment of the Site in accordance with the requirements of the 2017 SMP, and the Building Demolition Work Plan dated September 10, 2019 and the Post-Remedial Excavation Work Plan dated October 21, 2019 prepared by Impact Environmental Closures, Inc. (IEC) and Impact Environmental Engineering and Geology, PLLC. The Site redevelopment work has been completed and the SMP has been revised to reflect the changes in the engineering controls for the Site. The deed restrictions and institutional controls for the Site remain unchanged.

The subject site is located on the northwest corner of the intersection between 40th Avenue and 30th Street in Queens, New York. The site is designated as Block 399 Lot 34 on the Queens Tax Map; it consists of a single tax parcel with 133 feet of street frontage on 30th Street and 100 feet of street frontage on 40th Avenue for a total of 14,000 square feet (0.32 acres). The lot is currently developed with a mixed use residential-commercial 10-story building with a partial below grade level/cellar. A figure showing the site location and boundaries of this site is provided as **Figure 2**. The boundaries of the site are more fully described in the metes and bounds site description that is part of the Environmental Easement provided in **Appendix A**.

After completion of the construction work associated with redevelopment of the Site, some residual contamination was left at this site, which is hereafter referred to as "remaining contamination". Institutional Controls (ICs), incorporated into the initial site remedy, remain in place and new Engineering Controls were incorporated into Site redevelopment to control exposure to remaining contamination to ensure protection of public health and the environment.

This revised 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, 6 NYCRR Part 375 and the BCA Site # C241163-06-14 for the site, and thereby subject to applicable penalties.

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

This revised SMP was prepared by IEC on behalf of LIC Owner, 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 revised SMP addresses the means for implementing the ICs and/or ECs that are required by the Environmental Easement for the site.

1.2 Revisions

Any future revisions to this plan will be proposed in writing to the NYSDEC's project manager. The NYSDEC can also make changes to the SMP or request revisions from the remedial party. Revisions will be necessary upon, but not limited to, the following occurring: a change in media monitoring requirements, upgrades to or shutdown 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 project manager 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, 6 NYCRR 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. If the ground-intrusive activity qualifies as a change of use as defined in 6 NYCRR Part 375, the above mentioned 60-day advance notice is also required.
- 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 notifications. 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 **Appendix B**.

Table 1: Notifications*

Name	Title, Organization	Contact Information
Ruth Curley	NYSDEC, Environmental Engineer	ruth.curley@dec.ny.gov 518-402-9480
Gerald Burke	NYSDEC, Remediation Bureau Chief	gerald.burke@dec.ny.gov 518-402-9817
Kelly Lewandowski	NYSDEC, Site Control Chief	kelly.lewandowski@dec.ny.gov 518-402-9581

* 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 designated as Block 399, Lot 34 on the Queens Tax Map; it consists of a single tax parcel with 133 feet of street frontage on 30th Street and 100 feet of street frontage on 40th Avenue for a total of 14,000 square feet (0.32 acres) (boundary map is provided **as Figure 2**. The lot is currently developed with a mixed use residential-commercial 10-story building with a partial below grade level/cellar which occupies 100 percent (%) of the lot. The 0.32-acre property is fully described in **Attachment A – Environmental Easement**. The owner of the site parcel at the time of issuance of this SMP is LIC Owner, LLC.

2.2 Physical Setting

2.2.1 Land Use

The Site consists of a mixed use residential-commercial 10-story building with a partial below grade level/cellar. The Site is zoned manufacturing district/medium density apartment hours district M1-3/RX-7 with a special Long Island City Mixed Use District (LIC).

The properties adjoining the Site and surrounding the Site primarily include commercial properties including NYSDEC site #241127 to the north, a hotel, restaurant/commercial building and ARC Luxury Long Island City Apartments to the east, a commercial warehouse office building and a hotel to the south and a church and commercial buildings to the west.

2.2.2 Geology

The geologic setting of Long Island is well-documented and consists of crystalline bedrock overlain by layers of unconsolidated deposits. According to geologic maps of the area created by the United States Geologic Survey (USGS), the bedrock in this area of Queens is an igneous intrusive classified as the Ravenswood grano-diorite of middle Ordovician to middle Cambrian age. Unconsolidated sediments overlie the bedrock and consist of Pleistocene aged sand, gravel and silty clays, deposited by glacial-fluvial activity. Non-native fill materials consisting of dredge spoils, rubble and/or other materials have historically been used to raise and improve the drainage of low-lying areas.

Subsurface soils at the Site consists of a mixture of a silty non-native fill, to a depth of approximately 6 feet below grade followed by sandy silt to a depth of approximately 15 feet below grade.

According to the USGS topographic map for the area (Brooklyn Quadrangle), the elevation of the property is 28 feet above the National Geodetic Vertical Datum (NGVD). The area topography gradually slopes to the southeast.

2.2.3 Hydrogeology

Groundwater is present under water table conditions at a depth of approximately 20 feet below grade (fbg) and flows to the south.

2.3 Investigation and Remedial History

The Site was occupied by a gas station in 1936 and was redeveloped by 1947 into a 2-story warehouse utilized by Optical Products Corporation for manufacturing, shipping, and as an office. The warehouse building was later occupied by Union Wire Die Corp. (1960s), National Tea Packaging Co. Inc (1962-1991), and a telecommunications warehouse (1991-2006). Most recently the Site has been developed by a 2-story commercial warehouse, occupied by Personal Communications Inc., a distributer of wireless communications equipment. The two-story warehouse building was demolished in October-November 2019. The Site has been redeveloped with a 10-story mixed use building with a partial cellar.

Contamination was first identified at the Site in December 2013. Chlorinated solvents related to an on-site release and historic use were detected in shallow soil during environmental investigations. The former property owner, Ganesh Management, LLC, entered the New York State Brownfield Cleanup Program on July 1, 2014. The Site was remediated in accordance with the remedy selected by the NYSDEC in the Decision Document dated August 2016.

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.

September 2013 – Galli Engineering Phase I Environmental Site Assessment Report (ESA)

This Phase I ESA established a history dating back to 1887 by review of Sanborn Maps. A gas station with two gasoline tanks occupied the site by 1936. The property was redeveloped by 1947 into a 2-story warehouse utilized by Optical Products Corporation for manufacturing, shipping, and as an office. The warehouse building had several other occupants including Union Wire Die Corp (1960s-1980s), National Tea Packaging Co. Inc. (1962-1991), and a warehouse (1991-2006). The Site warehouse was used as an office space and distribution center for electronic goods at the time of the investigation. The Phase I ESA identified the following pertinent "site environmental conditions":

- The property is an E Designation site for hazardous materials, requiring Phase I and Phase II ESA Testing Protocol.
- Expected chemicals previously used on the Site includes petroleum, motor oil, nitrogen and sulfur oxides, TCA, arsenic, ammonia, ammonium chloride, sulfates, cyanide stripping solutions, silica and metallic fine posers, acid and alkaline cleaning solutions, CFCs, HCFCs, cadmium, and chlorinated solvents.

January 2014 – Environmental Business Consultants (EBC) Preliminary RI Data Summary

A remedial investigation (RI) was performed December 9-20, 2013 in accordance with a work plan approved by the New York City (NYC) Office of Environmental Remediation (OER). The RI included the soil, groundwater and soil gas samples. Trichloroethene (TCE), semi volatile organic compounds (SVOCs) and various metals were identified in shallow soil across the Site.

Groundwater was encountered at approximately 20 fbg. Chlorinated volatile organic compounds (CVOCs), including tetrachloroethene (PCE) and TCE, were detected above NYSDEC ambient water quality standards (AWQS). In addition, petroleum-related VOCs were also reported above AWQS in one sample.

Both PCE and TCE were reported in soil vapor above mitigation levels established within the NYS Department of Health (DOH) soil vapor guidance matrix. The report attributed the TCE to historical use of the site. PCE in groundwater was attributed to the adjacent

property to the north. Elevated SVOCs and metals are commonly associated with historic fill and are not believed to be related to historic use of the property.

December 18 2015 - AMC Engineering Immediate Action Report

An Immediate Action Report (IA) was prepared on December 18, 2015 by AMC after elevated indoor air concentrations of Trichloroethene (TCE) were reported above 20 ug/m^3, which exceeded NYSDOH guidelines and triggered an immediate action. As a result, a temporary activated carbon filtration system was installed, which improved air quality on both the first and second floors of the building. The temporary system continued to operate while a soil-vapor extraction (SVE) system was designed, approved by NYS and installed. The permanent SVE system began operation on October 31, 2016.

January 2016 – EBC Remedial Investigation Report (RIR)

This RI data was used to further characterize the nature and extent of contamination in groundwater and soil vapor at the Site and to complete a qualitative exposure assessment for future occupants of the buildings and the surrounding community.

Groundwater: CVOCs (PCE, TCE and/or cis-DCE) were reported above AWQS in most of the ground water samples. The highest PCE and TCE concentrations reported during the 2013 sampling were in wells MW2 (PCE-730 ug/L) and MW3 (TCE 100 ug/L), respectively, which are in upgradient positions. PCE and TCE were also reported at relatively high concentrations in MW4 in 2013 (PCE - 200 ug/L, TCE-63 ug/L) and in 2014 (PCE-670 ug/L, TCE, 150 ug/L). PCE and TCE were reported at significantly lower concentrations in downgradient wells MW5 in 2013 and in MW5, MW6 and MW7 during the 2014 sampling round. Petroleum VOCs were also reported in MW3 during the 2013 sampling event including trimethylbenzenes (total- 234 ug/L), ethylbenzene (130 ug/L), isopropylbenzene (39 ug/L) and total xylenes (1,090 ug/L).

Soil-Vapor: TCE and PCE were reported in all soil vapor samples at concentrations ranging from 11.5 µg/m^3 in SG17 (northwest side of the site) to 27,000 µg/m^3 in SG11 (west side of Site).

Soil: The soil boring program successfully delineated the extent of TCE contamination identified in the shallow soil samples to a depth of 6 feet. The zone of impacted soil is limited to southern half of the Site. Elevated levels of SVOCs and metals reported in shallow soil throughout the site are characteristic of the historic fill materials present at the site and throughout the area.

October 19, 2016 – EBC Supplemental Soil and Groundwater Sampling

This report documents supplemental field investigation work completed at the Site between July and September 2016 where additional groundwater sampling and soil sampling was performed at up-gradient locations to assess onsite migration of PCE and TCE from an adjacent source and the inspection and soil sampling around an Underground Storage Tank (UST) that was previously closed-in-place.

The results of the samples collected from the supplemental soil borings reported chlorinated VOCs (PCE and TCE) above unrestricted SCOs in the shallow samples only. All soil samples were collected from beneath the existing building.

Groundwater sampling of the five on-site wells and five sidewalk wells around the near the site indicates that the concentrations and distribution of CVOCs were similar to that reported in 2014 as part of the RI.

The results of the UST investigation confirmed that the tank was properly abandoned in place by filling with structural foam. Soil borings around the tank found no evidence of petroleum contamination with all samples non-detect for both VOC and SVOC compounds.

The SVE System installation was completed in October 2016 and began operation on October 31, 2016.

August 6, 2016 – EBC/AMC Engineering PLLC Remedial Action Work Plan (RAWP)

The RAWP recommended a Track 4 -Alternative 2 remedy which included both institutional and engineering controls. The RAWP proposed the following:

- Installation of a Soil Vapor Extraction (SVE) system beneath the existing building foundation. The system consisted of 4 vapor extraction wells connected by a 8 inch vent line which were connected to granulated activated carbon (GAC) vapor phase carbon vessels with a 2 inch discharge line;
- Implementation of a groundwater remediation contingency plan should the TCE in groundwater is found to be Site related;
- Implementation of a Site Management Plan (SMP) for long term maintenance of the Engineering Controls; and
- An Environmental Easement will be filed against the Site to ensure implementation of the SMP.

Remedial activities proposed for the Site were approved by the NYSDEC.

August 2016 – NYSDEC Decision Document

The Decision Document presented the following information:

1. Remedial Design - The remedial design program consisted of the construction, operation, optimization, maintenance and monitoring of the remedial program. Green remediation principles and techniques were also implemented to the extent feasible per DER-31.

2. Cover System - The existing site cover will be maintained to provide restricted residential use of the site. Any site redevelopment will maintain the existing site cover, which consists either of the structures such as buildings, pavement, sidewalks or soil where the upper two feet of exposed surface soil meets the applicable soil cleanup objectives (SCOs) for restricted residential use. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6NYCRR part 375-6.7(d).

3. Soil Vapor Extraction (SVE) - A SVE system will be operated to remove volatile organic compounds (VOCs) from the subsurface and address potential soil vapor intrusion. VOCs will be physically removed from the soil by applying a vacuum using four SVE wells installed into the vadose zone and air extracted from the SVE wells is treated prior to discharged to the atmosphere. Based on monitoring of the SVE effectiveness, the SVE system may transition to a sub-slab depressurization system to mitigate the migration of vapors into the building for long term use, if needed.

4. Enhanced Bioremediation - A pre-design study will be implemented to evaluate the presence of an onsite source area. If pre-design study results confirm a site-related source of TCE in groundwater, then in-situ enhanced biodegradation is to be utilized to treat contaminants in groundwater. The biological breakdown of contaminants through anaerobic reductive

dichlorination will be enhanced by an in-situ injection where the material, method and depth of injection will be determined during the remedial design.

5. Institutional Control - Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

- require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allow the use and development of the controlled property for restricted residential use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or NYCDOH; and
- require compliance with the Department approved Site Management Plan.

A Site Management Plan is required, which includes the following:

a. Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: The Environmental Easement.

Engineering Controls: The cover system and the soil vapor extraction system.

This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- descriptions of the provisions of the environmental easement including any land use and groundwater water use restrictions;
- a provision for evaluation of the potential for soil vapor intrusion in occupied existing or future buildings developed on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and NYSDEC notifications; and
- periodic reviews and certification of the institutional and/or engineering controls.

b. Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

- monitoring of sub-slab vapor, indoor air and groundwater, to assess the performance and effectiveness of the remedy;

- a schedule of monitoring and frequency of submittals to the Department; and
- monitoring for vapor intrusion for any occupied existing or future buildings developed on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

c. Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:

- procedures for operating and maintaining the remedy; and
- compliance inspection of the system(s) to ensure proper O&M as well as providing the data for any necessary reporting."

The remedial action objectives for this site per the Decision Document are as follows:

"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 ground or surface water contamination.

Soil

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

Soil Vapor

RAOs for Public Health Protection

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

November 2017 - AMC Engineering Final Engineering Report

As part of the remedial action completed at the Site, there were no plans to redevelop the property. The Site was remediated to meet Track 4 – Restricted Residential Use SCOs. The selected remedy completed at the Site were in accordance with the RAOs for the site consisting of the following components:

1. Installation of a Soil Vapor Extraction (SVE) system on the first floor of the facility building;
2. A cover system comprised of concrete-covered sidewalks, parking areas and concrete building slabs;
3. Development of a Site Management Plan for long term management of remaining contamination as required by the Environmental Easement, which includes plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operations and maintenance, and (4) reporting;
4. Execution and recording of an Environmental Easement to restrict land use and prevent future exposure to any contamination on site; and
5. Periodic certification of the institutional and engineering controls listed above.

September 2017 - AMC Site Management Plan

The Site Management Plan (SMP) was prepared for long term management of remaining contamination as required by the Environmental Easement, which included plans for Institutional Controls (ICs) and Engineering Controls (ECs). The SMP describes the procedures for the implementation and management of the IC/ECs, monitoring, SVE system operation and maintenance and reporting.

The ICs in the September 2017 SMP are:

- The property may be used for restricted residential, commercial or industrial use;
- All ECs must be operated and maintained as specified in this SMP;
- All ECs must be inspected at a frequency and in a manner defined in the SMP;
- The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or NYC 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;
- Groundwater and other environmental or public health monitoring must be performed as defined in the SMP;
- Data and information pertinent to site management must be reported at the frequency and in a manner as defined in the SMP;

- All future activities that will disturb remaining contaminated material must be conducted in accordance with the SMP;
- Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP;
- Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in the 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 6**, and any potential impacts that are identified must be monitored or mitigated; and
- Vegetable gardens and farming on the site are prohibited.

These ECs in this 2017 SMP are:

- A cover system, comprised of concrete sidewalks, parking areas and building slab placed over Track 4 portions of the Site, prevents exposure to remaining contamination. Disturbance/breach of the cover system must be completed in accordance with the Excavation Work Plan (EWP) which outlines procedures required. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and associated Community Air Monitoring Plan (CAMP).
- To remediate both impacted soil and mitigate vapor intrusion, a soil vapor extraction (SVE) system was installed at the Site which included four SVE wells using a 7.5 hp regenerative blower and vapor-phase GAC vessels. Procedures for operating and maintaining the SVE system, monitoring, sampling and the potential removal are documented in this SMP.
- The SMP provided the frequency and protocols for inspections to be completed. The inspections determine and document compliance with the SMP requirements, the environmental easement and the remedial performance criteria.

2017 SMP Sampling and Monitoring: This SMP required the collection and laboratory analysis of groundwater samples from existing wells to access compliance with applicable standards related to chlorinated VOCs contaminants.

An indoor air sampling protocol was also required which included the collection of six indoor air samples for an 8-hour period for VOC analysis.

2017 SMP Reporting Requirements: Site management, inspection, maintenance and monitoring events will be recorded on the appropriate site management forms, 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 and summarized in the Periodic Review Report.

December 20, 2017 – NYSDEC Certificate of Completion

The Certificate of Completion (COC) for satisfactorily completing the remedial program designated for the Site was issued by the NYSDEC. The allowable use of the site was restricted-residential, commercial and industrial through the filing of the COC with the recording office of the County.

October 21, 2019 – IEC Post-Remedial Excavation Work Plan

This work plan was prepared on behalf of the new Site owner for the redevelopment of the Site with a new mixed use residential-commercial 10-story building with a partial below grade level cellar. This work plan included the following items:

- Continued operation and maintenance of the existing Soil Vapor Extraction (SVE) system during the phased building demolition. Once the intrusive foundation work was initialed, the SVE system would decommissioned;
- Completion of in-situ waste characterization of soil/fill to be removed during excavation for new building foundation;
- Community Air Monitoring Plan (CAMP) during intrusive ground disturbance activities;
- Use of Material Export, Import and Reuse protocols as per the excavation work plan;
- Removal the closed in place 5,000-gallon UST;
- Collection of documentation samples at the final excavation extent to determine the level of residual contamination;
- Installation of an active sub-slab depressurization system and permanent monitoring points;
- Installation of a 20-mil vapor barrier beneath the new structure's slab and along foundation sidewalls;
- Completion of an engineered composite cover across the entire footprint of the Site;
- Preparation and submission of a Construction Completion Report, detailing the execution of all remedial action at the Site; and
- Issuance of the revised Site Management Plan, documenting the engineering and institutional controls for the Site.

October 21, 2019 – IEC Post-Remedial Excavation Work Plan (PREWP)

The PREWP was prepared to enable redevelopment of the Site as part of a remedial construction action and will ensure continued protection of human health and the environment, and includes the following items:

- Continued operation and maintenance of the existing Soil Vapor Extraction (SVE) system throughout demolition, until the foundation excavation begins for the redevelopment.
- Completion of an In-Situ Waste Characterization of soil/fill to be removed during excavation, including delineation of hazardous wastes if identified.
- Implementation of the Community Air Monitoring Plan (CAMP) during intrusive ground disturbance activities.
- Material Export, Import and Reuse protocols as per the SMP EWP.
- Procedures for the removal the existing 5,000-gallon UST and unknown/unregistered storage tanks or vessels as identified during the redevelopment excavation.
- Collection of a minimum of seventeen (17) documentation samples to be taken at the final excavation extent to determine the level of residual contamination.
- Installation of an active sub-slab depressurization system and permanent monitoring points.
- Installation of a 20-mil vapor barrier beneath the proposed structure's slab and along foundation sidewalls.
- Completion of an engineered composite cover across the entire footprint of the Site. The composite cover system will consist of concrete building slab and adjacent concrete sidewalks.
- Preparation and submission of a Construction Completion Report, detailing the execution of all remedial action at the Site.
- Issuance of an updated Site Management Plan, documenting all engineering and institutional controls.

Long-term management will continue be executed under the existing environmental easement in compliance with the SMP. No changes to the easement are anticipated as a result of the redevelopment.

2.4 Remedial Action Objectives

The Remedial Action Objectives (RAOs) for the Site as documented on the August 12, 2016 Decision Document are:

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 ground or surface water contamination.

Soil

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

Soil Vapor

RAOs for Public Health Protection

- 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

The primary contaminant of concern during previous Site investigations was trichloroethylene (TCE) in soil to depths of 10 to 12 fbg. One or more metals, including arsenic, chromium, copper, lead, mercury, nickel, silver and zinc, were also detected in soil above and below the Unrestricted Use and Restricted Residential SCOs. No soil excavation was completed as part of the previous remedial action completed for issuance of the Certificate of Completion (COC) in December 2017. Approximately 8,260 tons of soil/fill material has been removed from the Site as part of the excavation for the cellar and foundation associated with the new building development post COC.

The Site is sloped at grade from north to south and the terminal excavation depths would vary if reported in feet below grade; therefore, the terminal sample depths are based on elevations below the Project Construction Datum of 28 feet NAVD 88 (designated as the 0 feet, 0

inches). The commercial cellar excavation was terminated at approximately 18.33 feet NAVD 88 (approximately -10 feet). The sub-cellar excavation was terminated at approximately 15.33 feet NAVD 88 (approximately -15 feet). The elevator pit excavation was terminated at approximately 12.33 feet NAVD 88 (approximately -18 feet).

Fifteen (15) confirmation soil samples were collected for laboratory from the final excavation extent to document post excavation soil conditions. The soil samples were analyzed for TCL VOCs by USEPA Method 8260C and TAL Metals by USEPA Method 6010D or 7471B.

TCL VOCs were either not detected or were detected at concentrations below the Unrestricted Use SCOs in the fifteen (15) post excavation soil samples collected. The soil excavation completed as part of the Site redevelopment has removed VOC contaminated soil to meet the Unrestricted Use SCOs.

The TAL metals were either not detected or were detected at concentrations below the Unrestricted Use SCOs in ten (10) of the fifteen (15) soil samples collected. These detected metals meet the Track-4 Restricted Residential Use SCOs at these five (5) locations. Table 2 below summarizes the metals detected that exceed the Unrestricted Use SCOs but meet the Residential and Restricted-Residential SCOs.

Table 2 - Post Site Excavation Soil Sample Exceedances

Analyte	NY-Part 375 Unrestricted Use SCO mg/kg	NY-Part 375 Restricted-Residential Use SCO mg/kg	EP-7 mg/kg	EP-10 mg/kg	BS-2 mg/kg	BS-3 mg/kg	BS-4 mg/kg
Copper	**50**	270	ND	**98.7**	17.9	23.7	22.7
Lead	**63**	400	**136**	**191**	**69.2**	**101**	**73.4**
Mercury	**0.18**	0.81	**0.432**	**0.681**	**0.25**	**0.29**	**0.212**

mg/kg – milligrams per kilogram
Bold – Exceedance of Unrestricted Use SCO

The remaining contaminates were collected at a depth of approximately 6.5 fbg and these two areas are capped by the foundation slab construction of the new building thereby restricting access and exposure to these soil sample locations to building occupants and potential utility workers.

Figure 3 shows the location of the EP-7, EP-10, BS-2, BS-3 and BS-4 confirmation soil samples and summarizes the results of the fifteen (15) soil samples collected from the site after completion of excavation.

2.5.2 Groundwater

Previous investigations of groundwater beneath the Site have documented concentrations of CVOCs and petroleum related VOCs above the Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards (AWQS)/ 6 CRR-NY 703.5 Water Quality Standards (WQS). An upgradient off-Site source, Bridge Cleaners (site C241127), was suspected source of the PCE concentrations detected in groundwater beneath the Site based on the lack of a source of PCE in soil beneath the Site.

The depth to water beneath the Site is approximately 20 fbg, and the groundwater flow is in a southerly direction. Groundwater monitoring was previously completed on an annual basis using MW3 and MW4 prior to Site redevelopment. The on-Site wells MW-1 through MW-5 and off-Site wells MW-6, MW-7 and ADJ-2 were abandoned in accordance with the NYSDEC CP-43 Groundwater Monitoring Well Decommissioning Policy due to Site redevelopment excavation. Off-Site monitoring wells MW ADJ 3 and MW ADJ 5 (associated with the upgradient off-Site Bridge Cleaners) were not abandoned and MW ADJ 2 was replaced upon construction work completion.

Replacement monitoring well MW ADJ 2 was constructed of 10 feet of schedule 40 polyvinyl chloride (PVC) 0.010 well screen and 17 to 18 feet of PVC riser. A #010 Morie filter sand was placed in the borehole to 2 feet above the top of the well screen. A 2-foot hydrated bentonite seal was then placed on top of the filter sand and the remainder of the borehole was backfilled to grade. The well was sealed at the top with a locking expandable j-plug and are finished at grade with a steel road box. **Figure 4** shows the well locations and **Table 5**

below provides a summary of the well MW-ADJ 2 and MW ADJ 5 location and construction information.

Table 3 - Monitoring Well MW ADJ 2 and MW ADJ 5 Summary Details

Monitoring Well ID	Well Location	Approximate Lat/Long Coordinates	Well Diameter (inches)	Screen Top (fbg)	Screen Bottom (fbg)	Laboratory Analysis
MW ADJ 2	Cross/Down gradient	40.752258° N, 73.934575° W	2	18	28	TCL VOCs 8260
MW ADJ 5	Up/Cross gradient	40.752344° N, 73.935594° W	2	17	27	TCL VOCs 8260

In July 2021, Groundwater samples were collected from MW-ADJ-2 and MW ADJ 5, located in the sidewalk area on the east side of the Site, to evaluate post remedial action groundwater conditions. The samples were submitted to the analytical laboratory for TCL VOCs analysis in accordance with USEPA Method 8260C. The results indicate that PCE was detected above the AWQS of 5 micrograms per liter (µg/l) in both wells at low concentrations. TCE and chloroform were also detected at low concentrations in both wells at concentrations below the AWQS. **Figure 4** shows the well locations and the groundwater sample analytical report is provided in **Appendix C**. The table below provides a summary of the VOCs detected above the AWQS.

Table 4 - Groundwater Sample Results

Analyte	NYS AWQS µg/l	MW-ADJ-2 µg/l	MW-ADJ-5 µg/l
Tetrachloroethene (PCE)	**5**	**11**	**10**
Trichloroethene (TCE)	5	0.39 J	0.27 J
Chloroform	7	0.49 J	0.81 J

µg/l – micrograms per liter
Bold – Exceedance of AWQS
J – Estimated Value

2.5.3 Soil Vapor

Elevated concentrations of the chlorinated VOCs PCE and TCE were previously detected in soil vapor above mitigation levels established within the NYS DOH soil vapor guidance matrix. TCE concentrations previously detected in soil vapor samples ranged from 355 to 27,700 µg/m^3 and indoor air values ranged between 43 to 47 µg/m^3. The NYS DOH guideline for TCE is 2 µg/m^3.

Prior to redevelopment, soil vapor intrusion was addressed using a temporary indoor air filtration system (beginning in November 2015), followed by installation of a permanent SVE system. The permanent SVE system operated from October 2016 through December 2019. As part of the redevelopment, sampling after building demolition and prior to excavation indicated significantly reduced levels of TCE, most likely dud to the operation of the SVE system. These previously inaccessible site soils (that contained TCE during the RI), were excavated and removed from site. Soil vapor intrusion control measures were incorporated into the new building design.

The migration of soil vapor from onsite and/or offsite sources into the new building is now mitigated with a combination of: 1) Stego Wrap 20-mil Vapor Barrier beneath the building slab and Grace Bituthene System 4000 product on the exterior of foundation walls; and 2) the installation of an active Sub-Slab Depressurization Systems (SSDSs) beneath the footprint of the new building slab. This engineering control will be discussed in greater detail in the following section.

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 project manager.

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 **Appendix D**) 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 project manager.

3.2 Institutional Controls

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

- The property may be used for restricted residential; commercial or industrial] use;
- All ECs must be operated and maintained as specified in this SMP;

- All ECs must be inspected at a frequency and in a manner defined in the SMP;
- The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDEC or NYCDOH 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 Site boundaries noted on Figure 2 and any potential impacts that are identified must be monitored or mitigated;
- Vegetable gardens and farming on the site are prohibited; and
- An evaluation shall be performed to determine the need for further investigation and remediation should large scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible.

3.3 Engineering Controls

3.3.1 Cover (or Cap)

Exposure to remaining contamination at the site (meeting Track 4 Restricted-Residential SCOs) is prevented by a cover system placed over the site. This cover system is comprised of the foundation of the new building that encompasses the entire footprint of the Site in conjunction with adjoining concrete sidewalks to the east and south. This composite cover system is comprised of a 24-inch reinforced concrete foundation slab in the cellar and

sub-cellar. The foundation walls are 12-inch reinforced concrete. Upon completion of construction, there are no soil or grade-level landscaping at the Site. The foundation slab is underlain by a vapor barrier in accordance with standard construction practices.

The composite cover system will be a permanent engineering control. The system will be inspected, and its performance certified at specified intervals as required by the revised Site Management Plan. Procedures for the inspection of this cover are provided in the Monitoring and Sampling Plan included in Section 4.0 of this SMP. **Figure 5** presents the location of the cover system.

The Excavation Work Plan (EWP) provided in Appendix D outlines the procedures required to be implemented in the event the cover system is breached, penetrated or temporarily removed. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and associated Community Air Monitoring Plan (CAMP) prepared for the site and provided in **Appendix E**. The Health and Safety Plan (HASP) for the Site is provided in **Appendix F** and the Quality Assurance Project Plan (QAPP) is provided in **Appendix G**. Any disturbance of the site's cover system must be overseen by a qualified environmental professional as defined in 6 NYCRR Part 375, a Professional Engineer (PE) who is licensed and registered in New York State, or a qualified person who directly reports to a PE who is licensed and registered in New York State.

3.3.2 Sub-slab Depressurization Systems

Since the SVE system, that was previously used as an engineering control beneath the Site, was removed as part of redevelopment in accordance with NYSDEC approval, active sub-slab depressurization systems (SSDSs) in conjunction with a vapor barrier were installed during the construction phase of the new building. The active SSDS branches are installed to mitigate soil vapor migration into the building from residual on-Site soil vapor and possible soil vapor migrating from off-Site.

The SSDSs are located beneath the footprint of the building foundation slab which includes the cellar and sub-cellar areas. There are four (4) individual branches of 4-inch 0.020-inch slotted screen SCH 40 PVC pipes installed within 14-inches of porous granular material

consisting of ¾-inch clean crushed stone directly beneath the cellar foundation slab and vapor barrier membrane.

The active SSDS branches provide the correct coverage beneath the slab in accordance with US EPA sub-slab depressurization design guidelines which recommend a separate vent branch for every 4,000 square-feet of slab area. **Figure 6** shows the areal extent of the SSDSs installed at the Site.

The 4-inch SSDS risers from each branch penetrate the roof line and were placed at a minimum distance of 10-feet from all air intakes, operable windows, or recreational spaces. Each of the branch risers has been completed with a RadonAway RP265 fan. A pressure vacuum gauge and Checkpoint IIa Alarm, calibrated to activate an audible alarm at 0.25 inches water vacuum pressure, have been installed on each riser in the cellar accessible to building maintenance. The controls and electrical connections are protected within a locked utility area accessible by building maintenance. The four SSDS branches were started and have been running since July 23, 2021.

Seven (7) permanent sub-slab monitoring points, designated MP-1 through MP-7, were installed throughout the building concrete foundation slab to monitor the sub-slab pressure and collect sub-slab vapor samples as required.

The performance of the SSDS branches was documented by the collection of sub-slab pressure measurements on July 27, 2021 from the seven (7) monitoring points after startup. The data collected from the monitoring points confirmed the effective operation of the SSDS branches since the measurements meet the NYS DOH target requirement of -0.1 inches of water pressure differential beneath the slab.

Table 4 – Pressure Differential Measurements July 27, 2021

Monitoring Point	PID Measurements (PPM)	Manometer Readings (In W.C.)r
MP-1	29.9	-1.645
MP-2	0.0	-0.952
MP-3	0.0	-2.320

Monitoring Point	PID Measurements (PPM)	Manometer Readings (In W.C.)r
MP-4	2.8	-2.170
MP-5	21.9	-2.360
MP-6	5.2	-0.101
MP-7	5.9	-2.280

Procedures for operating and maintaining the SSDS are documented in the in Section 5.0 of this SMP. SSDS drawings and specifications, are included in **Appendix H**.

3.3.3 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.4 of NYSDEC DER-10. Unless waived by the NYSDEC, confirmation samples of applicable environmental media are required before terminating any remedial actions at the site. Confirmation samples require Category B deliverables and a Data Usability Summary Report (DUSR).

As discussed below, the NYSDEC may approve termination of a groundwater monitoring program. When a remedial party receives this approval, the remedial party will decommission all site-related monitoring, injection and recovery wells as per the NYSDEC CP-43 policy.

The remedial party will also conduct any needed restoration activities, such as sidewalk flag replacement and decommissioning treatment system equipment as applicable. Although not likely applicable for the Site, the remedial party will conduct any necessary restoration of vegetation coverage, trees and wetlands, and will comply with NYSDEC and United States Army Corps of Engineers regulations and guidance. Also, the remedial party will ensure that no ongoing erosion is occurring on the site.

3.3.4.1 - Cover (or Cap)

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

3.3.4.2 - Sub-Slab Depressurization Systems

The active SSDSs will not be discontinued unless prior written approval is granted by the NYSDEC and the NYSDOH project managers. If monitoring data indicates that the SSDSs may be converted to a passive system or are no longer be required, a proposal will be submitted by the remedial party to the NYSDEC and NYSDOH project managers. The Systems will remain in place and operational until permission to discontinue or alter their use is granted in writing by the NYSDEC and NYSDOH.

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 project manager. 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 Appendix G.

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

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

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

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

Reporting requirements are provided in Section 7.0 of this SMP.

4.2 Site – Wide Inspection

Site-wide inspections will be performed once per year. Site-wide inspections will be performed by a qualified environmental professional as defined in 6 NYCRR Part 375, a PE who is licensed and registered in New York State, or a qualified person who directly reports to a PE who is licensed and registered in New York State. Modification to the frequency or

duration of the inspections will require approval from the NYSDEC project manager. 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 **Appendix I** – Site Management Forms. The form will compile sufficient information to assess the following:

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

Inspections of all remedial components installed at the site will be conducted on an annual basis. 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.

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 project manager 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 defined in 6 NYCCR Part 375. Written confirmation must be provided to the NYSDEC project manager

within 7 days of the event that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

4.3 System Monitoring and Sampling

4.3.1 SSD System Monitoring

Inspection of the SSD System will be performed on an annual basis. A visual inspection of the accessible SSD system components will be completed during each monitoring event and will include, but is not limited to:

- Complete a visual inspection of the complete system to identify components that are damaged or not operating properly and require corrective action;
- Confirm operation of the fans (blowers), differential pressure and audible alarm and the U-Tube manometer for each system riser;
- Collect measurements for vacuum in inches of water using a digital manometer through monitoring points MP-1 through MP-7 to document sub-slab vacuum and record manometer readings on the site inspection form;
- Inspection of building conditions to identify changes that may impact operation of SSDS.

The monitoring of remedial systems must be conducted by a qualified environmental professional as defined in 6 NYCRR Part 375, a PE who is licensed and registered in New York State, or a qualified person who directly reports to a PE who is licensed and registered in New York State. Modification to the frequency or sampling requirements will require approval from the NYSDEC project manager. Unscheduled inspections and/or sampling may take place when a suspected failure of the individual branches of the SSD system has been reported or an emergency occurs that is deemed likely to affect the operation of the individual branches of the SSD system.

A complete list of SSDS components and the cover system that need to be inspected is provided in the Inspection Checklist, provided in Appendix I - 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, is required immediately.

4.3.2 Remedial System Sampling

No sample collection for laboratory analysis from the SSD system will be required as part of the operation and maintenance.

4.4 Post-Remediation Media Monitoring and Sampling

4.4.1 Soil Vapor Intrusion Sampling

The new SSD system branches have been designed to mitigate soil vapor and limit intrusion into the new building.

Soil vapor intrusion sampling needs to be performed once during the 2021-22 or 2022-23 heating season to assess the performance of the remedy and to determine of continued operation of the SSDS is required based on the results. Modification to the sampling requirements will require approval from the NYSDEC project manager.

The soil vapor/indoor air sampling event will include the following:

- NYSDEC/NYSDOH approval to shut down the system for 30 days prior to the sampling event.
- Collect One soil vapor sample from each sub-slab monitoring point designated as MP-1 through MP-7. One duplicate sample will be collected as part of the sampling event. Vacuum measurements will also be collected at each location and recorded.
- One indoor air sample will be collected at locations proximate (within couple of feet) of each of the seven sub-slab monitoring points.
- One outdoor ambient air sample will be collected to establish background during a sampling event.
- The samples will be collected for a period of 24-hours.
- Sample analysis will be TO-15 for VOCs analysis.

The sampling frequency may only be modified with the approval of the NYSDEC project manager. This SMP will be modified to reflect changes in sampling plans approved by the NYSDEC project manager.

Deliverables for the soil vapor intrusion sampling program are specified in Section 7.0 – Reporting Requirements.

4.4.2 Monitoring and Sampling Protocol

All sampling activities will be recorded in a field book and associated sampling log as provided in Appendix I - Site Management Forms. Other observations (e.g., groundwater monitoring well and sub-slab monitoring point integrity) will be noted on the sampling log. The sampling log will serve as the inspection form for the monitoring network.

5.0 OPERATION AND MAINTENANCE PLAN

5.1 General

This Operation and Maintenance Plan 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 SSD systems;
- Will be updated periodically to reflect changes in site conditions or the manner in which the SSD systems are operated and maintained.

Further detail regarding the Operation and Maintenance of the SSDS is provided in **Appendix J**- Specifications. A copy of the complete SMP is to be maintained at the site.

5.2 SSDS Performance Criteria

The fans for each branch of the SSDS must be on at all times for the SSDS to be considered functional. There is a vacuum gauge and alarm on the risers for each branch of the SSDS. The optimal flow and vacuum for the SSDS branches is detailed in the table below:

Table 6 Recommended SSDS Operating Parameters

SSDS Branch	Flow (cfm)	Applied Vacuum In W.C.
Branch 1	**176**	**1.0**
Branch 2	**176**	**1.0**
Branch 3	**176**	**1.0**
Branch 4	**176**	**1.0**

These data were selected as they represent the expected SSDS operating conditions. These conditions will be confirmed and possibly adjusted during the indoor air sampling confirming the system effectiveness at that time.

5.3 Operation and Maintenance of SSDS

The following sections provide a description of the operations and maintenance of the SSDS. Specifications for the SSDS are provided in **Appendix J**. Refer to Figure 6 for SSDS system layout.

5.3.1 System Start-Up and Testing

The manufacturer recommends that prior to start-up the operator:

- Verify operation and correct installation of the fans (blowers) and the alarms;
- Verify electrical wiring/components of fans (blowers) are in good condition (no signs of wear or damage);
- Ensure the RP Series Fan and risers are secure, vibration-free and situated at minimum distance of 10 feet from operation windows and HVAC air intakes.

Once the SSD system is started and running:

- Verify system vacuum pressure within normal operating range and less than the maximum recommended operating pressures Table 6;
- Measure vacuum at sub-slab monitoring points, and
- Verify operation of U-tube manometer and warning devices.

The SSDS is currently in operation and has undergone initial start-up testing. The system testing described above will also be conducted if, in the course of the system lifetime, the system is not functioning for a period greater that 48 hours or significant changes are made to the system and the system must be restarted.

5.3.2 Routine System Operation and Maintenance

Routine maintenance and inspection will be conducted to ensure that the SSDS is operating properly until the NYSDEC and the NYSDOH have determined no need for the system or approve the conversion from an active to a passive system. On an annual basis, the operator will visit the Site and perform the following activities:

- Conduct a visual inspection of the complete system;
- Confirm that the fans are operating properly by measuring flow and pressure using appropriate gauges/equipment;
- Collect measurements of sub-slab vacuum at all monitoring points (MP-1 through MP-7);
- Collect operating data following the SSDS Operations Log in Appendix I; and

- Inspect fans and ensure their operation.
- Inspect fans for bearing failures or signs of other abnormal operations, and repair or replace, if required;
- Inspect the discharge location of the vent pipes to ensure that no air intake or operable window has been located nearby;
- Determine, through discussions with building management, if any Heating, Ventilation, and Air Conditioning (HVAC) system modifications occurred that might affect the performance of the SSDS;
- Inspect the floor slab and foundation walls for evidence of cracks and/or holes, and repair of cracks and/or holes, if required;
- Inspect the integrity of accessible portions of the riser pipe and repair the riser pipe, if required.

5.3.3 Non-Routine Operation and Maintenance

This section is applicable if non-routine maintenance is required where the fans are not working properly, the SSDS becomes damaged, warning devices initiated, system or component replacement required or if the building's HVAC has undergone modifications that may reduce the effectiveness of the system. In general, the following actions will be performed as part of non-routine maintenance:

- Examine the building for structural or HVAC system changes, or other changes that may affect the performance of the SSDS (e.g., new combustion appliances or deterioration of the concrete floor slab);
- Examine and address the operation of the fans, as well as measure the sub-slab vacuum at monitoring points using a digital manometer;
- Repair or adjust the SSDS as appropriate. If necessary, the SSDS should be redesigned and restarted (see subsection 5.3.1 for system startup).

Monitoring activities for this system will occur during: start-up testing (Section 5.3.1), routine operations (Section 5.3.2), non-routine operations (Section 5.3.3). Each is described in the applicable sections of the SMP.

5.3.4 System Monitoring Devices and Alarms

The SSD system branches each have a warning device to indicate that the system is not operating properly. In the event that warning device is activated, applicable maintenance and repairs will be conducted, as specified in the SSD system specifications and restarted. Operational problems will be noted in the Periodic Review Report to be prepared for that reporting period.

6.0 PERIODIC ASSESSMENTS/EVALUATIONS

6.1 Climate Change Vulnerability Assessment

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

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

- The Site is located at an elevation of approximately 28 feet above mean sea level (AMSL), and the water table is approximately 20 fbg. The site is generally flat, and slopes to the south. Surface water at the Site drains to a stormwater detention tank located beneath the parking entry ramp on the southwest corner of the building. The stormwater detention system was installed during Site redevelopment in 2020-2021. Stormwater outside the building footprint is directed to the New York City sewer system. During intense rain events, localized street flooding is possible due to the relatively low permeability of paved areas.

- The nearest surface water body is the East River, located approximately 4,600 feet west-northwest of the Site. According to flood zone and National Wetland Inventory (NWI) data, the Site is not located within wetland delineated areas and is within Flood Zone X which are defined as areas of moderate coastal flood risk outside the 1% annual chance flood up to the 0.2% annual chance flood level. Flood zone and NWI data was obtained from the Federal Emergency Management Agency (FEMA) and U.S. Fish and Wildlife Services, respectively. In the event of power outage, the SSDS will be turned back on expeditiously unless there is a reasonable justification otherwise.

6.2 Green Remediation Evaluation

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

- Waste Generation: There will be minimal to no waste generated from the SSDS.
- Energy Usage: The SSDS uses four 7.5-hp vacuum blowers which operate at 100% capacity. Data from the soil vapor/indoor air heating season will be used to evaluate volatile contaminants and determine if the Site meets the criteria for converting the active SSDSs to passive systems. This would decrease electricity use.
- Emissions: Minimal emissions are expected from the SSDS risers since the volatile contaminants in soil have been removed. The operation and maintenance of the SSDSs require minimal service/maintenance, thereby reducing vehicle emissions for service contractor(s).
- Water Usage: Minimal water usage is expected in the operation of the SSDSs.
- Land and/or Ecosystems: The site previously operated as an industrial facility and has been redeveloped with a high use/energy efficient building; therefore, no effect identified for the land. The area immediately surrounding the Site is highly urbanized and there are no green spaces, trees and vegetation present, therefore, there is no effect identified for ecosystems.

6.2.1 Timing of Green Remediation Evaluations

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

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

6.2.2 Frequency of System Checks, Sampling and Other Periodic Activities

Transportation to and from the Site, 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.

Since the Site engineering controls consist of the operation of the SSDS and a cover system, frequent maintenance is not required. The SSDS has alarms which reduces the need for periodic system checks. An annual inspection minimizes the number of visits to the site and travel to the site can be completed via mass transit.

6.3 Remedial System Optimization

A Remedial Site Optimization (RSO) study will be conducted any time that the NYSDEC project manager 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, if required, will focus on overall site cleanup strategy, process optimization and management with the intent of identifying impediments to cleanup and improvements to site operations to increase efficiency, cost effectiveness and remedial time frames. Green remediation technology and principals are to be considered when performing the RSO.

7.0. REPORTING REQUIREMENTS

7.1 Site Management Reports

All site management inspection, maintenance and monitoring events will be recorded on the appropriate site management forms provided in Appendix I. These forms are subject to NYSDEC revision. All site management inspection, maintenance, and monitoring events will be conducted by a qualified environmental professional as defined in 6 NYCRR Part 375, a PE who is licensed and registered in New York State, or a qualified person who directly reports to a PE who is licensed and registered in New York State.

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

Table 7: Schedule of Interim Monitoring/Inspection Reports

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

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

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);

- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation);
- 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 NYSDEC project manager beginning twelve (12) months after the Satisfactory Completion Letter is issued. Thereafter, the PRR will be submitted annually to the NYSDEC project manager or at another frequency as may be required by the NYSDEC project manager. 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 Appendix A -Environmental Easement. The report will be prepared in accordance with NYSDEC's DER-10 and submitted within 30 days of the end of each certification period. Media sampling results, as required by the NYSDEC, 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 tables and figures will include a presentation of past data as part of an evaluation of contaminant concentration trends, as applicable.
- Results of all applicable 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 Remedial Action Work Plan (RAWP), ROD or Decision Document;
  - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;
  - Any new conclusions or observations regarding site contamination based on inspections or data generated by the Monitoring and Sampling Plan for the media being monitored;
  - Recommendations regarding any necessary changes to the remedy and/or Monitoring and Sampling Plan;
  - An evaluation of contaminant levels in the soil vapor and indoor air to determine if the remedy continues to be effective in achieving remedial goals as specified by the RAWP, ROD or Decision Document; and
  - 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 as defined in 6 NYCRR Part 375 or Professional Engineer licensed to practice and registered 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;*
- *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.*

  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] [I have been authorized and designated by all site owners/remedial parties to sign this certification] for the Site.

  "I certify that the New York State Education Department has granted a Certificate of Authorization to provide Professional Engineering services to the firm that prepared this Periodic Review Report."

The assumptions made in the qualitative exposure assessment remain valid. (must be certified in the PRR every 5 years).

The signed certification will be included in the Periodic Review Report.

The Periodic Review Report will be submitted, in electronic format, to the NYSDEC project manager and the NYSDOH project manager. The Periodic Review Report may also need to be submitted in hard-copy format if 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 or failure to conduct site management activities, a Corrective Measures Work Plan will be submitted to

the NYSDEC project manager 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 project manager.

7.4 Remedial Site Optimization Report

If an RSO is to be performed (see Section 6.3), upon completion of an RSO, an RSO report must be submitted to the NYSDEC project manager for approval. A general outline for the RSO report is provided in Appendix K. 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 project manager and the NYSDOH project manager.

8.0 REFERENCES

Galli Engineering, September 2013. *Phase I Environmental Site Assessment*.

Environmental Business Consultants, January 2016. *Remedial Investigation Report*.

AMC Engineering PLLC, December 2015. *Immediate Action Report.*

Environmental Business Consultants, August 2016. *Remedial Action Work Plan*.

AMC Engineering PLLC, September 2016. *Soil Vapor Extraction Remedial Design Document for 39- 40 30th Street, Queens NY*

Environmental Business Consultants, October 2016. A*dditional Soil and Groundwater Sampling Report.*

AMC Engineering PLLC, August 2016. *Remedial Action Work Plan.*

NYSDEC, August 12, 2016, Decision Document

AMC Engineering PLLC, September 2017. Site Management Plan

AMC Engineering PLLC, November 14, 2017. *Final Engineering Report*

Impact Environmental Closures, Inc., October 2019. *Post-Remedial Excavation Work Plan.*

Impact Environmental Engineering and Geology, PLLC, November 2019. *Construction Completion Report.*

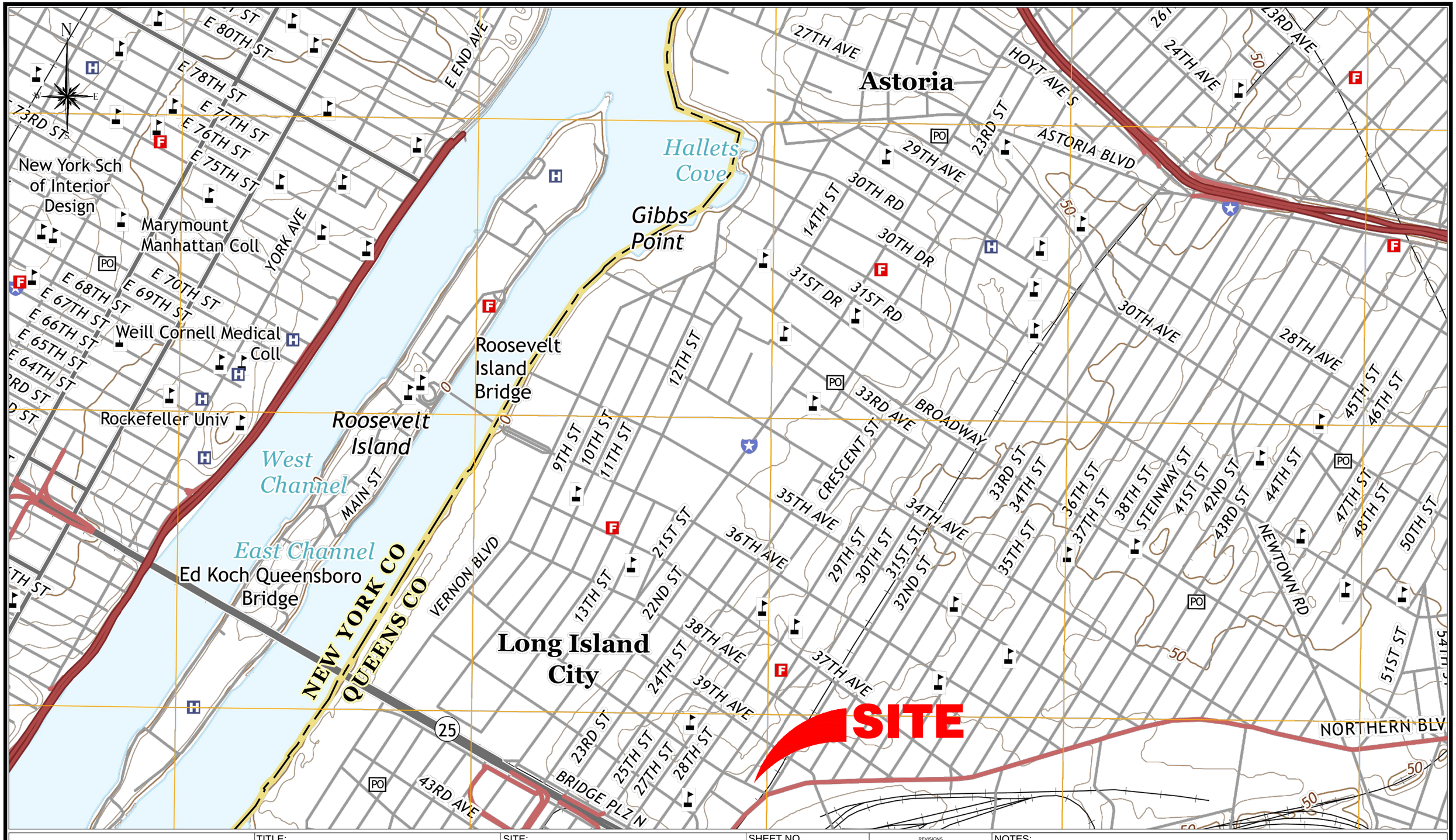
6 NYCRR Part 375, Environmental Remediation Programs. December 14, 2006.

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

NYSDEC, 1998. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1. June 1998 (April 2000 addendum).

FIGURES

Former Union Wire Die Corp.
39-40 30th Street, Queens, New York
BCP: C241163



IMPACT ENVIRONMENTAL
170 KEYLAND COURT
BOHEMIA, NEW YORK 11716
TEL (631) 269-8800 FAX (631) 269-1599

1000 PAGE AVENUE
LYNDHURST, NEW JERSEY 07071

TITLE:

SITE LOCATION MAP

SITE:

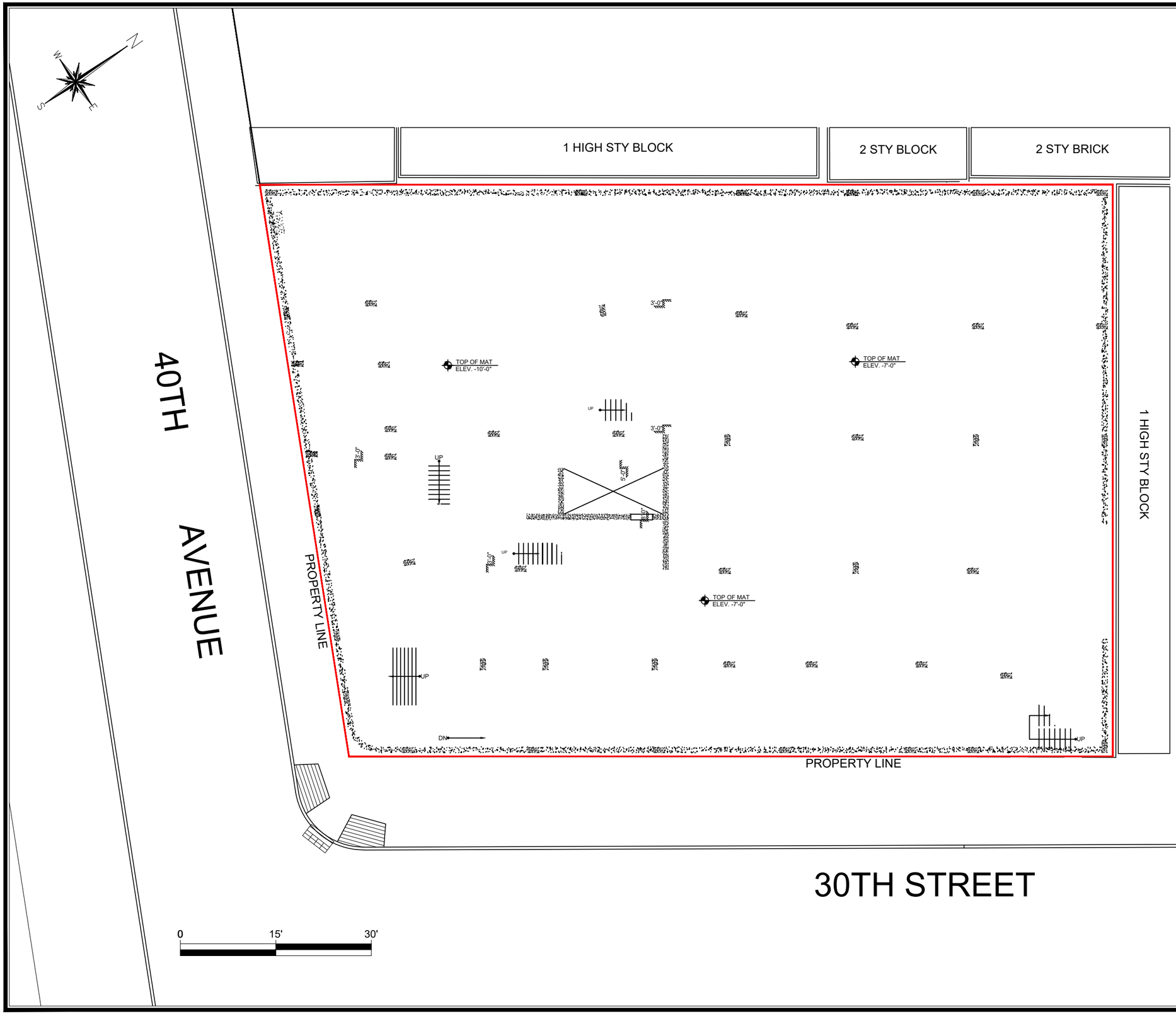
39-40 30th Street
Queens, NY

SHEET NO.
1

PROJECT NO.	12930
DESIGNED BY:	RD
DRAWN BY:	RD
CHECKED BY:	KK
DATE:	08/07/2019
SCALE:	N.T.S

REVISIONS	
NO:	DATE:

NOTES:
1. BASE MAP TAKEN FROM USGS TOPOGRAPHICAL MAP CENTRAL PARK QUADRANGLE (7.5 MINUTE SERIES, SCALE 1:24 000) DATED 2016.



NOTES:

1. BASE LAYOUT TAKEN FROM "SUPPORT OF EXCAVATION PLAN," NUMBER SOE-101.00 BY STRUCTURAL ENGINEERING TECHNOLOGIES, DATED 08/12/2019.

LEGEND:

FIGURE 2:
SITE BOUNDARY MAP

39-40 30th Street,
Queens, NY

SHEET NO.
002

PROJECT NO.	12930
DESIGNED BY:	RD
DRAWN BY:	AB
CHECKED BY:	JDF
DATE:	09/15/2021
SCALE:	1"=15'

REVISIONS	
NO:	DATE:

IMPACT ENVIRONMENTAL
170 KEYLAND COURT
BOHEMIA, NEW YORK 11716
TEL (631) 269-8800 FAX (631) 269-1599

1000 PAGE AVENUE
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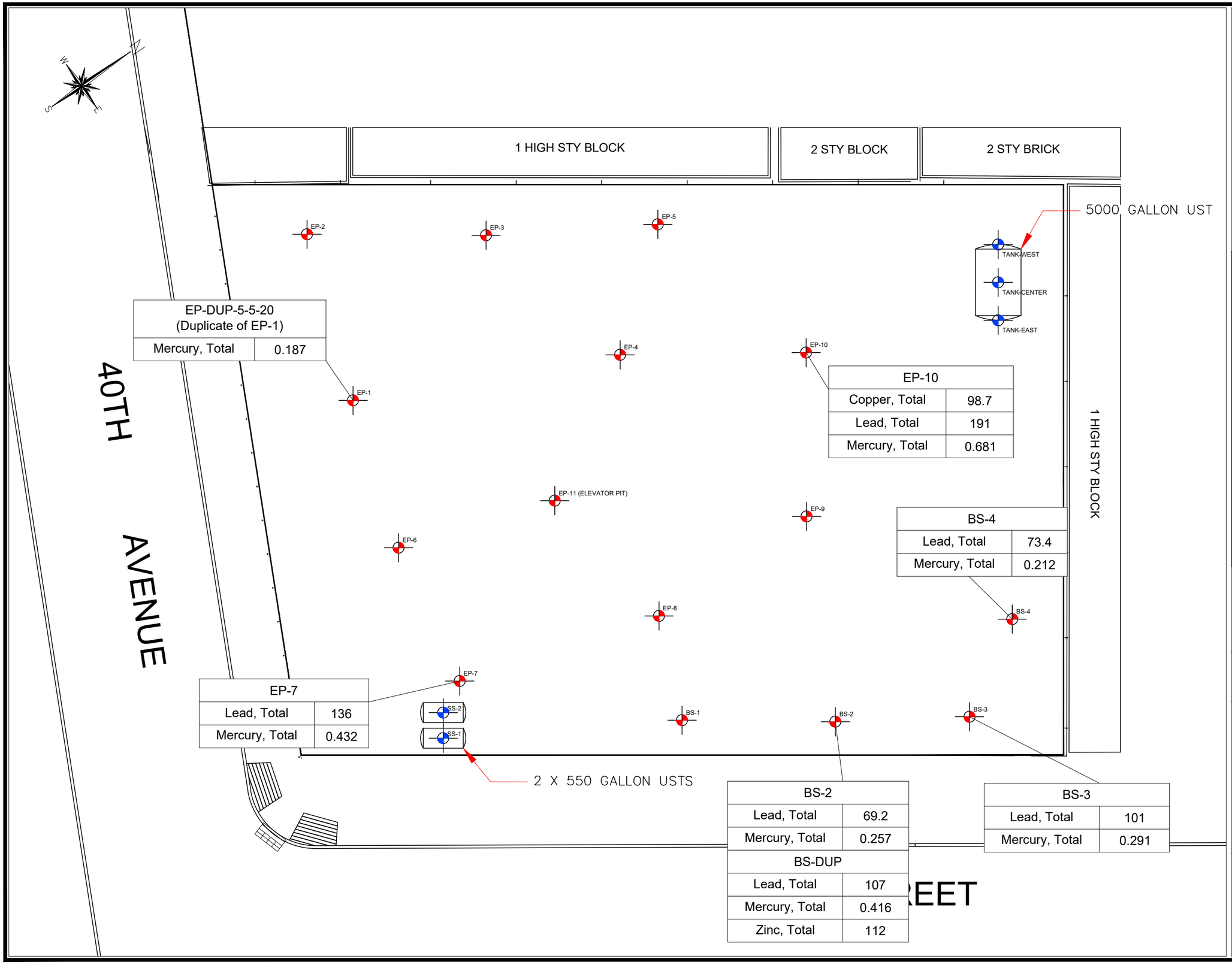


EP-DUP-5-5-20 (Duplicate of EP-1)	
Mercury, Total	0.187

EP-10	
Copper, Total	98.7
Lead, Total	191
Mercury, Total	0.681

BS-4	
Lead, Total	73.4
Mercury, Total	0.212

EP-7	
Lead, Total	136
Mercury, Total	0.432

BS-2	
Lead, Total	69.2
Mercury, Total	0.257
BS-DUP	
Lead, Total	107
Mercury, Total	0.416
Zinc, Total	112

BS-3	
Lead, Total	101
Mercury, Total	0.291

NOTES:

1. BASE LAYOUT TAKEN FROM "SUPPORT OF EXCAVATION PLAN," NUMBER SOE-101.00 BY STRUCTURAL ENGINEERING TECHNOLOGIES, DATED 08/12/2019.
2. RESULTS ARE REPORTED IN MILLIGRAMS PER KILOGRAM (MG/KG) OR PARTS PER MILLION (PPM).

LEGEND:

ENDPOINT SAMPLE LOCATION

FIGURE 3: POST-EXCAVATION CONFIRMATION SOIL SAMPLE LOCATION WITH EXCEEDANCES

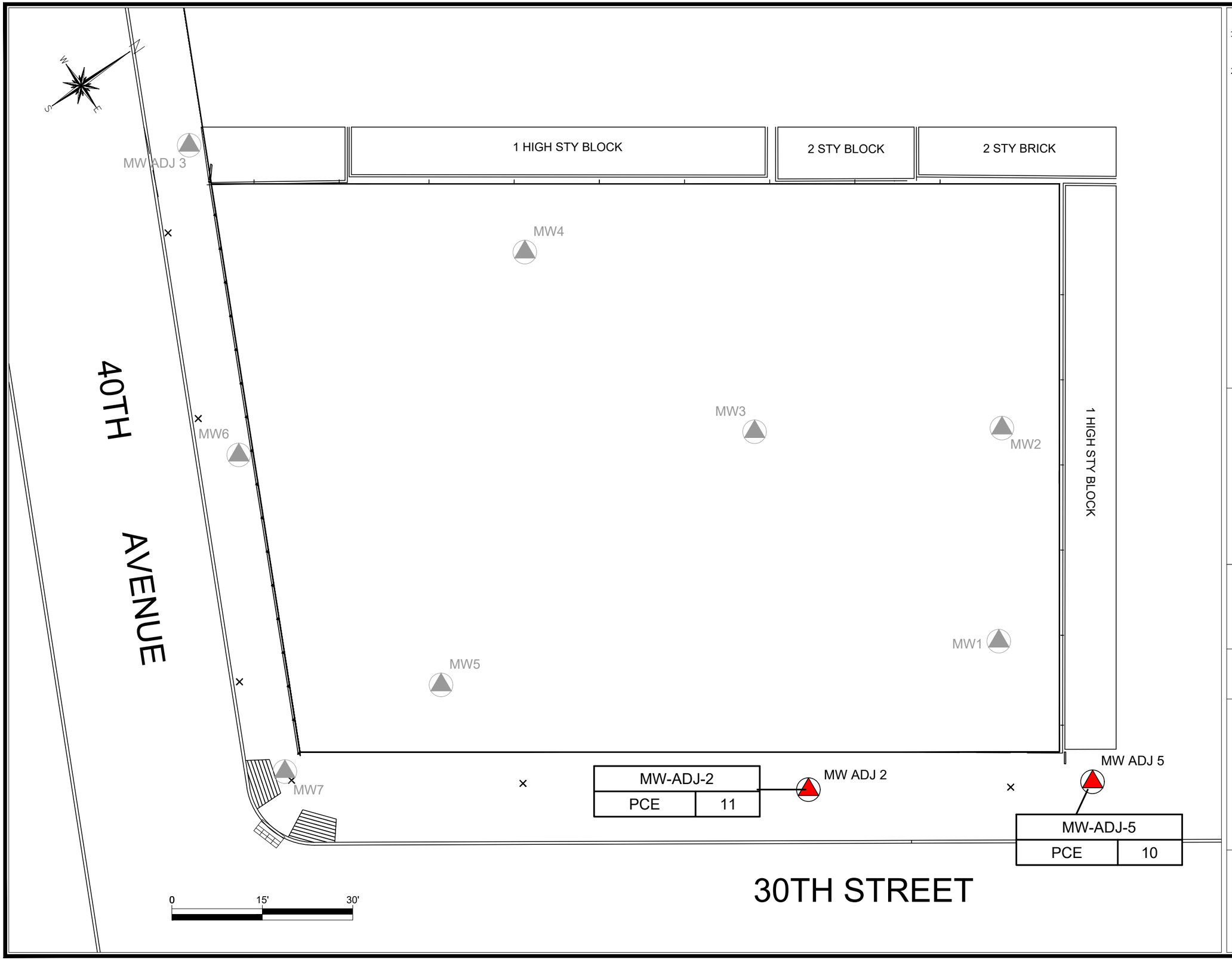
39-40 30th Street, Queens, NY

SHEET NO. 003

PROJECT NO.	12930
DESIGNED BY:	RD
DRAWN BY:	AB
CHECKED BY:	KK
DATE:	9/15/2021
SCALE:	NTS
REVISIONS	
NO:	DATE:

IMPACT ENVIRONMENTAL
170 KEYLAND COURT
BOHEMIA, NEW YORK 11716
TEL (631) 269-8800 FAX (631) 269-1599

1000 PAGE AVENUE
LYNDHURST, NEW JERSEY 07071



NOTES:

1. BASE LAYOUT TAKEN FROM "SUPPORT OF EXCAVATION PLAN," NUMBER SOE-101.00 BY STRUCTURAL ENGINEERING TECHNOLOGIES, DATED 08/12/2019.
2. BORING LOCATIONS APPROXIMATE. LOCATIONS AND RESULTS TAKEN FROM "FIGURE 4 - SOIL EXCEEDANCES," BY AMC ENGINEERING PLLC, DATED 08/29/2017.

LEGEND:

- MONITORING WELL LOCATION
- ABANDONED MONITORING WELL

FIGURE 4: WELL LOCATION MAP WITH GROUNDWATER EXCEEDANCES

39-40 30th Street, Queens, NY

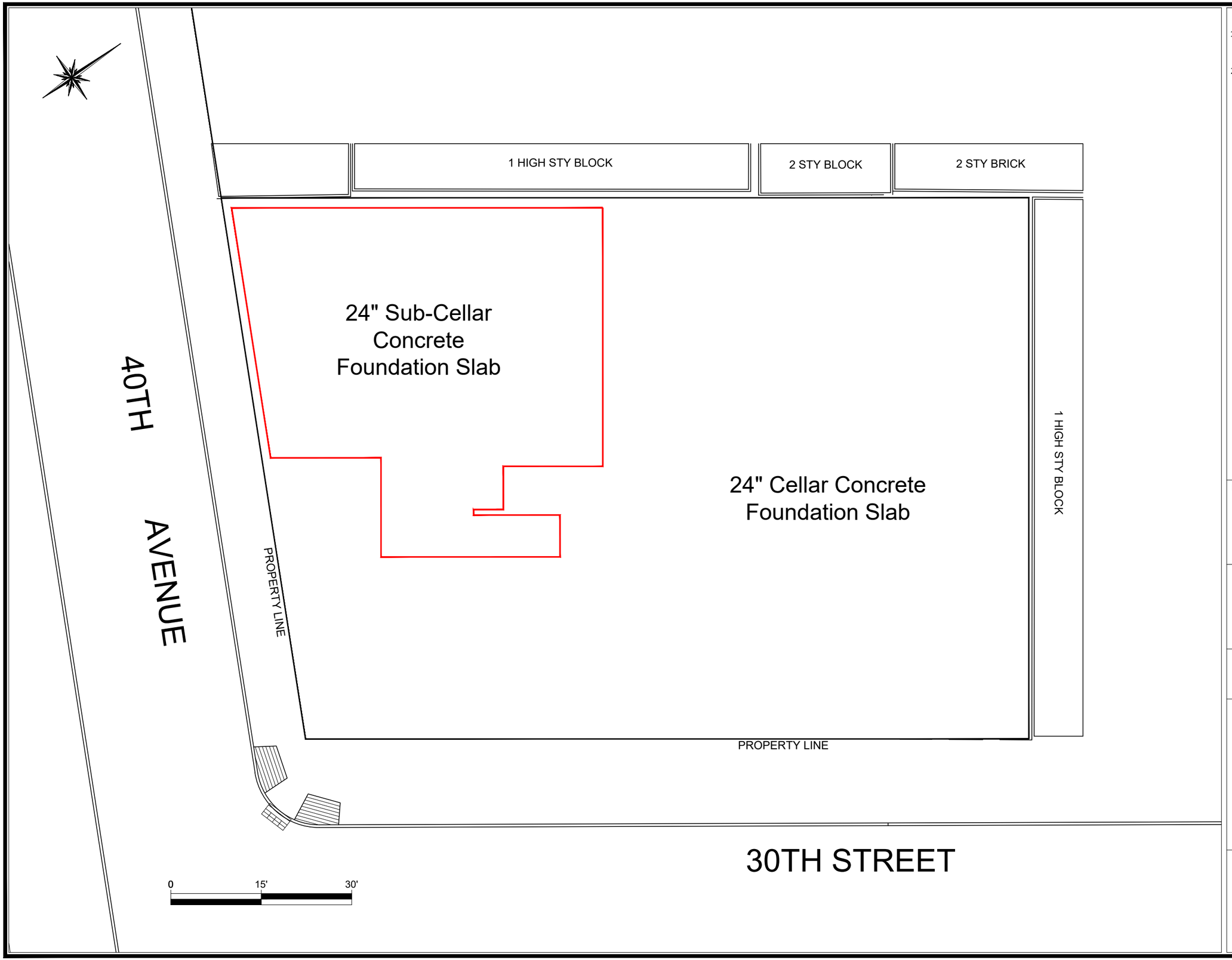
SHEET NO. 004

PROJECT NO.	12930
DESIGNED BY:	RD
DRAWN BY:	AB
CHECKED BY:	JDF
DATE:	09/15/2021
SCALE:	1"=15'

REVISIONS	
NO:	DATE:

IMPACT ENVIRONMENTAL
170 KEYLAND COURT
BOHEMIA, NEW YORK 11716
TEL (631) 269-8800 FAX (631) 269-1599

1000 PAGE AVENUE
LYNDHURST, NEW JERSEY 07071



NOTES:

1. BASE LAYOUT TAKEN FROM "SUPPORT OF EXCAVATION PLAN," NUMBER SOE-101.00 BY STRUCTURAL ENGINEERING TECHNOLOGIES, DATED 08/12/2019.
2. REFER TO FIGURE 9 FOR COMPOSITE COVER CROSS SECTION.

LEGEND:

FIGURE 5:
SITE COVER PLAN

39-40 30th Street
Queens, NY

SHEET NO.
005

PROJECT NO.	12930
DESIGNED BY:	RD
DRAWN BY:	RD
CHECKED BY:	XY
DATE:	09/15/2021
SCALE:	1"=15'

REVISIONS	
NO:	DATE:
1	11/23/2021

STATE OF NEW YORK
XIN YUAN
096444
LICENSED PROFESSIONAL ENGINEER

IMPACT ENVIRONMENTAL
170 KEYLAND COURT
BOHEMIA, NEW YORK 11716
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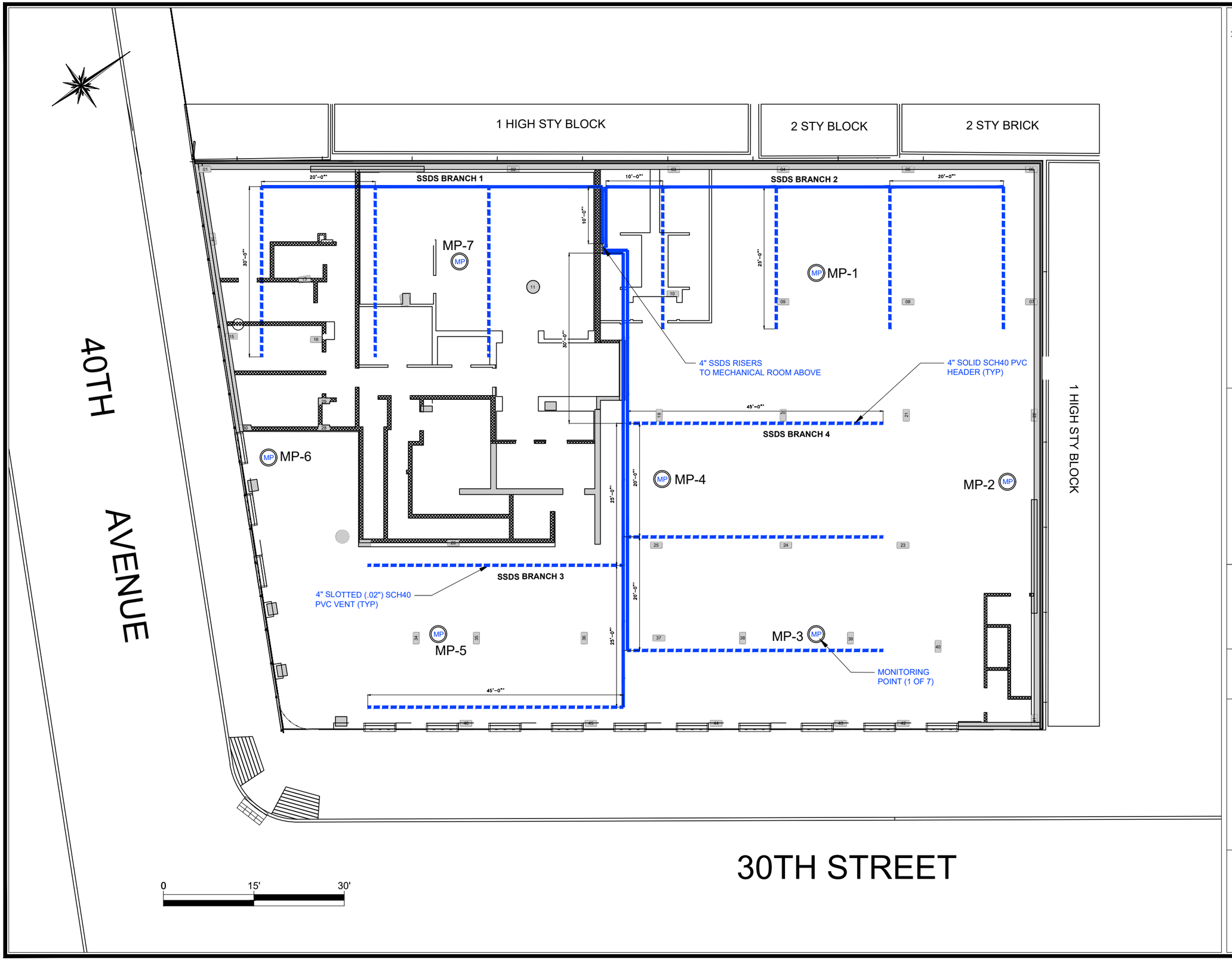

NOTES:

1. BASE LAYOUT TAKEN FROM "SUPPORT OF EXCAVATION PLAN," NUMBER SOE-101.00 BY STRUCTURAL ENGINEERING TECHNOLOGIES, DATED 08/12/2019.

LEGEND:

MP — SSDS MONITORING POINT LOCATION

FIGURE 6: SSDS LAYOUT AND MONIOTRING POINT LOCATIONS

39-40 30th Street, Queens, NY

SHEET NO. 006

PROJECT NO.	12930
DESIGNED BY:	RD
DRAWN BY:	AB
CHECKED BY:	XY
DATE:	11/23/2021
SCALE:	1"=15'

REVISIONS	
NO:	DATE:
1	11/23/2021

STATE OF NEW YORK · XIN YUAN · 096444 · LICENSED PROFESSIONAL ENGINEER

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BOHEMIA, NEW YORK 11716
TEL (631) 269-8800 FAX (631) 269-1599

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LYNDHURST, NEW JERSEY 07071

APPENDICIES

Former Union Wire Die Corp.
39-40 30th Street, Queens, New York
BCP: C241163

APPENDIX A
METES AND BOULDS LEGAL DESCRIPTION
AND ENVIRONMENTAL EASEMENT

Former Union Wire Die Corp.
39-40 30th Street, Queens, New York
BCP: C241163

According to the July 26, 1996 deed, the lot is defined as follows:

ALL that certain plot, piece or parcel of land, situate, lying and being in the First Ward, Borough and County of Queens, City and State of New York, bounded and described as follows:

BEGINNING at the comer formed by the intersection of the northerly side of 40th Avenue with the westerly side of 30th Street, as said Avenue and Street are laid out on the Final Topographical Map of the City of New York for the Borough of Queens;

RUNNING THENCE northerly along the westerly side of 30th Street, 133.72 feet;
THENCE westerly at right angles to the westerly side of 30th Street, 100.1 0 feet;

THENCE southerly and parallel with the westerly side of 30th Street, 149.31 feet to the northerly side of 40111 Street;

THENCE easterly along the northerly side of 40th Avenue, 101.31 feet to the comer, the point or place of BEGINNING.

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.

2017050400030001001E997A

RECORDING AND ENDORSEMENT COVER PAGE **PAGE 1 OF 11**

Document ID: 2017050400030001 Document Date: 04-18-2017 Preparation Date: 05-04-2017
Document Type: SUNDRY MISCELLANEOUS
Document Page Count: 9

PRESENTER:
FRONTIER RECORDINGS
69 CASCADE DRIVE
SUITE 101
ROCHESTER, NY 14614
585-955-6111
RECORDINGS@FRONTIERABSTRACT.COM

RETURN TO:
FRONTIER RECORDINGS
69 CASCADE DRIVE
SUITE 101
ROCHESTER, NY 14614
585-955-6111
RECORDINGS@FRONTIERABSTRACT.COM

PROPERTY DATA

Borough	Block	Lot	Unit	Address
QUEENS	399	34	Entire Lot	39-40 30TH STREET

Property Type: OTHER

CROSS REFERENCE DATA

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

PARTIES

PARTY 1:
GANESH MANAGEMENT, LLC
39-40 30TH STREET
LONG ISLAND, NY 11101

☒ Additional Parties Listed on Continuation Page

PARTY 2:
THE PEOPLE OF THE STATE OF NEW YORK, ACTING
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:	$	100.00
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 05-04-2017 14:35
City Register File No.(CRFN): **2017000171134**

City Register Official Signature

NYC DEPARTMENT OF FINANCE
OFFICE OF THE CITY REGISTER

2017050400030001001C9BFA

RECORDING AND ENDORSEMENT COVER PAGE (CONTINUATION) **PAGE 2 OF 11**

Document ID: 2017050400030001 Document Date: 04-18-2017 Preparation Date: 05-04-2017
Document Type: SUNDRY MISCELLANEOUS

PARTIES

PARTY 2:
THROUGH THEIR COMMISSIONER OF THE
DEPARTMENT OF
625 BROADWAY
ALBANY, NY 12233

PARTY 2:
ENVIRONMENTAL CONSERVATION
625 BROADWAY
ALBANY, NY 12233

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

THIS INDENTURE made this 18th day of April, 2017, between Owner(s) Ganesh Management, LLC, having an office at 26 Broadway, Suite 764, New York, New York 10004, County of New York, State of New York (the "Grantor"), and The People of the State of New York (the "Grantee."), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

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

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

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

WHEREAS, Grantor, is the owner of real property located at the address of 39-40 30th Street in the City of New York, County of Queens 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 399 Lot 34, being the same as that property conveyed to Grantor by deed dated February 24, 2002 and recorded in the City Register of the City of New York as CRFN # 2003000154906. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately 0.325 +/- acres, and is hereinafter more fully described in the Land Title Survey dated April 15, 2015 and last revised October 11, 2016 prepared by Thomas A. Fetterman, L.L.S. of Tectonic Engineering & Surveying Consultants P.C., 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: C241163-06-14, Grantor conveys to Grantee a permanent Environmental Easement pursuant to ECL Article 71, Title 36 in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement")

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(i) are in-place;

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

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

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

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

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

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

(7) the information presented is accurate and complete.

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

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

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

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

5. Enforcement

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

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

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

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

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

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

Parties shall address correspondence to:

Site Number: C241163
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.

Ganesh Management, LLC:

By: _____

Print Name: ANJALI GOPALANI

Title: MEMBER Date: 04/05/17

Grantor's Acknowledgment

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

On the 5th day of Apr. 1, in the year 2017, before me, the undersigned, personally appeared Anjali Gopalani, 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

KARNDEEP BHINDER
Notary Public - State of New York
No. 01BH6288673
Qualified in Suffolk County
My Commission Expires September 09, 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 18th day of April, in the year 2017, 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, situate, lying and being in the First Ward, Borough and County of Queens, City and State of New York, bounded and described as follows:

BEGINNING at the corner formed by the intersection of the northerly side of 40th Avenue with the westerly side of 30th Street, as said Avenue and Street are laid out on the Final Topographical Map of the City of New York for the Borough of Queens;

RUNNING THENCE northerly along the westerly side of 30th Street, 133.72 feet;

THENCE westerly at right angles to the westerly side of 30th Street, 100.10 feet;

THENCE southerly and parallel with the westerly side of 30th Street, 149.31 feet to the northerly side of 40th Street;

THENCE easterly along the northerly side of 40th Avenue, 101.31 feet to the corner, the point or place of BEGINNING.

Being approximately 0.325 acres more or less.

APPENDIX B
LIST OF SITE CONTACTS

Former Union Wire Die Corp.
39-40 30th Street, Queens, New York
BCP: C241163

LIST OF SITE CONTACTS

Below is a listing of all site contacts necessary for implementation of the SMP.

Name	Phone/Email Address
Roni Benjamini, Site Owner Joe Stern, Site Owner	RMB@1oakGC.com js@sbdevelopmentgroup.com 845-729-5428
LIC Owner, LLC Remedial Party	RMB@1oakGC.com 845-729-5428
Kevin Kleaka, Project Director/ QEP Xin Yuan, P.E.]	kkleaka@impactenvironmental.com xyuan@impactenvironmental.com 631-269-8800
Ruth Curly, Environmental Engineer NYSDEC DER Project Manager	ruth.curley@dec.ny.gov 518-402-9767
Gerald Burke, NYSDEC, Remediation Bureau Chief	gerald.burke@dec.ny.gov 518-402-9817
Eamonn O'Neil NYSDOH Project Manager	eamonn.oneil@doh.ny.gov 518-402-7860
Steve Russo Remedial Party Attorney	russos@gtlaw.com 212-801-2155

APPENDIX C
EXCAVATION WORK PLAN

Former Union Wire Die Corp.
39-40 30th Street, Queens, New York
BCP: C241163

EXCAVATION WORK PLAN

39-40 30TH STREET
QUEENS, NEW YORK

AUGUST 2017

EXCAVATION WORK PLAN (EWP)

E-1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the site owner or their representative will notify the 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 1: Notifications*

Name	Title, Organization	Contact Information
Ruth Curley	NYSDEC, Environmental Engineer	ruth.curley@dec.ny.gov; 518-402-9767
Michael J. Komoroske, P.E.	NYSDEC, Remediation Bureau Chief	michael.komoroske@dec.ny.gov; 518-402-9802
Kelly Lewandowski	NYSDEC, Site Control, Chief	518-402-9581, kelly.lewandowski@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.

E-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.

E-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.

E-4 MATERIALS EXCAVATION AND LOAD-OUT

A qualified environmental professional or person under their supervision will oversee all

invasive work and the excavation and load-out of all excavated material.
The owner of the property and 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.

E-5 MATERIALS TRANSPORT OFF-SITE

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

Material transported by trucks exiting the site will be secured with 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.

The soil disposal transport route will be as follows: ENTERING SITE - from the Long Island Expressway take the Borden Avenue Street exit (Exit 13) and head west on Borden Avenue to Jackson Avenue. Turn right, heading northeast on Jackson Avenue to Northern Boulevard (25A). Turn left heading west on 40th Avenue 5 blocks and the Site entrance on the right. EXITING SITE – Turn right out of Site entrance and continue west on 40th Street to 29th Street to 39th Avenue and turn right. Continue on 39th Avenue to Northern Boulevard and turn left. Continue on Northern Boulevard to Jackson Avenue. Turn left on 21st Street and follow signs onto the Long Island 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.

E-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).

E-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 representative locations in the fill.
50-100	2	1	
100-200	3	1	
200-300	4	1	
300-400	4	2	
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.

E-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.

E-9 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with the decision document. The existing cover system is comprised of the building structure and pavement areas. If the type of cover system changes from that which exists prior to the excavation, this will constitute a modification of the cover element of the remedy and the upper surface of the remaining contamination. A figure showing the modified surface will be included in the subsequent Periodic Review Report and in an updated SMP.

E-10 BACKFILL FROM OFF-SITE SOURCES

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

E-11 STORMWATER POLLUTION PREVENTION

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

E-12 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.

E-13 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.

APPENDIX D
GROUNDWATER LABORATORY REPORT

Former Union Wire Die Corp.
39-40 30th Street, Queens, New York
BCP: C241163

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

July 28, 2021

FOR: Attn: Juliana de la Fuente
Impact Closures
170 Keyland Court
Bohemia NY 11716

Sample Information		Custody Information		Date	Time
Matrix:	GROUND WATER	Collected by:		07/27/21	10:30
Location Code:	IMPACT-ICL	Received by:	B	07/27/21	17:38
Rush Request:	72 Hour	Analyzed by:	see "By" below		
P.O.#:	12930				

Laboratory Data

SDG ID: GCI83064
Phoenix ID: CI83064

Project ID: 39-40 30TH ST
Client ID: MW-ADJ-5

Parameter	Result	RL/ PQL	LOD/ MDL	Units	Dilution	Date/Time	By	Reference
1,4-dioxane								
1,4-dioxane	ND	100	50	ug/l	1	07/28/21	MH	SW8260C
Volatiles								
1,1,1-Trichloroethane	ND	2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,1,2,2-Tetrachloroethane	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,1,2-Trichloroethane	ND	2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,1-Dichloroethane	ND	2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,1-Dichloroethene	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,2,3-Trichlorobenzene	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,2,4-Trichlorobenzene	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,2-Dibromo-3-chloropropane	ND	1.0	0.50	ug/L	1	07/28/21	MH	SW8260C
1,2-Dibromoethane	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,2-Dichlorobenzene	ND	2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,2-Dichloroethane	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,2-Dichloropropane	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,3-Dichlorobenzene	ND	2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,4-Dichlorobenzene	ND	2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
2-Hexanone	ND	2.5	2.5	ug/L	1	07/28/21	MH	SW8260C
4-Methyl-2-pentanone	ND	2.5	2.5	ug/L	1	07/28/21	MH	SW8260C
Acetone	ND	5.0	2.5	ug/L	1	07/28/21	MH	SW8260C
Benzene	ND	0.70	0.25	ug/L	1	07/28/21	MH	SW8260C
Bromochloromethane	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Bromodichloromethane	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Bromoform	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Bromomethane	ND	2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Carbon Disulfide	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C

Project ID: 39-40 30TH ST
Client ID: MW-ADJ-5

Phoenix I.D.: CI83064

Parameter	Result		RL/ PQL	LOD/ MDL	Units	Dilution	Date/Time	By	Reference
Carbon tetrachloride	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Chlorobenzene	ND		2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Chloroethane	ND		2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Chloroform	0.81	J	2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Chloromethane	ND		2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
cis-1,2-Dichloroethene	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
cis-1,3-Dichloropropene	ND		0.40	0.25	ug/L	1	07/28/21	MH	SW8260C
Cyclohexane	ND		5.0	0.50	ug/L	1	07/28/21	MH	SW8260C
Dibromochloromethane	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Dichlorodifluoromethane	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Ethylbenzene	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Isopropylbenzene	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
m&p-Xylene	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Methyl ethyl ketone	ND		5.0	2.5	ug/L	1	07/28/21	MH	SW8260C
Methyl t-butyl ether (MTBE)	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Methylacetate	ND		2.5	2.5	ug/L	1	07/28/21	MH	SW8260C
Methylcyclohexane	ND		2.0	0.50	ug/L	1	07/28/21	MH	SW8260C
Methylene chloride	ND		3.0	1.0	ug/L	1	07/28/21	MH	SW8260C
o-Xylene	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Styrene	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Tetrachloroethene	10		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Toluene	ND		2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Total Xylenes	ND		1.0	1.0	ug/L	1	07/28/21	MH	SW8260C
trans-1,2-Dichloroethene	ND		2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
trans-1,3-Dichloropropene	ND		0.40	0.25	ug/L	1	07/28/21	MH	SW8260C
Trichloroethene	0.27	J	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Trichlorofluoromethane	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Trichlorotrifluoroethane	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Vinyl chloride	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
QA/QC Surrogates									
% 1,2-dichlorobenzene-d4	94				%	1	07/28/21	MH	70 - 130 %
% Bromofluorobenzene	100				%	1	07/28/21	MH	70 - 130 %
% Dibromofluoromethane	100				%	1	07/28/21	MH	70 - 130 %
% Toluene-d8	95				%	1	07/28/21	MH	70 - 130 %
Volatile Library Search Top 10	Completed						07/28/21	MH	

Parameter	Result	RL/ PQL	LOD/ MDL	Units	Dilution	Date/Time	By	Reference

RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected BRL=Below Reporting Level L=Biased Low 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:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
July 28, 2021
Official Report Release To Follow

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

July 28, 2021

FOR: Attn: Juliana de la Fuente
Impact Closures
170 Keyland Court
Bohemia NY 11716

Sample Information		Custody Information		Date	Time
Matrix:	GROUND WATER	Collected by:		07/27/21	11:15
Location Code:	IMPACT-ICL	Received by:	B	07/27/21	17:38
Rush Request:	72 Hour	Analyzed by:	see "By" below		
P.O.#:	12930				

Laboratory Data

SDG ID: GCI83064
Phoenix ID: CI83065

Project ID: 39-40 30TH ST
Client ID: MW-ADJ-2

Parameter	Result	RL/ PQL	LOD/ MDL	Units	Dilution	Date/Time	By	Reference
1,4-dioxane								
1,4-dioxane	ND	100	50	ug/l	1	07/28/21	MH	SW8260C
Volatiles								
1,1,1-Trichloroethane	ND	2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,1,2,2-Tetrachloroethane	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,1,2-Trichloroethane	ND	2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,1-Dichloroethane	ND	2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,1-Dichloroethene	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,2,3-Trichlorobenzene	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,2,4-Trichlorobenzene	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,2-Dibromo-3-chloropropane	ND	1.0	0.50	ug/L	1	07/28/21	MH	SW8260C
1,2-Dibromoethane	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,2-Dichlorobenzene	ND	2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,2-Dichloroethane	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,2-Dichloropropane	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,3-Dichlorobenzene	ND	2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,4-Dichlorobenzene	ND	2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
2-Hexanone	ND	2.5	2.5	ug/L	1	07/28/21	MH	SW8260C
4-Methyl-2-pentanone	ND	2.5	2.5	ug/L	1	07/28/21	MH	SW8260C
Acetone	ND	5.0	2.5	ug/L	1	07/28/21	MH	SW8260C
Benzene	ND	0.70	0.25	ug/L	1	07/28/21	MH	SW8260C
Bromochloromethane	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Bromodichloromethane	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Bromoform	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Bromomethane	ND	2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Carbon Disulfide	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C

Project ID: 39-40 30TH ST
Client ID: MW-ADJ-2

Phoenix I.D.: CI83065

Parameter	Result		RL/ PQL	LOD/ MDL	Units	Dilution	Date/Time	By	Reference
Carbon tetrachloride	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Chlorobenzene	ND		2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Chloroethane	ND		2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Chloroform	0.49	J	2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Chloromethane	ND		2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
cis-1,2-Dichloroethene	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
cis-1,3-Dichloropropene	ND		0.40	0.25	ug/L	1	07/28/21	MH	SW8260C
Cyclohexane	ND		5.0	0.50	ug/L	1	07/28/21	MH	SW8260C
Dibromochloromethane	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Dichlorodifluoromethane	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Ethylbenzene	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Isopropylbenzene	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
m&p-Xylene	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Methyl ethyl ketone	ND		5.0	2.5	ug/L	1	07/28/21	MH	SW8260C
Methyl t-butyl ether (MTBE)	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Methylacetate	ND		2.5	2.5	ug/L	1	07/28/21	MH	SW8260C
Methylcyclohexane	ND		2.0	0.50	ug/L	1	07/28/21	MH	SW8260C
Methylene chloride	ND		3.0	1.0	ug/L	1	07/28/21	MH	SW8260C
o-Xylene	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Styrene	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Tetrachloroethene	11		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Toluene	ND		2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Total Xylenes	ND		1.0	1.0	ug/L	1	07/28/21	MH	SW8260C
trans-1,2-Dichloroethene	ND		2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
trans-1,3-Dichloropropene	ND		0.40	0.25	ug/L	1	07/28/21	MH	SW8260C
Trichloroethene	0.39	J	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Trichlorofluoromethane	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Trichlorotrifluoroethane	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Vinyl chloride	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
QA/QC Surrogates									
% 1,2-dichlorobenzene-d4	95				%	1	07/28/21	MH	70 - 130 %
% Bromofluorobenzene	99				%	1	07/28/21	MH	70 - 130 %
% Dibromofluoromethane	107				%	1	07/28/21	MH	70 - 130 %
% Toluene-d8	97				%	1	07/28/21	MH	70 - 130 %
Volatile Library Search Top 10	Completed						07/28/21	MH	

Parameter	Result	RL/ PQL	LOD/ MDL	Units	Dilution	Date/Time	By	Reference

RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected BRL=Below Reporting Level L=Biased Low 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.

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Analysis Report

July 28, 2021

FOR: Attn: Juliana de la Fuente
Impact Closures
170 Keyland Court
Bohemia NY 11716

Sample Information		Custody Information		Date	Time
Matrix:	GROUND WATER	Collected by:		07/27/21	11:25
Location Code:	IMPACT-ICL	Received by:	B	07/27/21	17:38
Rush Request:	72 Hour	Analyzed by:	see "By" below		
P.O.#:	12930				

Laboratory Data

SDG ID: GCI83064
Phoenix ID: CI83066

Project ID: 39-40 30TH ST
Client ID: DUPLICATE

Parameter	Result	RL/ PQL	LOD/ MDL	Units	Dilution	Date/Time	By	Reference
1,4-dioxane								
1,4-dioxane	ND	100	50	ug/l	1	07/28/21	MH	SW8260C
Volatiles								
1,1,1-Trichloroethane	ND	2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,1,2,2-Tetrachloroethane	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,1,2-Trichloroethane	ND	2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,1-Dichloroethane	ND	2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,1-Dichloroethene	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,2,3-Trichlorobenzene	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,2,4-Trichlorobenzene	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,2-Dibromo-3-chloropropane	ND	1.0	0.50	ug/L	1	07/28/21	MH	SW8260C
1,2-Dibromoethane	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,2-Dichlorobenzene	ND	2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,2-Dichloroethane	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,2-Dichloropropane	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,3-Dichlorobenzene	ND	2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
1,4-Dichlorobenzene	ND	2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
2-Hexanone	ND	2.5	2.5	ug/L	1	07/28/21	MH	SW8260C
4-Methyl-2-pentanone	ND	2.5	2.5	ug/L	1	07/28/21	MH	SW8260C
Acetone	ND	5.0	2.5	ug/L	1	07/28/21	MH	SW8260C
Benzene	ND	0.70	0.25	ug/L	1	07/28/21	MH	SW8260C
Bromochloromethane	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Bromodichloromethane	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Bromoform	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Bromomethane	ND	2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Carbon Disulfide	ND	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C

Project ID: 39-40 30TH ST
Client ID: DUPLICATE

Phoenix I.D.: CI83066

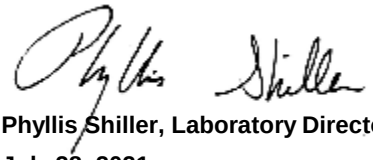
Parameter	Result		RL/ PQL	LOD/ MDL	Units	Dilution	Date/Time	By	Reference
Carbon tetrachloride	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Chlorobenzene	ND		2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Chloroethane	ND		2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Chloroform	0.47	J	2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Chloromethane	ND		2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
cis-1,2-Dichloroethene	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
cis-1,3-Dichloropropene	ND		0.40	0.25	ug/L	1	07/28/21	MH	SW8260C
Cyclohexane	ND		5.0	0.50	ug/L	1	07/28/21	MH	SW8260C
Dibromochloromethane	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Dichlorodifluoromethane	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Ethylbenzene	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Isopropylbenzene	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
m&p-Xylene	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Methyl ethyl ketone	ND		5.0	2.5	ug/L	1	07/28/21	MH	SW8260C
Methyl t-butyl ether (MTBE)	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Methylacetate	ND		2.5	2.5	ug/L	1	07/28/21	MH	SW8260C
Methylcyclohexane	ND		2.0	0.50	ug/L	1	07/28/21	MH	SW8260C
Methylene chloride	ND		3.0	1.0	ug/L	1	07/28/21	MH	SW8260C
o-Xylene	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Styrene	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Tetrachloroethene	11		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Toluene	ND		2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Total Xylenes	ND		1.0	1.0	ug/L	1	07/28/21	MH	SW8260C
trans-1,2-Dichloroethene	ND		2.0	0.25	ug/L	1	07/28/21	MH	SW8260C
trans-1,3-Dichloropropene	ND		0.40	0.25	ug/L	1	07/28/21	MH	SW8260C
Trichloroethene	0.38	J	1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Trichlorofluoromethane	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Trichlorotrifluoroethane	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
Vinyl chloride	ND		1.0	0.25	ug/L	1	07/28/21	MH	SW8260C
QA/QC Surrogates									
% 1,2-dichlorobenzene-d4	93				%	1	07/28/21	MH	70 - 130 %
% Bromofluorobenzene	100				%	1	07/28/21	MH	70 - 130 %
% Dibromofluoromethane	106				%	1	07/28/21	MH	70 - 130 %
% Toluene-d8	98				%	1	07/28/21	MH	70 - 130 %
Volatile Library Search Top 10	Completed						07/28/21	MH	

Parameter	Result	RL/ PQL	LOD/ MDL	Units	Dilution	Date/Time	By	Reference

RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected BRL=Below Reporting Level L=Biased Low 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:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director
July 28, 2021
Official Report Release To Follow

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

July 28, 2021

FOR: Attn: Juliana de la Fuente
Impact Closures
170 Keyland Court
Bohemia NY 11716

Sample Information		Custody Information		Date	Time
Matrix:	GROUND WATER	Collected by:		07/27/21	
Location Code:	IMPACT-ICL	Received by:	B	07/27/21	17:38
Rush Request:	72 Hour	Analyzed by:	see "By" below		
P.O.#:	12930				

Laboratory Data

SDG ID: GCI83064
Phoenix ID: CI83067

Project ID: 39-40 30TH ST
Client ID: TRIP BLANK

Parameter	Result	RL/ PQL	LOD/ MDL	Units	Dilution	Date/Time	By	Reference
1,4-dioxane								
1,4-dioxane	ND	100	50	ug/l	1	07/27/21	MH	SW8260C
Volatiles								
1,1,1-Trichloroethane	ND	2.0	0.25	ug/L	1	07/27/21	MH	SW8260C
1,1,2,2-Tetrachloroethane	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C
1,1,2-Trichloroethane	ND	2.0	0.25	ug/L	1	07/27/21	MH	SW8260C
1,1-Dichloroethane	ND	2.0	0.25	ug/L	1	07/27/21	MH	SW8260C
1,1-Dichloroethene	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C
1,2,3-Trichlorobenzene	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C
1,2,4-Trichlorobenzene	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C
1,2-Dibromo-3-chloropropane	ND	1.0	0.50	ug/L	1	07/27/21	MH	SW8260C
1,2-Dibromoethane	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C
1,2-Dichlorobenzene	ND	2.0	0.25	ug/L	1	07/27/21	MH	SW8260C
1,2-Dichloroethane	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C
1,2-Dichloropropane	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C
1,3-Dichlorobenzene	ND	2.0	0.25	ug/L	1	07/27/21	MH	SW8260C
1,4-Dichlorobenzene	ND	2.0	0.25	ug/L	1	07/27/21	MH	SW8260C
2-Hexanone	ND	2.5	2.5	ug/L	1	07/27/21	MH	SW8260C
4-Methyl-2-pentanone	ND	2.5	2.5	ug/L	1	07/27/21	MH	SW8260C
Acetone	ND	5.0	2.5	ug/L	1	07/27/21	MH	SW8260C
Benzene	ND	0.70	0.25	ug/L	1	07/27/21	MH	SW8260C
Bromochloromethane	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C
Bromodichloromethane	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C
Bromoform	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C
Bromomethane	ND	2.0	0.25	ug/L	1	07/27/21	MH	SW8260C
Carbon Disulfide	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C

Project ID: 39-40 30TH ST
Client ID: TRIP BLANK

Phoenix I.D.: CI83067

Parameter	Result	RL/ PQL	LOD/ MDL	Units	Dilution	Date/Time	By	Reference
Carbon tetrachloride	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C
Chlorobenzene	ND	2.0	0.25	ug/L	1	07/27/21	MH	SW8260C
Chloroethane	ND	2.0	0.25	ug/L	1	07/27/21	MH	SW8260C
Chloroform	ND	2.0	0.25	ug/L	1	07/27/21	MH	SW8260C
Chloromethane	ND	2.0	0.25	ug/L	1	07/27/21	MH	SW8260C
cis-1,2-Dichloroethene	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C
cis-1,3-Dichloropropene	ND	0.40	0.25	ug/L	1	07/27/21	MH	SW8260C
Cyclohexane	ND	5.0	0.50	ug/L	1	07/27/21	MH	SW8260C
Dibromochloromethane	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C
Dichlorodifluoromethane	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C
Ethylbenzene	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C
Isopropylbenzene	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C
m&p-Xylene	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C
Methyl ethyl ketone	ND	5.0	2.5	ug/L	1	07/27/21	MH	SW8260C
Methyl t-butyl ether (MTBE)	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C
Methylacetate	ND	2.5	2.5	ug/L	1	07/27/21	MH	SW8260C
Methylcyclohexane	ND	2.0	0.50	ug/L	1	07/27/21	MH	SW8260C
Methylene chloride	ND	3.0	1.0	ug/L	1	07/27/21	MH	SW8260C
o-Xylene	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C
Styrene	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C
Tetrachloroethene	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C
Toluene	ND	2.0	0.25	ug/L	1	07/27/21	MH	SW8260C
Total Xylenes	ND	1.0	1.0	ug/L	1	07/27/21	MH	SW8260C
trans-1,2-Dichloroethene	ND	2.0	0.25	ug/L	1	07/27/21	MH	SW8260C
trans-1,3-Dichloropropene	ND	0.40	0.25	ug/L	1	07/27/21	MH	SW8260C
Trichloroethene	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C
Trichlorofluoromethane	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C
Trichlorotrifluoroethane	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C
Vinyl chloride	ND	1.0	0.25	ug/L	1	07/27/21	MH	SW8260C
QA/QC Surrogates								
% 1,2-dichlorobenzene-d4	93			%	1	07/27/21	MH	70 - 130 %
% Bromofluorobenzene	96			%	1	07/27/21	MH	70 - 130 %
% Dibromofluoromethane	104			%	1	07/27/21	MH	70 - 130 %
% Toluene-d8	96			%	1	07/27/21	MH	70 - 130 %
Volatile Library Search Top 10	Completed					07/28/21	MH	

Project ID: 39-40 30TH ST
Client ID: TRIP BLANK

Phoenix I.D.: CI83067

Parameter	Result	RL/ PQL	LOD/ MDL	Units	Dilution	Date/Time	By	Reference

RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected BRL=Below Reporting Level L=Biased Low 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:

TRIP BLANK INCLUDED.

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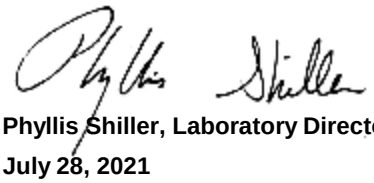

Phyllis Shiller, Laboratory Director
July 28, 2021
Official Report Release To Follow

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT ID: MW-ADJ-5

Lab Name: Phoenix Environmental Labs Client: IMPACT-ICL

Lab Code: Phoenix Case No.: SAS No.: SDG No.: GCI83064

Matrix:(soil/water) GROUND WATER Lab Sample ID: CI83064

Sample wt/vol: 25 (g/mL) mL Lab File ID: 0727_41.D

Level: (low/med) Date Received: 07/27/21

% Moisture: not dec. 100 Date Analyzed: 07/28/21

GC Column: RTX-VMS ID: 0.18(mm) Dilution Factor: 1

Purge Volume: 25000 (uL) Soil Aliquot Vol (uL): n.a.

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/KG) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

FORM I VOA-TIC

J - Used when estimating a concentration for TIC where a 1:1 response is assumed or when the result indicates the presence of a compound that meets the indentification criteria, but the results is less than the quantitation limit, but greater than zero.

N - The concentration is based on the response of the nearest internal. This flag is used on the TIC form for all compounds identified.

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT ID: MW-ADJ-2

Lab Name: Phoenix Environmental Labs Client: IMPACT-ICL

Lab Code: Phoenix Case No.: SAS No.: SDG No.: GCI83064

Matrix:(soil/water) GROUND WATER Lab Sample ID: CI83065

Sample wt/vol: 25 (g/mL) mL Lab File ID: 0727_42.D

Level: (low/med) Date Received: 07/27/21

% Moisture: not dec. 100 Date Analyzed: 07/28/21

GC Column: RTX-VMS ID: 0.18(mm) Dilution Factor: 1

Purge Volume: 25000 (uL) Soil Aliquot Vol (uL): n.a.

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/KG) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

FORM I VOA-TIC

J - Used when estimating a concentration for TIC where a 1:1 response is assumed or when the result indicates the presence of a compound that meets the indentification criteria, but the results is less than the quantitation limit, but greater than zero.

N - The concentration is based on the response of the nearest internal. This flag is used on the TIC form for all compounds identified.

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT ID: DUPLICATE

Lab Name: Phoenix Environmental Labs Client: IMPACT-ICL

Lab Code: Phoenix Case No.: SAS No.: SDG No.: GCI83064

Matrix:(soil/water) GROUND WATER Lab Sample ID: CI83066

Sample wt/vol: 25 (g/mL) mL Lab File ID: 0727_43.D

Level: (low/med) Date Received: 07/27/21

% Moisture: not dec. 100 Date Analyzed: 07/28/21

GC Column: RTX-VMS ID: 0.18(mm) Dilution Factor: 1

Purge Volume: 25000 (uL) Soil Aliquot Vol (uL): n.a.

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/KG) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

FORM I VOA-TIC

J - Used when estimating a concentration for TIC where a 1:1 response is assumed or when the result indicates the presence of a compound that meets the indentification criteria, but the results is less than the quantitation limit, but greater than zero.

N - The concentration is based on the response of the nearest internal. This flag is used on the TIC form for all compounds identified.

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT ID: CI83067 BLK

Lab Name: Phoenix Environmental Labs Client:

Lab Code: Phoenix Case No.: SAS No.: SDG No.:

Matrix:(soil/water) Water Lab Sample ID: CI83067 BLK

Sample wt/vol: 25 (g/mL) mL Lab File ID: 0727_29.D

Level: (low/med) Low Date Received: 07/27/21

% Moisture: not dec. n.a. Date Analyzed: 07/27/21

GC Column: RTX-VMS ID: 0.18(mm) Dilution Factor: 1

Purge Volume: 25000 (uL) Soil Aliquot Vol (uL): n.a.

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/KG) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

FORM I VOA-TIC

J - Used when estimating a concentration for TIC where a 1:1 response is assumed or when the result indicates the presence of a compound that meets the indentification criteria, but the results is less than the quantitation limit, but greater than zero.

N - The concentration is based on the response of the nearest internal. This flag is used on the TIC form for all compounds identified.

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT ID: TRIP BLANK

Lab Name: Phoenix Environmental Labs Client: IMPACT-ICL

Lab Code: Phoenix Case No.: SAS No.: SDG No.: GCI83064

Matrix:(soil/water) GROUND WATER Lab Sample ID: CI83067

Sample wt/vol: 25 (g/mL) mL Lab File ID: 0727_30.D

Level: (low/med) Date Received: 07/27/21

% Moisture: not dec. 100 Date Analyzed: 07/27/21

GC Column: RTX-VMS ID: 0.18(mm) Dilution Factor: 1

Purge Volume: 25000 (uL) Soil Aliquot Vol (uL): n.a.

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/KG) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

FORM I VOA-TIC

J - Used when estimating a concentration for TIC where a 1:1 response is assumed or when the result indicates the presence of a compound that meets the indentification criteria, but the results is less than the quantitation limit, but greater than zero.

N - The concentration is based on the response of the nearest internal. This flag is used on the TIC form for all compounds identified.

Sample Criteria Exceedances Report

GCI83064 - IMPACT-ICL

Criteria: NJ: IGWSS, RC; NY: 375, 375RRS; PA: CLNF,

State: NY

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

*** No Data to Display ***

Cooler: Yes [X] No [ ]
Coolant: IPK [X] ICE [ ] No [ ]
Temp 7.5 °C Pg of

PHOENIX Environmental Laboratories, Inc.

NY/NJ/PA 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

Contact Options:
[X] Phone: 631-269-8800
[ ] Fax:
[X] Email: JDELAFUENTE@IMPACTENVIRONMENTAL.COM

Customer: IMPACT ENVIRONMENTAL CLOSURES
Address: 170 KEYLAND COURT
BOHEMIA, NY

Project: 39-40 30TH ST.
Report to: JULIE DE LA FUENTE
Invoice to:
QUOTE # :

Project P.O: 12930

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature: [signature] Date: 07/27/21

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	NYSDEC TCL-VOCs (8260)	GL Amber 8 oz. w/H3PO4	Soil VOA Vials [ ] methanol [ ] H2O	GL Soil container ( ) oz	GL Soil container ( ) oz	40 ml VOA Vial [ ] As is [X] HCl	GL Amber 1000ml [ ] As is [ ] H2SO4	PL As is [ ] 250ml [ ] 500ml [ ] 1000ml	PL H2SO4 [ ] 250ml [ ] 500ml	PL NAOH 250ml	PL HNO3 250ml	Bacteria Bottle w/thio	Bacteria Bottle as is
830604	MW-ADT-5	GW	7/27/21	1030	X					3							
830605	MW-ADT-2	GW	7/27/21	1115	X					3							
830606	DUPLICATE	GW	7/27/21	1125	X					3							
830607	TRIP BLANK	TB	7/23/21		X					2							

Relinquished by:	Accepted by:	Date:	Time:
[signature]	[signature]	07/27/21	1400
		7/27	1738

Comments, Special Requirements or Regulations:
* CATEGORY B DELIVERABLES *

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

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

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

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

NY
[ ] TOGS GW
[ ] CP-51 SOIL
[ ] 375SCO Unrestricted Soil
[ ] 375SCO Residential Soil
[ ] 375SCO Residential Restricted Soil
[ ] 375SCO Commercial Soil
[ ] 375SCO Industrial Soil
[ ] Subpart 5 DW

PA
[ ] Clean Fill Limits
[ ] PA-GW
[ ] Reg Fill Limits
[ ] PA Soil Restricted
[ ] PA Soil non-restricted

State Samples Collected?
NY

APPENDIX E
COMMUNITY AIR MONITORING PLAN (CAMP)

Former Union Wire Die Corp.
39-40 30th Street, Queens, New York
BCP: C241163

COMMUNITY AIR MONITORING PLAN

39-40 30th STREET
QUEENS, NY

FEBRUARY - 2017

39-40 30th STREET, QUEENS NY

COMMUNITY AIR MONITORING PLAN
TABLE OF CONTENTS

APPENDICES

1.0 INTRODUCTION

This Community Air Monitoring Plan (CAMP) has been prepared for the excavation and building activities to be performed under a Remedial Action Work Plan (RAWP) at 39-40 30th Street, Queens NY. The CAMP provides measures for protection for the downwind community (i.e., off-site receptors including residences, businesses, and on-site workers not directly involved in the investigation activities) from potential airborne contaminant releases resulting from 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) 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 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.

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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.

CAMP
ACTION LIMIT REPORT

Project Location: _____

Date: _____ Time: _____

Name: _____

Contaminant: _____ PM-10: _____ VOC: _____

Wind Speed: _____ Wind Direction: _____

Temperature: _____ Barometric Pressure: _____

DOWNWIND DATA

Monitor ID #: _____ Location: _____ Level Reported: _____

Monitor ID#: _____ Location: _____ Level Reported: _____

UPWIND DATA

Monitor ID #: _____ Location: _____ Level Reported: _____

Monitor ID#: _____ Location: _____ Level Reported: _____

BACKGROUND CORRECTED LEVELS

Monitor ID #: Location: _____ Level Reported: Level Reported: _____

ACTIONS TAKEN

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

APPENDIX F
HEALTH AND SAFETY PLAN (HASP)

Former Union Wire Die Corp.
39-40 30th Street, Queens, New York
BCP: C241163

39-40 30th Street

QUEENS, NEW YORK
Block 399, Lot 34

CONSTRUCTION HEALTH AND SAFETY PLAN

February 2017

Prepared By:

EBC
ENVIRONMENTAL BUSINESS
1808 Middle Country Road
Ridge, NY 11961

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39-40 30th Street, Queens, New York

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39-40 30TH Street, Queens, New York

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STATEMENT OF COMMITMENT

This Health and Safety Plan (HASP) has been prepared to ensure that workers are not exposed to risks from hazardous materials during the Remedial Action at 39-40 30th Street, Queens, New York.

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

1.0 INTRODUCTION AND SITE ENTRY REQUIREMENTS

This document describes the health and safety guidelines developed by Environmental Business Consultants (EBC) for the planned Remedial Action at 39-40 30th Street, Queens, New York 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 Ganesh Management LLC and/or a regulatory agency upon receipt of new information regarding site conditions. Changes will be documented by written amendments signed by EBC's project manager, site safety officer and/or the EBC health and safety consultant.

1.1 Training Requirements

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

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

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

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

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

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

1.2 Medical Monitoring Requirements

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

1.3 Site Safety Plan Acceptance, Acknowledgment and Amendments

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

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

1.4 Key Personnel - Roles and Responsibilities

Personnel responsible for implementing this Health and Safety Plan are:

Name	Title	Address	Contact Numbers
Ms. Chawinie Miller	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 street address of the subject site is 39-40 30th Street, Queens, New York. The subject site is identified as Block 399, Lot 34 on the Borough of Queens Tax Map. The lot is located in the City of New York and Borough of Queens (Queens County). The lot consists of 133 feet of street frontage on 30th Street and 100 feet of street frontage on 40th Avenue for a for a total of 14,000 square feet (0.32 acres). The Site is currently developed with a two-story commercial warehouse which covers approximately 70 percent of the Lot.

The building is currently vacant but was most recently occupied by a warehouse. Prior to occupancy by the warehouse the site had multiple commercial tenants such as, gas station, Optical Products Corporation, Union Wire Die Corp, and National Tea Packaging Co. Inc.

The elevation of the property is approximately 28 feet above the National Geodetic Vertical Datum (NGVD). The area topography is relatively flat and consistent. The depth to groundwater beneath the site, as determined by field measurements, is approximately 20 feet below grade. Based on regional and local groundwater contour maps groundwater flow is expected to be west toward the East River approximately 0.84 miles from the Site.

2.1 Previous Investigations

2.1.1 Phase I Environmental Site Assessment Report (Galli September 2013)

A Phase I was competed by Galli Engineering, P.C. (Galli) in September, 2013. A history dating back to 1887 was established. According to a review of Sanborn maps, as well as personal interviews, the Site was undeveloped from 1887 to sometime between 1915 and 1936. By 1936, a gas station with two gasoline tanks occupied the site. The property was redeveloped by 1947 into a 2-story warehouse utilized by Optical Products Corporation for manufacturing, shipping, and as an office. The building has remained since, with several other occupants including Union Wire Die Corp (1960s-1980s), National Tea Packaging Co. Inc. (1962-1991), and a warehouse (1991-2006).

Based upon the Phase I Investigation, Galli listed the following "site environmental conditions":

- The subject property currently contains one warehouse used as an office space and distribution center for electronic goods.
- The property is an E Designation site for hazardous materials, requiring Phase I and Phase II Testing Protocol.
- The subject property was previously used as a gas station and automotive repair shop; an optical product manufacturing facility; a tea packaging facility; and a jewelry manufacturing facility.
- Expected chemicals previously used on the subject property include: petroleum, motor oil, nitrogen and sulfur oxides, TCA, arsenic, ammonia, ammonium chloride, sulfates, cyanide stripping solutions, silica and metallic fine posers, acid and alkaline cleaning solutions, CFCs, HCFCs, cadmium, and chlorinated solvents.

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- The property has an active violation in place from the Department of Buildings pertaining to an elevator (Violation Number 9027/416426).

- The property had a boiler removed in 2003. The property is currently serviced with natural gas.

- Asbestos containing materials (ACMs) in roofing and floor tiles, and lead based paint may exist on the subject property.

- No mold or water damage was observed during the site inspection.

- No storage of hazardous materials, distressed vegetation or other adverse environmental conditions were observed on the subject property at the time of inspection.

2.1.2 Remedial Investigation, (EBC December 9, 2013 through December 26, 2014)

The field work portion of the RI was conducted by EBC during several mobilizations to the site: the initial RI mobilization in December 2013 and a supplemental mobilization concluding on December 15, 2014, December 17, 2014 and December 26, 2014. A third mobilization was conducted on August 5, 2015. A fourth mobilization was performed on October 29, 2015 and a fifth mobilization was conducted on November 24, 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 sampling and analysis for volatile and semi-volatile organic compounds (VOCs, SVOCs) in soil samples from soil boring locations;
- The installation of groundwater monitoring wells;
- The collection and analysis of groundwater samples for volatile and semi-volatile organic compounds;
- Sampling for non-petroleum contaminants such as pesticides, PCBs and metals in soil and groundwater including the analysis of soil and groundwater samples
- The collection of analysis of subslab soil gas samples for VOCs.

The results of sampling performed during this RI, identified CVOCs in shallow soil and soil gas which are likely related to an on-site release, which could have included minor surface spills from the storage of spent or new TCE solvent. The timing and scenario of the release(s) are unknown.

Based upon the concentration distribution of TCE, the spill(s) likely occurred along the south and eastern portions of the building. CVOC contamination consisting of mainly TCE is present in shallow soil extending to depths of 6 to 10 feet below grade. Chlorinated VOCs including TCE and PCE were detected throughout the Site above NYSDEC groundwater standards.

Both TCE and PCE were reported in soil gas above mitigation levels established within the State

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DOH soil vapor guidance matrix.

PCE in groundwater was reported in all of the locations greater than the TCE concentrations suggesting that the TCE is related to dechlorinization of PCE and not a TCE release. Additionally the highest concentrations of PCE and TCE were reported in an upgradient location which is adjacent to and downgradient of the property to the north. This property is known as the Former Bridge Cleaners Site which is a NYS Brownfield Cleanup Program Site. This property has PCE contamination with a known off-site PCE plume.

Based on the absence of TCE in soil in the 10-12 and 13-15 foot intervals and the relatively low concentrations reported in groundwater, 20 feet below grade, it is unlikely that TCE migrated to the groundwater as a solvent. The TCE contamination in groundwater beneath the Site is likely related to the degradation of Bridge Cleaners PCE plume which is migrating beneath the Site.

The elevated TCE levels reported in soil gas are associated with off-gassing from the TCE impacted soil. It would not be expected to be related to off-gassing from the TCE impacted groundwater since the TCE concentrations in groundwater are relatively low. The elevated PCE levels in soil gas are either related to off-gassing from the PCE plume beneath the site or from the migration of vapors from PCE impacted soil on the adjacent Bridge Cleaners property.

No other source areas were identified or indicated during this RI. Elevated levels of SVOCs, pesticides and some metals reported in shallow soil are characteristic of the historic fill materials present at the site and throughout the area.

2.2 Redevelopment Plans

The Remedial Action to be performed under the RAWP is intended to make the Site protective of human health and the environment consistent with the contemplated end use. There is currently no redevelopment plan proposed for the Site. Redevelopment of the property may occur in the future.

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:

1. Installation of a Soil Vapor Extraction (SVE) system beneath the existing basement foundation;
2. Implementation of a groundwater remediation contingency, if TCE in groundwater is found to be Site related;
3. Implementation of a Site Management Plan (SMP) for long term maintenance of the Engineering Controls;

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4. An Environmental Easement will be filed against the Site to ensure implementation of the SMP.

3.0 HAZARD ASSESSMENT

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

3.0 HAZARD ASSESSMENT

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

3.1 Physical Hazards

3.1.1 Tripping Hazards

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

3.1.2 Climbing Hazards

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

3.1.3 Cuts and Lacerations

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

3.1.4 Lifting Hazards

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

3.1.5 Utility Hazards

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

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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.

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

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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.

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 arsenic, lead and mercury.

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

Acetone	Methylene Chloride	Tetrachloroethene	Trichloroethylene

Semi-Volatile organic compounds reported to be present in soil include the following:

Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(a)pyrene	Benzo(k)fluoranthene
Chrysene	Indeno(1,2,3-cd)pyrene		

Pesticides reported to be present in soil and / or groundwater include the following

4,4'-DDD	4,4-DDE	4,4-DDT

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Metals reported to be present in soil and / or groundwater include the following

Arsenic	Chromium	Copper	Lead	Mercury	Nickel	Zinc

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

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

3.3.1 Respirable Dust

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

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

3.3.2 Dust Control and Monitoring During Earthwork

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

3.3.3 Organic Vapors

Elevated levels of VOCs were detected in soil gas 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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Fax 631.924.2870

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.

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

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

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

6.1 General Site Work

A general excavation contractor will be responsible for site excavation/grading as needed for basement excavation, shoring, other building requirements, or as necessary to excavate contaminated soil as deemed necessary by the Remedial Action Work Plan and/or Project Manager. All onsite employees must have obtained OSHA 24-hour Hazardous Waste Operations and Emergency Response Operations training prior to performing soil disturbing activities.

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
Suffolk County Police	911
NYC Fire Department	911
NY Presbyterian/Weill Cornell Medical Center	(212) 746-5454
NYSDEC Spills Hotline	1-800-457-7362
NYSDEC Project Manager	(518) 402-9480
NYC Department of Health	(212) 676-2400
National Response Center	1-800-424-8802
Poison Control	1-800-222-1222
Project Manager	1-631-504-6000
Site Safety Officer	1-631-504-6000

7.3 Personnel Responsibilities During an Emergency

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

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

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

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

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

- Ensure that all required reports have been prepared.

The following key personnel are planned for this project:

- Project Manager — Ms. Chawinie Miller (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

International Chemical Safety Cards

ACETONE

ICSC: 0087

2-Propanone
Dimethyl ketone
Methyl ketone
C_3H_6O / CH_3COCH_3
Molecular mass: 58.1

ICSC # 0087
CAS # 67-64-1
RTECS # AL3150000
UN # 1090
EC # 606-001-00-8
April 22, 1994 Validated
Fi, review at IHE: 10/09/89

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Highly flammable.	NO open flames, NO sparks, and NO smoking.	Powder, alcohol-resistant foam, water in large amounts, 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			
•INHALATION	Sore throat. Cough. Confusion. Headache. Dizziness. Drowsiness. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	Dry skin.	Protective gloves.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
•EYES	Redness. Pain. Blurred vision. Possible corneal damage.	Safety spectacles or face shield . Contact lenses should not be worn.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Nausea. Vomiting. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Personal protection: self-contained breathing apparatus. 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. Then wash away with plenty of water.	Fireproof. Separated from strong oxidants. Store in an area without drain or sewer access.	F symbol Xi symbol R: 11-36-66-67 S: 2-9-16-26 UN Hazard Class: 3 UN Packing Group: II

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0087

International Chemical Safety Cards

ACETONE

ICSC: 0087

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.

CHEMICAL DANGERS:
The substance can form explosive peroxides on contact with strong oxidants such as acetic acid, nitric acid, hydrogen peroxide. Reacts with chloroform and bromoform under basic conditions, causing fire and explosion hazard. Attacks plastic.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 500 ppm as TWA, 750 ppm as STEL; A4 (not classifiable as a human carcinogen); BEI issued; (ACGIH 2004).
MAK: 500 ppm 1200 mg/m³
Peak limitation category: I(2); Pregnancy risk group: D; (DFG 2006).
OSHA PEL†: TWA 1000 ppm (2400 mg/m^3)
NIOSH REL: TWA 250 ppm (590 mg/m^3)
NIOSH IDLH: 2500 ppm 10%LEL See: 67641

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 can be reached rather quickly on evaporation of this substance at 20°C; on spraying or dispersing, however, much faster.

EFFECTS OF SHORT-TERM EXPOSURE:
The vapour irritates the eyes and the respiratory tract. The substance may cause effects on the central nervous system , liver , kidneys and gastrointestinal tract .

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the blood and bone marrow .

PHYSICAL PROPERTIES

Boiling point: 56°C
Melting point: -95°C
Relative density (water = 1): 0.8
Solubility in water:
miscible
Vapour pressure, kPa at 20°C: 24

Relative vapour density (air = 1): 2.0
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.2
Flash point: -18°C c.c.
Auto-ignition temperature: 465°C
Explosive limits, vol% in air: 2.2-13
Octanol/water partition coefficient as log Pow: -0.24

ENVIRONMENTAL DATA

N O T E S

Use of alcoholic beverages enhances the harmful effect.

Transport Emergency Card: TEC (R)-30S1090

NFPA Code: H 1; F 3; R 0;
Card has been partially updated in July 2007: see Occupational Exposure Limits.
Card has been partially updated in January 2008: see Storage.

ADDITIONAL INFORMATION

International Chemical Safety Cards

DICHLOROMETHANE

ICSC: 0058

Methylene chloride
DCM
CH_2Cl_2
Molecular mass: 84.9

ICSC # 0058
CAS # 75-09-2
RTECS # PA8050000
UN # 1593
EC # 602-004-00-3
December 04, 2000 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible under specific conditions. 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 (see Chemical Dangers).	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! STRICT HYGIENE!	
•INHALATION	Dizziness. Drowsiness. Headache. Nausea. Weakness. Unconsciousness. Death.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.
•SKIN	Dry skin. Redness. Burning sensation.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness. Pain. Severe deep burns.	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	Abdominal pain. (Further see Inhalation).	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Do NOT induce vomiting. Give plenty of water to drink. Rest.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Personal protection: filter respirator for organic gases and vapours. Do NOT let this chemical enter the environment. Ventilation. 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.	Separated from metals (see Chemical Dangers), food and feedstuffs . Cool. Ventilation along the floor.	Do not transport with food and feedstuffs. Xn symbol R: 40 S: (2-)23-24/25-36/37 UN Hazard Class: 6.1 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0058

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

DICHLOROMETHANE

ICSC: 0058

IMPORTANT DATA

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

PHYSICAL DANGERS:
The vapour is heavier than air. As a result of flow, agitation, etc., electrostatic charges can be generated.

CHEMICAL DANGERS:
On contact with hot surfaces or flames this substance decomposes forming toxic and corrosive fumes. Reacts violently with metals such as aluminium powder and magnesium powder, strong bases and strong oxidants causing fire and explosion hazard. Attacks some forms of plastic rubber and coatings.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 50 ppm as TWA; A3 (confirmed animal carcinogen with unknown relevance to humans); BEI issued; (ACGIH 2004).
MAK:
Carcinogen category: 3A;
(DFG 2004).
OSHA PEL: 1910.1052 TWA 25 ppm ST 125 ppm
NIOSH REL: Ca See Appendix A
NIOSH IDLH: Ca 2300 ppm See: 75092

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation 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 . Exposure could cause lowering of consciousness. Exposure could cause the formation of methaemoglobin.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the central nervous system and liver . This substance is possibly carcinogenic to humans.

PHYSICAL PROPERTIES

Boiling point: 40°C
Melting point: -95.1°C
Relative density (water = 1): 1.3
Solubility in water, g/100 ml at 20°C: 1.3
Vapour pressure, kPa at 20°C: 47.4
Relative vapour density (air = 1): 2.9
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.9
Auto-ignition temperature: 556°C
Explosive limits, vol% in air: 12-25
Octanol/water partition coefficient as log Pow: 1.25

ENVIRONMENTAL DATA

This substance may be hazardous in the environment; special attention should be given to ground water contamination.

NOTES

Addition of small amounts of a flammable substance or an increase in the oxygen content of the air strongly enhances combustibility. Depending on the degree of exposure, periodic medical examination is suggested. The odour warning when the exposure limit value is exceeded is insufficient. Do NOT use in the vicinity of a fire or a hot surface, or during welding. R30 is a trade name. Card has been partly updated in April 2005. See section Occupational Exposure Limits.

Transport Emergency Card: TEC (R)-61S1593

NFPA Code: H2; F1; R0;

ADDITIONAL INFORMATION

ICSC: 0058 **DICHLOROMETHANE**

International Chemical Safety Cards

TETRACHLOROETHYLENE

ICSC: 0076

1,1,2,2-Tetrachloroethylene
Perchloroethylene
Tetrachloroethene
C_2Cl_4 / $Cl_2C=CCl_2$
Molecular mass: 165.8

ICSC # 0076
CAS # 127-18-4
RTECS # KX3850000
UN # 1897
EC # 602-028-00-4
April 13, 2000 Validated

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			
EXPOSURE		STRICT HYGIENE! PREVENT GENERATION OF MISTS!	
•INHALATION	Dizziness. Drowsiness. Headache. Nausea. Weakness. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.
•SKIN	Dry skin. Redness.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness. Pain.	Safety goggles , face shield .	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Abdominal pain. (Further see Inhalation).	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
Ventilation. 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.	Separated from metals ,(see Chemical Dangers), food and feedstuffs . Keep in the dark. Ventilation along the floor.	Do not transport with food and feedstuffs. Marine pollutant. Xn symbol N symbol R: 40-51/53 S: (2-)23-36/37-61 UN Hazard Class: 6.1 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0076

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

TETRACHLOROETHYLENE

ICSC: 0076

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

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

PHYSICAL DANGERS:
The vapour is heavier than air.

CHEMICAL DANGERS:
On contact with hot surfaces or flames this substance decomposes forming toxic and corrosive fumes (hydrogen chloride, phosgene, chlorine). The substance decomposes slowly on contact with moisture producing trichloroacetic acid and hydrochloric acid. Reacts with metals such as aluminium, lithium, barium, beryllium.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 25 ppm as TWA, 100 ppm as STEL; A3 (confirmed animal carcinogen with unknown relevance to humans); BEI issued; (ACGIH 2004).
MAK: skin absorption (H);
Carcinogen category: 3B;
(DFG 2004).
OSHA PEL†: TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 3-hours)
NIOSH REL: Ca Minimize workplace exposure concentrations. See Appendix A
NIOSH IDLH: Ca 150 ppm See: 127184

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation 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 . If this liquid is swallowed, aspiration into the lungs may result in 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:
Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the liver and kidneys. This substance is probably carcinogenic to humans.

PHYSICAL PROPERTIES

Boiling point: 121°C
Melting point: -22°C
Relative density (water = 1): 1.6
Solubility in water, g/100 ml at 20°C: 0.015

Vapour pressure, kPa at 20°C: 1.9
Relative vapour density (air = 1): 5.8
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.09
Octanol/water partition coefficient as log Pow: 2.9

ENVIRONMENTAL DATA

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

N O T E S

Depending on the degree of exposure, periodic medical examination is suggested. The odour warning when the exposure limit value is exceeded is insufficient. Do NOT use in the vicinity of a fire or a hot surface, or during welding. An added stabilizer or inhibitor can influence the toxicological properties of this substance, consult an expert. Card has been partly updated in April 2005. See section Occupational Exposure Limits.

Transport Emergency Card: TEC (R)-61S1897

NFPA Code: H2; F0; R0;

ADDITIONAL INFORMATION

IMPORTANT LEGAL NOTICE:

	modifications made to produce the U.S. version is inclusion of the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

TRICHLOROETHYLENE

ICSC: 0081

1,1,2-Trichloroethylene
Trichloroethene
Ethylene trichloride
Acetylene trichloride
C_2HCl_3 / $ClCH=CCl_2$
Molecular mass: 131.4

ICSC # 0081
CAS # 79-01-6
RTECS # KX4550000
UN # 1710
EC # 602-027-00-9
April 10, 2000 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible under specific conditions. See Notes.		In case of fire in the surroundings: all extinguishing agents allowed.
EXPLOSION		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! STRICT HYGIENE!	
•INHALATION	Dizziness. Drowsiness. Headache. Weakness. Nausea. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Artificial respiration may be needed. 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, 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. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Give one or two glasses of water to drink. Rest.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Ventilation. Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. 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.	Separated from metals (see Chemical Dangers), strong bases, food and feedstuffs . Dry. Keep in the dark. Ventilation along the floor. Store in an area without drain or sewer access.	Do not transport with food and feedstuffs. Marine pollutant. T symbol R: 45-36/38-52/53-67 S: 53-45-61 UN Hazard Class: 6.1 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0081 OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

TRICHLOROETHYLENE

ICSC: 0081

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

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

PHYSICAL DANGERS:
The vapour is heavier than air. As a result of flow, agitation, etc., electrostatic charges can be generated.

CHEMICAL DANGERS:
On contact with hot surfaces or flames this substance decomposes forming toxic and corrosive fumes (phosgene , hydrogen chloride). The substance decomposes on contact with strong alkali producing dichloroacetylene , which increases fire hazard. Reacts violently with metal powders such as magnesium, aluminium, titanium, and barium. Slowly decomposed by light in presence of moisture, with formation of corrosive hydrochloric acid.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 50 ppm as TWA; 100 ppm as STEL; A5; BEI issued; (ACGIH 2004).
MAK:
Carcinogen category: 1; Germ cell mutagen group: 3B; (DFG 2007).
OSHA PEL†: TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 2 hours)
NIOSH REL: Ca See Appendix A See Appendix C
NIOSH IDLH: Ca 1000 ppm See: 79016

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation 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 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 , resulting in respiratory failure . Exposure could cause lowering of consciousness.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the central nervous system , resulting in loss of memory. The substance may have effects on the liver and kidneys (see Notes). This substance is probably carcinogenic to humans.

PHYSICAL PROPERTIES

Boiling point: 87°C
Melting point: -73°C
Relative density (water = 1): 1.5
Solubility in water, g/100 ml at 20°C: 0.1
Vapour pressure, kPa at 20°C: 7.8
Relative vapour density (air = 1): 4.5
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.3
Auto-ignition temperature: 410°C
Explosive limits, vol% in air: 8-10.5
Octanol/water partition coefficient as log Pow: 2.42
Electrical conductivity: 800pS/m

ENVIRONMENTAL DATA

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

N O T E S

Combustible vapour/air mixtures difficult to ignite, may be developed under certain conditions. Use of alcoholic beverages enhances the harmful effect. Depending on the degree of exposure, periodic medical examination is suggested. The odour warning when the exposure limit value is exceeded is insufficient. Do NOT use in the vicinity of a fire or a hot surface, or during welding. An added stabilizer or inhibitor can influence the toxicological properties of this substance, consult an expert.

Transport Emergency Card: TEC (R)-61S1710

NFPA Code: H2; F1; R0;
Card has been partially updated in October 2004: see Occupational Exposure Limits, EU Classification, Emergency Response.
Card has been partially updated in April 2010: see Occupational Exposure Limits, Ingestion First Aid, Storage.

ADDITIONAL INFORMATION

ICSC: 0081 **TRICHLOROETHYLENE**

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

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

International Chemical Safety Cards

BENZ(a)ANTHRACENE

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

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

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

CHEMICAL DANGERS:

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

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

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

EFFECTS OF SHORT-TERM EXPOSURE:

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

PHYSICAL PROPERTIES

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

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

ENVIRONMENTAL DATA

Bioaccumulation of this chemical may occur in seafood.

N O T E S

This substance is one of many polycyclic aromatic hydrocarbons - standards are usually established for them as mixtures, e.g., coal tar pitch volatiles. However, it may be encountered as a laboratory chemical in its pure form. Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken. Do NOT take working clothes home. Tetraphene is a common name. Card has been partly updated in October 2005 and August 2006: see sections Occupational Exposure Limits, EU classification.

ADDITIONAL INFORMATION

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

International Chemical Safety Cards

BENZO(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.

NOTES

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**

BENZO(a)PYRENE

ICSC: 0104

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

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

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Water spray, foam, powder, carbon dioxide.
EXPLOSION			
EXPOSURE	See EFFECTS OF LONG-TERM OR REPEATED EXPOSURE.	AVOID ALL CONTACT! AVOID EXPOSURE OF (PREGNANT) WOMEN!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN	MAY BE ABSORBED!	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety goggles or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention.

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

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0104

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

International Chemical Safety Cards

BENZO(a)PYRENE

ICSC: 0104

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

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.

N O T E S

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(k)FLUORANTHENE

ICSC: 0721

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

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

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE			In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION			
EXPOSURE		AVOID ALL CONTACT!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety spectacles or eye protection in combination with breathing protection if powder.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth. Refer for medical attention.

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

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0721

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

International Chemical Safety Cards

BENZO(k)FLUORANTHENE

ICSC: 0721

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

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

N O T E S

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

ADDITIONAL INFORMATION

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

International Chemical Safety Cards

CHRYSENE

ICSC: 1672

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

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

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Water spray. Dry powder. Foam. Carbon dioxide.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE	See EFFECTS OF LONG-TERM OR REPEATED EXPOSURE.	AVOID ALL CONTACT!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety goggles	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth.

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

SEE IMPORTANT INFORMATION ON BACK

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

International Chemical Safety Cards

CHRYSENE

ICSC: 1672

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
COLOURLESS TO BEIGE CRYSTALS OR POWDER

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

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

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

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

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

EFFECTS OF SHORT-TERM EXPOSURE:

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

PHYSICAL PROPERTIES

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

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

ENVIRONMENTAL DATA

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

NOTES

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

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

ADDITIONAL INFORMATION

International Chemical Safety Cards

INDENO(1,2,3-cd)PYRENE

ICSC: 0730

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

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

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE			In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION			
EXPOSURE		AVOID ALL CONTACT!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety spectacles or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth. Refer for medical attention.

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

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0730

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

International Chemical Safety Cards

INDENO(1,2,3-cd)PYRENE

ICSC: 0730

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

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

N O T E S

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

ADDITIONAL INFORMATION

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

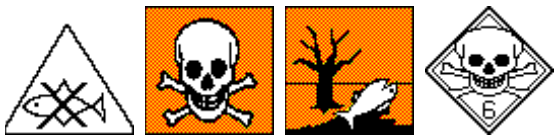
International Chemical Safety Cards

ARSENIC

ICSC: 0013

Grey arsenic
As
Atomic mass: 74.9

ICSC # 0013
CAS # 7440-38-2
RTECS # CG0525000
UN # 1558
EC # 033-001-00-X
October 18, 1999 Peer reviewed



TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames. NO contact with strong oxidizers. NO contact with hot surfaces.	Powder, water spray, foam, carbon dioxide.
EXPLOSION	Risk of fire and explosion is slight when exposed to hot surfaces or flames in the form of fine powder or dust.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		PREVENT DISPERSION OF DUST! AVOID ALL CONTACT! AVOID EXPOSURE OF (PREGNANT) WOMEN!	IN ALL CASES CONSULT A DOCTOR!
•INHALATION	Cough. Sore throat. Shortness of breath. Weakness. See Ingestion.	Closed system and ventilation.	Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.
•SKIN	Redness.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
•EYES	Redness.	Face shield 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	Abdominal pain. Diarrhoea. Nausea. Vomiting. Burning sensation in the throat and chest. Shock or collapse. Unconsciousness.	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Evacuate danger area! Sweep spilled substance into sealable containers. Carefully collect remainder, then remove to safe place. Chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment.	Separated from strong oxidants, acids, halogens, food and feedstuffs. Well closed.	Do not transport with food and feedstuffs. Marine pollutant. T symbol N symbol R: 23/25-50/53 S: 1/2-20/21-28-45-60-61 UN Hazard Class: 6.1 UN Packing Group: II

SEE IMPORTANT INFORMATION ON BACK

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

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

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**

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

ICSC: 0056

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

International Chemical Safety Cards

MERCURY

ICSC: 0056

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
ODOURLESS, HEAVY AND MOBILE SILVERY LIQUID METAL.

PHYSICAL DANGERS:

CHEMICAL DANGERS:
Upon heating, toxic fumes are formed. Reacts violently with ammonia and halogens causing fire and explosion hazard. Attacks aluminium and many other metals forming amalgams.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 0.025 mg/m³ as TWA (skin) A4 BEI issued (ACGIH 2004).
MAK: 0.1 mg/m³ Sh
Peak limitation category: II(8) Carcinogen category: 3B (DFG 2003).
OSHA PEL†: C 0.1 mg/m^3
NIOSH REL: Hg Vapor: TWA 0.05 mg/m^3 skin
Other: C 0.1 mg/m^3 skin
NIOSH IDLH: 10 mg/m^3 (as Hg) See: 7439976

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation of its vapour and through the skin , also as a vapour!

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

EFFECTS OF SHORT-TERM EXPOSURE:
The substance is irritating to the skin. Inhalation of the vapours may cause pneumonitis. The substance may cause effects on the central nervous systemandkidneys. The effects may be delayed. Medical observation is indicated.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
The substance may have effects on the central nervous system kidneys , resulting in irritability, emotional instability, tremor, mental and memory disturbances, speech disorders. Danger of cumulative effects. Animal tests show that this substance possibly causes toxic effects upon human reproduction.

PHYSICAL PROPERTIES

Boiling point: 357°C
Melting point: -39°C
Relative density (water = 1): 13.5
Solubility in water:
none

Vapour pressure, Pa at 20°C: 0.26
Relative vapour density (air = 1): 6.93
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.009

ENVIRONMENTAL DATA

The substance is very toxic to aquatic organisms. In the food chain important to humans, bioaccumulation takes place, specifically in fish.

N O T E S

Depending on the degree of exposure, periodic medical examination is indicated. No odour warning if toxic concentrations are present. Do NOT take working clothes home.

Transport Emergency Card: TEC (R)-80GC9-II+III

ADDITIONAL INFORMATION

ICSC: 0056 **MERCURY**

International Chemical Safety Cards

NICKEL

ICSC: 0062

Ni
Atomic mass: 58.7
(powder)

ICSC # 0062
CAS # 7440-02-0
RTECS # QR5950000
EC # 028-002-00-7
October 17, 2001 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Flammable as dust. Toxic fumes may be released in a fire.		Dry sand. NO carbon dioxide. NO water.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		PREVENT DISPERSION OF DUST! AVOID ALL CONTACT!	
•INHALATION	Cough. Shortness of breath.	Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety spectacles, or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Vacuum spilled material. Carefully collect remainder, then remove to safe place. Personal protection: P2 filter respirator for harmful particles.	Separated from strong acids.	Xn symbol R: 40-43 S: 2-22-36

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0062

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

NICKEL

ICSC: 0062

I

PHYSICAL STATE; APPEARANCE:
SILVERY METALLIC SOLID IN VARIOUS FORMS.

PHYSICAL DANGERS:

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

IMPORTANT DATA	Dust explosion possible if in powder or granular form, mixed with air. **CHEMICAL DANGERS:** Reacts violently, in powder form, with titanium powder and potassium perchlorate, and oxidants such as ammonium nitrate, causing fire and explosion hazard. Reacts slowly with non-oxidizing acids and more rapidly with oxidizing acids. Toxic gases and vapours (such as nickel carbonyl) may be released in a fire involving nickel. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: (Inhalable fraction) 1.5 mg/m³ as TWA A5 (not suspected as a human carcinogen); (ACGIH 2004). MAK: (Inhalable fraction) sensitization of respiratory tract and skin (Sah); Carcinogen category: 1; (DFG 2004). OSHA PEL*†: TWA 1 mg/m^3 *Note: The PEL does not apply to Nickel carbonyl. NIOSH REL*: Ca TWA 0.015 mg/m^3 See Appendix A *Note: The REL does not apply to Nickel carbonyl. NIOSH IDLH: Ca 10 mg/m^3 (as Ni) See: 7440020 **INHALATION RISK:** Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed. **EFFECTS OF SHORT-TERM EXPOSURE:** May cause mechanical irritation. Inhalation of fumes may cause pneumonitis. **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** Repeated or prolonged contact may cause skin sensitization. Repeated or prolonged inhalation exposure may cause asthma. Lungs may be affected by repeated or prolonged exposure. This substance is possibly carcinogenic to humans.
PHYSICAL PROPERTIES	Boiling point: 2730°C Melting point: 1455°C Density: 8.9 g/cm3 Solubility in water: none
ENVIRONMENTAL DATA	

N O T E S

At high temperatures, nickel oxide fumes will be formed. Depending on the degree of exposure, periodic medical examination is suggested. The symptoms of asthma often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential. Anyone who has shown symptoms of asthma due to this substance should avoid all further contact with this substance.

ADDITIONAL INFORMATION

ICSC: 0062 **NICKEL**

International Chemical Safety Cards

ZINC POWDER

ICSC: 1205

Blue powder
Merrillite
Zn
Atomic mass: 65.4
(powder)



ICSC # 1205
CAS # 7440-66-6
RTECS # ZG8600000
UN # 1436 (zinc powder or dust)
EC # 030-001-00-1
October 24, 1994 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Highly flammable. Many reactions may cause fire or explosion. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames, NO sparks, and NO smoking. NO contact with acid(s), base (s) and incompatible substances (see Chemical Dangers).	Special powder, dry sand, NO other agents. NO water.
EXPLOSION	Risk of fire and explosion on contact with acid(s), base(s), water and incompatible substances.	Closed system, ventilation, explosion-proof electrical equipment and lighting. Prevent build-up of electrostatic charges (e.g., by grounding). Prevent deposition of dust.	In case of fire: cool drums, etc., by spraying with water but avoid contact of the substance with water.
EXPOSURE		PREVENT DISPERSION OF DUST! STRICT HYGIENE!	
•**INHALATION**	Metallic taste and metal fume fever. Symptoms may be delayed (see Notes).	Local exhaust.	Fresh air, rest. Refer for medical attention.
•**SKIN**	Dry skin.	Protective gloves.	Rinse and then wash skin with water and soap.
•**EYES**		Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•**INGESTION**	Abdominal pain. Nausea. Vomiting.	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Extinguish or remove all ignition sources. Do NOT wash away into sewer. Sweep spilled substance into containers. then remove to safe place. Personal protection: self-contained breathing apparatus.	Fireproof. Separated from acids, bases oxidants Dry.	Airtight. F symbol N symbol R: 15-17-50/53 S: 2-7/8-43-46-60-61 UN Hazard Class: 4.3 UN Subsidiary Risks: 4.2

SEE IMPORTANT INFORMATION ON BACK

International Chemical Safety Cards

ZINC POWDER

ICSC: 1205

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

PHYSICAL STATE; APPEARANCE:
ODOURLESS GREY TO BLUE POWDER.

PHYSICAL DANGERS:
Dust explosion possible if in powder or granular form, mixed with air. If dry, it can be charged electrostatically by swirling, pneumatic transport, pouring, etc.

CHEMICAL DANGERS:
Upon heating, toxic fumes are formed. The substance is a strong reducing agent and reacts violently with oxidants. Reacts with water and reacts violently with acids and bases forming flammable/explosive gas (hydrogen - see ICSC0001) Reacts violently with sulfur, halogenated hydrocarbons and many other substances causing fire and explosion hazard.

OCCUPATIONAL EXPOSURE LIMITS:
TLV not established.

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

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

EFFECTS OF SHORT-TERM EXPOSURE:
Inhalation of fumes may cause metal fume fever. The effects may be delayed.

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

PHYSICAL PROPERTIES

Boiling point: 907°C
Melting point: 419°C
Relative density (water = 1): 7.14
Solubility in water: reaction
Vapour pressure, kPa at 487°C: 0.1
Auto-ignition temperature: 460°C

ENVIRONMENTAL DATA

N O T E S

Zinc may contain trace amounts of arsenic, when forming hydrogen, may also form toxic gas arsine (see ICSC 0001 and ICSC 0222). Reacts violently with fire extinguishing agents such as water, halons, foam and carbon dioxide. The symptoms of metal fume fever do not become manifest until several hours later. Rinse contaminated clothes (fire hazard) with plenty of water.

Transport Emergency Card: TEC (R)-43GWS-II+III
NFPA Code: H0; F1; R1;

ADDITIONAL INFORMATION

ICSC: 1205 **ZINC POWDER**

IMPORTANT LEGAL NOTICE:

APPENDIX D

HOSPITAL INFORMATION AND MAP

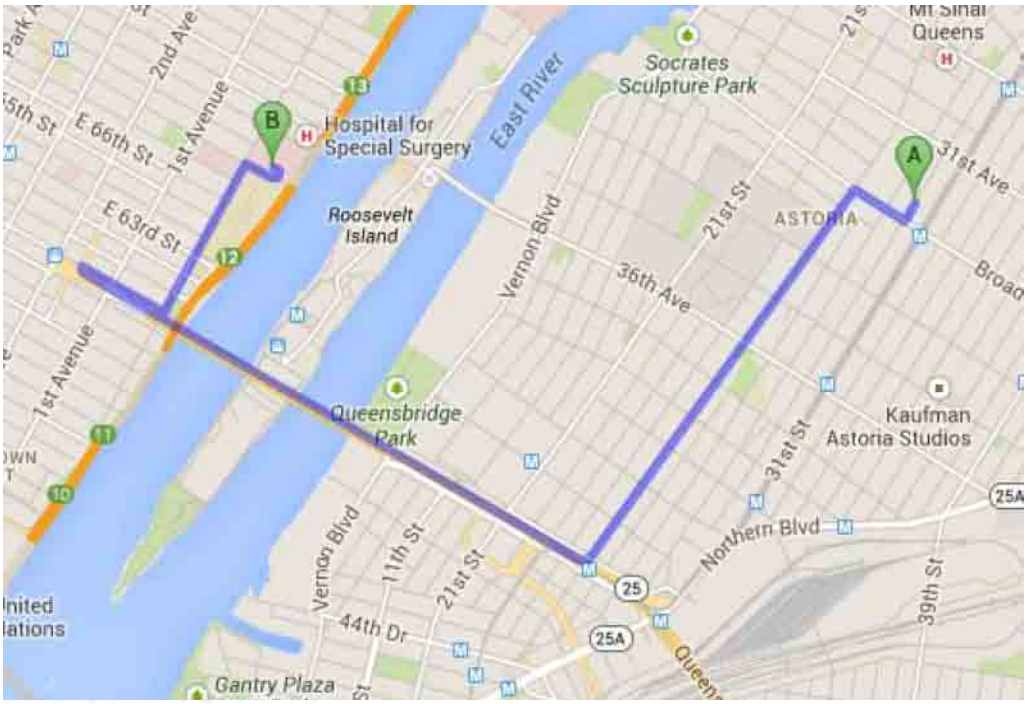
FIELD ACCIDENT REPORT

HOSPITAL INFORMATION AND MAP

The nearest emergency room to the site is:

NY Presbyterian/Weill Cornell Medical Center

525 E. 68th Street, New York, NY 10065
(212) 746-5454
3.4 Miles – About 10 Minutes



A 31-70 30th St, New York, NY 11106

	1. Head **southwest** on **30th St** toward **Broadway**	go 256 ft total 256 ft
↱	2. Take the 1st right onto **Broadway**	go 0.1 mi total 0.2 mi
↰	3. Turn left at the 2nd cross street onto **Crescent St** About 3 mins	go 1.1 mi total 1.3 mi
25	4. Take the ramp onto **New York 25 W/Ed Koch Queensboro Bridge** About 3 mins	go 1.2 mi total 2.4 mi
	5. Take the exit toward **E 60th St**	go 390 ft total 2.5 mi
↱	6. Keep right at the fork, follow signs for **1 Avenue N/FDR Drive**	go 0.1 mi total 2.6 mi
↱	7. Turn right onto **E 60th St**	go 0.2 mi total 2.8 mi
↰	8. Take the 2nd left onto **York Ave** About 1 min	go 0.4 mi total 3.2 mi
↱	9. Turn right onto **E 68th St**	go 433 ft total 3.3 mi
↰	10. Turn left to stay on **E 68th St** Destination will be on the left	go 180 ft total 3.4 mi

B 525 E 68th St, New York, NY 10065

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

NewYork-Presbyterian Hospital/Weill Cornell Medical Center

Legend

- Visitor's Entrance
- Accessible Entrance
- Emergency
- Information Desk
- Visitor Parking
- Subway Entrance
- Bus

Elevators

- G — Greenberg Pavilion
- ST — Starr Pavilion, J Corridor & L Corridor
- K — K Wing & F Wing, floors 2-9
- F — Baker Pavilion / F Wing, floors 9-24
- H — Baker Pavilion / F Wing, floors 9-23
- P — Payson Pavilion
- W — Whitney Pavilion
- M — M Wing
- N — N Wing

Additional Medical Offices

Weill Cornell Medical Assoc. Eastside
201 East 80th Street
Weill Cornell Medical Assoc. Westside
12 West 72nd Street
Iris Cantor Women's Health Center
425 East 61st Street
Weill Cornell Imaging at NewYork-Presbyterian
416 East 55th Street
425 East 61st Street, 9th Floor
520 East 70th Street, lobby level
1305 York Avenue, 3rd Floor

Hospital information:
212 746 5454

APPENDIX G
QUALITY ASSURANCE PROJECT PLAN (QAPP)

Former Union Wire Die Corp.
39-40 30th Street, Queens, New York
BCP: C241163

QUALITY ASSURANCE PROJECT PLAN
39-40 30th Street, Queens, NY

Prepared on behalf of:

Ganesh Management, LLC
39-40 30th Street
Queens, NY 11101

Prepared by:

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS
1808 MIDDLE COUNTRY ROAD
RIDGE, NY 11961

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QUALITY ASSURANCE PROJECT PLAN
39-40 30th Street, Queens, NY

TABLES

1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) has been prepared in accordance with DER-10 to detail procedures to be followed during the course of the sampling and analytical portion of the project, as required by the approved work plan.

To ensure the successful completion of the project each individual responsible for a given component of the project must be aware of the quality assurance objectives of his / her particular work and of the overall project. The EBC Project Director, Charles Sosik will be directly responsible to the client for the overall project conduct and quality assurance/quality control (QA/QC) for the project. The Project Director will be responsible for overseeing all technical and administrative aspects of the project and for directing QA/QC activities. 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.

Chawinie Reilly will serve as the Project Manager and will be responsible for implementation of the Remedial Investigation and coordination with field sampling crews and subcontractors. Reporting directly to the Project Manager will be the Field Operations Officer, Kevin Waters; who will serve as the on-Site qualified environmental professional who will record observations, direct the drilling crew 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	M. Dalal, Impact Environmental Closures, Inc. (IEC)
Project Manager	Implementation of the RI according to the RIWP.	J. de la Fuente, IEC
Laboratory Analysis	Analysis of soil samples by NYSDEC ASP methods Laboratory	NYSDOH-Certified Laboratory
Data review	Review for completeness and compliance	3rd party validation

EBC
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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 in groundwater and other volatile organic compounds (VOCs) in soil, 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 me related samples. II 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.

2.3 Accuracy

Accuracy is defined as the nearness of a real or the mean (x) of a set of results to the true value. Accuracy is assessed by means of reference samples and percent recoveries. Accuracy includes both precision and recovery and is expressed as percent recovery (% REC). The MS sample is used to determine the percent recovery. The matrix spike percent recovery (% REC) is calculated by the following equation:

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

Where:
SSR = spike sample results
SR = sample results

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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.
5. Surrogate spike analysis results (organics).
6. Matrix spike/matrix spike duplicate/matrix spike blank results.
7. QC check sample and standard recovery results
8. Blank results (field, trip, and method).

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9. Internal standard area and RT summary.

2.8 Laboratory Custody Procedures

The following elements are important for maintaining the field custody of samples:

- Sample identification
- Sample labels
- Custody records
- Shipping records
- Packaging procedures

Sample labels will be attached to all sampling bottles before field activities begin; each label will contain an identifying number. Each number will have a suffix that identifies the site and where the sample was taken. Approximate sampling locations will be marked on a map with a description of the sample location. The number, type of sample, and sample identification will be entered into the field logbook. A chain-of-custody form, initiated at the analytical laboratory will accompany the sample bottles from the laboratory into the field. Upon receipt of the bottles and cooler, the sampler will sign and date the first received blank space. After each sample is collected and appropriately identified, entries will be made on the chain-of-custody form that will include:

- Site name and address
- Samplers' names and signatures

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3.0 ANALYTICAL PROCEDURES

3.1 Laboratory Analysis

Samples will be analyzed by the NYSDOH ELAP laboratory for one or more of the following parameters: VOCs in groundwater by USEPA Method 8260 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. Note that waste characterization samples if analyzed will be in results only format and will not be evaluated in the DUSR.

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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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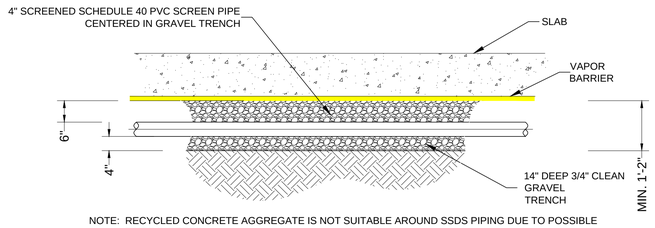
TABLE 2
SUMMARY OF
SAMPLING PROGRAM RATIONALE AND ANALYSIS

Matrix	Location	Number of Samples	Rationale for Sampling	Laboratory Analysis
Groundwater (water table)	From 2 monitoring wells MW3 and MW4.	2	To assess groundwater quality at the Site.	VOCs EPA Method 8260B
Total (Groundwater)		2		
Air Sample	Pre carbon canister location	1	Evaluate SVE system.	VOCs EPA Method TO15
Indoor Air Samples IA1, IA2, IA3, IA4, IA5, IA6 and OA1	6 Indoor Air samples and 1 outdoor air sample	7	Evaluate indoor air during the heating season	VOCs EPA Method TO15
Total (Soil Gas)		8		
MS/MSD	Matrix spike and Matrix spike duplicates at the rate 5%	1	To meet requirements of QA / QC program	1 MS/MSD for VOCs EPA Method 8260B
Trip Blanks	One laboratory prepared trip blank to accompany samples each time they are delivered to the laboratory.	1	To meet requirements of QA / QC program	VOCs EPA Method 8260B
Total (QA / QC Samples)		2		

APPENDIX H
SSDS DRAWINGS AND MANUFACTURERS SPECIFICATIONS

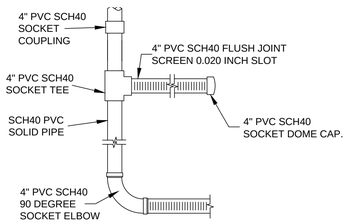
Former Union Wire Die Corp.
39-40 30th Street, Queens, New York
BCP: C241163



NOTE: RECYCLED CONCRETE AGGREGATE IS NOT SUITABLE AROUND SSDS PIPING DUE TO POSSIBLE FINES INGRESS.

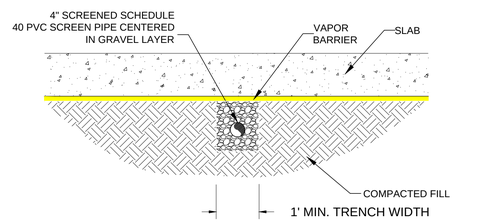
SCREEN PIPE TO BE LAID WITH A MINIMUM SLOPE OF $\frac{1}{8}$" VERTICAL TO 1' OF LENGTH, SLOPING DOWN FROM THE RISER CONNECTION TO PREVENT COLLECTION OF CONDENSATION/MOISTURE IN THE PIPE.

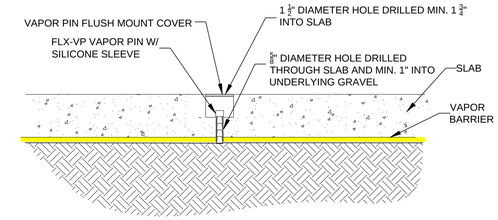
SUB-SLAB PIPING DETAIL 1



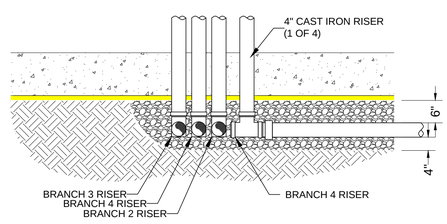
NOTE: ALL PVC CONNECTIONS TO BE ADHERED WITH LOW-VOC PRIMER AND PVC CEMENT.

SUB-SLAB PIPING PLAN VIEW

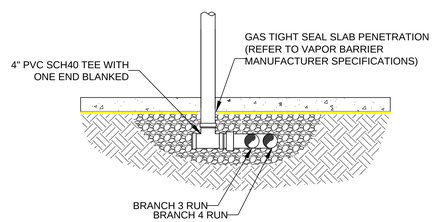




SUB-SLAB PIPING DETAIL 2

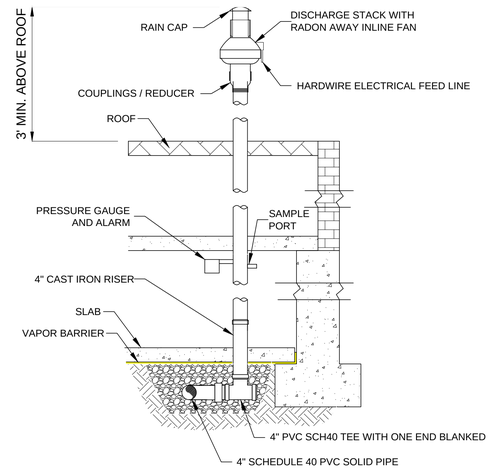


SUB-SLAB PIPING CONNECTION TO RISER DETAIL 1



SUB-SLAB PIPING CONNECTION TO RISER DETAIL 2

VAPOR PIN MONITORING POINT DETAIL



NOTE: NOT ALL REQUIRED ACCESSORIES ARE SHOWN.
REFER TO MANUFACTURER'S SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

TYPICAL SYSTEM PIPING AND EXHAUST ARRANGEMENT

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CIVIL:
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ENVIRONMENTAL ENGINEER:
IMPACT ENVIRONMENTAL
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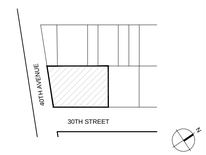
BOHEMIA, NEW YORK 11716

LIGHTING CONSULTANT:
GORECKI DESIGN ASSOCIATES, LLC
Thomaston, Maine

KEY PLAN:



BLOCK: 399
LOT: 34

NO.	DATE:	ISSUANCE:
7	03.03.2020	REVISED WITH CONTRACTOR INPUT
6	01.22.2020	ISSUED FOR 100% CDs
5	12.18.2019	PROGRESS PRINT
4	11.06.2019	ISSUED FOR 75% CDs
3	11.01.2019	ISSUED FOR DOB RESUBMISSION #2
2	10.02.2019	ISSUED FOR DOB RESUBMISSION
1	07.31.2019	ISSUED FOR DOB FILING/100% DD

DRAWING TITLE:

39-40 30TH STREET,
LONG ISLAND CITY, NY 11101

DRAWING TITLE:

SUB-SLAB DEPRESSURIZATION SYSTEM - DETAILS

SEAL & SIGNATURE:

DATE (MM.DD.YY): 03.03.2020
PROJECT No.: 12930
DRAWING BY: IMPACT
CHECKED BY: IMPACT
DWG. No.: SSDS_003
DWG. No.:

GENERAL NOTES

1. THE INTENT OF THE SUB-SLAB DEPRESSURIZATION SYSTEM DESCRIBED IN THIS PLAN IS TO PROMOTE PUBLIC SAFETY AND WELFARE BY CONTROLLING SOIL GAS INTRUSION POTENTIALLY EMANATING FROM BENEATH THE BUILDING SUB GRADE. THE SYSTEM IS NOT INTENDED TO REGULATE FLAMMABLE VAPORS THAT MAY ORIGINATE IN AND PROPAGATE FROM OTHER SOURCES, WHICH INCLUDE, BUT ARE NOT LIMITED TO, RUPTURED HAZARDOUS MATERIAL TRANSMISSION LINES, UNDERGROUND TANKS, OR SIMILAR INSTALLATIONS.

2. DESIGN GOAL IS TO MAINTAIN A SUB-SLAB VACUUM OF 0.004" OF WATER COLUMN (1 PASCAL) ACROSS THE SLABS. SEVEN (7) MONITORING POINTS INSTALLED INTO THE SLABS WILL BE USED IN STARTUP TESTING AND ONGOING DURING REGULAR OPERATION & MAINTENANCE.

3. SYSTEM INSTALLATION SHALL ADHERE TO: FINAL GUIDANCE FOR EVALUATING SOIL VAPOR INTRUSION IN THE STATE OF NEW YORK PREPARED BY NEW YORK STATE DEPARTMENT OF HEALTH (NYSDOH), DATED OCTOBER 2006 AND NEW YORK CITY MECHANICAL CODE, CHAPTER 5, SECTION MC 512-SUBSLAB EXHAUST SYSTEMS.

4. SUB-SLAB DEPRESSURIZATION SYSTEM SHALL CONSIST OF PERFORATED HORIZONTAL PIPES, NON-PERFORATED HEADER PIPES, RISER PIPES, MONITORING POINTS, CLEAN STONE LAID AROUND PERFORATED HORIZONTAL PIPES, IMPERVIOUS VAPOR BARRIER (DESIGNED BY OTHERS), MECHANICAL EXTRACTION SYSTEM AND EXHAUST POINTS.

5. FOUNDATION CONSISTS OF THREE SLABS AS SHOWN IN LAYOUT ABOVE. EACH SLAB WILL BE UNDERLAIN BY A SEPARATE BRANCH OF SSDS PIPING WITH DEDICATED RISER AND EXTRACTION FAN.

6. INSTALLATION OF THE SUB-SLAB COMPONENTS, VENT AND RISER PIPING, AND ROOF PENETRATIONS MUST BE COORDINATED WITH OTHER TRADES FOR THE INSTALLATION OF OTHER UTILITIES AND STRUCTURAL COMPONENTS.

7. RISER PIPE FROM SUB-SLAB TO ROOF SHALL BE COORDINATED WITH THE ARCHITECT AND MECHANICAL ENGINEER. RISER PIPE SHALL BE EXTENDED TO THE ROOF WITH MINIMAL CHANGES IN DIRECTION.

8. COMPONENTS PROPOSED LOCATIONS OF DEPRESSURIZATION SYSTEM RISER PIPES TO BE VERIFIED BY ARCHITECT.

HORIZONTAL PIPES

1. PERFORATED HORIZONTAL PIPES SHALL BE LISTED, MINIMUM SCHEDULE 40, SLOTTED OR PERFORATED POLYVINYL CHLORIDE (PVC) PIPE OR OTHER MATERIALS APPROVED BY THE DEPARTMENT OF BUILDING FOR THE INTENDED USE.

2. NON-PERFORATED HEADER PIPES SHALL BE LISTED, MINIMUM SCHEDULE 40, SOLID PVC PIPE OR OTHER MATERIAL APPROVED BY THE DEPARTMENT OF BUILDING FOR THE INTENDED USE.

3. NON-PERFORATED HEADER PIPES MUST BE INSTALLED WITH A MINIMUM SLOPE OF 1/8-INCH VERTICAL TO 1-FT HORIZONTAL TO ALLOW CONDENSATION/MOISTURE TO DRAIN BACK TO THE PERFORATED PIPE. ALL FITTINGS AND CONNECTIONS SHALL BE MADE BY THE SAME MANUFACTURER AS THE STRAIGHT PIPE AND OF THE TYPE RECOMMENDED BY THE MANUFACTURER FOR USE WITH THE PIPE.

RISER PIPES

1. RISER PIPE SHALL BE METAL PIPE ADHERING TO THE NEW YORK CITY BUILDING CODE.

2. ALL EXTERNAL METAL PIPES SHALL BE PAINTED WITH A CORROSION RESISTANT COATING.

3. VISIBLE AND ACCESSIBLE RISER PIPE MUST BE CLEARLY LABELED "CAUTION: DO NOT ALTER. SUBSURFACE VAPOR VENT PIPE." AT A MINIMUM OF EVERY 10 LINEAR FEET OF RISER PIPE RUN.

4. SAMPLING PORTS SHALL BE INSTALLED FOR EACH BRANCH OF THE SSDS IN AN ACCESSIBLE AREA FOR CONFIRMATION TESTING OF SYSTEM EFFECTIVENESS.

EXHAUST POINT(S)

1. POINT(S) OF EXHAUST SHALL BE:
   1.1. ABOVE THE EAVE OF THE ROOF (PREFERABLY, ABOVE THE HIGHEST EAVE OF THE BUILDING AND AT LEAST 12-INCHES ABOVE THE SURFACE OF THE ROOF);
   1.2. AT LEAST 10 FEET ABOVE GROUND LEVEL;
   1.3. AT LEAST 10 FEET AWAY FROM ANY OPENING THAT IS LESS THAN 2 FEET BELOW THE EXHAUST POINT; AND
   1.4. 10 FEET FROM ANY ADJOINING OR ADJACENT BUILDINGS, OR HVAC INTAKES OR SUPPLY REGISTERS.
2. RAIN GUARDS OR CAPS MUST BE PLACED ON THE EXHAUST POINT(S) SO AS NOT TO INCREASE THE POTENTIAL FOR SUBSURFACE VAPORS TO ENTER THE BUILDING BY BLOCKING THE EXHAUST.

GAS PERMEABLE STONE LAYER

1. THE SSDS PIPING WILL SIT SURROUNDED BY A GAS PERMEABLE STONE/GRAVEL LAYER OF MINIMUM 8" THICKNESS.

2. STONE LAYER SHALL NOT BE COMPACTED AND SHALL BE CONTINUOUS ACROSS DEPRESSURIZED AREA (I.E. NOT TRENCHED ALONG PERFORATED PIPING).

3. 3/4-INCH CLEAN STONE SHALL BE CLEAN, COARSE, NATURAL, ANGULAR, WASHED 3/4-INCH AGGREGATE WITH A GRADATION TO BE APPROVED BY THE STRUCTURAL ENGINEER.

4. IF REQUIRED, SLEEVES THROUGH GRADE BEAMS AND OTHER FOUNDATION COMPONENTS WILL BE DESIGNED BY OTHERS.

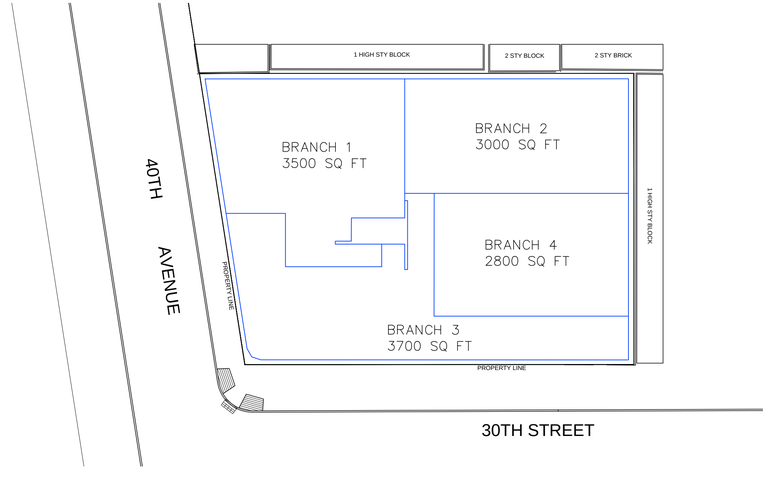
MECHANICAL EXTRACTION AND ALARMS

1. A DIFFERENTIAL PRESSURE SWITCH SHALL BE INSTALLED (RADONAWAY CHECKPOINT IIA OR SIMILAR) ON THE RISER PIPE BEFORE THE SUCTION FAN. THE DIFFERENTIAL PRESSURE SWITCH SHALL BE CONNECTED TO AN AUDIBLE ALARM, TRIGGERED IN THE EVENT OF LOSS OF SUCTION IN THE PIPE.

2. IN ADDITION TO THE DIFFERENTIAL PRESSURE SWITCH, A U-TUBE MANOMETER SHALL BE INSTALLED AT EACH RISER LOCATION, IN PROXIMITY TO THE POINT OF CONNECTION TO THE SUB-SLAB COMPONENTS FOR A VISUAL INDICATION OF SYSTEM OPERATION IN THE EVENT OF ALARM FAILURE.

3. SUPPLY POWER TO FAN(S), INCLUDING ALARM(S), TO BE DESIGNED BY OTHERS IN ACCORDANCE WITH MANUFACTURERS ELECTRICAL SPECIFICATIONS.

SSDS FAN SCHEDULE				
BRANCH	1	2	3	4
SLAB AREA	3500 SQ FT	3000 SQ FT	2700 SQ FT	3800 SQ FT
HORIZONTAL PIPE	160 LN. FT	180 LN. FT	170 LN. FT	205 LN. FT
FAN MODEL	RADONAWAY RP265	RADONAWAY RP265	RADONAWAY RP265	RADONAWAY RP265
RISER PIPE DIAMETER	4"	4"	4"	4"
FLOW AT 1" WC	176 CFM	176 CFM	176 CFM	176 CFM



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NEW YORK, NY 10001

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DEROSIER ENGINEERING, PLLC
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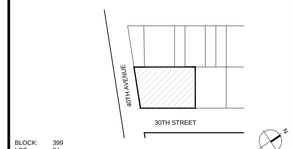
WARREN, NJ 07059

ENVIRONMENTAL ENGINEER:
IMPACT ENVIRONMENTAL
170 KEYLAND COURT
BOHEMIA, NEW YORK 11716

LIGHTING CONSULTANT:
GORECKI DESIGN ASSOCIATES, LLC
Thomaston, Maine

KEY PLAN:



BLOCK: 399
LOT: 34

NO.	DATE:	ISSUANCE:
7	03.03.2020	REVISED WITH CONTRACTOR INPUT
6	01.22.2020	ISSUED FOR 100% CDs
5	12.18.2019	PROGRESS PRINT
4	11.06.2019	ISSUED FOR 75% CDs
3	11.01.2019	ISSUED FOR DOB RESUBMISSION #2
2	10.02.2019	ISSUED FOR DOB RESUBMISSION
1	07.31.2019	ISSUED FOR DOB FILING/100% DD

DRAWING TITLE:
39-40 30TH STREET,
LONG ISLAND CITY, NY 11101

DRAWING TITLE:
SUB SLAB DEPRESSURIZATION SYSTEM - NOTES

SEAL & SIGNATURE:

DATE (MM.DD.YY): 03.03.2020
PROJECT No.: BEN_39-40 30TH
DRAWING BY: IMPACT
CHECKED BY: IMPACT
DWG. No.: SSDS_001
DWG. No.:

RadonAway®
The world's leading radon fan manufacturer

RPc Series

Radon Mitigation Fan

All RadonAway® fans are specifically designed for radon mitigation. RPc Series Fans provide superb performance, run ultra-quiet and are attractive. They are ideal for most sub-slab radon mitigation systems.

Features

- Energy efficient
- Ultra-quiet operation
- Meets all electrical code requirements
- Water-hardened motorized impeller
- Seams sealed to inhibit radon leakage (RP140c & RP145c double snap sealed)
- ETL Listed - for indoor or outdoor use
- Thermally protected motor
- Rated for commercial and residential use

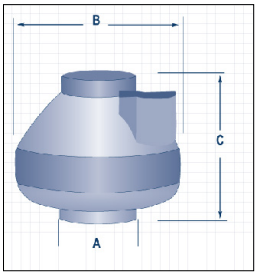
MODEL	P/N	FAN DUCT DIAMETER	WATTS	RECOM. MAX. OP. PRESSURE "WC	TYPICAL CFM vs. STATIC PRESSURE WC				
					0"	.5"	1.0"	1.5"	2.0"
RP140c*	23029-1	4"	15-21	0.7	135	70	-	-	-
RP145c	23030-1	4"	41-72	1.7	166	126	82	41	3
RP260c	23032-1	6"	47-65	1.3	251	157	70	-	-
RP265c	23033-1	6"	91-129	2.2	334	247	176	116	52
RP380	28208	8"	95-152	2.0	497	353	220	130	38

Made in USA with U.S. and imported parts.

ETL Listed

All RadonAway® inline radon fans are covered by our 5-year, hassle-free warranty.

Most Efficient 2017
*RP140c Only



Model	A	B	C
RP140c	4.5"	9.7"	8.5"
RP145c	4.5"	9.7"	8.5"
RP260c	6"	11.75"	8.6"
RP265c	6"	11.75"	8.6"
RP380	8"	13.41"	10.53"

For Further Information Contact Your Radon Professional:

Rev C 0517
P/N 02008

INSTALLATION & OPERATING INSTRUCTIONS
Instruction P/N IN015 Rev E
FOR *CHECKPOINT IIa*™ P/N 28001-2 & 28001-3
RADON SYSTEM ALARM

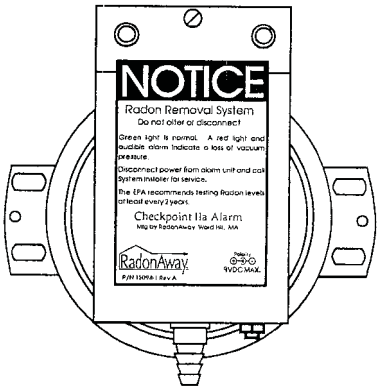
INSTALLATION INSTRUCTIONS
(WALL MOUNTING)

Select a suitable wall location near a vertical section of the suction pipe. The unit should be mounted about four or five feet above the floor and as close to the suction pipe as possible. Keep in mind that with the plug-in transformer provided, the unit must also be within six feet of a 120V receptacle. **NOTE: The Checkpoint IIa is calibrated for vertical mounting, horizontal mounting will affect switchpoint calibration.**

Drill two ¼" holes 4" apart horizontally where the unit is to be mounted.

Install the two ¼" wall anchors provided.

Hang the CHECKPOINT IIa from the two mouting holes located on the mounting bracket. Tighten the mounting screws so the unit fits snugly and securely against the wall.



Drill a 5/16" hole into the side of the vent pipe about 6" higher than the top of the unit.

Insert the vinyl tubing provided about 1" inside the suction pipe.

Cut a suitable length of vinyl tubing and attach it to the pressure switch connector on the CHECKPOINT IIa.

CALIBRATION AND OPERATION.

The CHECKPOINT IIa units are calibrated and sealed at the factory to alarm when the vacuum pressure falls below the factory setting and should not normally require field calibration. Factory Settings are:
28001-2 -.25" WC Vacuum
28001-3 -.10" WC Vacuum

To Verify Operation:

With the exhaust fan off or the pressure tubing disconnected and the CHECKPOINT IIa plugged in, both the red indicator light and the audible alarm should be on.

Turn the fan system on or connect the pressure tubing to the fan piping. The red light and the audible alarm should go off. The green light should come on.

Now turn the fan off. The red light and audible alarm should come on in about two or three seconds and the green light should go out.

WARRANTY INFORMATION

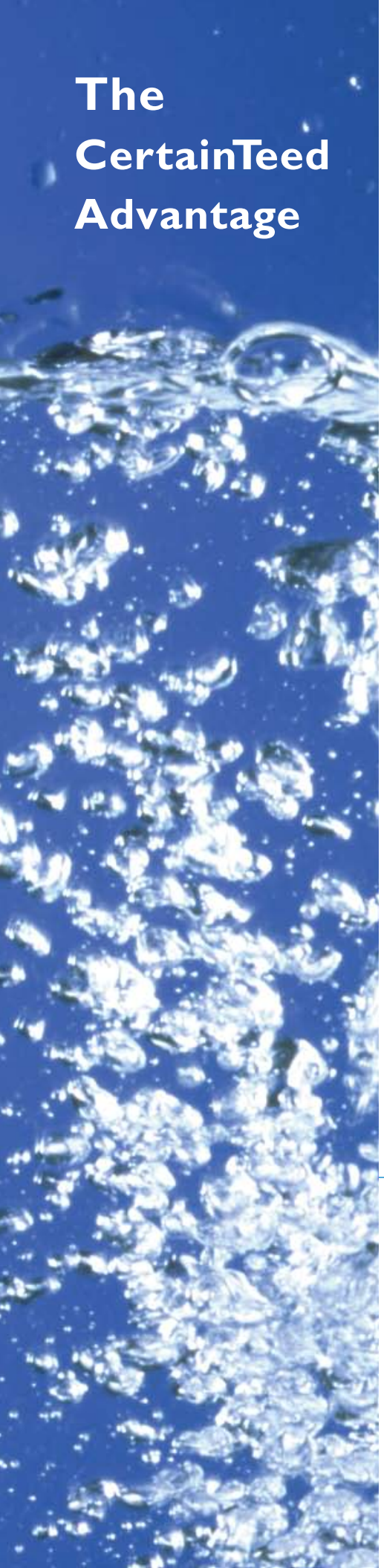
Subject to applicable consumer protection legislation, RadonAway warrants that the CHECKPOINT IIa will be free from defective material and workmanship for a period of (1) year from the date of purchase. Warranty is contingent on installation in accordance with the instructions provided. This warranty does not apply where repairs or alterations have been made or attempted by others; or the unit has been abused or misused. Warranty does not include damage in shipment unless the damage is due to the negligence of RadonAway. All other warranties, expressed or written, are not valid. To make a claim under these limited warranties, you must return the defective item to RadonAway with a copy of the purchase receipt. RadonAway is not responsible for installation or removal cost associated with this warranty. In no case is RadonAway liable beyond the repair or replacement of the defective product FOB RadonAway.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. THERE IS NO WARRANTY OF MERCHANTIBILITY. ALL OTHER WARRANTIES, EXPRESSED OR WRITTEN, ARE NOT VALID.

For service under these warranties, contact RadonAway for a Return Material Authorization (RMA) number and shipping information. **No returns can be accepted without an RMA.** If factory return is required, the customer assumes all shipping costs to and from factory.

Manufactured by:
RadonAway
Ward Hill, MA
(978)-521-3703

The CertainTeed Advantage

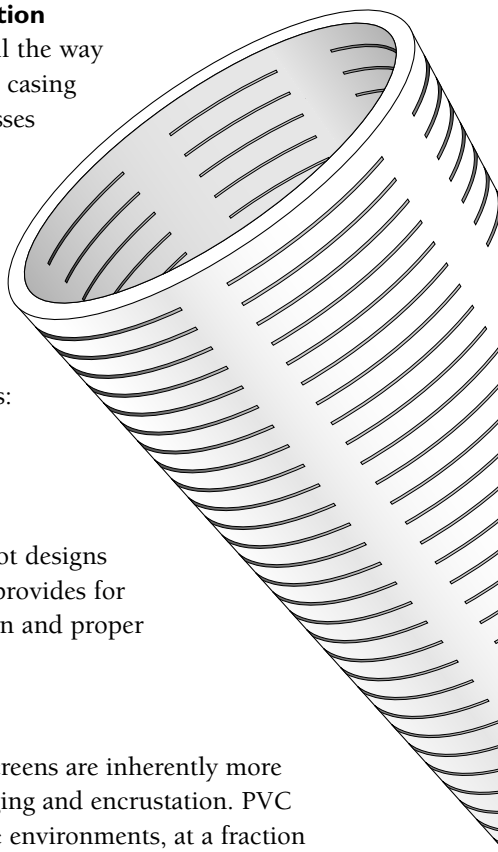


CertainTeed – the name that contractors have come to associate with the industry's broadest line of high-quality PVC well products – is also the industry leader in high performance slotted well casing. Using new manufacturing technology, slotted casing can now be produced with open areas and efficiencies that rival those of other screens, often at a fraction of the cost. Combine PVC screens with PVC well casing for the ultimate corrosion-resistant, low-maintenance water well!

A Size and Joining System for Every Application

Slotted casing can be produced in sizes from 2" all the way up to the largest commercially available PVC well casing product (17.4" O.D.), in a variety of wall thicknesses and strengths to suit virtually all applications:

- Domestic
- Irrigation
- Municipal
- Aquifer Storage and Recovery
- Environmental



CertainTeed also offers a choice of joining systems: traditional solvent-weld or the contractor-proven, all-weather Certa-Lok™ mechanical joint.

Slot Width Selection

A wide selection of precision-machined factory slot designs (.010"-.125") with closely spaced inlet openings provides for uniform development over the length of the screen and proper stabilization of the gravel pack.

Long Life

Well rehabilitation costs are minimized, as PVC screens are inherently more resistant than conventional steel products to clogging and encrustation. PVC also outperforms stainless steel in highly corrosive environments, at a fraction of the cost. All screens are manufactured from PVC casing that is listed by NSF International as safe for use with potable water.

Single Source for All Your Well Product Needs

No more unloading, local-machining, and repackaging required. With CertainTeed, the industry's best slotted casing is shipped ready to use – no field fabrication required – along with your other PVC well product needs, including solid casing, drop pipe for submersible pumps, and a variety of fittings.

Underdrain Pipe

Slotted PVC casing is also ideal for use as underdrain pipe. Applications include, but are not limited to:

- Leachate collection systems for solid waste landfills
- Drainage and dewatering applications
- Mining heap leach projects

PVC underdrain pipe is supplied with precision-machined slots, which provide greater intake capacity and continuous, clog-resistant drainage of fluids, as compared to standard round-hole perforated pipe. Slotted underdrain reduces entrance velocity into the pipe, thereby reducing the possibility that solids will be carried into the system. Slot rows can generally be positioned symmetrically or asymmetrically around the pipe circumference, depending upon the application. Outside diameters are generally the same for PVC and non-corrugated polyethylene (HDPE) pipe. However, the HDPE pipe must be extruded with a thicker wall (and therefore a reduced cross-sectional flow area) to obtain a comparable stiffness rating.

Slotted PVC and Underdrain Pipe Specifications

This chart illustrates standard manufacturing capabilities only. Not all products shown are routinely stocked – call for availability.
Slot configurations not included on this chart are covered under CertainTeed's non-standard product warranty.

NOM. SIZE	NOM. O.D.	NO. OF ROWS	CLASS	MIN. WALL THICKNESS	JOINT AVAILABILITY	O.D. OPEN AREA, SQ. INCHES PER FOOT OF SCREEN (.25" SLOT SPACING) SLOT WIDTH INCHES										
						0.010	0.013	0.016	0.020	0.025	0.032	0.040	0.050	0.085	0.100	0.125
2"	2.375	4	SCH40	0.154	SW	2.4	3.1	3.7	4.6	5.6	7.0					
3"	3.500	4	SCH40	0.216	SW	2.6	3.4	4.1	5.0	6.2	7.7					
4"	4.500	4	SDR26	0.173	SW											
			SDR21	0.214	SW	3.0	3.9	4.8	8.0	9.7	12.2	14.8	18.2	27.2		
			SCH40	0.237	SW,CLIB											
4 1/2"	4.950	4	SDR26	0.190	SW,CLIB											
			SCH40	0.248	SW,CLIB	3.0*	4.5*	5.4*	9.2	11.3	14.1	17.1	21.0	31.5		
			SDR17	0.291	SW,CLIB											
5"	5.563	4	SDR26	0.214	SW											
			SDR21**	0.265	SW,CLIB		4.5*	5.4*	10.0	12.3	15.4	18.7	23.0	34.4		
			SDR17	0.327	SW,CLIB											
			SCH80	0.375	CLIB											
6"	6.625	6	SDR26	0.255	SW											
			SCH40	0.280	SW,CLIB											
			SDR21	0.316	SW,CLIB			8.2*	12.6	15.4	19.2	23.4	28.7	43.0		
			SDR17	0.390	SW,CLIB											
6 1/4"	6.900	6	DR27.6	0.250	SW											
6 1/8"			SDR21	0.329	SW,CLIB				12.6*	15.4	19.2	23.4	28.7	43.0		
6.9"O.D.			SDR17	0.406	SW,CLIB											
8"	8.625	6	SDR26	0.332	SW											
			SDR21	0.410	SW				14.2*	20.3	25.4	30.8	37.9	56.7	63.8	74.6
			SDR17	0.508	CLIB											
10"	10.750	6	SDR26	0.413	SW											
			SDR21	0.511	SW					22.5*	28.1	34.1	41.9	62.7	70.7	82.5
			SDR17	0.632	CL											
12"	12.750	8	SDR26	0.490	SW											
			SDR21	0.606	SW					30.0*	37.4	45.5	55.9	83.7	94.2	110.1
			SDR17	0.750	CL											
14"	14.000	8	SCH40	0.437	SW					32.9*	41.1	49.9	61.3	91.8	103.4	120.7
			SDR17	0.823	CL											
16"	16.000	10	SCH40	0.500	SW											
		10	SDR26	0.616	SW,CL					36.3	45.3	55.1	67.6	101.2	114.0	133.1
		8	SDR21	0.762	CL					31.0	38.7	47.0	57.7	86.4	97.3	113.6
		8	SDR17	0.941	CL						43.5	52.8	64.9	97.2	109.4	127.8
17.4" O.D.	17.400	8	SDR17	1.024	CL							52.8	64.9	97.2	109.4	127.8

KEY: SW = Solvent Weld Belled End, CL = Certa-Lok (w/coupling), CLIB = Certa-Lok Integral Bell
* = Not available in SDR17 or SCH80
** = Equivalent to SCH40

Notes:
1. As a general rule, Flow Rating (GPM/ft) in a gravel-packed well = O.D. Open Area (in^2/ft)* (.50 blockage factor)* (.31 conversion factor) at an entrance velocity of 0.1 fps.
2. Open area percentage varies from 2% to over 20%, depending upon casing size and slot width.
3. CertainTeed can supply a detailed Engineering Specification for any of the products shown, or for special made-to-order products.
4. Slots can often be lengthened on thick-wall products to provide additional I.D. penetration; revised specifications showing increased open area are available upon request.
5. Standard slot spacing = .25". Smaller and wider spacing is available - wider spacing is recommended for slot widths of .100" and above.
6. Specifications subject to change. Standard manufacturing tolerances apply.
7. All dimensions are in inches.

Fire Sprinkler Pipe

Schedule 10 and Schedule 40

Submittal Data Sheet

SCHEDULE 10 WEIGHTS AND DIMENSIONS

NPS	NOMINAL OD		NOMINAL ID		NOMINAL WALL		WT./FT.	WT./FT. H_2O FILLED	PCS./LIFT	WT./LIFT 21'	WT./LIFT 24'	WT./LIFT 25'	UL
	in.	mm	in.	mm	in.	mm	lbs.	lbs.		lbs.	lbs.	lbs.	CRR*
1	1.315	33.4	1.097	27.9	0.109	2.77	1.405	1.814	70	2065	2360	2459	11.4
1¼	1.660	42.2	1.442	36.6	0.109	2.77	1.807	2.514	61	2315	2645	2756	7.3
1½	1.900	48.3	1.682	42.7	0.109	2.77	2.087	3.049	61	2673	3055	3183	5.8
2	2.375	60.3	2.157	54.8	0.109	2.77	2.640	4.222	37	2051	2344	2442	4.7
2½	2.875	73.0	2.635	66.9	0.120	3.05	3.354	5.895	30	2226	2544	2651	3.5
3	3.500	88.9	3.260	82.8	0.120	3.05	4.336	7.949	19	1730	1977	2060	2.6
4	4.500	114.3	4.260	108.2	0.120	3.05	5.619	11.789	19	2242	2562	2669	1.6
5	5.563	141.3	5.295	134.5	0.134	3.40	7.780	17.309	13	2124	2427	2529	1.5
6	6.625	168.3	6.357	161.5	0.134	3.40	9.298	23.038	10	1953	2232	2325	1.0
8	8.625	219.1	8.249	209.5	0.188	4.78	16.960	40.086	7	2493	2849	2968	2.1

SCHEDULE 40 WEIGHTS AND DIMENSIONS

NPS	NOMINAL OD		NOMINAL ID		NOMINAL WALL		WT./FT.	WT./FT. H_2O FILLED	PCS./LIFT	WT./LIFT 21'	WT./LIFT 24'	WT./LIFT 25'	UL
	in.	mm	in.	mm	in.	mm	lbs.	lbs.		lbs.	lbs.	lbs.	CRR*
1	1.315	33.4	1.049	26.6	0.133	3.38	1.68	2.055	70	2470	2822	2940	1.000
1¼	1.660	42.2	1.380	35.1	0.140	3.56	2.27	2.922	51	2431	2778	2894	1.000
1½	1.900	48.3	1.610	40.9	0.145	3.68	2.72	3.602	44	2513	2872	2992	1.000
2	2.375	60.3	2.067	52.5	0.154	3.91	3.66	5.109	24	1845	2108	2196	1.000
2½	2.875	73.0	2.469	62.7	0.203	5.16	5.80	7.871	20	2436	2784	2900	1.000
3	3.500	88.9	3.068	77.9	0.216	5.49	7.58	10.783	13	2069	2365	2464	1.000
3½	4.000	101.6	3.548	90.1	0.226	5.74	9.12	13.400	10	1915	2189	2280	1.000
4	4.500	114.3	4.026	102.3	0.237	6.02	10.80	16.311	10	2268	2592	2700	1.000
5	5.563	141.3	5.047	158.2	0.258	6.55	14.63	23.262	7	2151	2458	2560	1.000
6	6.625	168.3	6.065	154.1	0.280	7.11	18.99	31.498	5	1994	2279	2374	1.000
8**	8.625	219.1	7.981	202.7	0.322	8.18	28.58	50.240	5	3001	3430	3573	1.000

** Calculated using Standard UL CRR formula, UL Fire Protection Directory, Category VIZY. The CRR is a ratio value used to measure the ability of a pipe to withstand corrosion. Threaded Schedule 40 steel pipe is used as the benchmark (value of 1.0).*

*** 8 NPS Schedule 40 is FM Approved but not UL Listed.*

WFS-081619

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A DIVISION OF ZEKELMAN INDUSTRIES

Standard Operating Procedure Installation and Extraction of the Vapor Pin®

Updated September 9, 2016

Scope:

This standard operating procedure describes the installation and extraction of the VAPOR PIN® for use in sub-slab soil-gas sampling.

Purpose:

The purpose of this procedure is to assure good quality control in field operations and uniformity between field personnel in the use of the VAPOR PIN® for the collection of sub-slab soil-gas samples or pressure readings.

Equipment Needed:

- Assembled VAPOR PIN® [VAPOR PIN® and silicone sleeve(Figure 1)]; Because of sharp edges, gloves are recommended for sleeve installation;
- Hammer drill;
- 5/8-inch (16mm) diameter hammer bit (hole **must** be 5/8-inch (16mm) diameter to ensure seal. It is recommended that you use the drill guide). (Hilti™ TE-YX 5/8" x 22" (400 mm) #00206514 or equivalent);
- 1½-inch (38mm) diameter hammer bit (Hilti™ TE-YX 1½" x 23" #00293032 or equivalent) for flush mount applications;
- ¾-inch (19mm) diameter bottle brush;
- Wet/Dry vacuum with HEPA filter (optional);
- VAPOR PIN® installation/extraction tool;
- Dead blow hammer;
- VAPOR PIN® flush mount cover, if desired;
- VAPOR PIN® drilling guide, if desired;
- VAPOR PIN® protective cap; and
- VOC-free hole patching material (hydraulic cement) and putty knife or trowel for repairing the hole following the extraction of the VAPOR PIN®.

Figure 1. Assembled VAPOR PIN®

Installation Procedure:

1) Check for buried obstacles (pipes, electrical lines, etc.) prior to proceeding.

2) Set up wet/dry vacuum to collect drill cuttings.

3) If a flush mount installation is required, drill a 1½-inch (38mm) diameter hole at least 1¾-inches (45mm) into the slab. Use of a VAPOR PIN® drilling guide is recommended.

4) Drill a 5/8-inch (16mm) diameter hole through the slab and approximately 1-inch (25mm) into the underlying soil to form a void. Hole **must** be 5/8-inch (16mm) in diameter to ensure seal. It is recommended that you use the drill guide.

5) Remove the drill bit, brush the hole with the bottle brush, and remove the loose cuttings with the vacuum.

6) Place the lower end of VAPOR PIN® assembly into the drilled hole. Place the small hole located in the handle of the installation/extraction tool over the vapor pin to protect the barb fitting, and tap the vapor pin into place using a dead blow hammer (Figure 2). Make sure the installation/extraction tool is aligned parallel to the vapor pin to avoid damaging the barb fitting.

Figure 2. Installing the VAPOR PIN®

During installation, the silicone sleeve will form a slight bulge between the slab and the VAPOR PIN® shoulder. Place the protective cap on VAPOR PIN® to prevent vapor loss prior to sampling (Figure 3).

Figure 3. Installed VAPOR PIN®

7) For flush mount installations, cover the vapor pin with a flush mount cover, using either the plastic cover or the optional stainless-steel Secure Cover (Figure 4).

Figure 4. Secure Cover Installed

8) Allow 20 minutes or more (consult applicable guidance for your situation) for the sub-slab soil-gas conditions to re-equilibrate prior to sampling.

9) Remove protective cap and connect sample tubing to the barb fitting of the VAPOR PIN®. This connection can be made using a short piece of Tygon™ tubing to join the VAPOR PIN® with the Nylaflow tubing (Figure 5). Put the

Nylaflow tubing as close to the VAPOR PIN® as possible to minimize contact between soil gas and Tygon™ tubing.

Figure 5. VAPOR PIN® sample connection

10) Conduct leak tests in accordance with applicable guidance. If the method of leak testing is not specified, an alternative can be the use of a water dam and vacuum pump, as described in SOP Leak Testing the VAPOR PIN® via Mechanical Means (Figure 6). For flush-mount installations, distilled water can be poured directly into the 1 1/2 inch (38mm) hole.

Figure 6. Water dam used for leak detection

11) Collect sub-slab soil gas sample or pressure reading. When finished, replace the protective cap and flush mount cover until the next event. If the sampling is complete, extract the VAPOR PIN®.

Extraction Procedure:

1) Remove the protective cap, and thread the installation/extraction tool onto the barrel of the VAPOR PIN® (Figure 7). Turn the tool clockwise continuously, don't stop turning, the VAPOR PIN® will feed into the bottom of the installation/extraction tool and will extract from the hole like a wine cork, DO NOT PULL.

2) Fill the void with hydraulic cement and smooth with a trowel or putty knife.

Figure 7. Removing the VAPOR PIN®

- Prior to reuse, remove the silicone sleeve and protective cap and discard. Decontaminate the VAPOR PIN® in a hot water and Alconox® wash, then heat in an oven to a temperature of 265° F (130° C) for 15 to 30 minutes. For both steps, **STAINLESS – ½ hour, BRASS 8 minutes**

3) Replacement parts and supplies are available online.

Using Vapor Pins® for Pressure Field Extension Testing

Vapor Pins® are widely used for Pressure Field Extension (PFE) tests of radon and vapor-mitigation systems. The PFE test (also called a "Suction Field Extension Test" or "Communication Test") ensures that a sub-slab depressurization (SSD) system creates sufficient vacuum everywhere beneath a floor. PFE testing is essential for proper system design and installation, and periodic testing in subsequent years verifies that the SSD continues to operate within specified limits. A common approach to measuring subslab vacuum is to drill a hole in the slab, jam a manometer into the hole, and take a reading, while running a radon fan or shop vacuum at the suction pit. Unfortunately, it can be difficult to form a tight seal between the manometer and the slab, and the test hole cannot be left open for subsequent testing.

A better approach for PFE testing is to measure the sub-slab vacuum through a Vapor Pin®. The Vapor Pin® provides a tight seal against the slab, and with the Vapor Pin® Cap in place, prevents the loss of soil gas to indoor air. The Vapor Pin® can be left in place indefinitely for subsequent measurements, or removed and reused elsewhere. For radon testing, the Vapor Pin® can be reused by simply cutting off and replacing the silicone sleeve between holes. For vapor-intrusion use, the Vapor Pin® should also be decontaminated before moving it to a different location.

For conducting PFE tests during pilot testing, the Vapor Pin® can be installed in the stick-up configuration, which requires drilling a 5/8-inch diameter hole in the slab. If the Vapor Pin® will be left in place for subsequent testing, it is typically installed in the flush-mount configuration, so that it doesn't pose a trip hazard. The flush-mount installation requires drilling a 1-1/2 diameter inch hole and a 5/8-inch diameter hole. The flush-mount Vapor Pin® may be covered with Cox-Colvin's stainless steel Secured Cover, which reduces the risk of tampering, or a black plastic Flush Mount Cover, which is more economical. We recommend using brass Vapor Pins® for one-time use, such as pilot testing, and stainless steel Vapor Pins® if points will be left in place for subsequent testing.

Using Vapor Pins® for Vapor-Intrusion Assessments

The Vapor Pin® has a number of applications, but it was designed to collect soil gas for vapor-intrusion assessments, and it does it well. The soil gas directly beneath a building floor, "subslab" soil gas, best represents the risk of vapor-intrusion, because it is the next closest thing to indoor air. But unlike indoor air, subslab soil gas generally does not contain background contamination from indoor or outdoor sources. Subslab soil gas more representative of indoor conditions than deep soil gas, and it's easier to collect using hand-held equipment.

Subslab soil gas is normally collected prior to sampling indoor air. One or more Vapor Pins® are installed by drilling 5/8-inch holes through the floor with a hammer drill, and installing them, as described in the Standard Operating Procedure (SOP) _____. For a one-time sampling event, one can use brass Vapor Pins® installed in the stick-up configuration. If repeat sampling is needed, we recommend installing stainless-steel Vapor Pins® in the flush-mount configuration.

After installing the Vapor Pin® and allowing soil gas to equilibrate for two hours or more, connect the Summa canister, TO-17, or other sample container to the Vapor Pin®, purge the dead space in the sample train, and collect the sample, as described in the SOP _____. As discussed in the memorandum "Using Vapor Pins® for Source Characterization", vapor sources are often located away from obvious locations, such as buried tanks and degreasing areas, so we recommend conducting field screening at additional locations when working near potential source areas.

Always follow the appropriate guidance when assessing vapor intrusion. Some regulatory agencies allow or encourage the use of the Vapor Pin®, but some guidance might preclude the use of some devices.

APPENDIX I
SITE MANAGEMENT FORMS

Former Union Wire Die Corp.
39-40 30th Street, Queens, New York
BCP: C241163

Active Sub Slab Depressurization System (SSDS) Annual Inspection Form

39-40 30th Street, Long Island City, Queens, New York

BCP Site No. C241163

Inspection	Branch 1	Branch 2	Branch 3	Branch 4	Comments
Are the SSDS fans (blowers) operational and air discharging?					
Is there any visual damage to the roof top SSDS equipment?					
Are associated piping clamps and seals near fans intact and properly sealed?					
Are there any blockages in the SSDS piping?					
Are there any holes, cracks or other physical deficiencies in SSDS Piping?					
Are the SSDS manometer u-tube devices measuring pressure at each Branch riser?					
Is the pressure measurement at or below -0.1 in w.c.?					
Are the SSDS alarms for each branch functioning properly?					

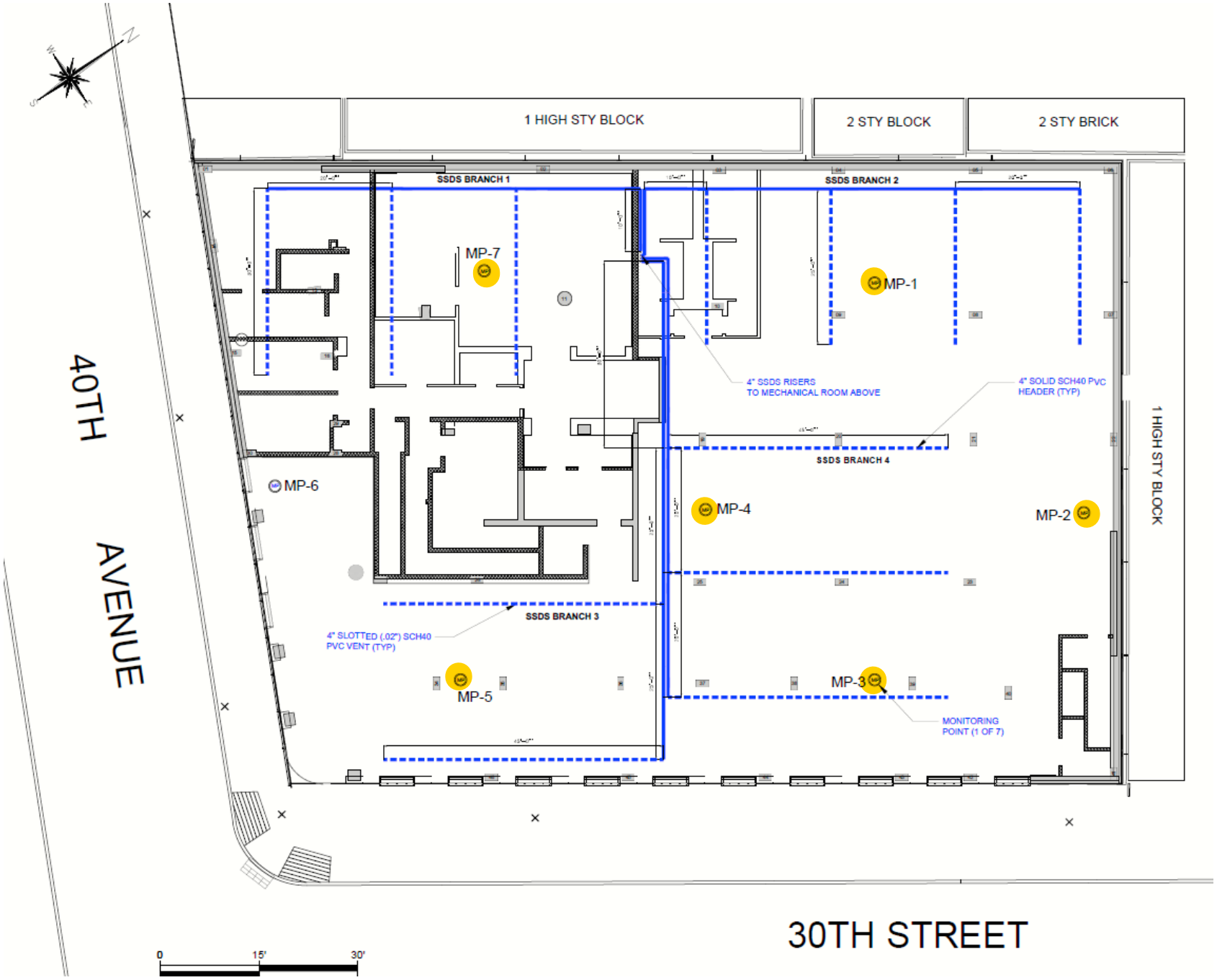
This form must be signed by the inspector qualified to perform the annual inspection:

Name of Inspector: _____

Signature of Inspector: _____

Date of Inspection: _____

SSDS Monitoring Point Pressure Measurement Locations:



SSDS Monitoring Point Measurements:

Monitoring Point Identification	Time	PID Reading (ppm)	Manometer Measurement (in w.c.)	Monitoring Point Condition/Comments
MP-1				
MP-2				
MP-3				
MP-4				
MP-5				
MP-6				
MP-7				

Site Cover/Cap System Inspection

Inspection Date: _____

Inspector's Name/Title: _____

Weather Conditions: _____

Inspection Items		Yes	No	Comments
1. Land Use	Has site land use changed or been altered?			
	If so, Has Site Cap been affected?			
2. Vegetation	Is there vegetation present on the Site and if so has the integrity of the cap been impacted?			
	Is corrective action required?			
3. Cap Integrity	Has cover material been disturbed and if so what is cause of disturbance?			
	Has the underlying material been exposed?			
	What is the extent of damage?			
4. Repairs	Identify areas where repairs have been made and cause of the repair?			

Take photos representing the Site cap.

APPENDIX J
REMEDIAL SYSTEM OPTIMIZATION (RSO)

Former Union Wire Die Corp.
39-40 30th Street, Queens, New York
BCP: C241163

REMEDIAL SYSTEM OPTIMIZATION FOR

Former Union Wire Dye Corp.

39-40 30th Street,

Long Island City, NY 11101

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