MOVE YOUR ENVIRONMENT FORWARD

SITE CHARACTERIZATION WORK PLAN – ADDENDUM

11-24 Wyckoff Avenue – Site #241255
11-24 Wyckoff Avenue
Queens, New York 11385

Prepared For:

Contract# D009808, Work Assignment No. 35
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, New York 12233-7012

Prepared By:

HRP Associates, Inc.
1 Fairchild Square, Suite 110
Clifton Park, NY 12065

HRP #: DEC1035.P3

Issued On: August 16, 2023

TABLE OF CONTENTS

Figures

Tables

Attachments

General Information

Project/Site Information:

11-24 Wyckoff Avenue Site
11-24 Wyckoff Avenue
Queens, New York
DEC Site ID #241255

Consultant Information:

HRP Associates, Inc.
1 Fairchild Square, Suite 110
Clifton Park, NY 12065
Phone: 518-877-7101
Fax: 518-877-8561
E-mail: Patrick.Montuori@hrpassociates.com
Project Number: DEC1035.P2

Client Information:

Contract# D009808-35
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, New York 12233-7017

Report Date: 8/16/2023

Report Author:

Elliott Jackson
Project Consultant

Project Manager:

Patrick Montuori, P.G.
Project Manager

QEP Certification:

I, Patrick Montuori, certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.

Patrick Montuori - Project Manager

List of Acronyms

amsl	Above Mean Sea Level
AOC	Area of Concern
CAMP	Community Air Monitoring Program
CO	Carbon Monoxide
CVOC	Chlorinated Volatile Organic Compounds
ELAP	Environmental Laboratory Approval Program
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
FAP	Field Activities Plan
ft bg	Feet Below Grade
GBT	Gallagher Bassett Technical Services
HASP	Site-Specific Health and Safety Plan
HRP	HRP Associates, Inc.
H_2S	Hydrogen Sulfide
IDW	Investigation Derived Waste
LEL	Lower Explosive Limit
MTA	Metro Transit Authority
NTU	Nephelometric Turbidity Units
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
O_2	Oxygen
PCB	Polychlorinated Biphenyls
PCE	Tetrachloroethene
PFAS	Per- and Polyfluoroalkyl Substances
PID	Photoionization Detector
QAPP	Quality Assurance Protection Plan
REC	Recognized Environmental Conditions
RRSCO	Restricted Residential Use Soil Cleanup Objectives
SC	Site Characterization
SCG	NYSDEC Standards, Criteria and Guidance
SCR	Site Characterization Report
SVI	Soil Vapor Intrusion
SVOC	Semi-Volatile Organic Compounds
SSDS	Sub-Slab Depressurization System
1,1,1-TCA	1,1,1-Trichloroethane
TAL	Target Analyte List
TCE	Trichloroethene
TCL	Target Compound List
TOGS	Technical Operational Guidance Series
UST	Underground Storage Tank
UUSCO	Unrestricted Use Soil Cleanup Objectives
VOC	Volatile Organic Compounds
WA	Work Assignment
WCD	WCD Group

1.0 INTRODUCTION

On May 16, 2022, HRP Associates, Inc. (HRP) was authorized to complete New York State Department of Environmental Conservation (NYSDEC) Work Assignment (WA) No. 35 (D009808-35) for Site Characterizations (SC) at P-Sites located in Region 2 (New York, New York). This Work Plan Addendum summarizes Site-specific background information and a scope of work for the 11-24 Wyckoff Avenue SC (Site No. 241255). This document is intended to supplement information provided in the Generic Region 2 P-Site Work Plan dated August 8, 2022. The scope of work for the 11-24 Wyckoff Avenue SC, discussed herein, was developed based on HRP's review of previous investigations conducted between 2018 and 2020, as well as discussions and planning with NYSDEC staff.

1.1 Site Description and Background Information

The 11-24 Wyckoff Avenue Site (the Site) is located at 11-24 Wyckoff Avenue in the Ridgewood section of Queens, New York (Block 3542, Lot 50). The Site location is depicted in **Figure 1**. The Site and the proposed on-site and off-site investigation locations are depicted in **Figure 2A** and **Figure 2B**. The 0.34-acre Site is occupied by one single story "U"-shaped building, totaling approximately 12,900 square feet. The building consists of two large open spaces, several offices, and two partial basements on the southeastern and southwestern portions of the building. A paved driveway is located in the center of the northern portion of the Site. The Site is serviced by municipal water and sewer.

Historic Site operations included residential use from as early as 1902, a garage from 1914 to 1950, and a knitting mill/textile manufacturing facility from 1958 to 2018. The Site has been vacant since 2018. The current Site building was constructed in 1958 and has been occupied by Val Bee Knitting Mills Inc., from 1958 to 1983, Tavin Knitting Mills Inc., beginning in 1983, and Hakos Knits Inc., beginning in 2000. The Site was also occupied by Woodward Finishing Incorporated in 2014 and Olivia Finishing Incorporated from at least 2014 to 2017.

The Site is zoned M-1-4, a light manufacturing zoning district. Properties surrounding the Site are a mix of industrial, commercial, and residential use. A Metropolitan Transit Authority (MTA) subway line (L-Train 14th Street – Canarsie) runs under the Site and along Wyckoff Avenue as depicted in **Figure 2A** and **Figure 2B**. At present the areas surrounding the Site include:

- North: Wyckoff Avenue, a self-storage facility, residential properties (60 feet), a daycare center (75 feet), and industrial properties including an auto repair shop (235 feet).
- South: Industrial properties, Cooper Avenue, residential properties (320 feet) Wolf-Alport Chemical Company – NYSDEC Site (#241180), an Environmental Protection Agency (EPA) National Priority List (NPL) Site (380 feet).
- East: A lot used for car and con-ex box storage, a Long Island Railroad (LIRR) elevated railway, and Evergreen Cemetery.
- West: Residential properties (20 ft), industrial properties, and Decatur Street.

The area surrounding the Site has historically included several commercial and industrial uses including at adjoining properties located south of the Site (formerly gasoline storage, a knitting mill, manufacturing, and tow truck company) and east of the Site (formerly a filling station, automotive

repair, laundry, and oil distribution). Current and historic property use at the Site and surrounding area are summarized in **Table 1** and depicted in **Figure 3**.

1.2 Site Geology and Hydrogeology

The Site is relatively flat and lies at an elevation of approximately 80 feet above mean sea level (ft amsl). Regional topography slopes west towards the East River.

The United States Geological Survey (USGS) "Bedrock and Engineering Geologic Maps of New York County and Parts of Kings and Queens Counties, New York, and Parts of Bergen and Hudson Counties, New Jersey" indicate the bedrock underlying the Site is part of the Hartland Formation, a mica-schist and quartz feldspar granulite. Bedrock is overlain by unconsolidated till moraine deposits belonging to the Upper Cretaceous Monmouth Group, Matawan Group, and Magothy Formation and consisting of silty clay, glauconitic sandy clay, sand, and gravel (Fisher et al., 1970). Bedrock has not been encountered in any on-site investigations conducted to date.

Based on soil borings installed during previous investigations, WCD Group (WCD) identified the upper 6-8 feet of soils as historic fill material consisting of brown fine sand with varying amounts of medium sand, brick, and building debris. Native soils underlying historic fill were described by WCD as brown medium to fine sand with trace gravel.

During previous investigations, groundwater was encountered at a depth of approximately 62 feet below grade (ft bg) at the Site. Groundwater flow direction beneath the Site has not been determined by previous investigations. A Record of Decision for the Wolff-Alport Chemical Company Site (#241180) located approximately 380 feet south of the Site boundary indicated that groundwater beneath that site flows south.

1.3 Previous Investigations and Remedial Actions

In preparation of this work plan HRP reviewed the following previous investigation reports and work plans:

- Phase I Environmental Site Assessment (ESA), prepared by WCD, dated July 2018.
- Phase II ESA, prepared by WCD, dated December 2018 (field work completed August and October 2018).
- Tank Closure Report, prepared by Gallagher Bassett Technical Services (GBTS), dated March 2020 (tank removal performed June 2019).
- Sub-Slab Depressurization System (SSDS) Completion Report, prepared by GBTS, dated June 10, 2022.

In 2018 WCD conducted a Phase I ESA for the Site at 11-24 Wyckoff Avenue. The Phase I ESA identified the following recognized environmental conditions (RECs):

- Potential impacts from a 2,000-gallon fuel oil underground storage tank (UST). According to available records reviewed for the Phase I ESA, leak testing was not performed on the tank since its installation.

- Former commercial uses of the subject property (as a garage and knitting mill), adjoining properties (a former filling station at the eastern adjoining property) and the surrounding area (several filling stations, automotive repair facilities, and industrial/manufacturing facilities).

In 2018 WCD conducted a Phase II ESA to investigate the RECs and to evaluate both the soil and soil vapor beneath the Site. The Phase II ESA was conducted in two mobilizations taking place in August and December 2018. WCD conducted the following activities as part of the investigation:

- Installation of 15 soil borings to depths ranging from 3 to 15 ft bg.
- Continuous screening of soils using a photoionization detector (PID).
- Collection of 15 soil samples for laboratory analysis. Soil samples SB-01 through SB-05 were analyzed for volatile organic compounds (VOCs) via EPA Method 8260, and semivolatile organic compounds (SVOCs) via EPA Method 8270. Samples SB-06 through SB-09, and HB-01 through HB-04 were analyzed for halogenated compound list VOCs only.
- Installation, development, and sampling of one monitoring well in the center portion of the Site building with a screen interval of 40 to 70 ft bg. One groundwater sample was collected from the well and analyzed for VOCs via EPA Method 8260.
- The installation of four sub-slab soil vapor points at a depth of 16 inches below the concrete slab. The duration of the soil vapor samples were two hours and were analyzed for VOCs via EPA Method TO-15.

Based on the data collected during the Phase II ESA, WCD found the following:

- No field evidence of petroleum impacts was encountered in soil borings installed in the vicinity of the 2,000-gallon fuel oil UST. No VOCs were detected at concentrations exceeding laboratory reporting limits in any of the 15 soil samples collected with the exception of trace concentrations of the chlorinated volatile organic compounds (CVOCs) tetrachloroethene (PCE), 1,1,1- trichloroethane (1,1,1-TCA), and chloroform detected in samples collected from SB-06 and SB-07 in the central portion of the Site building. The samples were collected in the vicinity of floor drains at depths of 4-5 ft bg. CVOCs were not detected in soils at concentrations exceeding Unrestricted Use Soil Cleanup Objectives (UUSCOs). Soil boring locations and soil analytical results are depicted in **Figure 4.**
- The CVOCs PCE, trichloroethene (TCE), and 1,1,1-TCA were detected in sub-slab soil vapor samples collected within the building. In the sub-slab soil vapor samples SV-03 and SV-04, collected beneath the southeastern and southern-central portions of the building, PCE was detected at concentrations at which New York State Department of Health (NYSDOH) Soil Vapor/Indoor Air matrices recommend mitigation regardless of indoor ambient air quality. The source of the CVOC impacts to Site soil vapor have not been identified based on data collected to date. Soil vapor point locations and analytical results are depicted in **Figure 5**.
- Groundwater analytical results indicate the CVOCs PCE (150 ug/L) and TCE (5.3 ug/L), and petroleum-related VOC toluene (11 ug/L) were detected at concentrations exceeding the Technical Operational Guidance Series (TOGS) 1.1.1 Class GA criteria (5 ug/L) in monitoring well MW-01. Other CVOCs were detected in the groundwater sample at concentrations not exceeding TOGS 1.1.1 Class GA criteria. The source of CVOC impacts to Site groundwater have not been identified based on data collected to date. The location of MW-01 and a

summary of VOC concentrations exceeding TOGS 1.1.1 Class GA criteria are depicted in **Figure 5**.

In 2020, GBTS completed a tank closure report for the 2,000-gallon UST identified during the Phase I ESA. The tank excavation and closure in-place included the following activities performed in June 2019:

- The UST was uncovered at an approximate depth of 3.58 ft bg.
- 145 gallons of an oil-water mixture were pumped from the tank for off-site disposal as non-hazardous waste. No holes were observed in the tank after the material was removed.
- Eight holes were cut in the walls and base of the tank for confirmatory excavation wall and base soil sampling. A total of eight soil samples were collected for laboratory analysis of CP-51 list VOCs via EPA Method 8260.
- The tank was filled with 10 yards of concrete and the excavation was graded level with the surface using clean fill.

Following completion of closure activities, the UST was registered with the NYSDEC as "closed in-place". No evidence of petroleum release or petroleum impacts to soil were observed during tank closure activities. Petroleum related CP-51 list VOCs were not detected in any of the soil samples collected. SVOCs were detected at concentrations exceeding UUSCOs and Restricted Residential Use Soil Cleanup Objectives (RRSCOs) in five of the eight confirmation samples. WCD attributed the SVOC detections in soil to historic fill material based on the lack of gross petroleum impacts.

In 2022, GBTS completed the installation a SSDS to address CVOC contamination discovered in soil vapor beneath the Site. The SSDS consists of three systems which depressurize the slab-on-grade and basement portions of the building. The slab-on-grade systems utilize horizontal sub-slab piping embedded in a crushed stone layer and overlain by a vapor barrier. The basement systems consist of a series of suction pits. The system includes vapor monitoring points, visual pressure indicators installed on SSDS risers, and audible alarms. The SSDS layout is depicted in **Figure 2A**. Start-up testing conducted on February 8, 2022, found a vacuum of 0.004 inches of water column (IWC) or greater was present at each of 8 sub-slab monitoring points, confirming the building was adequately depressurized. An Operations and Maintenance (O&M) Manual attached to the report outlines procedures for routine inspections (which include annual vacuum measurements from sub-slab monitoring points), non-routine maintenance, and reporting requirements to ensure and document the efficacy of the SSDS.

1.4 Areas of Concern

It is unknown if chlorinated solvents were used on-site; however, solvents including PCE and TCE have historically been used in textile manufacturing and knitting mills in processes such as fabric dry cleaning, wool scouring, and fabric finishing as well as in the cleaning of machinery such as rollers and spinning machines. Analytical results from sub-slab soil vapor samples collected in previous investigations indicate that CVOCs are present in groundwater and soil vapor at concentrations exceeding NYSDEC Standards, Criteria and Guidance values (SCGs) (**Figure 5**). Although trace concentrations of CVOCs have been detected in shallow soils beneath the slab of the Site building (**Figure 4**), the source of the CVOC impacts identified in on-site soil vapor and groundwater has not been identified. On-site soil sampling completed to-date has targeted shallow native soils at depths

ranging from 2 to 15 ft bg, including soils in the vicinity of the UST, a sump, several floor drains, and the locations of soil vapor points where elevated CVOC concentrations were detected. Fill material directly beneath the slab (0-2 ft bg), which reportedly includes brick and building debris, has not been sampled to date. Based on elevated CVOC concentrations in sub-slab soil vapor (collected at a depth of 16 inches below the slab), and trace detections in sub-slab soil (4-5 ft bg), the shallow fill material may be the source of these detections. Although other potential on-site release areas were evaluated by previous investigations, including the loading dock area, the former sump, and former floor drains (believed to have been removed following installation of the SSDS), only limited soil sampling was performed (one sample interval per boring, generally at 4-5 ft bg). Therefore, additional sampling of shallow soils (which may have been impacted by a surface release) and soils at the invert depth of each drainage structure is warranted. Based on the layout of the building, the northeast-southwest running corridors of the "U"-shaped building were likely used as the production floor of knitting mills/textile factories which formerly occupied the Site. These corridor areas were not thoroughly evaluated by previous investigations, based on information provided to HRP. In addition, soil beneath 15 ft bg has not been characterized by previous investigations. Based on the presence of dissolved PCE in groundwater at MW-01, a source of PCE may be present in sub-slab soils above the water table (approximately 62 ft bg).

The property adjoining the Site to the south has historically operated as a knitting mill and textile manufacturing facility and may be a potential source of CVOC impacts. The property adjoining the Site to the east has historically operated as a laundry service. It is unknown if dry cleaning operations were ever performed on the property. Other current and historic properties surrounding the Site may represent additional sources (**Figure 3** and **Table 1**).

Based on previous investigations CVOCs may be migrating off-site through groundwater and soil vapor, however the extent of impacts to these media has not been delineated and groundwater flow direction has not been determined. Although groundwater flow direction has not been determined, regional groundwater data suggest flow direction is trending towards the south.

In summary, the following areas of concern (AOCs) were identified and require further investigation to characterize the nature and extent of the impacts and evaluate potential pathways of exposure:

- Potential on-site sources of CVOC impacts to groundwater and soil vapor require further characterization including:
    - Fill material directly beneath the slab (0-2 ft bg).
    - Former floor drains in the slab on-grade and eastern basement portions of the building.
    - Former sump located in the western basement.
    - The loading dock driveway.
    - The east and west corridors of the Site building which may have been part of the manufacturing production floor.
    - Deep on-site soils extending to the groundwater interface at 62 ft bg.
- Potential off-site sources of CVOC impacts to groundwater and soil vapor including the properties which adjoin the Site to the south and east and have historically operated as a knitting mill and laundry service respectively.
- The extent of CVOC impacts in groundwater and soil vapor beneath the surrounding area have not been delineated. CVOCs have the potential to migrate off-site through groundwater

and soil vapor. Exposure pathways to CVOCs in soil vapor may exist to off-site receptors including residential properties and a daycare to the north of the Site.

Additional AOCs warranting further characterization may be identified during the implementation of the SC.

2.0 SITE CHARACTERIZATION SCOPE OF WORK

In order to investigate the AOCs described above, HRP proposes the installation of shallow and deep soil borings to characterize soils and fill material beneath the slab of the building and in the loading dock area to determine if an on-site source of CVOC impacts exists. Groundwater monitoring wells and soil vapor points will be installed in the area surrounding the Site to delineate CVOC impacts, determine if impacts may be related to an off-site source, and identify potential impacts to off-site receptors. Sub-slab soil vapor intrusion (SVI) investigation will be completed in up to five off-site properties during the heating season, following groundwater and soil vapor investigations.

Proposed investigation locations are depicted in **Figures 2A** (on-site) and **Figure 2B** (off-site). Final locations will be determined in the field based on field observations and the GPR survey. Proposed soil boring, monitoring well, and exterior soil vapor point locations will be installed within a permissible distance from MTA subway infrastructure as determined based on boring depth and MTA restrictions. Due to MTA restrictions, groundwater monitoring wells and soil vapor points cannot be installed on Wyckoff Avenue to screen potential SVI exposure pathways to a daycare center and two residential properties north of the Site. Therefore, each of these properties will be solicited for SVI structure sampling as depicted in **Figure 2B**. Additional SVI investigation locations will be determined based on analytical results from groundwater and exterior soil vapor point sampling. Sample location justifications are presented in **Table 2**. Sample types and locations are summarized in **Table 3** and sample Quality Assurance/Quality Control (QA/QC) details (analyses, containers, hold times, etc.) are summarized in **Table 4**. A site-specific Health and Safety Plan (HASP) is provided in **Attachment A**. A Community Air Monitoring Plan (CAMP) that details procedures for air monitoring during intrusive activities is included in **Attachment B.**

The following sections provide specifics regarding the scope of work developed in support of a SC at 11-24 Wyckoff Avenue. The work is to be completed in general accordance with the generic Region 2 P-Site SC Work Plan dated August 29, 2022, and HRP's generic field activities plan (FAP), HASP, and Quality Assurance Project Plan (QAPP). Sample handling, decontamination procedures, and disposal of investigation derived waste (IDW) related to the scope of work below are to be performed in accordance with the above-referenced work plans. Sampling procedures for per- and polyfluoroalkyl substances (PFAS) are included in the Generic FAP and laboratory analytical methods and standard operating procedures are discussed in the QAPP included in the Region 2 P-Site SC Work Plan and the Generic QAPP for Work Assignments.

2.1 Permit Acquisition, Utility Clearance, and Ground Penetrating Radar (GPR) Survey

Prior to performing intrusive work, HRP will perform the following activities:

- Obtain all New York City Department of Transportation (NYCDOT) permits necessary to install soil borings, monitoring wells, and soil vapor points in the right-of-way (city sidewalks).
- Obtain approval and necessary permits from the MTA for soil borings/monitoring wells installed within 200 feet of MTA railways (including the LIRR elevated railway and the L-Train – Canarsie Subway line as shown in **Figure 2B**) located at the intersection of Wyckoff Avenue and Cooper Avenue.
- Call in underground utility clearance through NYS Code Rule 753/Dig Safe System.

- Complete a GPR survey of the Site property, including all accessible areas within the Site building. GPR and other utility tracing techniques (radio frequency and magnetometer) will be used to identify subsurface structures that may present pathways for contaminants to the subsurface. Additionally, GPR will be conducted within a 10-foot radius of each proposed boring location to ensure boring areas are clear of obstructions and identify any other potential AOCs.

2.2 Subsurface Soil Characterization

In order to delineate the extent of CVOC impacts to soils beneath the Site, HRP proposes the following activities:

- Up to 16 on-site soil borings will be installed using a direct push drill rig or similar, to collect continuous soil samples and characterize subsurface conditions from surface grade to a maximum completion depth of 70 ft bg. HRP will collect data to determine the characteristics of historic fill and native soils beneath the Site and the distribution of contamination in on-site soils. Soils will be collected with a macrocore sampler or similar in 5-foot intervals for descriptive characterization. All soil samples will be screened for volatile organic vapors using a PID, and any evidence of contamination will be noted and used for selection of soil samples. Proposed soil boring locations are depicted in **Figure 2A**, and sampling location justifications are presented in **Table 2**. Locations of proposed soil borings were selected outside of the zone of influence of the MTA L-Train Subway. Final locations of soil borings will be determined in the field based on field observations and results of the GPR survey to target subsurface structures and other potential AOCs.

    - Up to 12 on-site soil borings will be installed to a completion depth of approximately 10 ft bg to characterize shallow subsurface conditions beneath the Site. Each proposed shallow boring location was selected to be a minimum distance of 30 feet from subway infrastructure to meet MTA requirements. Up to two soil samples will be collected per shallow on-site soil boring for laboratory analysis. One soil sample per boring will be biased towards soil/fill immediately beneath the concrete slab (or asphalt pavement) at depths of approximately 0-2 ft bg. A second soil sample will be biased towards soil/fill exhibiting the greatest evidence of contamination (PID readings, staining, odors, etc.). If evidence of contamination is not observed, the second soil sample will be biased towards the approximate invert depth of floor drains, sumps, tanks, or other underground structures (if present), or the base of the soil boring.

    - Up to 4 on-site soil borings will be installed to a completion depth of approximately 70 ft bg to characterize subsurface conditions beneath the Site. Each proposed deep boring location was selected to be a minimum distance of 65 feet from subway infrastructure to meet MTA requirements. Up to 8 soil samples will be collected per deep on-site soil boring for laboratory analysis. One soil sample per boring will be biased towards soil/fill immediately beneath the concrete slab at a depth of approximately 0-2 ft bg. The remaining seven samples will be collected at a frequency of one sample per 10 ft of depth, biased towards soil exhibiting the greatest evidence of contamination, as described above.

- Up to 65 soil samples (56 regular samples, plus 3 duplicate, 3 matrix spike [MS], and 3 matrix spike duplicate [MSD] samples) will be submitted for laboratory analysis of Target Compound List (TCL) VOCs +10 via EPA Method 8260.

- Up to 10 soil samples (7 regular, 1 duplicate, 1 MS, and 1 MSD samples) will be collected and submitted for laboratory analysis for the following additional analyses:

    - TCL semivolatile organic compounds (SVOCs) +20 by EPA Method 8270
    - Target Analyte List (TAL) metals by EPA Method 6010B
    - Total mercury by EPA Method 9012
    - TCL polychlorinated biphenyls (PCBs) by EPA Method 8082
    - Chlorinated herbicides by EPA Method 8151
    - Pesticides by EPA Method 8081B
    - PFAS NYSDEC analyte list compounds by Draft EPA Method 1633

- Duplicate, MS, and MSD soil samples will be collected at a frequency of 1 per 20 regular samples.

- All on-site soil borings drilled through the building slab will be grouted with a Portland cement grout from the base of the boring to the base of sub-grade gravel installed with the SSDS. Clean gravel will be used as backfill above the Portland cement grout to allow air flow through the SSDS gravel layer. The slab will be repaired with hydraulic cement, poured equal in thickness to the existing building slab, and finished to grade.

2.3 Groundwater Characterization

In order to delineate the extent of CVOC impacts to groundwater beneath the Site and off-site area, and obtain groundwater flow information, HRP proposes the following activities:

- Install up to 5 permanent overburden groundwater monitoring wells in off-site locations to an estimated depth of 70 ft bg. Monitoring wells will be installed around the Site to determine groundwater flow direction and to screen for potential off-site CVOC contamination and receptors for contamination. Each proposed monitoring well location was selected to be a minimum distance of 65 feet from subway infrastructure to meet MTA requirements. For the purpose of determining depth to water, identifying potential impacts to groundwater quality and aquifer characteristics, soil samples will be collected continuously, logged, and screened using a calibrated PID during the installation of monitoring wells. Monitoring wells will be installed using the hollow stem auger (HSA) method and sampled continuously using a split spoon or macrocore sampler. Proposed monitoring well locations are depicted in **Figure 2B**. Final locations will be determined in the field based on the results of field screening. Sample location justifications are provided in **Table 2**.
- The wells will be constructed of 2-inch PVC riser and 10 feet of 2-inch PVC slotted screen, positioned to intersect the top of the water table. The annular space of each well will be backfilled with an appropriately sized sand pack and a bentonite seal. The wells will be

installed using flush-mounted protective casings and locking covers or a locking protective steel stick-up as appropriate.

- Develop the 5 monitoring wells. Each well will be developed by pumping and purging until the field parameters stabilize for a minimum of three consecutive readings of 10 percent variability or less. Field parameters will include temperature, pH, and specific conductance. In addition, the turbidity of the groundwater must achieve a reading of 50 Nephelometric Turbidity Units (NTUs) or less during the field parameter readings. All purged groundwater generated during well development and sampling will be characterized and disposed of in accordance with DER-10.
- Collect groundwater samples from each of the 5 newly installed monitoring wells and 1 existing on-site monitoring well (MW-1) for laboratory analysis. Groundwater samples will be collected in general accordance with low-flow groundwater sampling procedures.
- In the event that the existing on-site monitoring well has been abandoned, one grab groundwater sample will be collected from one deep soil boring installed on-site using a retractable steel screen in the direct push borehole. The grab groundwater sample will be collected from the groundwater table interface and analyzed for TCL VOCs +10 by EPA Method 8260.
- Up to 11 groundwater samples (6 regular, 1 duplicate, 1 MS, 1 MSD, 1 field blank, and 1 trip blank) will be analyzed for TCL VOCs +10 by Method 8260.
- Up to 6 groundwater samples (3 regular, 1 duplicate, 1 MS, and 1 MSD) will be analyzed for the following additional analyses:

    - TCL SVOCs +20 by EPA Method 8270
    - 1,4-dioxane by EPA Method 8270 SIM
    - TAL metals by EPA Method 6010B
    - Total mercury by EPA Method 9012
    - TCL PCBs by EPA Method 8082
    - Chlorinated herbicides by EPA Method 8151
    - Pesticides by EPA Method 8081B
    - PFAS NYSDEC analyte list compounds by EPA Method 1633

2.4 Soil Vapor Characterization

In order to delineate the extent of CVOC impacts to soil vapor in the off-site area, HRP proposes the following activities:

Exterior Soil Vapor Point Installation and Sampling

- Installation of up to 5 permanent soil vapor points, paired with monitoring wells in the area surrounding the Site. Locations for soil vapor monitoring points were determined based on subway infrastructure and to identify potential pathways for CVOC contamination migration. Justification for sampling locations is presented in **Table 2**. A direct push drill rig will be used to advance soil borings to a maximum depth of 10 ft bg. Soil vapor points are to be collocated with proposed monitoring wells. Proposed off-site soil vapor point locations are depicted in **Figure 2B**.
- For the purpose of identifying potential sources of impacts to soil vapor quality, soil samples will be collected continuously, logged, and screened using a calibrated PID.

- Soil vapor points are to be constructed using 6-inch steel screens and nylon, Teflon, or Teflon-lined tubing. Soil vapor points are to be backfilled with No. 0 filter sand and finished with a 2-foot bentonite seal and an 8-inch road box. Soil vapor points will be set at a depth of 10 ft bg.
- Soil vapor and outdoor air samples will be collected using 6-liter summa canisters fitted with 2-hour regulators and analyzed for VOCs via EPA Method TO-15.
- Up to 7 air samples (5 soil vapor, 1 duplicate soil vapor, and 1 outdoor air) will be analyzed for VOCs via EPA Method TO-15. Duplicate soil vapor samples will be collected at a frequency of one per 20 samples. Ambient outdoor air samples will be collected at a frequency of one sample per day.

Sub-Slab SVI Structure Sampling

- Completion of sub-slab SVI structure sampling at up to five off-site structures. Off-site structures will be selected based on analytical results from off-site soil vapor points and discussions with NYSDEC and NYSDOH. A daycare center identified to the north of the Site will be included in the properties solicited for off-site SVI investigations. Three properties north of the Site, including the daycare center mentioned above, will be solicited for SVI structure sampling due to MTA restrictions which prohibit installation of exterior soil vapor points and monitoring wells on that portion of Wyckoff Avenue.
- Sub-slab SVI structure sampling will be completed in accordance with NYSDOH's *Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006* and will include collection of sub-slab soil vapor samples and air samples and the completion of a NYSDOH Indoor Air Quality Questionnaire and Building Inventory.
- Sub-slab soil vapor points will be installed by advancing a ¼-inch drill bit immediately below the slab (anticipated one foot or less) using a handheld electric hammer drill. Sub-slab soil vapor points will be installed, leak tested, and sampled in accordance with NYSDOH's *Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006.*
- SVI air and sub-slab soil vapor samples will be collected using 6-liter summa canisters fitted with 8-hour (any building with only commercial property use) or 24-hour regulators (any building with residential use) and analyzed for VOCs via EPA Method TO-15.
- Up to 18 air samples (5 sub-slab, 5 first floor indoor air, 5 basement indoor air, 2 outdoor air, and 1 duplicate), will be analyzed for VOCs via EPA Method TO-15. Duplicate soil vapor samples will be collected at a frequency of one per 20 samples. Ambient outdoor air samples will be collected at a frequency of one sample per day.
- Paired sub-slab soil vapor/indoor air locations will be determined in the field at the time of the building inspection. Locations will be selected in accordance with Section 2.6.2 of the NYSDOH's *Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006*. Paired samples will be installed and collected in central locations away from building footing foundations and if possible, biased towards the Site/source of soil vapor impacts. Other factors which may impact SVI sample locations include presence of flooring (tile or wood flooring), building operations/traffic, and chemical storage locations.

Draft results from each soil vapor sampling event, including completed Indoor Air Quality Questionnaires and Building Inventories, and laboratory analytical data will be provided to the NYSDEC and NYSDOH on receipt. Final results will be provided to the NYSDEC and NYSDOH as part of the SC Report, discussed in **Section 2.8** below.

2.5 Survey of Investigation Locations

A topographic and property boundary survey of the Site property will be performed by a New York State licensed land surveyor. The field survey will include establishing project horizontal control and the collection of planimetric features for the development of 2D mapping. Locations and elevations of monitoring wells, soil vapor points, soil borings, and other pertinent Site features will be surveyed according to a horizontal and vertical datum. Coordinates and elevations provided to HRP by the surveyor will be plotted on an aerial image base map of the Site.

Monitoring well top of casing elevations will be surveyed according to a vertical datum to within an accuracy of plus or minus 0.01 feet. A notch will be etched in all interior casings, or a permanent black mark (as historically used), to provide a reference point for all future groundwater elevation measurements.

2.6 Analytical Data Quality Evaluation

As per the generic Region 2 P-Site SC Work Plan, all laboratory analysis will be completed by an Environmental Laboratory Approval Program (ELAP) laboratory selected by the NYSDEC. The selected laboratory will provide data deliverables in formats acceptable to the NYSDEC and data validator (NY ASP B and NYSDEC EQuIS formats). All laboratory data will be reviewed by a third-party data validator according to the requirements referenced in the generic Region 2 P-Site SC Work Plan and HRP's Generic QAPP.

2.7 Daily and Monthly Reports

HRP will prepare daily field activity reports to be submitted to the NYSDEC on a daily basis. Daily field activity reports document field conditions and included the following information:

- Date and weather.
- Listing of personnel on-site.
- A summary of work activities performed.
- A summary of field observations.
- A summary of CAMP data.
- A summary of waste generated.
- A summary of anticipated future work activities.

A monthly field activity report will be provided to the NYSDEC and will include a summary of field activities, findings (including analytical laboratory data received) and CAMP data from the previous month.

2.8 Site Characterization Report

The Site Characterization Report (SCR) will be prepared as part of this work assignment following completion of the field activities. The SCR will provide a description of the field activities, present

data collected during field characterization, present a physical description of the Site including geology and hydrogeology, and provide an analysis and interpretation of the available data in the context of existing Site conditions. The report will include tabulated laboratory analytical results, Site maps, and a discussion of contaminant concentrations, including a comparison to NYSDEC SCGs as described in Section 3.13 of DER-10.

The following New York State SCGs will be used for evaluation of analytical results:

- NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1); Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations dated October 1993; Revised June 1998; ERRATA Sheet dated January 1999; and Addendum dated April 2000, and proposed Addendum dated June 2021 (including proposed criteria for PFAS and 1,4-dioxane.

- NYSDEC Regulation, 6 NYCRR Subpart 375-6, "Remedial Program Soil Cleanup Objectives" which applies to the development and implementation of the remedial programs for soil and other media set forth in subparts 375-2 through 375-4 [Inactive Hazardous Waste Disposal Site Remedial Program, Brownfield Cleanup Program, and Environmental Restoration Program] and includes the soil cleanup objective tables developed pursuant to ECL 27-1415(6).

- NYSDOH Soil Vapor/Indoor Air Matrices dated 2017.

2.8.1 Redacted SCR

In the event that SVI or other investigation activities are performed on private property, two versions of the SCR will be submitted, a standard SCR, and a version in which addresses of off-site properties have been redacted.

2.9 Project Schedule

This SC will be performed according to the following time frames (includes estimated review times for reports by the Department), understanding that the schedule may compress as best as circumstances may allow. A summary table is included below.

CATEGORY	TASK	START	END
Task 1 – Preliminary Activities	Work Plan, QAPP, and HASP (Includes Department Review and Approval)	5/25/2023	9/15/2023
Task 2 – Investigation, Environmental Sampling, and Implementation	Off-site Property Access and NYCDOT, MTA, and LIRR Permit Acquisition (for Monitoring Well and Soil Vapor Point Installation)	8/10/2023	9/30/2023
	On-site and Off-site Soil Boring, Monitoring Well, and Soil Vapor Point Installation	10/02/2023	10/13/2023
	Off-site Property Access Acquisition and SVI Sampling (to be Completed During Heating Season)	11/15/2023	12/01/2023
Task 3 – Site Characterization Report (SCR)	Report Preparation and Submittal	09/01/2023	12/31/2023

3.0 REFERENCES

Caldwell, D.H., et.al., 1986, Surficial Geologic Map of New York, New York State Museum – Geological Survey, Map and Chart series No. 40.

Environmental Protection Agency, September 2017, Wolff-Alport Chemical Company, Record of Decision Superfund Site, Ridgewood, Queens County, New York.

Gallagher Bassett Technical Services, March 2020, Tank Closure Report - 11-24 Wyckoff Avenue.

Gallagher Bassett Technical Services, June 2022, Sub-Slab Depressurization System Completion Report – 11-24 Wyckoff Avenue.

New York State Department of Environmental Conservation, Division of Environmental Remediation, May 2010, DER-10 Technical Guidance for Site Investigation and Remediation.

New York State Department of Health, Center for Environmental Health, Bureau of Environmental Exposure Investigation, October 2006, Updated May 2017, Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York.

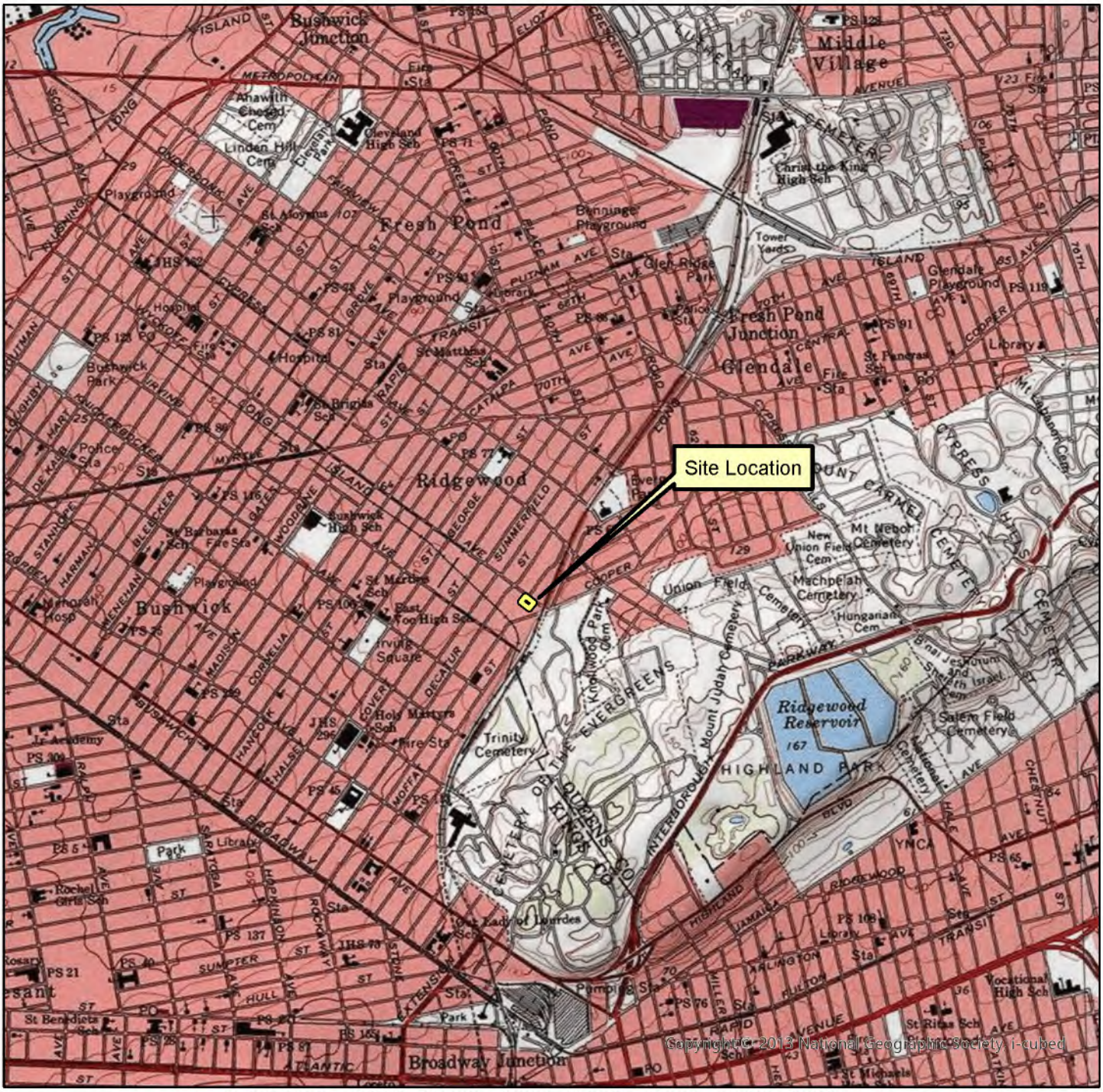
Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. http://websoilsurvey.sc.egov.usda.gov/. Accessed [7/6/2022].

United States Geological Survey, 1990, Bedrock and Engineering Geologic Maps of New York County and Parts of Kings and Queens Counties, New York, and Parts of Bergen and Hudson Counties, New Jersey.

WCD Group, July 2018, Phase I Environmental Site Assessment, 11-24 Wycoff Avenue.

WCD Group, December 2018, Phase II ESA, 11-24 Wycoff Avenue.

FIGURES



0 500 1,000 2,000 3,000 4,000 5,000 6,000 7,000 8,000

Feet

1:24,000

N

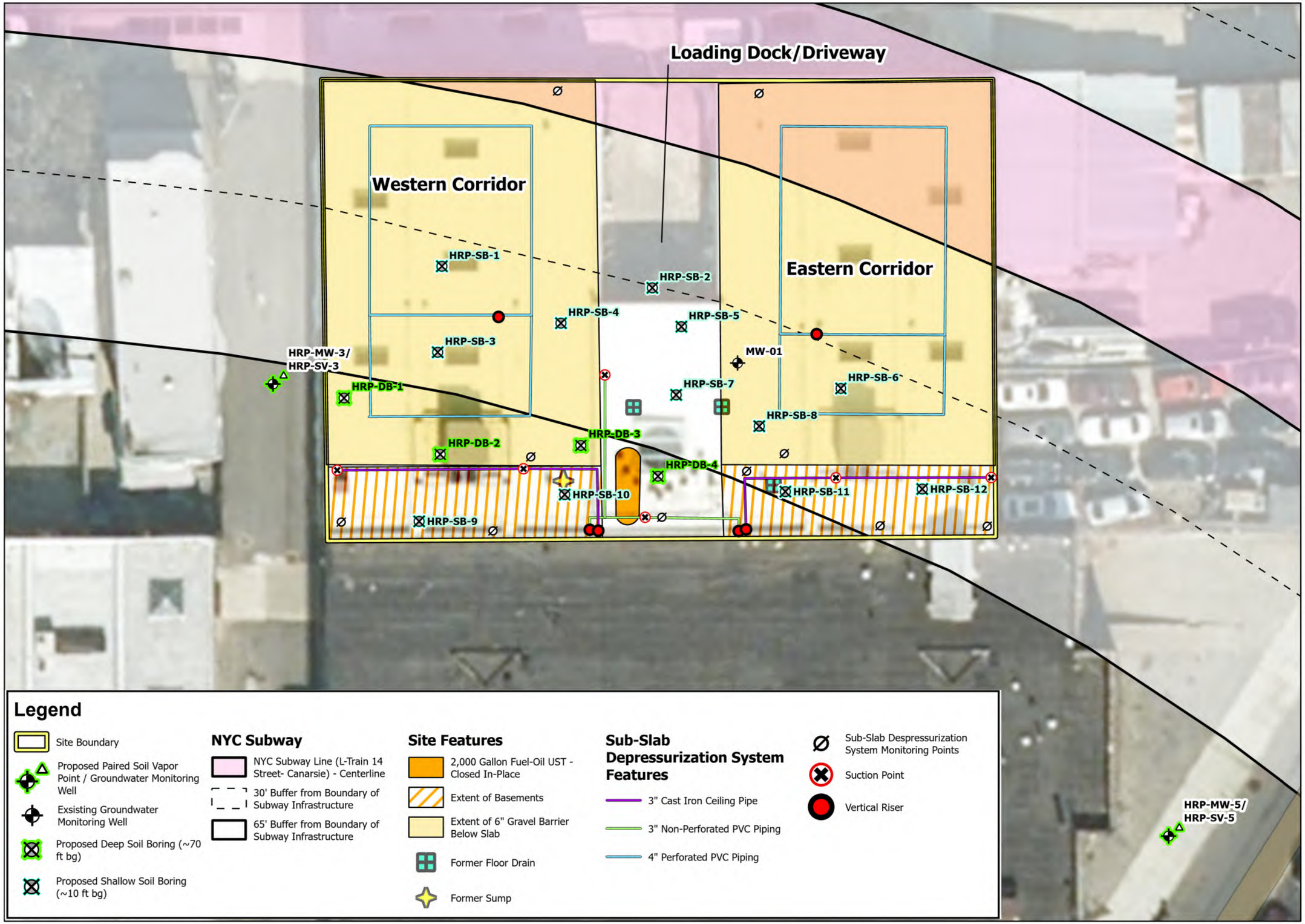
USGS Quadrangle Information
Quad ID: 40073-F3
Name: Jamaica, New York
Date Rev: 1976
Date Pub: 1979

Figure 1
Site Location
11-24 Wyckoff Avenue
Queens, New York
HRP # DEC1035.P2
Scale 1" = 2,000'

HRP
MOVE YOUR ENVIRONMENT FORWARD
ONE FAIRCHILD SQUARE
SUITE 110
CLIFTON PARK, NY 12065
(518) 877-7101
HRPASSOCIATES.COM

Path: S:\Data\N\NYDEC - NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION\NEW YORK\MULTIPLE SITE ADDRESS\DEC1035P2 - Region 2 P-Sites\GIS\wyckoff ave\wyckoff ave 1124\

Path: S:\Data\NNYDEC - NYSDEC\NEW YORK\MULTIPLE SITE ADDRESS\DEC1035P2 - Region 2 P-Sites\GIS\wyckoff ave\wyckoff ave 1124\wyckoff ave 1124.aprx



Legend

- Site Boundary
- Proposed Paired Soil Vapor Point / Groundwater Monitoring Well
- Exsisting Groundwater Monitoring Well
- Proposed Deep Soil Boring (~70 ft bg)
- Proposed Shallow Soil Boring (~10 ft bg)

NYC Subway

- NYC Subway Line (L-Train 14 Street- Canarsie) - Centerline
- 30' Buffer from Boundary of Subway Infrastructure
- 65' Buffer from Boundary of Subway Infrastructure

Site Features

- 2,000 Gallon Fuel-Oil UST - Closed In-Place
- Extent of Basements
- Extent of 6" Gravel Barrier Below Slab
- Former Floor Drain
- Former Sump

Sub-Slab Depressurization System Features

- 3" Cast Iron Ceiling Pipe
- 3" Non-Perforated PVC Piping
- 4" Perforated PVC Piping
- Sub-Slab Despressurization System Monitoring Points
- Suction Point
- Vertical Riser

HRP
MOVE YOUR ENVIRONMENT FORWARD
ONE FAIRCHILD SQUARE
SUITE 110
CLIFTON PARK, NY 12065
(518) 877-7101
HRPASSOCIATES.COM

North

0 10 20 Feet

Revisions						
No.						
Date						

Designed By: CMS

Drawn By: EWJ

Reviewed By: PWM

Issue Date: 8/10/2023

Project No: DEC1035.P2

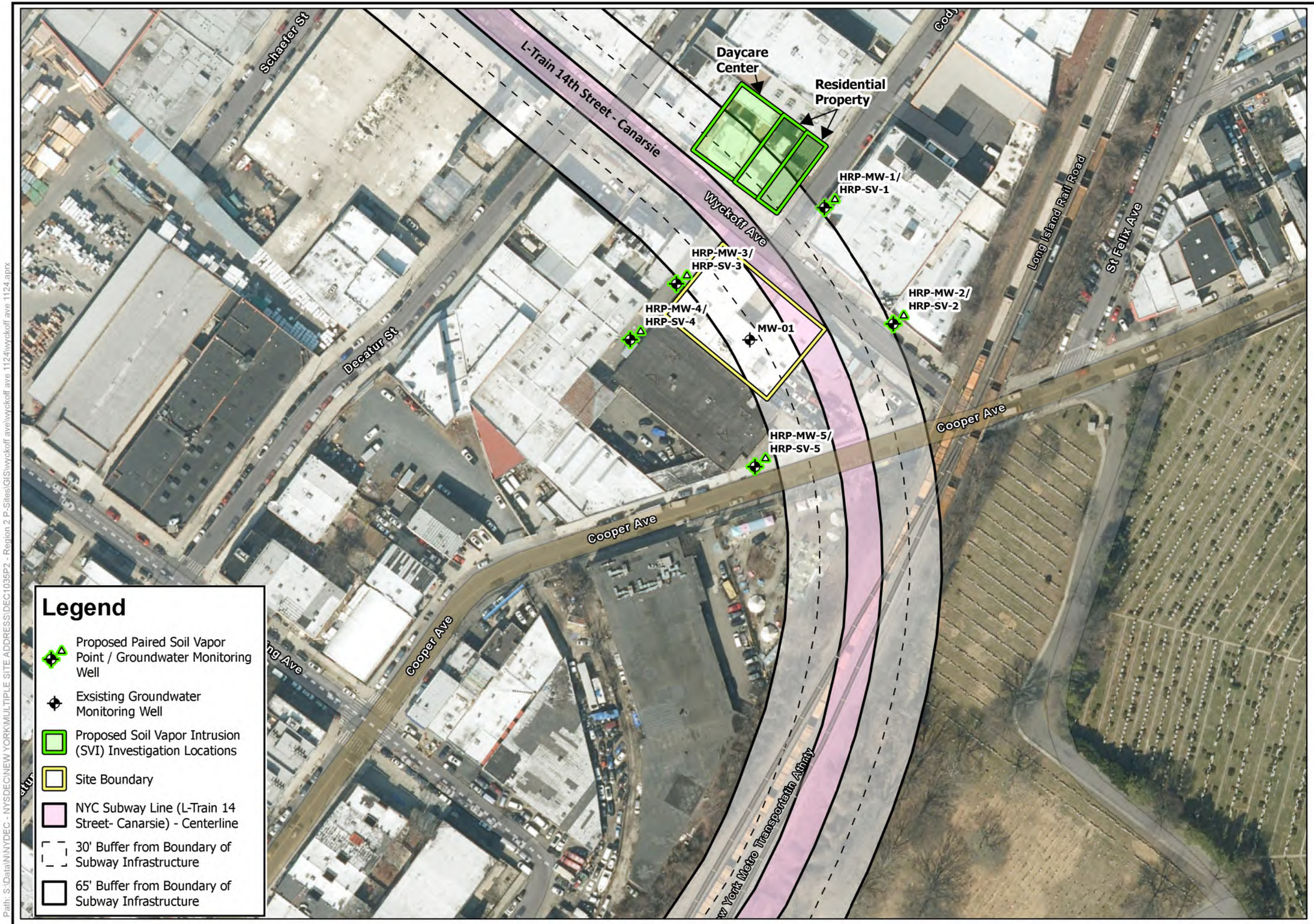
Sheet Size: 11x17

Site Plan and Proposed Investigation Locations - On-Site

11-24 Wyckoff Avenue Off-Site
NYSDEC Site #241255
11-24 Wyckoff Avenue
Queens, New York

Figure No.

2A



HRP
MOVE YOUR ENVIRONMENT FORWARD
ONE FAIRCHILD SQUARE
SUITE 110
CLIFTON PARK, NY 12065
(518) 877-7101
HRPASSOCIATES.COM

North

0 50 100
Feet

Revisions					
No.					
Date					

Designed By: CMS	Drawn By: EWJ	Reviewed By: PWM
Issue Date: 6/19/2023	Project No: DEC1035.P2	Sheet Size: 11x17

Site Plan and Proposed Investigation Locations - Off-Site

11-24 Wyckoff Avenue
NYSDEC Site #241255
11-24 Wyckoff Avenue
Queens, New York

Figure No.
2B

Path: S:\Data\NY\NYDEC - NYSDEC\NEW YORK\MULTIPLE SITE ADDRESS\DEC1035P2 - Region 2 P-Sites\GIS\wyckoff ave\wyckoff ave 1124\wyckoff ave 1124.aprx

Property of Interest map IDs correspond to Table 1.

Path: S:\Data\NY\DEC - NYSDEC\NEW YORK\MULTIPLE SITE ADDRESS\DEC1035P2 - Region 2 P-Sites\GIS\wyckoff ave\wyckoff ave 1124\wyckoff ave 1124.aprx

HRP
MOVE YOUR ENVIRONMENT FORWARD
ONE FAIRCHILD SQUARE
SUITE 110
CLIFTON PARK, NY 12065
(518) 877-7101
HRPASSOCIATES.COM

North

0 50 100 Feet

Revisions					
No.					
Date					

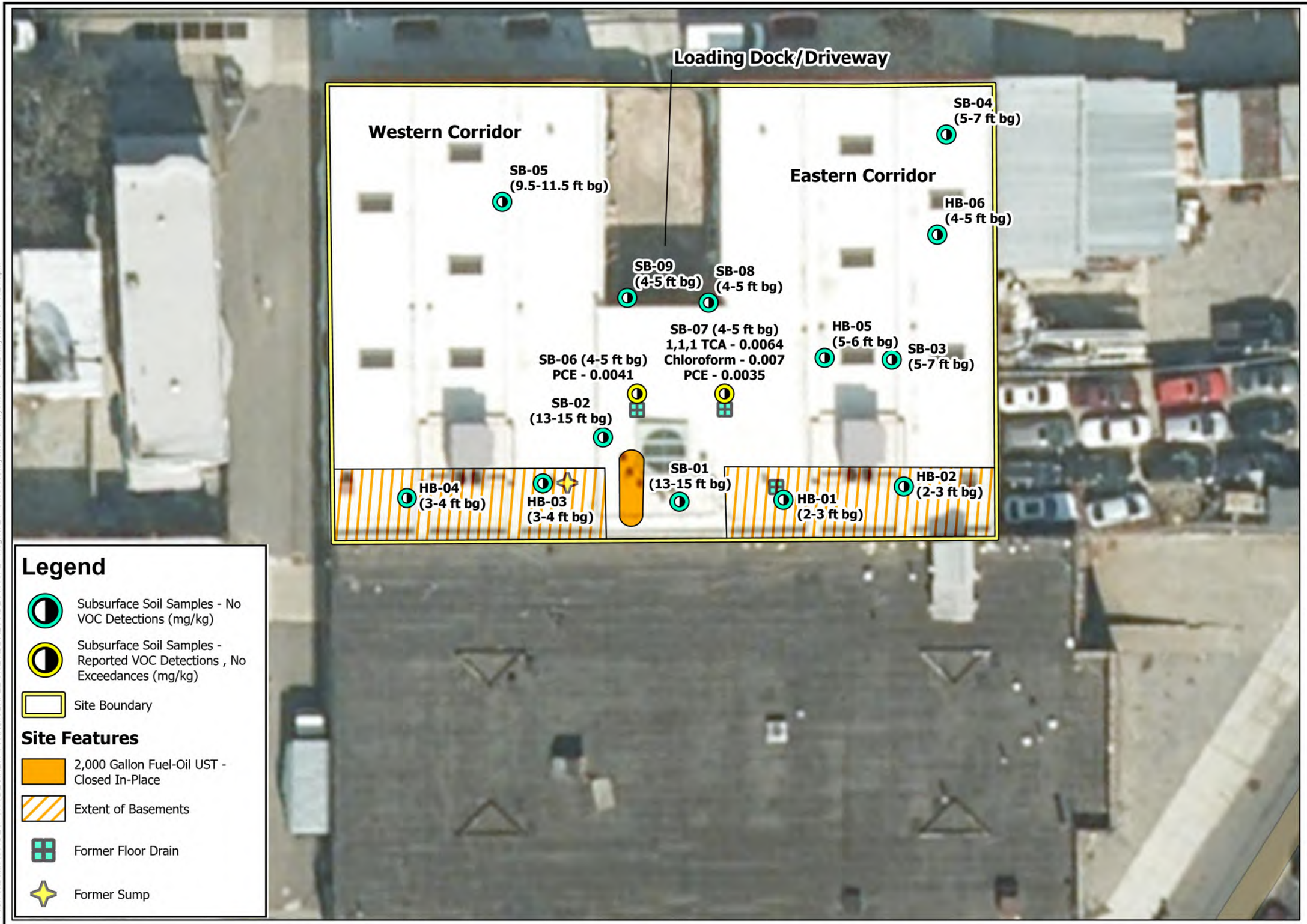
Designed By: CMS	Drawn By: EWJ	Reviewed By: PWM
Issue Date: 8/10/2022	Project No: DEC1035.P2	Sheet Size: 11x17

11-24 Wyckoff Avenue
Surrounding Property Use

11-24 Wyckoff Avenue
NYSDEC Site #241255
11-24 Wyckoff Avenue
Queens, New York

Figure No.

3



HRP
MOVE YOUR ENVIRONMENT FORWARD
ONE FAIRCHILD SQUARE
SUITE 110
CLIFTON PARK, NY 12065
(518) 877-7101
HRPASSOCIATES.COM

North

0 10 20
Feet

Revisions					
No.					
Date					

Designed By:	Drawn By:	Reviewed By:
CMS	EWJ	PWM

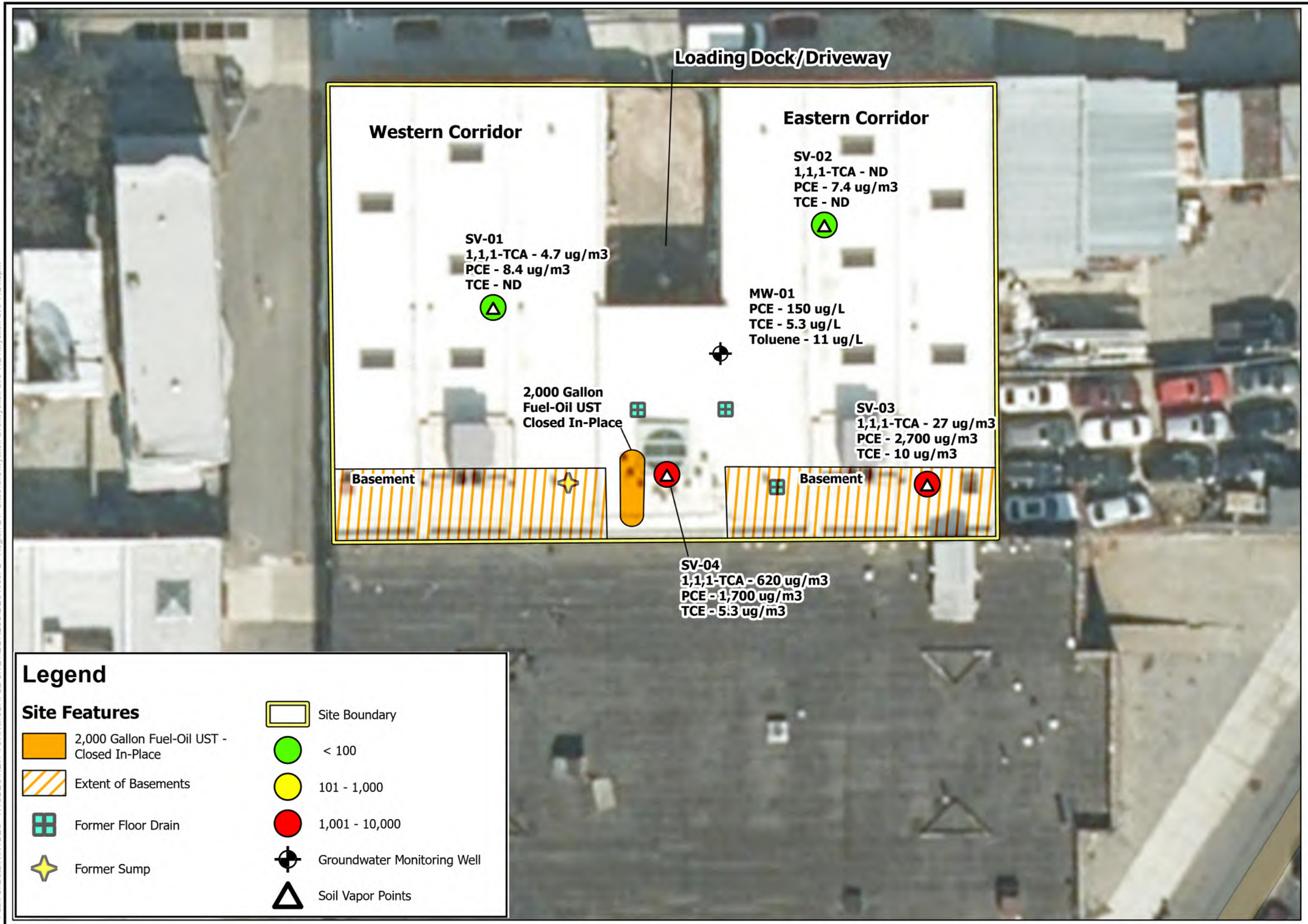
Issue Date:	Project No:	Sheet Size:
8/10/2023	DEC1035.P2	11x17

Previous Site Investigation VOCs in Soil

11-24 Wyckoff Avenue Off-Site
NYSDEC Site #241255
11-24 Wyckoff Avenue
Queens, New York

Figure No.
4

Path: S:\Data\NY\NYDEC - NYSDEC\NEW YORK\MULTIPLE SITE ADDRESS\DEC1035P2 - Region 2 P-Sites\GIS\wyckoff ave\wyckoff ave 1124\wyckoff ave 1124.aprx



HRP
MOVE YOUR ENVIRONMENT FORWARD
ONE FAIRCHILD SQUARE
SUITE 110
CLIFTON PARK, NY 12065
(518) 877-7101
HRPASSOCIATES.COM

North

0 10 20 Feet

Revisions					
No.					
Date					

Designed By:	Drawn By:	Reviewed By:
CMS	EWJ	PWM

Issue Date:	Project No:	Sheet Size:
8/10/2023	DEC1035.P2	11x17

Previous Site Investigation VOCs in Groundwater and Soil Vapor

11-24 Wyckoff Avenue Off-Site
NYSDEC Site #241255
11-24 Wyckoff Avenue
Queens, New York

Figure No.

5

TABLES

Table 1
Historical Property Use and Relevant Regulatory Findings

11-24 Wyckoff Avenue Site
NYSDEC Site No. 241255
11-24 Wyckoff Avenue
Queens, New York 11385

Map Number	Address	Distance/ Direction from Site (ft)	Current Business Names	Historical Property Use	Historic Business Names	Years Listed	Relevant Regulatory Findings
On-Site							
-	11-24 Wyckoff Avenue (NYSDEC Site No. 241255)	-	Vacant	Auto Garage	-	1914-1950	NYSDEC Site No. 241255 PBS 2-612992
				Knitting Mill	Val Bee Knitting, Tavin Knitting Mills, Hakos Knits Inc.	1958-2018	
				Finishing	Woodward Finishing, Olivia Finishing	2014-2017	
Off-Site							
1	1127-1129 Irving Avenue (Wolf-Alport Chemical Company, NYSDEC Site No. 241180)	380	Primo Motorcycle Mechanic Primo Autobody Repair K+M Auto Repair Terranova Restoration	Chemical Manufacturing	Wolf-Alport Chemical Company	1936-1950	NYSDEC Site No. 241180 PBS 2-609769 PBS 2-610862
				Fuel Storage	-	1936-1950	
				Filling Station	-	1980-2006	
				Industrial Manufacturing	CLO Manufacturing	1980-2006	
2	56-06 Cooper Ave	245	Axios NYC Silvestri Millwork and Painting RE-CO BKLYN	Kitchen Cabinet Manufacturing	Boro Kitchen Cabinet Inc.	1980-2006	PBS 2-600446 RCRA SQG - NYD001556695 Historic Generator D001, D035, F003, F005 NY Spill 9810343 NY Spill 9810344 NY Spill 9810345
3	10-95 Irving Street	470	The Box Factory Grand Central Atelier Pirate.com Rehearsal Studios	Label Making and Printing	Muirson Label Co	1950	PBS 2-607748
4	1540 Decatur Street	235	Industrial Manufacturing	Bowling Ally	-	1936-1950	-
5	56-03 Cooper Avenue	190	OCS Industries	Brass Foundry	Accurate Brass Casting Company	1936	PBS 2-609487 RCRA NONGEN NYP004489092
				Machine shop	-	1936	
				Chemical Manufacturing	AJAX Manufacturing Co Inc	1950-2006	
6	56-23 Cooper Ave	0	Ready Biz Group Briana's Fashion	Cooperage	-	1914-1936	PBS 2-609487 NY Spill 0313957 NY Spill 0307769
				Gas Tanks	-	1936-1950	
				Soap Manufacturing	-	1950	
				Knitting Mill	Vicsone Knitting Mills	1980-2000	
				Tow Truck Company	Popeye Towing	2006	
7	56-41 Cooper Ave	0	Vacant	Filling Station	-	1936-1950	-
				Laundry	-	1950	
				Auto Garage and Service Station	-	1950	
				Oil Company	Humble Oil and Refining Co	1963-1970	
8	56-03 Cooper Avenue	175	North American Iron Works	Auto Garage	-	1936	-
				Cardboard Box Manufacturing	-	1950	
9	56-03 Cooper Avenue	140	North American Iron Works	Auto Garage	-	1936	-
				Paper Tube Manufacturing	-	1950	
10	56-03 Cooper Avenue	120	North American Iron Works	Fender Repair	-	1936	-
				Auto Painting	DUCO Painting	1936	
				Autobody Repair	-	1950	
11	1540 Decatur Street	230	Marvin Gardens	Cold Storage	-	1950	-
12	11-25 Wyckoff Ave	100	Cube Smart Self Storage	Meat Packing Plant	Louis Meyer, Stahl Meyers Meet Packing Plant	1936-1980	PBS 2-360821 NY Spill 0008624
				Fuel Storage	-	1936-1980	
				Garage	-	1936-1980	
				Grease Storage	-	1950-1980	
				Diesel Engine Repair	-	1950-1980	
				Knitting Mill	Cody Knitting Mill	1976-2017	
				Self Storage	-	2006	
13	5721-5731 Cooper Ave	390	JJM Platinum Hand Car Wash Action Glass Emanon Electric	Filling Station	-	1936-1980	RCRA NONGEN NYP004538740
				Auto Repair	-	1936-2006	
				Electric Pump Repair	-	1980	
14	10-80 Schaeffer Street	325	Multiple Art Studios Bridge and Tunnel Brewery Small Restaurants	Garage	-	1914-1950	PBS 2-335053 RCRA NONGEN NYP004785176 NY Spill 1409147
				Fuel Storage	-	1914-1950	
				Carpentry Shop	-	1914	
				Coal Storage	-	1914	
				Green House	-	1914	
				Brewery	Diogenes Brewing Company	1914-1950	
				Malt Beverage Company	Malt Diastase Co	1950-2006	
				Laboratory	-	1950	
				Sheet Metal Manufacturing	-	1980-2006	
				Printing	-	2006	
15	1544 Decatur Street	180	North American Iron Works	Filling Station	-	1936-1950	-
				Storage Yard	-	2006	
16	11-01 Wyckoff Ave	235	Lynn's Car Service Center	Auto Repair	-	1936-2006	RCRA LQG NYP005108101 - Historic Generator D008
17	1103-1105 Wyckoff Ave	200	H&S Steel Builders Corp	Carpentry Shop	-	1936	-
				Bronze Foundry	-	1950-2006	
18	11-09 Wyckoff Ave	235	MG Sunshine Daycare	Metal Plater	-	1930-2006	-
19	10-60 Wyckoff Ave	625	Extra Space Storage	Picture Frame Manufacturing	Radio Picture Frame Co	1950-1980	PBS 2-603279 NY Spill 1507454
				Woodworking and Spraying	-	1950-1980	
				Self Storage	-	2006	
20	10-37 Wyckoff Ave	790	Bubble House Laundromat	Knitting Factory	-	1936-1950	-
21	10-51 Wyckoff Ave	695	Kosti's Last Sunday Bookstore	Copper Works	-	1914	-
				Storage of Paper Goods	-	1936-1950	
22	10-59 Wyckoff Ave	625	J&C Finishing	Autobody	-	1980-2006	-
23	1063 Wyckoff Ave	575	El Novillo (Restaurant)	Wagon Repair	-	1914-1936	-
				Auto Repair Shop	-	1950	
				Machine Shop	-	1980-2006	
24	10-71 Wyckoff Ave	405	10-71 Wyckoff Ave Parking	Laundry	-	1936-1950	-
				Parking Garage	-	2006	
25	10-89 Wyckoff Ave	305	Western Beef	Auto Garage	-	1936-1950	PBS 2-360821
				Filling Station	-	1936-1950	
26	1614 Summerfield Street	360	Pinnacle Realty Of New York	Auto Garage	-	1936-1950	-
27	1624 Decatur Street	345	Atlas Candy Wholesale	Brush Manufacturing	Ebrrun Brush Manufacturing	1914	-
				Machine Shop	-	1936-2006	
				Auto Repair	-	1980-2006	

Notes:
Distance from Site boundary to off-site locations measured from nearest point of each
LQG = Large Quantity Generator
SQG = Small Quantity Generator
VSQG = Very Small Quantity Generator
CESQG = Conditionally Exempt Small Quantity Generator
D001 = Ignitable Waste
D008 = Lead
D018 = Benzene
D035 = Methyl Ethyl Keystone
F003 = Nonhalogenated Solvents
F005 = Nonhalogenated Solvents
PBS = Petroleum Bulk Storage, NYSDEC Database
CBS = Chemical Bulk Storage, NYSDEC Database

Table 2
Sampling Justification Summary

11-24 Wyckoff Avenue Site
NYSDEC Site No. 241255
11-24 Wyckoff Avenue
Queens, New York

Location ID	Sample Type	Proposed Sample Depths	Location	Number of Samples	Justification	Analyses
HRP-SB-1	Shallow soil	Below slab (0-2 ft bg); Biased toward evidence of contamination to a maximum depth of 10 ft bg	Western corridor of Site building	Up to 2	Investigate impacts to surface/shallow subsurface soil related to historic use of the western corridor of the building	65 (56 regular, 9 QA/QC) samples analyzed for TCL VOCs 10 (7 regular, 3 QA/QC) samples analyzed for the following analyses: TCL SVOCs TAL Metals Total Mercury TCL PCBs Chlorinated herbicides Pesticides PFAS
HRP-SB-2	Shallow soil		Loading dock	Up to 2	Investigate impacts to surface/shallow subsurface soil related to historic use of the loading dock area	
HRP-SB-3	Shallow soil		Western corridor of Site building	Up to 2	Investigate impacts to surface/shallow subsurface soil related to historic use of the western corridor of the building	
HRP-SB-4	Shallow soil		Western corridor of Site building	Up to 2	Investigate impacts to surface/shallow subsurface soil related to historic use of the western corridor of the building	
HRP-SB-5	Shallow soil		Central portion of Site building	Up to 2	Investigate impacts to surface/shallow subsurface soil in the central portion of the building	
HRP-SB-6	Shallow soil		Eastern corridor of Site building	Up to 2	Investigate impacts to surface/shallow subsurface soil related to historic use of the eastern corridor of the building	
HRP-SB-7	Shallow soil		Central portion of the Site, between two former floor drains	Up to 2	Investigate impacts to surface/shallow subsurface soil adjacent to two former floor drains	
HRP-SB-8	Shallow soil		Eastern corridor of Site building	Up to 2	Investigate impacts to surface/shallow subsurface soil related to historic use of the eastern corridor of the building	
HRP-SB-9	Shallow soil		Western basement of the Site building	Up to 2	Investigate impacts to surface/shallow subsurface soil related to historic use of the western basement, near elevated detections of CVOCs in soil vapor from previous investigations	
HRP-SB-10	Shallow soil		Western basement of the Site building, near former sump	Up to 2	Investigate impacts to surface/shallow subsurface soil adjacent to a former sump, near elevated detections of CVOCs in soil vapor from previous investigations	
HRP-SB-11	Shallow soil		Eastern basement of the Site building, near former floor drain	Up to 2	Investigate impacts to surface/shallow subsurface soil adjacent to a former floor drain, near elevated detections of CVOCs in soil vapor from previous investigations	
HRP-SB-12	Shallow soil		Eastern basement of the Site building	Up to 2	Investigate impacts to surface/shallow subsurface soil related to historic use of the eastern basement, near elevated detections of CVOCs in soil vapor from previous investigations	
HRP-DB-1	Deep soil	Below slab (0-2 ft bg); Biased toward evidence of contamination, spaced at 10 ft intervals to maximum depth of 70 ft bg	Western corridor of Site building	Up to 8 (1 shallow, 7 at 10 ft intervals)	Investigate impacts to subsurface soil related to historic use of the western corridor of the building	
HRP-DB-2	Deep soil		Western corridor of the Site building	Up to 8 (1 shallow, 7 at 10 ft intervals)	Investigate impacts to subsurface soil related to historic use of the western corridor of the building	
HRP-DB-3	Deep soil		Western corridor of the Site building	Up to 8 (1 shallow, 7 at 10 ft intervals)	Investigate impacts to subsurface soil related to historic use of the western corridor of the building	
HRP-DB-4	Deep soil		Central portion of the Site adjacent to closed-in-place 2,000-gallon fuel-oil UST	Up to 8 (1 shallow, 7 at 10 ft intervals)	Investigate impacts to subsurface soil related to historic Site use near elevated detections of CVOCs in soil vapor from previous investigations	

Notes:
TCL = Target Compound List
VOCs = Volatile Organic Compounds
ft bg = feet below grade
SVOCs = Semivolatile Organic Compounds
TAL = Target Analyte List
PCBs = Polychlorinated biphenyls
PFAS = Per- and poly-fluoroalkyl substances
See Tables 3 and 4 for laboratory analytical methods

Table 2
Sampling Justification Summary

11-24 Wyckoff Avenue Site
NYSDEC Site No. 241255
11-24 Wyckoff Avenue
Queens, New York

Location ID	Sample Type	Proposed Sample Depths	Location	Number of Samples per Location (non-QA/QC)	Justification	Analyses
HRP-MW-1	Groundwater	10 ft of screen set to intersect groundwater interface. Estimated total depth of 70 ft bg	North of Site, near intersection of Cody Avenue and Wyckoff Avenue	1	Determine groundwater flow direction. Investigate potential off-site impacts to groundwater migrating from the Site. Identify potential off-site source(s) of contamination	Up to 11 (6 regular, 5 QA/QC) samples analyzed for TCL VOCs Up to 6 (3 regular, 3 QA/QC) samples analyzed for the following analyses: TCL SVOCs 1,4 Dioxane TAL Metals Total mercury TCL PCBs Chlorinated Herbicides Pesticides PFAS
HRP-MW-2	Groundwater		Northeast of Site, on northern sidewalk of Wyckoff Avenue	1		
HRP-MW-3	Groundwater		West of Site in driveway of off-site property	1		
HRP-MW-4	Groundwater		Southwest of Site in driveway of off-site property	1		
HRP-MW-5	Groundwater		Southeast of Site, on northern sidewalk of Cooper Avenue	1		
MW-01	Groundwater	Existing monitoring well screened 40-70 ft bg	Central portion of the Site (if present) Grab groundwater sample from HRP-DB-4 (if not present)	1		
HRP-SV-1	Soil Vapor	Estimated completion depth of 10 ft bg	North of Site, near intersection of Cody Avenue and Wyckoff Avenue	1	Investigate potential impacts to soil vapor migrating from the Site. Identify potential off-site source(s) of soil vapor contamination.	VOCs by TO-15
HRP-SV-2	Soil Vapor		Northeast of Site, on northern sidewalk of Wyckoff Avenue	1		
HRP-SV-3	Soil Vapor		West of Site in driveway of off-site property	1		
HRP-SV-4	Soil Vapor		Southwest of Site in driveway of off-site property	1		
HRP-SV-5	Soil Vapor		Southeast of Site, on northern sidewalk of Cooper Avenue	1		
SVI Structure Sampling	Soil Vapor	Sub-slab	Up to five properties surrounding the Site, including 2 residential properties and 1 daycare center located northwest of the Site	Up to 18 total (5 sub-slab, 10 indoor air, 2 outdoor air, 1 duplicate)	Investigate SVI exposure pathways to receptors surrounding the Site	VOCs by TO-15

Notes:
TCL = Target Compound List
VOCs = Volatile Organic Compounds
ft bg = feet below grade
SVOCs = Semivolatile Organic Compounds
TAL = Target Analyte List
PCBs = Polychlorinated biphenyls
PFAS = Per- and poly-fluoroalkyl substances
See Tables 3 and 4 for laboratory analytical methods

Table 3
Sampling Summary

11-24 Wyckoff Avenue
NYSDEC Site # 241255
11-24 Wyckoff Avenue
Queens, NY 11385

Activity/ Matrix	Number of Sample Locations	Proposed Sample Locations	Number of Samples to be Collected	Analyses
Soil	16	2 soil samples to be collected per boring from 12 proposed shallow on-site soil borings	65 (56 regular, 9 QA/QC)	TCL VOCs+10 by EPA Method 8260 QA/QC: 1 duplicate, 1 MS, 1 MSD per 20 samples
		8 soil samples to be collected per boring from 4 proposed deep on-site soil borings		TCL VOCs+10 by EPA Method 8260 QA/QC: 1 duplicate, 1 MS, 1 MSD per 20 samples
		7 soil samples will be selected from shallow and deep soil borings for additional analyses	10 (7 regular, 3 QA/QC)	TCL SVOCs+20 by EPA Method 8270 TAL Metals by EPA Method 6010B Total Mercury by EPA Method 1631 TCL PCBs by EPA Method 8082 TCL Pesticides by EPA Method 8081B TCL Chlorinated Herbicides by EPA Method 8151 PFAS by EPA Method 1633 QA/QC: 1 duplicate, 1 MS, 1 MSD, 1 PFAS field blank per 20 samples
Groundwater	6	5 proposed and 1 existing monitoring well	11 (6 regular, 5 QA/QC)	TCL VOCs+10 by EPA Method 8260 QA/QC: 1 duplicate, 1 MS, 1 MSD, 1 field blank, 1 trip blank per 20 samples
	3	3 proposed monitoring wells will be selected for additional analyses	6 (3 regular, 3 QA/QC)	TCL SVOCs+20 by EPA Method 8270 TAL Metals by EPA Method 6010B Total Mercury by EPA Method 1631 TCL PCBs by EPA Method 8082 TCL Pesticides by EPA Method 8081B TCL Chlorinated Herbicides by EPA Method 8151 PFAS by EPA Method 1633 1,4-Dioxane by EPA 8270 SIM QA/QC: 1 duplicate, 1 MS, 1 MSD per 20 samples
Soil Vapor	5	7 proposed permanent vapor point locations; 1 soil vapor grab sample per location; 1 outdoor ambient air sample per day of sampling. Sample will be collected using 6-liter summa cannisters fitted with 2-hour regulators	7 (5 soil vapor, 1 outdoor ambient air, 1 duplicate)	TO-15
	5	SVI investigations in up to 5 off-site structures. Includes 1 sub-slab soil vapor sample, 1 basement indoor air samples, and 1 first floor indoor air sample per structure; 1 outdoor air sample per day of sampling. Samples will be collected using 6-liter summa cannisters fitted with 8-hour or 24-hour regulators depending on property use	18 (5 sub-slab soil vapor, 10 indoor air; 2 outdoor air, 1 duplicate)	

Acronym List:
MS/MSD: Matrix spike/matrix spike duplicate
PCBs: Polychlorinated biphenyls
PFAS: Per- and polyfluoroalkyl substances
TCL: Total compound list
VOCs: Volatile organic compounds
SVOCs: Semivolatile organic compounds

MOVE YOUR ENVIRONMENT FORWARD

Table 4
Analytical Methods/Quality Assurance Summary

11-24 Wyckoff Avenue
NYSDEC Site # 241255
11-24 Wyckoff Avenue
Queens, NY 11385

					Containers per Sample			Preservation Requirements			
Parameter	**Matrix**	**Number of Samples (including Field QC)**	**Preparation Method**	**Analytical Method**	**No.**	**Size**	**Type**	**Temp.**	**Light Sensitive**	**Chemical**	**Maximum Holding Time**
SOIL											
VOCs by GC/MS	Soil/Sediment/Sludge	65	5035A	SW-846 Method 8260B	1	2 oz	clear glass jar	2-6º C	No	NA	14 days
SVOCs by GC/MS	Soil/Sediment/Sludge	10	3546	SW-846 Method 8270C	1	4 oz	amber glass jar	2-6º C	Yes	NA	14 days
TAL Metals by ICP	Soil/Sediment/Sludge	10	3050B	SW-846 Method 6010B	1	2 oz	clear glass jar	NA	No	NA	6 months
Total Mercury	Soil/Sediment/Sludge	10	3050B	SW-846 Method 1631	1	2 oz	clear glass jar	NA	No	NA	28 days
Chlrorinated Herbicides and Pesticides by GC	Soil/Sediment/Sludge	10	3546	SW-846 Method 8081A	1	8 oz	clear glass jar	2-6º C	No	NA	14 days
PCBs by GC	Soil/Sediment/Sludge	10	3546	SW-846 Method 8082	1	8 oz	clear glass jar	2-6º C	No	NA	14 days
PFAS	Soil/Sediment/Sludge	10	NA	EPA Method 1633	1	8 oz	polypropylene	2-6º C	No	NA	14/28 days
GROUNDWATER											
VOCs by GC/MS	Aqueous	11	5035	SW-846 Method 8260B	3	40 ml	glass vial	2-6º C	No	HCL	14 days
PFAS	Aqueous	6	NA	EPA Method 1633	3	250 ml	polypropylene	2-6º C	No	NA	14/28 days
1,4-Dioxane	Aqueous	6	3510C	SW-846 Method 8270 SIM	2	500 ml	amber glass	2-6º C	Yes	NA	7 days
SVOCs by GC/MS	Aqueous	6	3510C	SW-846 Method 8270C	2	Liter	amber bottle	2-6º C	Yes	NA	7 days
TAL Metals by ICP	Aqueous	6	3005A	SW-846 Method 6010B	1	500 ml	plastic bottle	2-6º C	No	Nitric Acid	6 months
Chlorinated Herbicides and Pesticides by GC	Aqueous	6	3510C	SW-846 Method 8081	2	liter	clear glass bottle	2-6º C	No	NA	14/28 days
PCBs by GC	Aqueous	6	3510C	SW-846 Method 8082	1	liter	clear glass bottle	2-6º C	No	NA	7 days
SOIL VAPOR											
VOCs	Soil Vapor, Air	7	NA	EPA TO-15	1	6-Liter	summa canister, 2-hour regulator	NA	No	NA	30 days (summa canister)
VOCs	Soil Vapor, Air	18	NA	EPA TO-15	1	6-Liter	summa canister, 8-hour or 24-hour regulator	NA	No	NA	30 days (summa canister)

ATTACHMENT A
Site-Specific Health and Safety Plan (HASP)

MOVE YOUR ENVIRONMENT FORWARD

SITE-SPECIFIC HEALTH AND SAFETY PLAN (HASP)

11-24 Wyckoff Avenue - Site # 224255
Queens, New York 11385

Prepared For:

New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233
Contract #D009808

Prepared By:

HRP Associates, Inc.
1 Fairchild Square, Suite 110
Clifton Park, NY 12065

HRP #: DEC1035.P3

Issued On: August 10, 2023

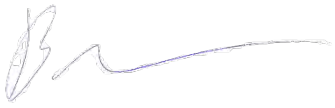
Addendum Number	Date Issued	Reason For Modification

Disclaimer

HRP Associates does not guarantee the health or safety of any person entering this site. Due to the potential hazards of this site and the activity occurring thereon, it is not possible to discover, evaluate, and provide protection for all possible hazards which may be encountered. Strict adherence to the health and safety guidelines set forth herein will reduce, but not eliminate, the potential for injury at this site. The health and safety guidelines in this plan were prepared specifically for this site for use and should not be used on any other site.

CERTIFICATION

This Addendum to HRP's Generic Health and Safety Plan has been prepared under the supervision of, and has been reviewed by, an Associate Safety Professional (ASP) certified by the Board of Certified Safety Professionals.



Bryan Sherman, ASP
ASP # 31838

TABLE OF CONTENTS

Figures

Tables

Appendices

1.0 EMERGENCY CONTACTS/PLANNING

The Health and Safety Officer will coordinate the entry and exit of response personnel in the event of an emergency. The following information, including directions to the nearest hospital shall be posted at the Site. When contacting the local authorities, be sure to provide: your name, facility name, full address, telephone number, and the nature of the emergency.

Emergency Phone Numbers 11-24 Wyckoff Avenue Queens, NY	
Emergency Contact	**Phone Number**
Fire, Ambulance, Police Emergency:	911
NYCPD 104th Precinct (Sector B) Police Department (routine calls):	718-386-3004
FDNY Engine 277- Fire Department (routine calls):	718-965-8277
Wyckoff Heights Medical Center	718-963-7272
Poison Control Center:	1-800-222-1222
DEC spills hotline:	1-800-457-7362
National Response Center:	800-424-8802
Project Manager: Patrick Montuori	845-531-9490
Site Safety Officer: Elliott Jackson	716-489-0415
NYSDEC Project Manager: Steven Wu	718-482-6725

Map and directions to the following medical facilities are provided in **Figure 3**:

- **Wyckoff Heights Medical Center**
  (approximately 1.4 miles from the work site)

First Aid, Fire Protection, Emergency Response Equipment Storage Locations	
First Aid Kit:	In Vehicle
Fire Extinguisher:	In Vehicle
Eye Wash (Bottle):	In Vehicle

A Safety and Logistics Planning call will be held prior to conducting any intrusive activities at the site. Representatives from HRP and each subcontractor will attend the call to discuss logistical and safety challenges general to the scope of work and specific to the Site. This call is documented on the Safety and Logistics Planning Call Log in **Appendix A.**

2.0 INTRODUCTION

2.1 Purpose and Scope

This Health and Safety Plan (HASP) addresses the health and safety practices that will be employed by HRP Associates, Inc. personnel and our subcontractors participating in the Site Characterization (SC) that will be performed at the site. The SC will be comprised of several tasks to evaluate the environmental condition of the Site and the surrounding area, including installation of soil borings, soil vapor points, and monitoring wells to collect soil, air, and groundwater samples.

This HASP has been developed in accordance with HRP's Generic Safety and Health Program as required under OSHA's Hazardous Waste Operations Standard (29 CFR 1910.120). This Plan has been developed to establish minimum standards necessary for onsite investigation activities to protect the health and safety of HRP personnel. HRP site personnel have received the required level of training and field experience as required under subpart (e) of the Standard and have received medical examinations in accordance with HRP's medical surveillance program as required under subpart (f) of the Standard. No other personnel will be permitted in the Exclusion Zone unless they have received training and medical surveillance under the Standard.

HRP personnel and associated contractors shall be familiar with this HASP prior to conducting proposed site work. This plan must be present on site and be available for reference/inspection when the subject site work is being conducted.

2.2 Site Information and Areas of Environmental Concern

2.2.1 Site Information and Description

Site Name: 11-24 Wyckoff Avenue

Site Address: 11-24 Wyckoff Avenue, Queens, NY

Site Contact: Steven Wu, NYSDEC

Phone Number: (718) 482-6725

2.3 Background and Project Description

The Site is located on 11-24 Wyckoff Avenue in the Ridgewood section of Queens, New York (**Figure 1**). The full extent of the Site will be defined by the results of this SC. The 11-24 Wyckoff Avenue property (Block 3542, Lot 50) is a 0.34-acre lot occupied by a single story "U"-shaped building of approximately 12,900 square feet. The building has two large open spaces, offices, and two partial basements on the southeastern and southwestern corners of the building.

11-24 Wyckoff Avenue has previous historical use including: residential use (1902), a garage (1914-1950), and textile manufacturing (1958-2018).

Previous investigations identified the presence of CVOCs (primarily tetrachloroethene and trichloroethene; PCE and TCE respectively) in sub-slab soil vapor and indoor air within the building at concentrations exceeding mitigation guidance values outlined in the 2017 NYSDOH Soil Vapor Intrusion Guidance Matrices. Concentrations of PCE, TCE, and toluene in groundwater samples on site were found exceeding the standards set forth in the Technical Operation Guidance Series (TOGS) 1.1.1 Class GA criteria. Soil vapor impacts have been addressed in the on-site building via the installation and operation of a sub-slab depressurization system.

The purpose of the SC is to determine groundwater and soil gas/vapor quality in this area to determine whether the Site conditions pose a risk to public health and the environment. In accordance with DER-10 *Technical Guidance for Site Investigation and Remediation (May 2010),* the primary objectives of the SC scope of work are to:

- Investigate the identified areas of concern (AOCs) associated with the Site and determine if they have resulted in surface or subsurface contamination and evaluate the extent of the contamination, if any;

- Obtain geologic and hydrogeologic data from the Site. The specific information that should be collected and/or verified includes: soil types (or fill), depth to groundwater, groundwater flow direction, subsurface geology, bedrock characteristics, etc. Determine if applicable standards, criteria, and guidance contained in NYSDEC DER-10 and set forth for the Site are contravened;

- Preliminarily delineate the vertical and horizontal extent of contaminated groundwater, if any;

- Establish a baseline for any remedial work that will be necessary to address impacted media; and

- Determine if the site represents a threat to public health or the environment.

2.3.1 Personnel Designations

The following personnel are designated to perform the stated project activities and to ensure that the requirements of this HASP are met. The same person may fill more than one role, and/or serve as an alternate in the absence of the designated team member.

The following personnel are designated to perform the stated project activities and to ensure that the requirements of this HASP are met. The same person may fill more than one role, and/or serve as an alternate in the absence of the designated team member. All subcontractors must have received the required level of training and field experience as required under subpart (e) of OSHA 29 CFR 1910.120 and OSHA 29 CFR 1926.65 for Hazardous Waste Operations and Emergency Response (HAZWOPER).

Project Team Member	Responsibilities and Tasks
Patrick Montuori (or Qualified Alternate Safety Officer)	**HSO – HRP Associates, Inc.** - Ensuring all site work is being performed in accordance with HRP Associates, Inc. Safety Program, as well as in accordance with local, state and federal regulations. - Directing and implementing HRP's HASP. - Reviewing the Subcontractor's HASP and being aware of the hazards detailed therein. - Conduct a job orientation meeting and routine safety meetings for HRP Associates, Inc. employees and subcontractors, as applicable. - Provide copies of these inspections, recordkeeping/personnel logs to the engineer/contractor as required. - Ensuring all project personnel have been adequately trained in the recognition and avoidance of unsafe conditions. - Authorizing Stop Work Orders that shall be executed upon the determination of an imminent health and safety concern, and will notify the appropriate contacts upon issuance of this order. - Authorizing work to resume, upon approval from the Contractor. - Directing activities, as defined in the HRP's and the Contractor's written HASP, during emergency situations. - Providing personnel monitoring where applicable. - Ensuring that adequate personal protective equipment and first aid supplies are available. - Ensure site security, to the extent practicable. - Ensure accident victims are promptly cared for, and the incident is investigated and properly reported.
David Stoll (Site Supervisor/ Project Manager) **Mark Wright (Alternate Site Supervisor)**	**Site Supervisor/Project Manager – HRP Associates, Inc.** - Monitor and assist the site Health and Safety officer. - Maintain appropriate rules, regulations and codes at the job site. - Provide advance safety planning for all activities through the use of scheduling and administrative controls. - Obtain site-specific health and safety information and communicate that information with the appropriate personnel (i.e. contractors, client, etc.) - Report all injuries, illnesses and other incidents to the Director of Safety. - Ensure all HRP personnel are trained and qualified to perform site work.
Site Workers (Subcontractors)	**Site Workers** - Read and work in accordance with this HASP. - Report all unsafe work practices to the HSO. - Report all incidents, including near-misses to the HSO. - Work in a safe manner. - Provide Designated Competent Person
A complete list of HRP employee and subcontractor responsibilities (as applicable) can be found in the HRP Generic Health and Safety Plan. 1 A list of site workers will be maintained in the Personnel Log (**Appendix B**) 2 Supervisors Investigation Report included as (**Appendix C**)	

3.0 AREAS OF ENVIRONMENTAL CONCERN

3.1 Scope of Work

In general, the work to be performed by HRP and HRP's subcontractors consists of investigative methods to evaluate the environmental condition of the Site. The SC investigation fieldwork for this task includes the following subtasks:

- Obtain required permits from NYCDOT and MTA to complete intrusive investigative activities on-site and in the right-of-way.
- Call in Underground Utility Clearance through NYS Code Rule 753/Dig Safe System
- Complete a Ground Penetrating Radar (GPR) survey to locate utilities and/or obstructions in the ground that may affect the locations of soil borings and/or monitoring well.
- Groundwater and Soil Characterization (existing monitoring well sampling, soil boring installation and grab groundwater sampling, permanent monitoring well installation, development, and sample collection).
- Soil Vapor Intrusion Investigation (installation of temporary soil vapor points and collection of vapor samples, SVI structure sampling).
- Characterization and Disposal of Investigation Derived Waste
- Analytical Data Quality Evaluation
- Base Map Development and Site Survey

Property Access, Underground Utility Clearance and Ground Penetrating Radar (GPR)

- A utility clearance will be conducted.
- Sampling locations will be marked prior to installation and public utility clearance services will be contacted to mark out the utilities prior to the survey.
- GPR surveying will be completed within a 10-foot radius of each of soil boring location utilized for the collection of grab groundwater samples, installation of permanent groundwater monitoring wells, and installation of temporary soil vapor points.

Subsurface Soil Characterization

- Up to 16 on-site soil borings will be installed using a direct push drill rig or similar, to collect continuous soil samples and characterize subsurface conditions from surface grade to a maximum completion depth of 70 ft bg. Soils will be collected with a macrocore sampler or similar for descriptive characterization. All soil samples will be screened for volatile organic vapors using a PID, and any evidence of contamination will be noted and used for selection of soil samples. Up to 12 on-site soil borings will be installed to a completion depth of approximately 10 ft bg at a minimum distance of 30 feet from subway

infrastructure, and up to 4 on-site soil borings will be installed to a completion depth of approximately 70 ft bg at a minimum distance of 65 feet away from subway infrastructure to characterize subsurface conditions beneath the Site. Soil borings will be installed at their respective distances from subway infrastructure in order to satisfy zone of influence requirements for drilling near MTA subway lines.

- Up to two samples will be collected per shallow soil boring, and up to eight samples will be collected per deep soil boring. In total, up to 65 soil samples (56 regular samples, plus 9 Quality Assurance/Quality Control [QA/QC]) will be submitted for laboratory analysis of Target Compound List (TCL) VOCs +10 via EPA Method 8260. Up to 10 soil samples (7 regular, 1 duplicate, 1 matrix spike, 1 matrix spike duplicate) will be collected and submitted for laboratory analysis for an expanded list of analyses.
- All on-site soil borings drilled through the building slab will be grouted with a Portland cement grout from the base of the boring to the base of sub-grade gravel installed with the SSDS. Clean gravel will be used as backfill above the Portland cement grout to allow air flow through the SSDS gravel layer. The slab will be repaired with hydraulic cement, poured equal in thickness to the existing building slab, and finished to grade.

Groundwater Characterization

- Up to 5 permanent overburden monitoring wells will be installed in off-site locations to an estimated depth of 70 ft bg. Each proposed monitoring well will be installed at least 65 feet away from subway infrastructure to meet MTA requirements. For the purpose of determining depth to water, identifying potential impacts to groundwater quality and aquifer characteristics, soil samples will be collected continuously, logged, and screened using a calibrated PID during the installation of monitoring wells. Wells will be installed using the hollow stem auger (HAS) method and sampled continuously using a split spoon or macrocore sampler.
- The wells will be constructed of 2-inch PVC riser and 10-feet of 2-inch PVC slotted screen, positioned to intercept the top of the water table. The annular space of each well will be backfilled with an appropriately sized sand pack and a bentonite seal. The wells will be installed using flush-mounted protective casings and locking covers or a locking protective steel stick-up as appropriate.
- HRP will develop the 5 newly installed monitoring wells by pumping and purging until the field parameters stabilize for a minimum of three consecutive readings of 10 percent variability or less. Field parameters will include temperature, pH and specific conductance. In addition, the turbidity of the groundwater must achieve a reading of 50 Nephelometric Turbidity Units (NTUs) or less during the field parameter readings. All purged groundwater generated during well development and sampling will be characterized and disposed of in accordance with DER-10.
- Up to 11 groundwater samples (including one from an existing monitoring well on-site/a grab groundwater sample in the event that the on-site monitoring well has been abandoned) including 6 regular samples and 5 QA/QC samples will be analyzed for TCL VOCs+10 by EPA Method 8260. 6 groundwater samples (3 regular samples and 3 QA/QC) will be analyzed for an expanded list of analyses.

Soil Vapor Characterization

- Up to 5 permanent soil vapor points will be installed in off-site locations, paired with proposed monitoring wells. A direct push drill rig will be used to advance soil borings to a maximum depth of 10 ft bg.
- Soil samples will be collected continuously and logged and screened with a calibrated PID for the purpose of identifying potential impacts to soil vapor quality.
- Soil vapor points are to be constructed using 6-inch steel screen and nylon, Teflon, or Teflon-lined tubing. Soil vapor points are to be filled with No. 0 filter sand and finished with a 2-ft bentonite seal and an 8-inch road box. Soil vapor points will be set at a depth of 10 ft bg.
- Soil vapor and outdoor air samples will be collected 6-liter summa canisters fitted with 2-hour regulators and analyzed for VOCs via EPA Method TO-15. Up to 7 air samples (5 soil vapor, 1 outdoor air, and 1 duplicate soil vapor) will be collected.
- Additionally, sub-slab SVI structure sampling will be completed at up to 5 off-site structures. Off-site structures will be selected based on analytical results from off-site soil vapor points and discussions with NYSDEC and NYSDOH.
- Sub-slab SVI structure sampling will be completed in accordance with NYSDOH's *Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006* and will include collection of sub-slab soil vapor samples and air samples and the completion of a NYSDOH Indoor Air Quality Questionnaire and Building Inventory.
- Sub-slab soil vapor points will be installed by advancing a ¼-inch drill bit immediately below the slab (anticipated 1 foot or less) using a handheld electronic hammer drill. Sub-slab soil vapor points will be installed, leak tested, and sampled in accordance with NYSDOH's *Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006.*
- SVI air and sub-slab soil vapor samples will be collected using 6-liter summa canisters fitted with an 8-hour or 24-hour regulator based on use of the building (8-hour for commercial and 24-hour for residential). Up to 18 air samples (5 sub-slab, 10 indoor air, 2 outdoor air, and 1 duplicate soil vapor) will be collected and analyzed for VOCs via EPA Method TO-15.

Additional information is provided in the Site-Specific Work Plan prepared for this Site under separate cover.

4.0 HAZARD ANALYSIS

The project hazard analysis below identifies the hazards that are anticipated to be encountered by the project team.

Physical Hazards Present	☐ Electricity ☒ Trips/Falls/Floor openings ☒ Holes/Pits ☒ Inclement weather ☐ Heat ☒ Cold ☐ Vibration ☐ Flying particles	☐ Ionizing radiation ☐ Non-Ionizing radiation ☐ Lasers ☒ Overhead hazards ☒ Noise ☐ Visible dust ☐ Falling objects ☐ Other _____
Health/Chemical Hazards Present [1]	☒ Dust/Fumes/Particulates ☒ Flammable/Combustible ☐ Compressed gas ☐ Explosive ☐ Water reactive ☐ Unstable ☒ Contact with contaminated media	☐ Oxidizer ☐ Corrosive ☐ Toxic ☐ Highly Toxic ☐ Irritant ☐ Sensitizer ☐ Carcinogen/Mutagen ☐ Other _____
Environmental/Equipment Hazards Present	☒ Heavy machinery ☒ Drilling ☐ Water operations ☒ Mobile equipment ☒ Road work ☐ Railroad work ☐ Forklifts ☐ Power tools ☐ Welding ☐ Gas cylinders ☒ Overhead/underground utilities	☐ Trenching/excavation ☐ Elevated heights/man lifts ☐ Scaffolding ☐ Ladders ☒ Confined spaces ☐ Energized equipment ☒ Overhead hazards ☒ Drums/container handling ☒ Insects/rodents/snakes ☐ Biological hazards ☐ Other _____
Personal Safety Considerations	☐ Security Issues ☐ Remote setting ☐ Employees working alone ☒ Limited lighting	☐ Off hour shifts ☐ Dangerous wildlife/animals ☒ Limited cell phone service ☐ Other _____
[1] **Table 1** (following the text of this HASP) provides a list of chemical substances for reference, along with odor threshold, permissible exposure limit (PEL), threshold limit value (TLV), OSHA ceiling, IDLH concentration, route of exposure and symptoms of acute exposure, if any.		

Details of specific hazards associated with individual tasks will be discussed in the Daily Job Brief Record (**Appendix D**).

4.1 Hazard Analysis Summary / Minimization

HRP's Corporate Health & Safety Plan (in conjunction with this HASP) will be cross-referenced in order to obtain the safe work practice procedures for mitigating and preventing project site hazards identified in the table above. Job site hazard prevention and minimization information can be found in Section 3 of HRP's Generic Health & Safety Plan.

Confined Spaces

Only properly trained HRP personnel are authorized to enter confined spaces. Confined space entry may be performed by subcontractors who have the proper training and experience to conduct this work. Confined space entry is not anticipated during the SC.

Excavations

It is HRP's policy to ensure that for excavation projects the subcontracted environmental contractor will provide a competent person to perform daily and as needed inspections of excavation sites. This policy will be conveyed through the subcontract agreement with the environmental contractor. At a minimum HRP will provide our employees involved with construction projects with awareness level training regarding excavation hazards and notify the subcontracted firm if any obvious excavation safety hazard exists during on-site activities.

Chemical Hazards

Hazardous chemicals known or suspected to be onsite are listed in **Table 1a** (follows text). **Table 1a** includes Chemical name, odor threshold OSHA PEL, ACGIH TLV, OSHA STEL, IDLH Concentrations, routes of exposure and symptoms of acute exposure. Chemicals likely to be encountered during site work are highlighted.

4.2 Changes in Conditions or Scope

Should conditions or the scope of work described herein change significantly; a HASP Addendum will be completed.

4.3 Monitoring Procedures

Air monitoring will be used to determine the concentrations of various chemicals while working in the exclusion zone to evaluate worker exposure to contaminated media. In order to determine potential health hazards and to determine the level of personal protection needed during sampling activities within the areas of concern, a Photoionization Detector (PID) will be periodically operated to monitor air quality for the purpose of ensuring minimal exposure to volatile organic compounds. Monitoring of atmospheres adjacent to on-going excavations and around the treatment area shall also be conducted with a PID.

The following environmental monitoring instruments/procedures shall be used on-site at the specified intervals.

Instrument/Procedure	**Sampling Interval**
Photoionization Detector (PID) in the breathing zone	Periodically as deemed by HSO

Background ambient air levels will be established outside the exclusion zone prior to commencement of site work. Ambient air sampling will occur in the breathing zone of site workers for comparison to the action levels (described below). Additionally, air sampling will be conducted in the vicinity of any intrusive exploration (i.e., near excavations, trenches, etc.) to determine if any contaminants are present.

The following *Action Levels* will be used:

Instrument	Action Level	Level of Protection or Action Required
PID	No reading above background	▪ No action required. ▪ Continue PID monitoring. ▪ (Modified) Level D protection.
PID	Up to 5 ppm above background	▪ Evacuate exclusion zone. ▪ Recheck levels after 15 minutes. ▪ If levels are sustained, reassess. ▪ Use engineering controls to lower breathing zone vapors. ▪ Level C protection (at the HSO direction).
PID	>5 ppm above background	▪ Evacuate exclusion zone. ▪ Recheck levels after 15 minutes. ▪ Use engineering controls to lower breathing zone vapors. ▪ If levels are sustained, contact Safety Manager, and re-evaluate HASP.

When an action level is equaled or exceeded, the work area should be evacuated, and the area re-tested with the sampling device. If the appropriate action level continues to be exceeded, the HSO will have to assess the use of engineering controls to lower vapor levels or availability of required increased personal protection equipment before authorizing re-entry.

Calibration of all instruments will occur at least once per day, when in use. An equipment calibration log is included in **Appendix E.**

For the indoor drilling work in enclosed air spaces and inadequate air flow, air monitoring will be conducted while drilling equipment is being used. The on-site air monitoring will include using direct reading air monitoring equipment such as the Systems 5-gas detector includes a PID with a 10.6 eV lamp or approved equal for the detection of volatile organic vapors and dedicated sensors for the detection of combustible gas, oxygen, hydrogen sulfide and carbon monoxide.

SUMMARY OF AIR MONITORING PROGRAM AND ACTION LEVELS		
Action Level	**Level of Protection**	**Action to be Taken**
COMBUSTIBLE GAS METER		
>10% LEL scale		Halt work, evacuate area and allow ventilating to below 10% LEL prior to resuming work. Notify Project Management Personnel.
OXYGEN		
<20.5%		Continuous monitoring. Consider engineering controls.
< 19.5%		Evacuate work area. Institute ventilation and engineering controls. Maintain site condition for at least 10 min. before proceeding. Notify Project Management Personnel.
>22%		Continuous monitoring. Identify combustion sources.
>23.5%		Evacuate. Institute engineering controls as necessary before proceeding. Explosive condition may be present. Notify Project Management Personnel.
HYDROGEN SULFIDE		
<1 ppm		Continue monitoring.
>10 ppm		Halt work, evacuate area and allow area to ventilate below 10 ppm. Contact the Project Management Personnel.
CARBON MONOXIDE		
<25ppm		Continue monitoring.
>35ppm		Halt work, evacuate area and allow area to ventilate below 10 ppm. Contact the Project Management Personnel.

When an action level is equaled or exceeded, the work area should be evacuated, and the area re-tested with the sampling device. If the appropriate action level continues to be exceeded, the HSO will have to assess the use of engineering controls to lower vapor levels or availability of required increased personal protection equipment before authorizing re-entry.

Calibration of all instruments will occur at least once per day, when in use.

5.0 ENGINEERING CONTROL MEASURES/GENERAL SAFETY

5.1 Air Monitoring

In order to determine potential health hazards and to determine the level of personal protection needed during drilling, excavation and sampling activities within the areas of concern, a PID will be periodically operated to monitor air quality for the purpose of ensuring minimal exposure to volatile organic compounds. Please refer to Section 4.3 of this plan for specific air monitoring procedures/action levels.

5.2 Protective Zones

Prior to commencement of work in area of suspected contamination, protective zones specific for each phase of the Plan will be established by the HSO if necessary, prior to the start of field work. The purpose of the protective zones is to prevent potential cross-contamination of adjacent areas as well as to protect project personnel from exposure to contaminated areas.

Protective zones shall be delineated as follows:

- Exclusion Zone: This is the contaminated area in which intrusive activities are performed. The "Area of Environmental Concern" (AOEC) is located within this area. A single access point for entrance and exit should be established and maintained, if possible. This zone should be delineated from the Contaminant Reduction Zone via perimeter cones or caution tape, or other applicable method. The Exclusion Zone delineation and any necessary modifications will be based on site conditions.

- Contaminant Reduction Zone: This zone is a transition zone located between the Exclusion Zone and the Support Zone and is utilized to decontaminate personnel and equipment.

- Support Zone: This zone will be utilized by equipment and vehicle storage and will be kept free of contaminated material. The HSO will determine the location of this zone. In the event of a site evacuation, the rally point will be on the sidewalk entrance to the Site building at 11-24 Wyckoff Avenue (**Figure 2**). The designated rally point may be relocated by the HSO based on project or site conditions. All site workers will be notified of any relocation prior to implementation.

6.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

6.1 Level of Protection

As identified in Section 4.0, the overall health and safety risk associated with chemical hazards for HRP and associated contractors is considered significant. This is primarily due to the moderate concentrations of chemical contaminants expected based on minimal contact personnel will have with any potentially contaminated media. Therefore, the minimal level of protection for HRP personnel during the conduct of all the environmental work performed at the site will be Level D PPE, and will generally consist of the PPE listed below:

- Steel toe/shank work boots
- Hard hat, as necessary
- Safety vest, as necessary
- Coveralls/tyvek, as necessary
- Safety glasses/goggles/face shield, as necessary
- Hearing protection, as necessary

If site conditions warrant, an upgrade to Level C PPE may be required (refer to Section 4.3 for the appropriate *Action Levels*) then the contractors will make Level C personal protective equipment (PPE) readily available. Level C PPE generally includes:

- Full face, air purifying respirator with organic vapor cartridges
- Same as Level D, but also includes tyvek taped pant/boot and glove/shirt

If it is determined protection beyond Level C is required, HRP will re-evaluate the HASP as well as the site conditions, and will revise the HASP as required. The following table provides a summary of the minimum level of PPE required on site:

Description	Level of Protection [1]	
	D	C
Body		
Work Clothes	R	R
Chemical Protective Suit (Tyvek)	O	R
Visibility Vest	O [2]	O [2]
Apron	O	O
Fall Protection	O [2]	O [2]
Head		
Hard Hat	R	R
Head Warmer	O	O
Eyes & Face		
Safety Glasses	R	R
Goggles (based on hazard)	O	R
Face Shield	O	O
Ears		
Plugs or Muffs	R [2]	R [2]
Hands & Arms		
Work Gloves	R	O [2]

Description	Level of Protection [1]	
	D	C
Chemical Resistant Gloves (Nitrile)	O	R
Insulated Gloves	O	O
Foot		
Work Boots/Steel Toe Boots	R	R
Chemical Resistant Boots	O	O
Disposable Boot Covers	O	O
Respiratory Protection [3]		
½ Mask Air Purifying Respirator (APR) or Full face APR	NA	R
Dust Protection	O	NA
Powered APR	NA	NA
SCBA/Supplied Air Respirator	NA	NA

R = Required, **O** = Optional, **NA** = Not Applicable

[1] The level of protection identified here does not include the necessary equipment for entering confined spaces. Refer to Moran Environmental Recovery's Safety Manual Confined Space Program for atmospheric sampling protocols and breathing and rescue equipment necessary for those operations.

[2] The use of this PPE may or may not be required depending on site conditions/location and will be addressed at the time of task assignment by the HSO.

[3] Respiratory protection necessary to protect against VOC, dusts/particulates and not oxygen deficient atmospheres.

The following table provides a general description of potential field activity tasks to be performed and associated (recommended) PPE. The use of this PPE may or may not vary depending on site conditions and will be addressed at the time of task assignment by the HSO.

Task Description	Invasive (Y/N)	Protection Level
Site Mobilization - Surveying, fence and barrier installation, hay bale installation, decon and work zone set up, soil staging areas preparation	N	Level D
Soil and Water Sampling - Drilling, sampling, soil moving as needed.	Y	Modified Level D or Level C – Respirator as needed based on monitoring. Eye protection required during collection of any liquid sample
Soil Excavation, Staging and Load-Out	Y	Modified Level D – or Upgrade to Level C dependent on monitoring
Decontamination - Truck dry sweeping, decon pressure wash of equipment, PPE change out	Y	Modified Level D – or Upgrade to Level C dependent on monitoring
Waste Management - Soil load-out for off-site disposal, water removal for disposal, PPE disposal	Y	Modified Level D – or Upgrade to Level C dependent on monitoring
Site Control (Exclusion, Decontamination, Support Zones)	N	Modified Level D – or Upgrade to Level C dependent on monitoring
Communications - Use of hand signals, backup alarms, and voice	N	NA
Site Restoration	Y	Level D

7.0 DECONTAMINATION

7.1 Decontamination Procedures

All personnel and equipment leaving the exclusion zone must be properly cleaned and decontaminated. When there is evidence of chemical contamination during the site operations, all personnel will be decontaminated under the direction of the HSO. Clean-up and/or decontamination of personnel shall consist of washing off excessively soiled PPE with a disinfectant detergent scrub and water. At the very least, all personnel should wash their hands and face before leaving the exclusion zone. After washing, all disposable clothing (tyvek, gloves, etc.) will be removed and placed in a double lined plastic bag.

Sampling tools and any other non-disposable items will be decontaminated between sampling points, and at the direction of HRP personnel, to prevent cross-contamination of work areas or environmental samples, as applicable.

7.2 Emergency Decontamination

If immediate medical attention is required in an emergency, decontamination will be performed after the victim has been stabilized. If a worker has been exposed to an extremely toxic or corrosive material, then emergency decontamination will consist of flushing with copious amounts of water. If the victim cannot be decontaminated because it will interfere with emergency medical aid being administered, then the victim should be wrapped with plastic or other available items (i.e. an uncontaminated coverall) to reduce potential contamination of other personnel or medical equipment.

If a site worker has been overcome by heat related illness, then any protective clothing should be removed immediately. In the case of non-medical emergency evacuation, decontamination should be performed as quickly as possible, unless instant evacuation is necessary to save life or prevent injury.

7.3 Personal Hygiene

All employees will be required to wash hands and face prior to eating, smoking, drinking and going to the bathroom. Workers will be required to remove contaminated PPE and clothing prior to leaving the Contaminant Reduction Zone. All field personnel should avoid contact with potentially contaminated substances such as puddles, pools, mud, etc.

Additional personal hygiene requirements, intended to prevent the spread of the novel corona virus to site workers will be in effect during site activities. These procedures include mobile handwashing stations and the requirement for site workers to wear face coverings. Additional details are included in **Appendix F**.

8.0 EMERGENCY ACTION PLAN/SPILL RESPONSE

In the event of a worker injury, fire, explosion, spill, flood, or other emergency that threatens the safety and health of site workers, the following procedure will be followed:

1. If the emergency originates within the work area covered by this Plan, the HRP HSO shall act as the Emergency Coordinator. The emergency evacuation signal is an air horn or a loud yell. All emergency situations (including worker injuries, no matter how small) will be reported to the HSO, who will determine the appropriate emergency response, up to and including evacuation. Only the HSO may initiate evacuation of the work area. The HSO will be responsible for reporting any emergency situation to the appropriate authorities, using a telephone or other appropriate method.

2. In the case of an evacuation, site workers will exit the site along the safest route(s) and assemble with team members at a safe rally point. Those workers in the Exclusion Zone will follow the emergency decontamination procedures outlined in Section 7.2. Accounting of all site personnel will be conducted by the HSO using the personnel log at a location determined by the HSO.

3. HRP personnel are not permitted to participate in handling the emergency. Fire and medical emergencies will be handled by the local fire department and ambulance service. In the case of a spill of hazardous materials the NYSDEC will be contacted.

   In addition, the HSO/Project Manager must advise the site contact that the New York Spill Hotline should be contacted and, if the spill quantity is greater than the Reportable Quantity (RQ) under CERCLA and/or SARA, the National Response Center (NRC) and Local Emergency Planning Committee should also be contacted. If the spill begins to flow overland and threatens to contaminate a storm drain or surface water, HRP personnel may attempt to contain and isolate the spill using any available resources, but only if, in the judgment of the HSO, such action will not expose the workers to dangerous levels of hazardous substances and is necessary to preserve life or property. In the event that a spill of material of any amount threatens to reach navigable waters, the NRC shall be contacted.

4. Once initial emergency procedures to protect worker safety and health have been addressed, and control of emergency has been completed, the HSO will complete an Investigation Report and submit this form to the appropriate personnel (HRP and/or client contact).

5. All site workers will be familiarized with the above procedures during the pre-entry briefing to be conducted before site work begins.

9.0 TRAINING/MEDICAL SURVEILLANCE

9.1 Training Requirements

All HRP and HRP subcontractor personnel who enter the work zone and/or Exclusion Zone must have successfully completed the 40-hour or 24-hour training requirement outlined in 29 CFR 1910(e). If the 40-hour or 24-hour training of any person occurred more than 12 months prior to commencement of work, then that person must have attended an 8-hour refresher course within the 12 months prior to commencement of work. If respirators are in use in the Exclusion Zone, then all personnel must have undergone respirator training and a fit test within the last 12 months. Training certificates and records for HRP employee(s) are on file at HRP. All other contractors will be required to supply written proof of training before being allowed into the Exclusion Zone.

9.2 Pre-Entry Briefing

Prior to commencement of work in an area of suspected contamination, HRP's Health and Safety Officer will conduct a pre-entry briefing with on-site contractors, which will include the following:

- Name of the HSO and person responsible for the visitor log.
- Description of the parcel as well as location of emergency telephones and the location/boundaries of the Exclusion Zone, Contamination Reduction Zone, and Support Zone, if established.
- Review of hospital locations and directions.
- Review of tasks to be conducted within the parcel by the site workers.
- Review of the Emergency Action Plan and rally point, including the nearest emergency communications and telephone numbers.
- The nature, level, and degree of anticipated hazards (physical and chemical) involved in the site work.
- Required personal protective equipment.
- Decontamination procedures.

The HSO should also, at this time, ensure that all on-site HRP and HRP subcontractor personnel have read the HASP and signed the last page of the original (Section 11.0). If additional information on the site becomes available, the HSO will call additional briefings as necessary.

9.3 Morning Safety (Tailgate) Meeting

The HRP HSO will conduct a safety overview meeting at the beginning of each workday on the site. The meeting will be given in addition to any tailgate meetings that the subcontractor conducts. A summary of the meeting topics signed by the personnel attending the meeting is included in **Appendix D**.

9.4 Medical Surveillance

All HRP and HRP subcontractor personnel entering the Exclusion Zone must have had a physical within the 12 months prior to commencement of site work. A physician's written opinion regarding fitness for work for each employee including work limitations, if any, is on file at HRP, as applicable. A written opinion for all other site personnel must be supplied prior to commencement of site work to the HRP HSO. Any work limitations for site personnel, or relevant medical information (i.e. allergic reactions to medication) should be included in this Plan.

10.0 AUTHORIZATIONS

Personnel authorized to enter the Exclusion Zone include the personnel listed in Section 2.4. Persons not listed in Section 2.4 may enter the Exclusion Zone only if the appropriate training and medical fitness certifications have been supplied to either the HRP Project Manager or Health and Safety Manager and the HSO or his/her designee on site has approved site entry. All personnel entering or leaving the Exclusion Zone must sign in and sign out with the recordkeeper.

11.0 FIELD TEAM REVIEW

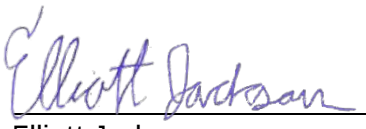
All HRP personnel shall sign below after reading this HASP and shall agree with the following statement:

"I have read and understand this site specific Health and Safety Plan.
I will comply with the provisions set forth therein."

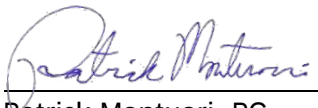
Printed Name	Signature	Date

12.0 APPROVALS

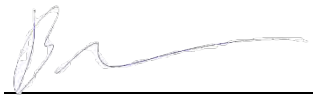
This plan meets the minimum requirements of 29 CFR 1910.120 and 29 CFR 1929.65 and has been written for specified site conditions, dates, and personnel, and must be amended if conditions change. By their signature, the undersigned certify that this HASP is approved and will be utilized during activities at the project.



Elliott Jackson — Date
On-Site Health and Safety Officer



Patrick Montuori, PG — Date
Project Manager



Bryan Sherman, ASP — Date
Office Health and Safety Manager

Subcontractor:

I have been provided a copy of this HASP for review.

_____ — _____
Name — Date

Representing _____

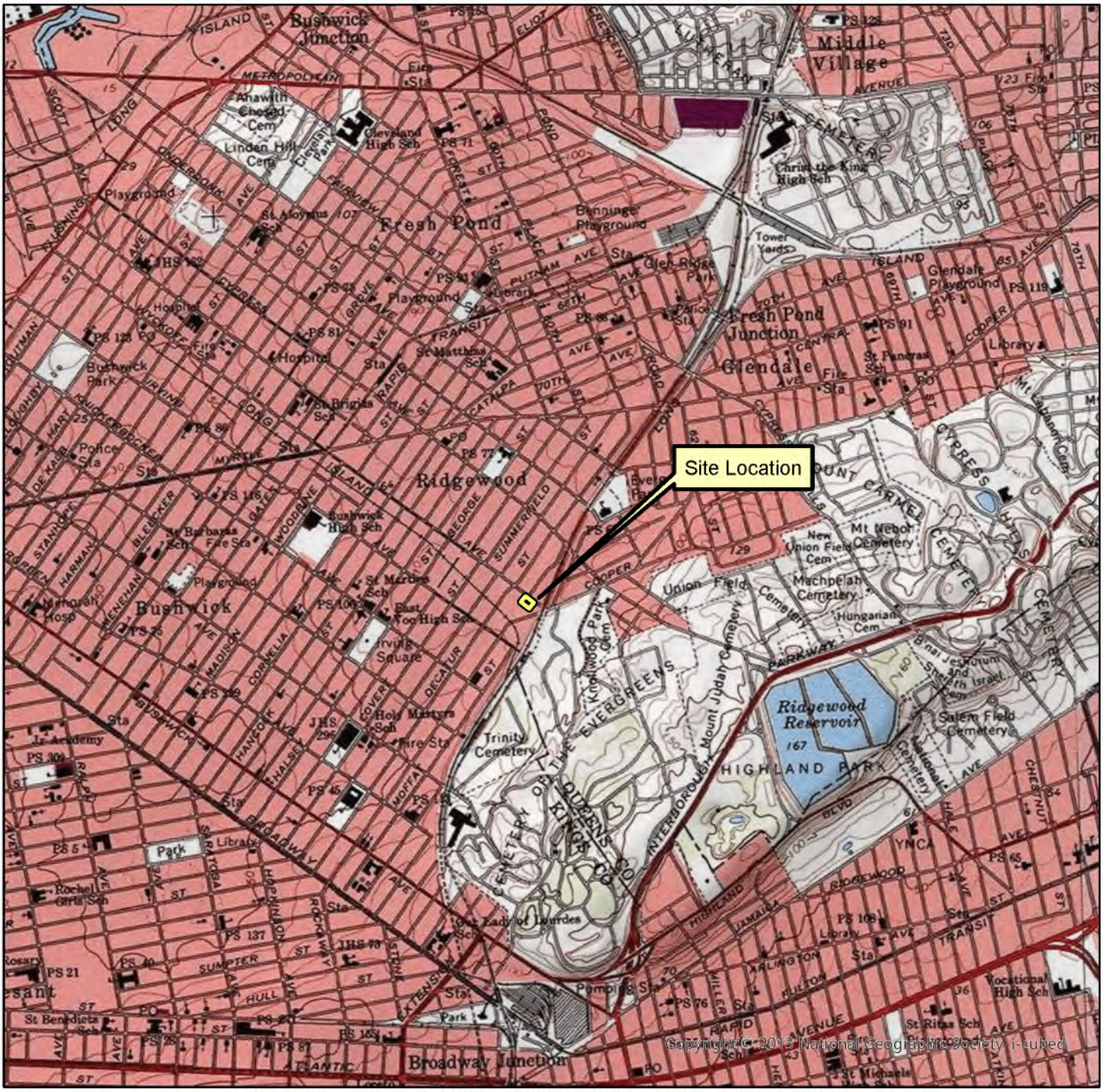
The Designated Competent person representing [subcontractor] at the site will be

_____.

Any alternate Competent Person will be noted in the Daily Job Brief Record (**Appendix D**).

ADDITIONAL APPROVALS (or Re-Approvals)	
Name:	**Date:**

FIGURES



0 500 1,000 2,000 3,000 4,000 5,000 6,000 7,000 8,000

Feet

1:24,000

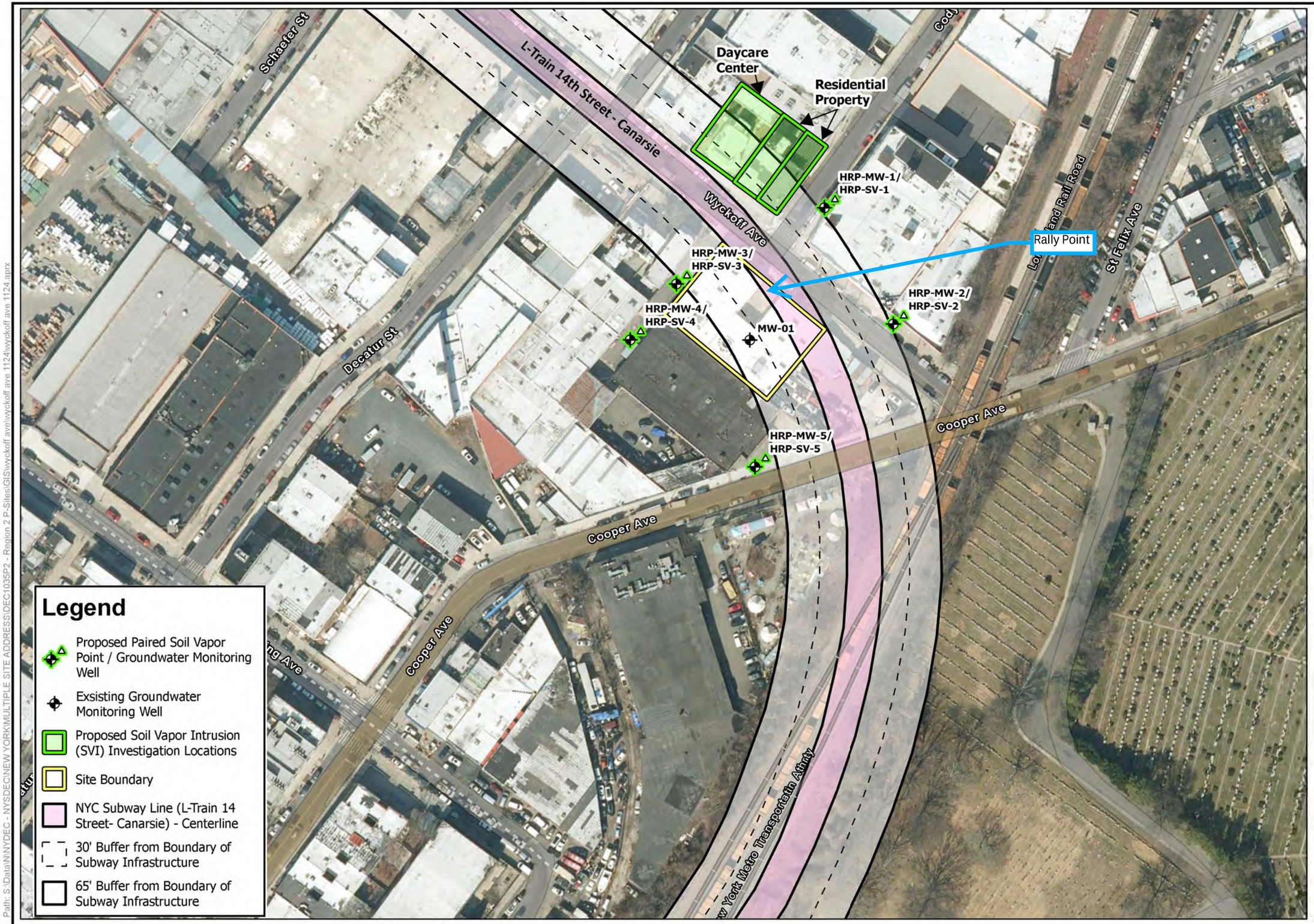
N

USGS Quadrangle Information
Quad ID: 40073-F3
Name: Jamaica, New York
Date Rev: 1976
Date Pub: 1979

Figure 1
Site Location
11-24 Wyckoff Avenue
Queens, New York
HRP # DEC1035.P2
Scale 1" = 2,000'

HRP
MOVE YOUR ENVIRONMENT FORWARD
ONE FAIRCHILD SQUARE
SUITE 110
CLIFTON PARK, NY 12065
(518) 877-7101
HRPASSOCIATES.COM

Path: S:\Data\N\NYDEC - NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION\NEW YORK\MULTIPLE SITE ADDRESS\DEC1035P2 - Region 2 P-Sites\GIS\wyckoff ave\wyckoff ave 1124\



HRP
MOVE YOUR ENVIRONMENT FORWARD
ONE FAIRCHILD SQUARE
SUITE 110
CLIFTON PARK, NY 12065
(518) 877-7101
HRPASSOCIATES.COM

North

0 50 100 Feet

Revisions					
No.					
Date					

Designed By:	Drawn By:	Reviewed By:
CMS	EWJ	PWM

Issue Date:	Project No:	Sheet Size:
6/19/2023	DEC1035.P2	11x17

Site Plan and Proposed Investigation Locations - Off-Site

11-24 Wyckoff Avenue
NYSDEC Site #241255
11-24 Wyckoff Avenue
Queens, New York

Figure No.
2

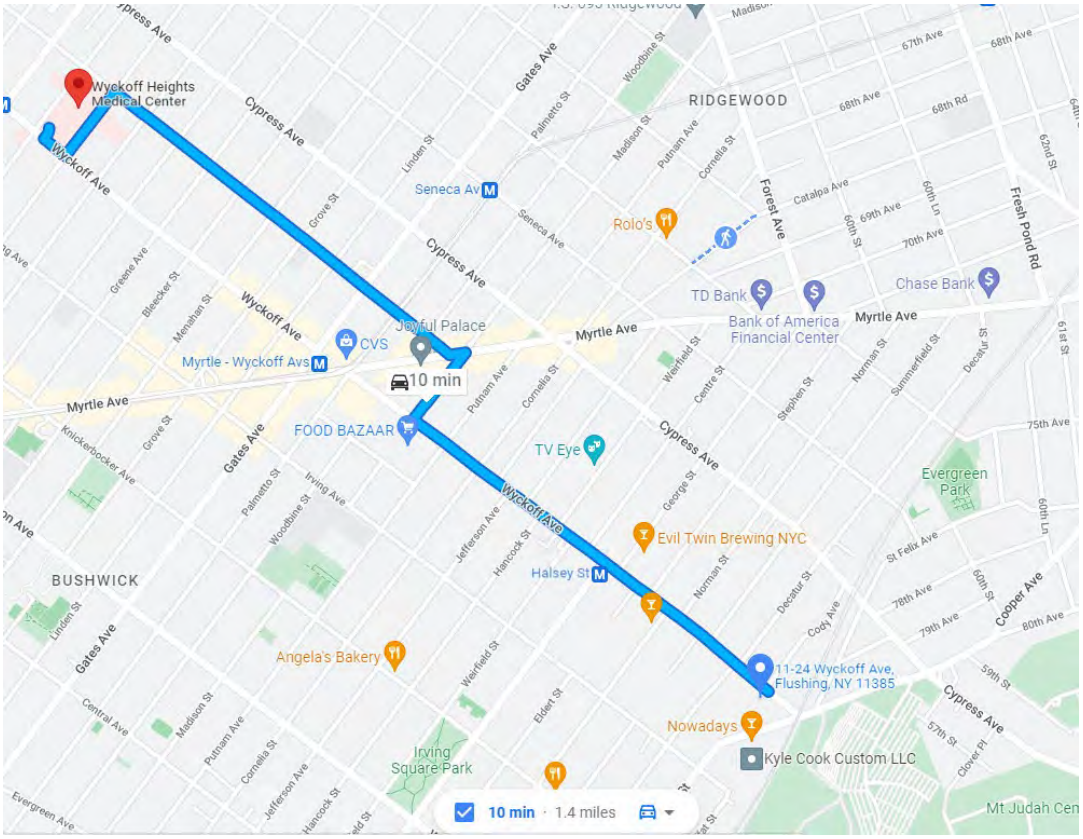
Path: S:\Data\NY\NYDEC - NYSDEC\NEW YORK\MULTIPLE SITE ADDRESS\DEC1035P2 - Region 2 P-Sites\GIS\wyckoff ave\wyckoff ave 1124\wyckoff ave 1124.aprx

Figure 3: Route and Map to Nearest Hospital

Directions to Wyckoff Heights Medical Center

Total Estimated Time: 10 minutes
Total Estimated Distance: 1.4 miles

Begin at 11-24 Wyckoff Avenue, Queens, NY
End at Wyckoff Heights Medical Center
374 Stockholm Street, Queens, NY



TABLES

TABLE 1a
CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

CONTAMINANT	ODOR THRESHOLD	OSHA PEL[1]	TLV (ACGIH)	OSHA CEILING[2] /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE[3]
1,1,1 Trichloroethane	44 ppm	350 ppm	350 ppm	---	700 ppm	Inh, Ing, Con	Head, Lass, CNS, Derm
1,1,2-Trichloroethane	---	10 ppm	10 ppm	----	[100 ppm]	Inh, Ing, Abs, Con	Eyes, Nose Irrit, Resp Irrit, CNS, Liver, Kidney Damage, Derm, [Carc]
1,2,4 Trimethylbenzene 1,3,5 Trimethylbenzene		25 mg/m^3	25 ppm	25 mg/m^3	ND	Inh, Ing, Con	Irrit Eyes, Skin, Nose, Throat, Resp Sys, Bron, Hyprochronic Anemia, Head, Drow, Ftg, Dizz, Nau, Inco, Vomit, Conf, Chemical Pneu (aspir lig)
1,1' Biphenyl	0.0062 mg/m^3	0.2 ppm	0.2 ppm	---	100 mg/m^3	Inh	
1,1-Dichloroethane	120 ppm	100 ppm	100 ppm	---	3,000 ppm	Inh, Ing, Con	CNS Depres, Skin Irrit, Liver, Lung and Kidney Damage
1,1-Dichloroethylene***	500 ppm	---	5 ppm	---	---	Inh, Con	CNS depress, Resp, [Carc]
1,2-Dichlorobenzene	50 ppm	50 ppm	25 ppm		200 ppm	Inh, Ing, Abs, Con	Irrit, Resp
1,2-Dichloroethylene	26-87 ppm	200 ppm	200 ppm	---	1,000 ppm	Inh, Ing, Con	Vomit, Irrit Eyes, Resp Sys; CNS Depres
1,2-Dichloropropane	130-190 ppm	75 ppm	75 ppm	---	[400 ppm]	Inh, Con, Ing	Eye irritation, Drow, light-headedness; irritated skin, [Carc]
1,3-Dichlorobenzene	---	----	---	----	---	----	----
1,4-Dichlorobenzene	20 ppm	75 ppm	10 ppm	----	[150 ppm]	Inh, Ing	[Carc], Eye Irrit, swelling around eye, headache, nausea, vomiting
1-Methylnaphthalene	0.02 ppm	---	---	---	---	---	---
2,4-Dichlorophenol	1.4007 mg/m^3	---	---	---	---	---	---
2,4-Dimethylphenol	0.001 mg/m^3	---	---	---	---	---	---
2-Methylnaphthalene	0.01 ppm	---	---	---	---	---	---
2-Methylphenol (o-cresol) [skin]	1.4 mg/L	5 ppm	5 ppm	---	250 ppm	Inh, Abs, Ing, Con	Confusion, depression, Resp Fail; difficulty breathing, irregular rapid respiration, weak pulse; skin, eye burns; dermatitis

TABLE 1a
CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

CONTAMINANT	ODOR THRESHOLD	OSHA PEL[1]	TLV (ACGIH)	OSHA CEILING[2] /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE[3]
3, 3'-Dichlorobenzidine	---	None	**---**	---	---	Inh, Abs, Ing, Con	Sens, Derm, Head, Dizz, Burns, GI Upset, [Carc]
4-Isopropyltoluene	---	---	---	---	---	Con, Inh, Ing	Defat, Eryt
Acenephthene	0.5048 mg/m^3	---	---	---	---	---	---
Acenaphthylene	---	---	---	---	---	---	---
Acetone	47.5 mg/m^3	1,000 ppm	500 ppm		2,500 ppm	Ing, Inh, Con	Head, Dizz; Irrit Eyes, Nose, Throat; Derm, CNS, Depress, Derm
Acetonitrile	70 mg/m^3	40 ppm	20 ppm	---	500 ppm	Inh, Ing, Abs, Con	Asphy; Nau, Vomit; Chest Pain; Weak, Stupor, Convuls; Eye Irrit
Aldrin	---	0.25 mg/m^3	0.25 mg/m^3	---	25 mg/m^3	Inh, Abs, Ing, Con	Head, Dizz, Nau, Vomit, Mal, Myo, [Carc]
Anthracene (Coal Tar Pitch)	---	0.2 mg/m^3			[80 mg/m^3]	Inh, Con	Derm, bron, [carc]
Antifreeze		50 ppm	100 mg/m^3 (aerosol)	---	ND	Inh, Ing, Con	Irrit Eyes, Skin, Nose, Throat, Nau, Vomit, Abdom Pain, Lass, Dizz, Stup, Conv, CNS, Depres, Skin Sen
Arsenic	----	0.010 mg/m^3	0.01 mg/m^3	----	[5 mg/m^3]	Abs, Inh, Con, Ing	Derm; GI; Resp Irrit; ulceration of nasal septum; Resp, Irrit, Hyper Pig of Skin, [Carc]
Barium (elemental)	---	0.5 mg/m^3	0.5 mg/m^3		50 mg/m^3 (barium components)	Inh, Ing, Con	Resp. Irrit, GI, Muscle Spasm, Eye Irrit, Slow Pulse; skin burns
Benzene*	4.7 ppm	1 ppm	0.5 ppm	5 ppm	[500 ppm]	Inh, Ing, Abs, Con	Irrit Eyes, Nose, Throat; Head, Nau, Derm, Ftg, Anor, Lass, [Carc]
Benzo(a)anthracene (coal tar pitch)	---	0.2 mg/m^3			[80 mg/m^3]	Inh, Con	[Carc], Derm, Bron
Benzo(a)pyrene (coal tar pitch)	---	0.2 mg/m^3	---		[80 mg/m^3]	Inh, Con	[Carc], Derm, Bron
Benzo(b)fluoranthene (coal tar pitch)	---	0.2 mg/m^3	---		[80 mg/m^3]	Inh, Con	[Carc], Derm, Bron

TABLE 1a
CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

CONTAMINANT	ODOR THRESHOLD	OSHA PEL[1]	TLV (ACGIH)	OSHA CEILING[2] /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE[3]
Benzo(g,h,i)perylene (coal tar pitch)	---	0.2 mg/m^3			[80 mg/m^3]	Inh, Con	[Carc], Derm, Bron
Benzo(k)fluoranthene (coal tar pitch)	---	0.2 mg/m^3			[80 mg/m^3]	Inh, Con	[Carc], Derm, Bron
Bis (2-ethylhexyl) Phthalate**	N/A	5 mg/m^3	5 mg/m^3	10 mg/m^3	[5,000 mg/m^3]	Inh, Ing, Con	[Carc], Irrit Eyes
Cadmium (dust)	---	0.005 mg/m^3	Lowest concentration feasible 0.01 mg/m^3	---	[9 mg/m^3]	Inh, Ing	CNS, Resp, Irrit, Vomit, Cough, Head, Chills, Nau, Diarr, Pulm Edema, Dysp, Chest Tight, [Carc]
Carbazole	---	---	---	---	---	Inh	---
Carbon disulfide	0.1-0.2 ppm	20 ppm	1 ppm	30 ppm	500 ppm	Inh, Abs, Ing, Con	Diz, Head,Ftg, Ner, anorexia, trembling hands, loss of fine motor coord, gastritis, eye, skin burns, Derm
Carbon Tetrachloride***	21.4 ppm	10 ppm	5 ppm	25 ppm	[200 ppm]	Inh, Abs, Con, Ing	CNS Depres, Nau, Vomit, Irrit, Irrit Eyes, Skin, Drow, Dizz, [Carc]
Chlorobenzene***	0.98 mg/m^3	75 ppm	10 ppm	---	1,000 ppm	Inh, Ing, Con	Irrit, Drow, CNS, Depres, Eyes, Skin, Nose, Inco.
Chloroform***	85 ppm	50 ppm	10 ppm	50 ppm	[500 ppm]	Inh, Ing. Con, Abs	Dizz, Dullness, Nau, Head, Ftg, Irrit Eyes, Skin, Conf, [Carc]
Chromium	---	1 mg/m^3	0.5 mg/m^3	---	250 mg/m^3	Inh, Ing, Con	Irrit Eyes, Sens Derm
Chrysene (coal tar pitch)		0.2 mg/m^3	---		[80 mg/m^3]	Inh, Con	Derm, Bron, [Carc]
Cis-1-2-Dichloroethylene	---	200 ppm	200 ppm	----	1000 ppm	Inh, Con, Ing	Irrit Eyes, Resp, CNS Depress
Copper (dusts and mists) (fumes)		1 mg/m^3 0.1 mg/m^3	1 mg/m^3 0.2 mg/m^3	----	100 mg/m^3	Inh, Ing, Con	Vomit, Derm, CNS, Irrit, Derm, Nau, Taste (metallic)
Cyanide	0.9 mg/m^3	5 mg/m^3	5 mg/m^3 (10 min)	5 mg/m^3	25 mg/m^3	Inh, Ing, Abs, Con	Weak, Head, Nau, Conf, Cyan
Dibenzo(a,h)anthracene						Inh, Ing	

TABLE 1a
CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

CONTAMINANT	ODOR THRESHOLD	OSHA PEL[1]	TLV (ACGIH)	OSHA CEILING[2] /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE[3]
Dichloromethane	540 mg/m^3	25 ppm	50 ppm	125 ppm	[2,300 ppm]	Inh, Abs, Ing, Con	Irrit Eyes, Skin, lass, drow, dizz, Numb, tingl, Nau, [Carc]
Diethylphthalate**	---	None	5 mg/m^3	---	N.D.	Inh, Ing, Con	Irrit Eyes, Skin, Nose, Throat, Head, Dizz, Nau, Lac, Possible Polyneur, Vestibular Dysfunc, Pain, Numb, lass, Spasms in Arms and Legs
Di-n-octylphthalate	---	---	---	---	---	Inh, Ing, Con	---
Dimethylpthalate	---	5 mg/m^3	5 mg/m^3	---	2,000 mg/m^3	Inh, Ing, Con	Irrit, Resp, Abdom
Ethyl Benzene*	8.7 mg/m^3	100 ppm	100 ppm	125 ppm	700 ppm	Inh, Abs, Con	Head. Irrit, Derm, Narc., Irrit Eyes, Skin; Coma
Fluoranthene		0.2 mg/m^3	0.2 mg/m^3			Ing, Inh	[Carc]
Fluorine*	6 mg/m^3	0.1 ppm	1 ppm	2 ppm	25 ppm	Inh, Con	
Fuel Oil/#2	----	----	300 ppm	----		Inh, Abs, Ins, Con	Irrit Eyes, Skin, Derm, Head, Ftg, Blurred Vision, Dizz, Conf
Ideno(1,2,3-cd)pyrene		0.2 mg/m^3				Ing, Inh	
Lead (inorganic forms and dust as Pb)****		0.05 mg/m^3	0.05 mg/m^3		100 mg/m^3	Inh, Ing, Con	Irrit, Cns, Vomit, Narco, Weak, Pall, Insom, Lass, Abdom, Constip
Mercury (organic alkyl compounds) [skin]		0.01 mg/m^3	0.01 mg/m^3	0.03 mg/m^3	2 mg/m^3	Inh, Abs, Ing, Con	Irrit Eyes, Skin; Cough & Chest Pain, Bron Pneu, Tremor, Insom, Irrty, Indecision, Head, Ftg, Weak, Stomatitis, Salv, GI Dist, Anor, Low-wgt, Ataxia
Mercury (compounds)	----	0.1 mg/m^3	0.025 mg/m^3	0.1 mg/m^3	10 mg/m^3	Inh, Abs, Ing, Con	Irrit Eyes, Skin; Cough & Chest Pain, Bron Pneu, Tremor, Insom, Irrty, Indecision, Head, Ftg, Weak, Stomatitis, Salv, GI Dist, Anor, Low-wgt, Ataxia
Methanol	13.1150 mg/m^3	200 ppm	200 ppm	---	6,000 ppm	Inh, Abs, Ing, Con	Irrit Eyes, Skin, Resp, Head, drow, dizz, Nau, Vomit, vis dist, Optic, derm

TABLE 1a
CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

CONTAMINANT	ODOR THRESHOLD	OSHA PEL[1]	TLV (ACGIH)	OSHA CEILING[2] /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE[3]
Methyl Ether	----	----	---	----	---	Inh	Poison
Methyl Ethyl Ketone (2-Butanone)***	0.7375 mg/m^3	200 ppm	200 ppm	300 ppm	3,000 ppm	Inh, Con, Ing	Irrit Eyes, Skin, Nose, Throat, Head, Dizz, Vomit, Derm
Methylene Chloride	540 mg/m^3	25 ppm	50 ppm	125 ppm	[2,300 ppm]	Inh, Ing, Con, Abs	Ftg, Weak, dizz, drow, Numb, Tingle [carc], Irrit Eyes, Skin, Nau
Mineral Spirit	20 ppm	500 ppm	100 ppm	---	20,000 mg/m^3	Inh, Ing, Con	Irrit Eyes, Nose, Throat, Dizz, Derm, Chemical pneu
Methyl tert butyl ether (MTBE)	---	---	50 ppm	---		Inh, Abs	
Naphtha	0.86 ppm	100 ppm	400 ppm	---	1,000 ppm	Inh, Con, Ing	Light Head, Drow, Irrit, Derm, Irrit Eyes, Skin, Nose
Naphthalene*	0.084 ppm	10 ppm	10 ppm	15 ppm	250 ppm	Inh, Abs, Ing, Con	Eye irritation; headache; confusion, excitement, malaise (vague feeling of ill-being); nausea, vomiting, abdominal pain; irritated bladder; profuse sweating; renal shutdown; dermatitis
Nickel (metal)	---	1 mg/m^3	1.5 mg/m^3	---	[10 mg/m^3]	Inh, Ing, Con	Head, Verti, Nau, Vomit, Pain, Cough, Weak, Convuls, Delirium, Pneu, ,[Carc]
Nitrobenzene	0.0235 mg/m^3	1 ppm	1 ppm	---	200 ppm	Inh, Abs, Ing, Con	Irrit Eyes, Skin, Anoxia, Derm, Anem, Methem
n-Butylbenzene	---	---	---	---	---	---	---
n-Propylbenzene	---	---	---	---	---	---	---
PCBs 42% chlorine (Aroclor 1242)	---	1 mg/m^3 (skin)	1 mg/m^3 (skin)	---	[5 mg/m^3]	Inh, Abs, Ing, Con	Irrit Eyes, Chloracne, Liver Damage [carc]
PCBs 54% chlorine (Aroclor 1254)	---	0.5 mg/m^3 (skin)	0.5 mg/m^3 (skin)	---	[5 mg/m^3]	Inh, Abs, Ing, Con	Irrit Eyes; Chloracne, Liver Damage [carc]

TABLE 1a
CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

CONTAMINANT	ODOR THRESHOLD	OSHA PEL[1]	TLV (ACGIH)	OSHA CEILING[2] /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE[3]
Petroleum Distillates	---	500 ppm	100 ppm		[1,100 ppm]	Inh, Ing, Con	Dizz, Drow, Head, Dry Skin, Nau, Irrit Eyes, Nose, Throat, [Carc]
Phenanthrene (Coal Tar Pitch)		0.2 mg/m^3	0.2 mg/m^3		[80 mg/m^3]	Inh, Con	Derm, bron, (carc)
Phenol**	0.1786 mg/m^3	5 ppm	5 ppm	---	250 ppm	Inh, Abs, Ing, Con	Irrit Eyes, Nose, Throat, Anor, Low Wgt, Weak Musc Ache, Pain, Dark Urine, Cyan, Liver, Kidney Damage, Skin, Burns, Derm, Ochronosis, Tremor, Convuls, Twitch
Pyrene		0.2 mg/m^3			[80 mg/m^3]	Inh, Con	[Carc]
Sec-Butylbenzene	---	---	---	---	---	---	---
Selenium	N/A	0.2 mg/m^3	0.2 mg/m^3	Unknown	1 mg/m^3	Inh, Ing, Con	Irrit, Head, Fever, Chills, Skin/Eye Burns, Metallic Taste, GI, Dysp, Bron
Silver (metal and soluble compounds as Ag)	----	0.01 mg/m^3	Metal = 0.1 mg/m^3 Soluble 0.01 mg/m^3		10 mg/m^3	Inh, Ing, Con	Blue-gray Eyes, Nasal Septum, Throat, Skin; Irrit, Ulcer, Skin, GI Dist
Tetrachloroethylene (a.k.a. perchloroethylene)***	4.68 ppm	100 ppm	25 ppm	200 ppm	[150 ppm]	Inh, Ing, Con, Abs	Irrit Eyes, Skin, Nose, throat, Resp. Nau, flush face, Neck, dizz, inco, head, drow, eryth, [Carc]
Toluene*	2.14 ppm	200 ppm	50 ppm	300 ppm	500 ppm	Inh, Abs, Ins, Con	Resp, Irrit, Ftg, Conf, Dizz, Head, Derm, Euph, Head, Dilated Pupils, Lac, Ner, Musc FTg, Insom, Pares, Derm, lass
Petroleum Distillates (naphtha)	10 ppm	100 ppm	400 ppm	---	1,000 ppm	Con, Inh, Ing	---
Trans 1,2-Dichloroethylene	0.3357 mg/m^3	200 ppm	200 ppm	---	1,000 ppm	Inh, Con	Irrit, Resp, CNS depress
Trichloroethylene***	21.4 ppm	100 ppm	50 ppm	200 ppm	[1,000 ppm]	Inh, Con, Abs, Ing	Head, Vert, Nau, Vomit, Derm, Vis Dist, Tremors, Som, Nau, Irrit Eyes, Skin, Card Acc., Ftg, [Carc]

TABLE 1a
CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

CONTAMINANT	ODOR THRESHOLD	OSHA PEL[1]	TLV (ACGIH)	OSHA CEILING[2] /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE[3]
Trichlorofluoromethane	28 mg/m^3	1,000 ppm	1,000 ppm		2,000 ppm	Inh, Con, Ing	Inco, trem, derm, card, asph, frost
Trichlorotrifluoroethane	45 ppm	1,000 ppm	1,000 ppm	1,250 ppm	2,000 ppm	Inh, Con, Ing	Irrit Skin, throat, Drow, Derm, CSN, Depress
Vinyl Chloride***	10-20 ppm	1 ppm	1 ppm	5 ppm	ND	Inh, Con	Lass, Abdom, Gi Bleeding; Hepatomegaly; Pallor or Cyan of Extremities; Liq: Frostbite; [Carc]
VM&P Naphtha (petroleum naphtha)	---	---	300 ppm	---	ND	Con, Ing, Inh	Irrit Eyes, Nose, Throat, Dizz, drow, head, nau, dry skin, chem. Pneumonitis
Xylene*	4.5 mg/m^3	100 ppm	100 ppm	150 ppm	900 ppm	Inh, Ing, Abs, Con	Dizz, Drow, Irrit, Excite, Nau, Vomit, Eyes, Skin, Nose, Throat
Zinc (oxide)	---	5 mg/m^3	2 mg/m^3	---	500 mg/m^3	Inh	Dry Throat, Cough, Chills, Tight Chest, Blurred Vision
4,4' DDD	---	---	---	---	---	Ing, Inh, Con	---
4,4' DDE	---	---	---	---	---	Ing, Inh, Con	---
4,4' DDT	5.0725 mg/m^3	1 mg/m^3	1 mg/m^3	---	[500 mg/m^3]	Inh, Abs, Ing, Con	Irrit Eyes, Skin, Pares, Tongue, Lips, Face, Trem, Anxi, Dizz, Conf, Mal, Head, Lass, Conv, Paresi Hands, Vomit, [Carc]
Aldrin		0.25 mg/m^3	0.25 mg/m^3	---	[25 mg/m^3]	Inh, Abs, Ing, Con	Head, Dizz, Nau, Vomit, Mal, Myo [Carc]
Chlordane [skin]	0.0084 mg/m^3	0.5 mg/m^3	0.5 mg/m^3		[100 mg/m^3]	Inh, Abs, Ing, Con	Blurred vision, confusion, delirium, cough; abdominal pian, nausea, vomiting diarrhea; irritability, tremor, convulsions [Carc]
EDB	76.8 mg/m^3	20 ppm		30 ppm	[100 ppm]	Inh, Abs	Resp. Irr, Eye Irr. [Carc]
Endosulfan I Endosulfan II	---	0.1 mg/m^3	0.1 mg/m^3	---	N.D.	Inh, Abs, Ing, Con	Irrit, Skin, Nau, Conf, Agit, Flush, Dry, Trem, Conv, Head
Endosulfan Sulfate		---	0.1 mg/m^3	---	---	Ing, Con	---

TABLE 1a
CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

CONTAMINANT	ODOR THRESHOLD	OSHA PEL[1]	TLV (ACGIH)	OSHA CEILING[2] /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE[3]
Endrin	1.8×10^{-2} ppm	0.1 mg/m^3	0.1 mg/m^{-3}	---	2 mg/m^3	Inh, Abs, Ing, Con	Epil Conv, Stup, Head, Dizz, Abdom, Nau, Vomit, Insom, Agress, Conf, Drow, Lass, Anor
Endrin Aldehyde	1.8×10^{-2} ppm	---	---	---	---	Inh, Con	---
Endrin Ketone	---	---	---	---	---	---	---
Heptachlor	0.02 ppm	0.5 mg/m^3	0.05 mg/m^3	---	[35 mg/m^3]	Inh, Abs, Ing, Con	In animals, Trem, Conv, [Carc]
Heptachlor epoxide	0.02 ppm	---	0.05 mg/m^3	---	---	Ing, Inh	Trem, Conv, [Carc]
Hydrogen Cyanide(Hydrocyanic Acid)	0.9 mg/m^3	10 ppm (11 mg/m^3)	4.7 ppm	4.7 ppm	50 ppm	Con, Inh, Ing, Abs	Asphy & death at high levels; Weak, Head, Conf, Nau, Vomit, Incr. Rate and Depth of Respiration or Respiration Slow and Gasping

NOTES

* = Constituent found in ETPH

**=Constituent found in Acid/Base/Neutral Extractable Compounds

***=Constituent found in Volatile Organic Compounds

****=Constituent found in Leaching Lead

[1]PEL = Permissible Exposure Limit. If no PEL is available, then the NIOSH Threshold Limit Value (TLV) should be used, if available.

[2]Ceiling limit or Short Term Exposure Limit (STEL), if available. Again, the NIOSH TLV may be used if no OSHA standard exists.

[3]Abbreviations are contained on the next page

[ ] = Potential Occupational Carcinogen

ND = Not Been Determined

ABBREVIATIONS

abdom = Abdominal
abs = Absorption
aggress = Aggressiveness
agit = Agitation
anor = Anorexia
anos = Anosmia (loss of the sense of smell)
Anxi = anxiety
anem – Anemia
aspir = Aspiration
asph – asphyxia
bron = Bronchitis
bron pneu = Bronchitis pneumonitis
[carc] = Potential occupational carcinogen
Card = Cardiac arrhythmias
CNS = Central nervous system
conf = Confusion
constip = Constipation
con = Skin and/or eye contact
conv = Convulsions
corn = Corneal
cyan = Cyanosis
defat = Defatting
depres = Depressant/Depression
derm = Dermatitis
diarr = Diarrhea
dist = Disturbance
dizz = Dizziness
drow = Drowsiness
dry = Dry mouth
dysp = Dyspnea (breathing difficulty)
emphy = Emphysema
epil-conv = Epileptiform convulsions
eryth = Erythema
euph = Euphoria
fib = Fibrosis
frost = frostbite
ftg = Fatigue
flush = Flushing
GI = Gastrointestinal
head = Headache
hyperpig = Hyperpigmentation
inco = Incoordination
ing = Ingestion
inh = Inhalation
inj = Injury
insom = Insomnia
irrit = Irritation
irrty = Irritability
lac = Lacrimination (discharge of tears)
lass = Lassitude (weakness, exhaustion)
li-head = Lightheadedness
liq = Liquid
low-wgt = Weight loss
mal = Malaise (vague feeling of discomfort)
malnut = Malnutrition
methem = Methemoglobinemia
myo = Myochonic (jerks of limbs)
mg/m = milligrams/cubic meter
muc memb = Mucous membrane
mus ftg = Muscle fatigue
narco = Narcosis
nau = Nausea
ner = Nervousness
numb = Numbness
optic = Optic nerve damage (blindness)
pall = Facial pallor
parap = Paralysis
ppm = Parts per million
pares = Paresthesia
paresi = Paresis
peri neur = Peripheral neuropathy
pneu = Pneumonitis
prot = Proteinuria
pulm = Pulmonary
peri neur = Peripheral neuropathy
pneu = Pneumonia
prot = Proteinuria
pulm = Pulmonary
repro = Reproductive
resp = Respiratory
skin sen = skin sensitization
salv = Salvation
som = Somnolence (sleepiness unnatural drowsiness)
subs = Substernal (occurring beneath the sternum)
stup = Stupor
sys = System
tingle = tingle limbs
trem – Tremors
verti = Vertigo
vis dist = Visual disturbance
vomit = Vomiting
weak = Weakness

TABLE 1b: Physical Hazards Known or Suspected On-Site

TABLE 1b PHYSICAL HAZARDS KNOWN OR SUSPECTED ON-SITE			
Description of Hazard	**Methods to Identify and Minimize**	**Potential for Occurrence**	**Potentially Affected Tasks**
1. Operating Heavy Equipment	• Utilizing proper equipment operation methods • Maintain safe clearance distances • Wear appropriate eye/ear protection according to manufacturer's recommendations	Moderate	Observation of Excavation/Sampling
2. Inclement weather	• Determine probable weather conditions prior to arrival at site • Avoid working during hurricanes, blizzards, persistent heavy rain or snow, close thunderstorms	Moderate	Observation of Excavation/Sampling
3. Heat/cold Stress	• Determine probable weather conditions prior to arrival at site • Wear proper clothing • Monitoring of yourself and team mates • Drink plenty of fluids • Utilize work breaks as often as necessary • Avoid working in extreme cold conditions	Moderate	Observation of Excavation/Sampling
4. Slip, trip, and fall hazards caused by irregular and loose rocky topography	• Wear appropriate footwear to increase traction when possible • Be aware of surroundings	Low	Observation of Excavation/Sampling

TABLE 1b PHYSICAL HAZARDS KNOWN OR SUSPECTED ON-SITE			
Description of Hazard	**Methods to Identify and Minimize**	**Potential for Occurrence**	**Potentially Affected Tasks**
5. Utilities	• Complete a Call Before You Dig markout prior to the work start date • Obtain buried private lines information from and clear sampling locations with Site Contact • Avoid using heavy equipment or drill rig in close proximity to overhead utilities • Inspect sampling areas for Call Before You Dig markings; inspect catch basins and manholes to determine buried pipeline directions prior to sampling • Avoid sampling within area of pavement cuts that may be indicative of buried lines	Moderate	Observation of Excavation/Sampling
6. Vehicle Traffic	• Wear appropriate high visibility clothing • Block off the work area to prevent vehicles from entering	Moderate	High Traffic areas
7. Use of heavy machinery in indoor spaces	• Monitor the indoor air for appropriate gases with a 4-gas meter • Ensure proper ventilation of interior spaces while using gas powered machines • Use appropriate respirator protection and adequate wetting of the area if cutting or drilling through concrete creates silica dust	Low	Drilling in indoor spaces
8. Inhalation of Volatiles	• Implement and adhere to action levels stipulated in air monitoring program for volatile organics • Wear appropriate protective equipment • Report potential exposure symptoms immediately • Utilize engineering controls such as fans	Low	Observation of Excavation/Sampling

TABLE 1b PHYSICAL HAZARDS KNOWN OR SUSPECTED ON-SITE			
Description of Hazard	**Methods to Identify and Minimize**	**Potential for Occurrence**	**Potentially Affected Tasks**
9. Skin contact with volatile organic compounds, semi volatile organic compounds, metals, TPHs, PCBs, pesticides, cyanide	• Wear appropriate protective clothing • Follow proper decontamination procedures • Report potential exposure symptoms immediately	Low	Observation of Excavation/Sampling

APPENDIX A

Safety and Logistics Planning Call Log

Safety and Logistics Call Log
DEC009808

Date of Call _____

Work Assignment Number / Task _____

DEC Site Name and Number _____

Names of Attendees (and phone #s):

HRP

HRP PM	_____
HRP SSO	_____
HRP Other	_____
HRP Other	_____
HRP Other	_____

Subcontractors

Driller Contact	_____
Utility Survey	_____
Surveyor	_____
Construction	_____
Other	_____

DEC

DEC PM	_____
DEC Other	_____

Other _____

Brief Description Scope of Work (Task Specific): Use additional forms for additional tasks.

_____

_____

_____

_____

_____

_____

_____

_____

_____

Logisitics:

Date of Work: _____

Time to Meet: _____

Site Contact (phone): _____

Notification of Site Contact made by: _____

Describe any unusal site-specific conditions/logistics here (if any): _____

_____

Notes below as needed:

Water Needed? Source Confirmed?	Y / N	_____
Electricity Needed? Source Confirmed?	Y / N	_____
Water Storage Needed?	Y / N	_____
Water Discharges? Permits Needed/Attained?	Y / N	_____
Air Monitoring - CAMP?	Y / N	_____

Will there be intrusive work? Y / N _____

Locations marked in the field? Y / N _____

NYS Code Rule 753/Dig Safe System: Ticket Number: _____

Confirmed that mark-out complete? Y / N

Anticipated Subsurface Conditions (Geology, Utilites, etc.): _____

Anticipated Depth to Groundwater: _____

Will NAPL/Product be Present: Y / N Describe: _____

_____

Safety and Logistics Call Log
DEC009808

Will there be any other parties entering the work zones? Describe control measures:

Lab and Equipment:

Equipment: Y / N PID IP Water Level Indicator CAMP Pumps controllers Survey Eq. GPS
Other: _____

Lab Analytical Required: Y / N VOCs SVOCs Metals PFAS 1,4D PCBs Pest/Herb
Other: _____

Media Tested: Soil Sediment Groundwater Surface Water Sub-slab[soil] Vapor Indoor Air
Notes of sample collection methods: _____

Bottle Order Received/ Checked? Y / N
How will samples be conveyed to lab? _____
Sample TAT? Standard 24 hr TAT 48 hr TAT Other: _____

Review Site - Specific Hazards (per Site-Specific HASP to be provided prior to all parties):

Site Constituents of Concern: (circle)
VOCs HVOCs AVOCs SVOCs PFAS 1,4-Dioxane
metals pesticides herbicides
Asbestos PCBs
Lead Other:_____
Biologicals

Site Setting: Urban Suburban Unoccupied
Traffic Bystanders Crime Plants Animals Vectors
Overhead Utilities Underground Utilities Large Equipment
High Voltage Flood/Tidal Limited Access
Confined Spaces

Task-Specific Chemicals and Hazards (describe): _____
PPE Level (circle): D C B A Modifications: _____
Glove types: _____ Face covering needed? Y/ N
Other specialty PPE: _____

Safe to Work Alone: Y / N
Other Precautions: Y / N Describe: _____

COVID 19 Protocols to be Observed: Y / N

Waste Containment:

How/ where will materials be contained, labelled, stored, or disposed? _____

Miscellaneous:

APPENDIX B
Personnel Log

PERSONNEL LOG

Name	Representing	Date	Time In	Time Out

APPENDIX C

Supervisor's Investigation Report

INCIDENT REPORT

Section 1.0: Complete By Employee and Project Manager

(provide to Human Resources Manager) Incident Case No. _____

Employee Name: Employee Title/Position:	Age: Sex: □ Female □ Male	Time employee began work: Date of Incident: Time of Incident:	Weather Conditions: Date of Report: Time Report Completed:
Department: Office Location: Supervisor:			
Employee Address: Street: City/Town: Zip Code: Phone Number:	Location of Incident: Address: City/Town: State:		

Type of Incident:
□ Motor Vehicle Accident or □ Near Miss or □ Injury occurred during routine work

□ Company or □ Personal Vehicle?

First-Aid performed on-site? Yes / No
Other Medical Attention Provided? Yes / No

Time lost from work? Yes / No Number of Hours: or Number of Days:

If injuries occurred, list names and describe nature, degree, and body part injured: Number of injured:_____

1.

2.

3.

4.

Complete Section 3.0

WITNESS STATEMENT: WHAT HAPPENED AND WHAT WAS THE EMPLOYEE DOING BEFORE THE INCIDENT OCCURRED? WHAT WAS THE EMPLOYEE DOING WHEN THE INCIDENT OCCURRED? WHAT WAS THE EMPLOYEE DOING AFTER THE INCIDENT OCCURRED?	Describe what took place? Who was at fault for vehicle accidents, citation? Was power equipment involved, if so, describe?

WHAT WAS THE NATURE OF THE INJURY OR ILLNESS?	Tell us the body part that was affected and how it was affected – be specific Examples: strained lower back; chemical burn on hand
WHAT WAS THE ROOT CAUSE OF THE INCIDENT? List other individual involved in Section 3. COULD INCIDENT HAVE BEEN AVOIDED? HOW?	Get all the facts by studying the Job and situation involved. Question by use of WHY - WHAT – WHERE – WHEN – WHO – HOW Were there other factors (e.g., noise, ventilation, illumination, fatigue, age, medical conditions) that contributed to the accident?
WAS TRAINING FOR THE WORK ACTIVITY PROVIDED: TYPE: DATES:	WERE WARNING SIGNS OR LABELS POSTED:
WHAT SHOULD BE DONE? HOW CAN INCIDENT BE AVOIDED IN THE FUTURE?	WAS PERSONAL PROTECTIVE EQUIPMENT USED? NEEDED: AVAILABLE: CONTRIBUTED TO INJURY:
WHAT HAVE YOU DONE THUS FAR?	Take or recommend action, depending upon your authority. Follow up – was action effective?
HOW WILL THIS IMPROVE OPERATIONS?	OBJECTIVE Eliminate job hindrances

Completed by:	Reviewed by:	Date

Section 2.0: Complete By Supervisor or Human Resources Manager

Name: Role (witness, observer, injured, participant, etc.):	Address: Phone Number
Name: Role:	Address: Phone Number
Name: Role:	Address: Phone Number
Name: Role:	Address: Phone Number
Name: Role:	Address: Phone Number
Name: Role:	Address: Phone Number

Section 3.0: Corrective Actions (To be Completed by OHSM and CHSO)

Are corrective actions warranted? □ Yes □ No If so, proceed with corrective action list

Corrective Actions. List long term actions to be taken as a result of incident (use additional sheets if needed)	How was the corrective action implemented?	Target date of completion

OHSM Name:	CHSO Name:
OHSM Signature:	CHSO Signature:

End of incident report. Section 4.0 is to be completed and maintained by the Human Resources Department.

Section 4.0: Complete By Human Resources Manager

Incident Report Case No. _____

The information on this page is considered CONFIDENTIAL and must be treated as such. This page will only be available to Human Resources Department or the employee's supervisor.

Insured Name:	Employee Hire Dates: Start at Company: Current Position:
Policy Number:	Is employee a company: Owner, Officer, Neither.
Employee Soc. Sec. No.:	Marital Status: Spouse Name:
Was Employee Pay Interrupted, or paid in full for time:	Employee Pay Period: Weekly, Bi-Weekly, Monthly, Other (specify)
Employee Compensated by hourly or salary? Wage Information: (tips, bonuses, commission)	Typical No. of hours worked per day____, hours per week____. Typical Start of day time_____, end of day time_____.
Date of Stop Work: Date Returned to Work:	How often has employee visited doctor/hospital?
Doctor: Authorized by Co.: Y / N Street: City/Town: Zip Code: Phone Number: Authorized by Co.: Y / N	Hospital: Street: City/Town: Zip Code: Phone Number: Authorized by Co.: Y /N
Was the employee treated in an emergency room? □ Yes □ No	Was employee hospitalized overnight as an in-patient? □ Yes □ No If so, for how many days? _____

APPENDIX D
Daily Job Brief Record

JOB BRIEF RECORD

	11-24 Wyckoff Avenue, Queens, NY	DEC1035.P3
Person Conducting	Site Name/Address	HRP Client Name/Job #
Steven Wu (718) 482-6725		Patrick Montuori (845) 531-9490
Client Contact/Phone	HRP H&S Rep.	HRP Supervisor
Date/Time	Number Attending	Weather

Designated Competent Person: _____

Description of Work: _____

Attendees (use additional sheets as needed):

Name	Company	Signature

Emergency Telephone Numbers

FIRE / POLICE / AMBULANCE: 911

Hospital Name & Location: **Wyckoff Heights Medical Center, 374 Stockholm Street**

NYSDEC Spill Line: 1-518-457-7362 National Response Center: 800-424-8802 CBYD: 800-922-4455

Health & Safety Manager: Jake Smith: 864.289.0311 1508

HAZARDS

- ☐ Toxic
- ☐ Corrosive
- ☐ Flammable
- ☐ Combustible
- ☐ Reactive
- ☐ Path Waste
- ☐ Asbestos
- ☐ Extreme Cold/Heat
- ☐ Drains/Sumps
- ☐ Sharp Objects
- ☐ Drilling in Soil
- ☐ Lighting
- ☐ Slips/Trips/Falls
- ☐ Lead
- ☐ Soil Excavation
- ☐ Tank Excavation
- ☐ Trenching
- ☐ Floor Holes
- ☐ Working on/near Water
- ☐ Underground/Overhead Utilities
- ☐ Vehicle Traffic
- ☐ Hot Work
- ☐ Vac Truck
- ☐ Ladders
- ☐ Noise
- ☐ Lifting
- ☐ Powerwashing
- ☐ Elevated Work Area
- ☐ Live Electrical Circuits
- ☐ Pneumatic Tools
- ☐ Drum Handling
- ☐ Abrasive Blasting

PERSONAL SAFETY

- ☐ Supplied Air Respirator
- ☐ Fully Encapsulating Suit
- ☐ Overboots
- ☐ Safety Glasses
- ☐ Reflective Vests
- ☐ Hearing Protection
- ☐ SAR w/Egress Bottle
- ☐ Flash Suit
- ☐ Lifebelt/Lanyard
- ☐ Chemical Goggles
- ☐ Eye Wash
- ☐ Evacuation Plan
- ☐ SCBA
- ☐ NOMEX (flam resistant)
- ☐ Hardhats
- ☐ Face Shield
- ☐ Safety Shower
- ☐ Communications
- ☐ Air Purifying Respirator Cartridge: _____
- ☐ Protected Coveralls, Type: _____
- ☐ Outer Gloves, Type: _____
- ☐ Inner Gloves, Type: _____
- ☐ First Aid Kit
- ☐ Properly Sloped Excavation/ Trench
- ☐ PFD's
- ☐ Ventilation

FIRE SAFETY

☐ Fire Extinguishers ☐ Hot Work Permit ☐ Fire Blanket ☐ Explosion-Proof Equipment
☐ Equipment Grounded & Bonded ☐ Non-Sparking Tools ☐ Eliminate Ignition Sources ☐ Area Kept Wet
☐ Smoking Area Designated Location: _____ ☐ Alarm Box in Area, Location: _____
☐ Fire Hose Laid Out

ISOLATE EQUIPMENT

☐ Establish Exclusion Zone/Traffic Cones ☐ Work Signs
☐ Stop Transfers ☐ Caution Tape Area
☐ GFCIS ☐ Temporary Fencing

ELECTRICAL EQUIPMENT

☐ LockOut/TagOut ☐ Non-Conductive Tools
☐ Equipment Grounded ☐ FR Suits/Coveralls

AIR MONITORING Type of Meter: _____ Date last calibrated: _____

SUBSTANCE	LEVEL B MAX.	ACTION LEVEL/LEVEL C MAX.	LEVEL D MAX.

Health & Safety Comments / Topics & Safety Rules Reviewed / Questions / Concerns:

_____
_____
_____
_____
_____
_____
_____

Contaminants of Concern: _____

HEALTH & SAFETY SIGNATURE: _____ Date: _____

Is there a Site-Specific or Generic Health & Safety Plan available on-site? Yes ☐ No ☐

☐ HAZARD ZONES NOT APPLICABLE, GENERAL WORK AREA

Level D ☐ Modified Level D ☐ Level C ☐

Anything above Level C, foreman should use a Confined Space Permit/Form.

Note: HOT WORK requires a hot work permit and minimum 20# fire extinguisher. Foreman or HSM must record at least one contaminant of concern above. Toxic plants may be considered a COC if no chemical hazards are expected.

LEVEL C
Respirator Type: _____

Name	Zone	Time In	Time Out	Decon Type

Before performing Level C work, ALL employees must review HRP's Respiratory Protection Program - a copy of which must be on-site along with a HASP.

APPENDIX E
Equipment Calibration Log

EQUIPMENT CALIBRATION LOG		
Instrument	**Calibration Date**	**Calibrated By**

APPENDIX F

COVID-19 Health and Safety Guidelines

COVID19
SITE SPECIFIC HASP ADDENDUM

This addendum will remain in effect until what time the CDC, NIAID, and/or Surgeon General guidance is provided that removes the heightened awareness of social distancing, hand washing, and other protocols in response to COVID-19.

NECESSARY ADDITIONAL SUPPLIES

- Hand sanitizer (minimum 60% alcohol)
- Squeeze bottles of water (if no running water at job site)
- Soap
- Disinfectant (for tools, vehicles, common areas, etc.)
- Caution tape, cones or similar to set up social distancing boundaries as needed

EMPLOYEE HEALTH PROTECTION – ZERO TOLERANCE

The following applies to both HRP employees and contracted staff working on behalf of the HRP or the client.

- ZERO TOLERANCE FOR SICK WORKERS REPORTING TO WORK. IF YOU ARE SICK, STAY HOME! IF YOU FEEL SICK, GO HOME! IF YOU SEE SOMEONE SICK, SEND THEM HOME!
- If you are exhibiting any of the symptoms below, you are to report this to your supervisor (via phone, text or email) right away, and head home from the job site or stay home if already there.
  If you notice a co-worker showing signs or complaining about such symptoms, he or she should be directed to their supervisor (via phone, text or email) and asked to leave the project site immediately.
  COVID-19 Typical Symptoms:
    - Fever
    - Cough
    - Shortness of Breath
    - Sore Throat
    - Loss of taste or smell
- Prior to starting a shift, each employee will verbally self-certify to their supervisor that they:
    - Have no signs of a fever or a measured temperature above 100.3 degrees or greater, a cough or trouble breathing within the past 24 hours.
    - Have not had “close contact” with an individual diagnosed with COVID-19. “Close contact” means living in the same household as a person who has tested positive for COVID-19, caring for a person who has tested positive for COVID-19, being within 6 feet of a person who has tested positive for COVID-19 for about 15 minutes, or coming in direct contact with secretions (e.g., sharing utensils, being coughed on) from a person who has tested positive for COVID-19, while that person was symptomatic.
    - Have not been asked to self-isolate or quarantine by their doctor or a public health official.
    - These self-certifications may be documented at the request of the site owner
- Workers that are working in a confined space or inside a closed building envelope will have to be temperature screened by a Medical Professional or designated individual. Such screening shall be performed out of public view to respect privacy and results are kept private.
- Employees exhibiting symptoms or unable to self-certify should be directed to leave the work

site and seek medical attention and applicable testing by their health care provider. They are not to return to the work site until cleared by a medical professional.

GENERAL ON-THE-JOB GUIDANCE TO PREVENT EXPOSURE & LIMIT THE TRANSMISSION OF THE VIRUS

All Job Sites

- No touching or direct contact with other individuals, including handshaking.
- Wash hands often with soap and water for at least 20 seconds or alternatively when soap and water are not available, use an alcohol-based hand sanitizer with at least 60% ethanol or 70% isopropanol
- A "No Congregation" policy is in effect, individuals must implement social distancing by maintaining a minimum distance of 6-feet from all other individuals
- Avoid face to face meetings – critical situations requiring in-person discussion must follow social distancing
- Conduct all meetings via conference calls, if possible. Do not convene meetings of more than 10 people. Recommend use of cell phones, texting, web meeting sites and conference calls for project discussion
- Be sure to use your own water bottle, and do not share
- To avoid external contamination, bring food from home
- Maintain Social Distancing separation during breaks and lunch.
- To avoid sharing germs, please clean up after yourself. DO NOT make others responsible for moving, unpacking and packing up your personal belongings
- If you or a family member is feeling ill, stay home!

Multi-person job sites (i.e. HRP and subcontractors, etc.)

- Contractor and Field Offices are to be locked down to all but authorized personnel
- Each jobsite should develop cleaning and decontamination procedures that are posted and shared (if multi-person job site). These Procedures must cover all areas including trailers, gates, equipment, vehicles, etc. and shall be posted at all entry points to the sites, and throughout the project site.
- All individual work crew meetings/tailgate talks should be held outside and follow social distancing
- Please keep all crews a minimum of 6' apart at all times to eliminate the potential of cross contamination
- At each job briefing/tool box talk, employees are asked if they are experiencing any symptoms, and are sent home if they are
- Each jobsite should have laminated COVID-19 safety guidelines and handwashing instructions (last page of this addendum)
- All restroom facilities/porta-potties should be cleaned and handwashing stations must be provided with soap, hand sanitizer and paper towels
- All surfaces should be cleaned at least twice a day, including desk, work stations, door handles, laptops, etc.
- All common areas and meeting areas are to be regularly cleaned and disinfected at least once a day but preferably twice a day

- Single person job sites (just one HRP employee, no subs, vendors, etc.)
  - It is that person's responsibility to clean and disinfect all tools and reusable supplies upon return to the office

- Cover coughing or sneezing with a tissue, then throw the tissue in the trash and wash hands, if no tissue is available then cough into your elbow
- Avoid touching eyes, nose, and mouth with your hands

WORK SITE RISK PREVENTION PRACTICES

- At the start of each shift, confirm with all employees that they are healthy.
- All employees will be required to wear gloves (either latex or cut resistant depending on the task at hand)
- Use of eye protection is required (Safety glasses or googles at a minimum with or without face shields).
- In work conditions where required social distancing is impossible to achieve, affected employees shall be supplied PPE including as appropriate a standard face covering, gloves, and eye protection.
- All employees shall drive to work site/parking area in a single occupant vehicle. No one should ride together in the same vehicle
- When entering a machine or vehicle which you are not sure you were the last person to enter, make sure that you wipe down the interior and door handles with disinfectant prior to entry
- In instances where it is possible, workers should maintain separation of 6' from each other per CDC guidelines.
- Multi person activities will be limited where feasible (two person lifting activities)
- Large gathering places on the site such as shacks and break areas will be eliminated and instead small break areas will be used with seating limited to ensure social distancing.
- Contact the cleaning person for your office trailer or office space and ensure they have proper COVID- 19 sanitation processes. Increase their cleaning visits to daily
- Clean all high contact surfaces a minimum of twice a day in order to minimize the spread of germs in areas that people touch frequently. This includes but is not limited to desks, laptops and vehicles

Wash Stations: All sites without ready access to an indoor bathroom or running water MUST install Wash Stations or provide other means for handwashing

- Install hand wash stations with hot water, if possible, and soap at fire hydrants or other water sources to be used for frequent handwashing for all onsite employees.
- All onsite workers must help to maintain and keep stations clean
- If a worker notices soap or towels are running low or out, immediately notify supervisors
- Garbage barrels will be placed next to the hand wash station for disposal of tissues/towels
- If no other alternative exists, bring squeeze bottles with water and soap (only authorized for single employee job sites)

Please Note: This document is not intended to replace any formalized procedures currently in place within the site specific HASP or any job related contracts.

Where this guidance does not meet or exceed the standards put forth by the state, municipality, site owner, contractor or subcontractor, everyone shall abide by the most stringent procedure.

A site-specific COVID-19 Officer (also known as the Health and Safety Officer) shall be designated for every site.

Print and post at each job site

COVID-19/ Health and Safety Officer Name: _____

Phone Number: _____

Any issue of non-compliance with these guidelines shall be a basis for pausing the work. The Health and Safety Officer will address corrective actions with the subcontractor. Any additional issues of non-conformance may be subject to action against the subcontractor's prequalification and certification status.

APPENDIX G

Safety Data Sheets
(for chemicals brought to the Site)

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

1 Identification of the substance/mixture and of the supplier

1.1 Product identifier

Trade Name: Alconox
Synonyms:
Product number: Alconox

1.2 Application of the substance / the mixture : Cleaning material/Detergent

1.3 Details of the supplier of the Safety Data Sheet

Manufacturer	**Supplier**
Alconox, Inc. 30 Glenn Street White Plains, NY 10603 1-914-948-4040	Not Applicable

Emergency telephone number:
ChemTel Inc
North America: 1-800-255-3924
International: 01-813-248-0585

2 Hazards identification

2.1 Classification of the substance or mixture:

In compliance with EC regulation No. 1272/2008, 29CFR1910/1200 and GHS Rev. 3 and amendments.

Hazard-determining components of labeling:
Tetrasodium Pyrophosphate
Sodium tripolyphosphate
Sodium Alkylbenzene Sulfonate

2.2 Label elements:

Skin irritation, category 2.
Eye irritation, category 2A.

Hazard pictograms:

Signal word: Warning

Hazard statements:
H315 Causes skin irritation.
H319 Causes serious eye irritation.

Precautionary statements:
P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352 If on skin: Wash with soap and water.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P321 Specific treatment (see supplemental first aid instructions on this label).
P332+P313 If skin irritation occurs: Get medical advice/attention.
P362 Take off contaminated clothing and wash before reuse.
P501 Dispose of contents and container as instructed in Section 13.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

Additional information: None.

Hazard description

Hazards Not Otherwise Classified (HNOC): None

Information concerning particular hazards for humans and environment:

The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.

Classification system:

The classification is according to EC regulation No. 1272/2008, 29CFR1910/1200 and GHS Rev. 3 and amendments, and extended by company and literature data. The classification is in accordance with the latest editions of international substances lists, and is supplemented by information from technical literature and by information provided by the company.

3 Composition/information on ingredients

3.1 Chemical characterization : None

3.2 Description : None

3.3 Hazardous components (percentages by weight)

Identification	Chemical Name	Classification	Wt. %
CAS number: 7758-29-4	Sodium tripolyphosphate	Skin Irrit. 2 ; H315 Eye Irrit. 2; H319	12-28
CAS number: 68081-81-2	Sodium Alkylbenzene Sulfonate	Acute Tox. 4; H303 Skin Irrit. 2 ; H315 Eye Irrit. 2; H319	8-22
CAS number: 7722-88-5	Tetrasodium Pyrophosphate	Skin Irrit. 2 ; H315 Eye Irrit. 2; H319	2-16

3.4 Additional Information : None.

4 First aid measures

4.1 Description of first aid measures

General information: None.

After inhalation:

Maintain an unobstructed airway.

Loosen clothing as necessary and position individual in a comfortable position.

After skin contact:

Wash affected area with soap and water.

Seek medical attention if symptoms develop or persist.

After eye contact:

Rinse/flush exposed eye(s) gently using water for 15-20 minutes.

Remove contact lens(es) if able to do so during rinsing.

Seek medical attention if irritation persists or if concerned.

After swallowing:

Rinse mouth thoroughly.

Seek medical attention if irritation, discomfort, or vomiting persists.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

4.2 Most important symptoms and effects, both acute and delayed

None

4.3 Indication of any immediate medical attention and special treatment needed:

No additional information.

5 Firefighting measures

5.1 Extinguishing media

Suitable extinguishing agents:

Use appropriate fire suppression agents for adjacent combustible materials or sources of ignition.

For safety reasons unsuitable extinguishing agents : None

5.2 Special hazards arising from the substance or mixture :

Thermal decomposition can lead to release of irritating gases and vapors.

5.3 Advice for firefighters

Protective equipment:

Wear protective eye wear, gloves and clothing.
Refer to Section 8.

5.4 Additional information :

Avoid inhaling gases, fumes, dust, mist, vapor and aerosols.
Avoid contact with skin, eyes and clothing.

6 Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures :

Ensure adequate ventilation.
Ensure air handling systems are operational.

6.2 Environmental precautions :

Should not be released into the environment.
Prevent from reaching drains, sewer or waterway.

6.3 Methods and material for containment and cleaning up :

Wear protective eye wear, gloves and clothing.

6.4 Reference to other sections : None

7 Handling and storage

7.1 Precautions for safe handling :

Avoid breathing mist or vapor.
Do not eat, drink, smoke or use personal products when handling chemical substances.

7.2 Conditions for safe storage, including any incompatibilities :

Store in a cool, well-ventilated area.

7.3 Specific end use(s):

No additional information.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

8 Exposure controls/personal protection

8.1 Control parameters :

7722-88-5, Tetrasodium Pyrophosphate, OSHA TWA 5 mg/m3.

8.2 Exposure controls

Appropriate engineering controls:

Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use or handling.

Respiratory protection:

Not needed under normal conditions.

Protection of skin:

Select glove material impermeable and resistant to the substance.

Eye protection:

Safety goggles or glasses, or appropriate eye protection.

General hygienic measures:

Wash hands before breaks and at the end of work.
Avoid contact with skin, eyes and clothing.

9 Physical and chemical properties

Appearance (physical state, color):	White and cream colored flakes - powder	**Explosion limit lower:** **Explosion limit upper:**	Not determined or not available. Not determined or not available.
Odor:	Not determined or not available.	**Vapor pressure at 20°C:**	Not determined or not available.
Odor threshold:	Not determined or not available.	**Vapor density:**	Not determined or not available.
pH-value:	9.5 (aqueous solution)	**Relative density:**	Not determined or not available.
Melting/Freezing point:	Not determined or not available.	**Solubilities:**	Not determined or not available.
Boiling point/Boiling range:	Not determined or not available.	**Partition coefficient (n-octanol/water):**	Not determined or not available.
Flash point (closed cup):	Not determined or not available.	**Auto/Self-ignition temperature:**	Not determined or not available.
Evaporation rate:	Not determined or not available.	**Decomposition temperature:**	Not determined or not available.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

Flammability (solid, gaseous):	Not determined or not available.	**Viscosity**:	a. Kinematic: Not determined or not available. b. Dynamic: Not determined or not available.
Density at 20°C:	Not determined or not available.		

10 Stability and reactivity

10.1 Reactivity : None

10.2 Chemical stability : None

10.3 Possibility hazardous reactions : None

10.4 Conditions to avoid : None

10.5 Incompatible materials : None

10.6 Hazardous decomposition products : None

11 Toxicological information

11.1 Information on toxicological effects :

Acute Toxicity:

Oral:

: LD50 > 5000 mg/kg oral rat - Product .

Chronic Toxicity: No additional information.

Skin corrosion/irritation:

Sodium Alkylbenzene Sulfonate: Causes skin irritation. .

Serious eye damage/irritation:

Sodium Alkylbenzene Sulfonate: Causes serious eye irritation .

Tetrasodium Pyrophosphate: Rabbit - Risk of serious damage to eyes .

Respiratory or skin sensitization: No additional information.

Carcinogenicity: No additional information.

IARC (International Agency for Research on Cancer): None of the ingredients are listed.

NTP (National Toxicology Program): None of the ingredients are listed.

Germ cell mutagenicity: No additional information.

Reproductive toxicity: No additional information.

STOT-single and repeated exposure: No additional information.

Additional toxicological information: No additional information.

12 Ecological information

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

12.1 Toxicity:

Sodium Alkylbenzene Sulfonate: Fish, LC50 1.67 mg/l, 96 hours.
Sodium Alkylbenzene Sulfonate: Aquatic invertebrates, EC50 Daphnia 2.4 mg/l, 48 hours.
Sodium Alkylbenzene Sulfonate: Aquatic Plants, EC50 Algae 29 mg/l, 96 hours.
Tetrasodium Pyrophosphate: Fish, LC50 - other fish - 1,380 mg/l - 96 h.
Tetrasodium Pyrophosphate: Aquatic invertebrates, EC50 - Daphnia magna (Water flea) - 391 mg/l - 48 h.

12.2 Persistence and degradability: No additional information.

12.3 Bioaccumulative potential: No additional information.

12.4 Mobility in soil: No additional information.

General notes: No additional information.

12.5 Results of PBT and vPvB assessment:

PBT: No additional information.

vPvB: No additional information.

12.6 Other adverse effects: No additional information.

13 Disposal considerations

13.1 Waste treatment methods (consult local, regional and national authorities for proper disposal)

Relevant Information:

It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities. (US 40CFR262.11).

14 Transport information

14.1	**UN Number:** ADR, ADN, DOT, IMDG, IATA	None
14.2	**UN Proper shipping name:** ADR, ADN, DOT, IMDG, IATA	None
14.3	**Transport hazard classes:** ADR, ADN, DOT, IMDG, IATA	**Class:** None **Label:** None **LTD. QTY:** None

US DOT

Limited Quantity Exception: None

Bulk:	**Non Bulk:**
RQ (if applicable): None	**RQ (if applicable):** None
Proper shipping Name: None	**Proper shipping Name:** None
Hazard Class: None	**Hazard Class:** None
Packing Group: None	**Packing Group:** None
Marine Pollutant (if applicable): No additional information.	**Marine Pollutant (if applicable):** No additional information.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

	Comments: None	**Comments:** None
14.4	**Packing group:** ADR, ADN, DOT, IMDG, IATA	None
14.5	**Environmental hazards** :	None
14.6	**Special precautions for user:**	None
	Danger code (Kemler):	None
	EMS number:	None
	Segregation groups:	None
14.7	**Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code:** Not applicable.	
14.8	**Transport/Additional information:**	
	Transport category:	None
	Tunnel restriction code:	None
	UN "Model Regulation":	None

15 Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture.

North American

SARA

Section 313 (specific toxic chemical listings): None of the ingredients are listed.
Section 302 (extremely hazardous substances): None of the ingredients are listed.

CERCLA (Comprehensive Environmental Response, Clean up and Liability Act) Reportable

Spill Quantity: None of the ingredients are listed.

TSCA (Toxic Substances Control Act):

Inventory: All ingredients are listed.
Rules and Orders: Not applicable.

Proposition 65 (California):

Chemicals known to cause cancer: None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for females: None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for males: None of the ingredients are listed.

Chemicals known to cause developmental toxicity: None of the ingredients are listed.

Canadian

Canadian Domestic Substances List (DSL):
All ingredients are listed.

EU

REACH Article 57 (SVHC): None of the ingredients are listed.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

Germany MAK: Not classified.

Asia Pacific

Australia

Australian Inventory of Chemical Substances (AICS): All ingredients are listed.

China

Inventory of Existing Chemical Substances in China (IECSC): All ingredients are listed.

Japan

Inventory of Existing and New Chemical Substances (ENCS): All ingredients are listed.

Korea

Existing Chemicals List (ECL): All ingredients are listed.

New Zealand

New Zealand Inventory of Chemicals (NZOIC): All ingredients are listed.

Philippines

Philippine Inventory of Chemicals and Chemical Substances (PICCS): All ingredients are listed.

Taiwan

Taiwan Chemical Substance Inventory (TSCI): All ingredients are listed.

16 Other information

Abbreviations and Acronyms: None

Summary of Phrases

Hazard statements:

H315 Causes skin irritation.
H319 Causes serious eye irritation.

Precautionary statements:

P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352 If on skin: Wash with soap and water.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P321 Specific treatment (see supplemental first aid instructions on this label).
P332+P313 If skin irritation occurs: Get medical advice/attention.
P362 Take off contaminated clothing and wash before reuse.
P501 Dispose of contents and container as instructed in Section 13.

Manufacturer Statement:

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

NFPA: 1-0-0

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

HMIS: 1-0-0

SAFETY DATA SHEET

Version 5.2
Revision Date 02/24/2014
Print Date 11/13/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Distilled water

Product Number : 07-6061
Brand : Katayama OEM Partner
REACH No. : A registration number is not available for this substance as the substance or its uses are exempted from registration, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.
CAS-No. : 7732-18-5

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Not a hazardous substance or mixture.

2.2 GHS Label elements, including precautionary statements

Not a hazardous substance or mixture.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula : H2O H_2O
Molecular Weight : 18.02 g/mol
CAS-No. : 7732-18-5
EC-No. : 231-791-2

No ingredients are hazardous according to OSHA criteria.
No components need to be disclosed according to the applicable regulations.

4. FIRST AID MEASURES

4.1 Description of first aid measures

If inhaled
If not breathing give artificial respiration

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
no data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.2 Special hazards arising from the substance or mixture
no data available

5.3 Advice for firefighters
no data available

5.4 Further information
The product itself does not burn.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
For personal protection see section 8.

6.2 Environmental precautions
no data available

6.3 Methods and materials for containment and cleaning up
Wipe up with absorbent material (e.g. cloth, fleece).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
No special storage conditions required.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters
Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice.

Personal protective equipment

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min

Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Respiratory protection
No special protective equipment required.

Control of environmental exposure
Prevent product from entering drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Colour: colourless
b)	Odour	no data available
c)	Odour Threshold	no data available
d)	pH	6.0 - 8.0 at 25 °C (77 °F)
e)	Melting point/freezing point	0.0 °C (32.0 °F)
f)	Initial boiling point and boiling range	100 °C (212 °F) - lit.
g)	Flash point	not applicable
h)	Evapouration rate	no data available
i)	Flammability (solid, gas)	no data available
j)	Upper/lower flammability or explosive limits	no data available
k)	Vapour pressure	no data available
l)	Vapour density	no data available
m)	Relative density	1.000 g/cm3 at 3.98 °C (39.16 °F)
n)	Water solubility	completely miscible
o)	Partition coefficient: n-octanol/water	no data available
p)	Auto-ignition temperature	no data available
q)	Decomposition temperature	no data available
r)	Viscosity	no data available
s)	Explosive properties	no data available
t)	Oxidizing properties	no data available

9.2 Other safety information
no data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
no data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
no data available

10.4 Conditions to avoid
no data available

10.5 Incompatible materials
no data available

10.6 Hazardous decomposition products
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
no data available

Inhalation: no data available

Dermal: no data available

no data available

Skin corrosion/irritation
no data available

Serious eye damage/eye irritation
no data available

Respiratory or skin sensitisation
no data available

Germ cell mutagenicity
no data available

Carcinogenicity

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

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
no data available

no data available

Specific target organ toxicity - single exposure
no data available

Specific target organ toxicity - repeated exposure
no data available

Aspiration hazard
no data available

Additional Information
RTECS: ZC0110000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity
no data available

12.2 Persistence and degradability
not applicable

12.3 Bioaccumulative potential
no data available

12.4 Mobility in soil
no data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

no data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Taking into account local regulations the product may be disposed of as waste water after neutralisation.

14. TRANSPORT INFORMATION

DOT (US)
Not dangerous goods

IMDG
Not dangerous goods

IATA
Not dangerous goods

15. REGULATORY INFORMATION

REACH No. : A registration number is not available for this substance as the substance or its uses are exempted from registration, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.

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

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

SARA 311/312 Hazards
No SARA Hazards

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Water	7732-18-5	

New Jersey Right To Know Components

	CAS-No.	Revision Date
Water	7732-18-5	

California Prop. 65 Components

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

16. OTHER INFORMATION

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	0
Fire Hazard:	0
Reactivity Hazard:	0

Further information

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

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.2 Revision Date: 02/24/2014 Print Date: 11/13/2016

Nitric Acid, 3M

SECTION 1 : Identification of the substance/mixture and of the supplier

Product name : **Nitric Acid, 3M**

Manufacturer/Supplier Trade name:

Manufacturer/Supplier Article number: **S25860**

Recommended uses of the product and uses restrictions on use:

Manufacturer Details:

AquaPhoenix Scientific
9 Barnhart Drive, Hanover, PA 17331

Supplier Details:

Fisher Science Education
15 Jet View Drive, Rochester, NY 14624

Emergency telephone number:

Fisher Science Education Emergency Telephone No.: 800-535-5053

SECTION 2 : Hazards identification

Classification of the substance or mixture:

Oxidizing
Oxidizing liquids, category 3

Corrosive
Serious eye damage, category 1
Skin corrosion, category 1B

Ox. liq. 3
Skin corrosion/irritation - Skin Corr. 1B
Eye Damage 1

Signal word :Danger

Hazard statements:
May intensify fire; oxidizer
Causes severe skin burns and eye damage
Causes serious eye damage

Precautionary statements:
If medical advice is needed, have product container or label at hand
Keep out of reach of children
Read label before use
Keep away from heat/sparks/open flames/hot surfaces. No smoking
Wear protective gloves/protective clothing/eye protection/face protection
Do not breathe dust/fume/gas/mist/vapours/spray
Do not eat, drink or smoke when using this product
Take any precaution to avoid mixing with combustibles
Keep/Store away from clothing/combustible materials
Wash skin thoroughly after handling
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing
Immediately call a POISON CENTER or doctor/physician
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
Specific treatment (see supplemental first aid instructions on this label)
In case of fire: Use agents recommended in section 5 for extinction
Store locked up
Dispose of contents/container to ...

Other Non-GHS Classification:

WHMIS

C 

 E

NFPA/HMIS

NFPA SCALE (0-4)

Health	3
Flammability	0
Physical Hazard	2
Personal Protection	X

HMIS RATINGS (0-4)

SECTION 3 : Composition/information on ingredients

Ingredients:		
CAS 7697-37-2	Nitric Acid	26.03 %
CAS 7732-18-5	Deionized Water	73.97 %
		Percentages are by weight

SECTION 4 : First aid measures

Description of first aid measures

After inhalation: Move exposed individual to fresh air. Loosen clothing as necessary and position individual in a comfortable position.Seek medical advice if discomfort or irritation persists.

After skin contact: Wash affected area with soap and water. Rinse or flush skin/hair gently with water for at least 30 minutes.Seek immediate medical attention

After eye contact: Protect unexposed eye. Remove contact lens(es) if able to do so during rinsing. Rinse or flush eye gently with water for at least 30 minutes, lifting upper and lower lids.Seek immediate medical attention (ophthalmologist)

After swallowing: Rinse mouth thoroughly. Do not induce vomiting. Have exposed individual drink sips of water. Seek medical attention if irritation, discomfort or vomiting persists.

Most important symptoms and effects, both acute and delayed:

Headache, Shortness of breath.Irritation/burns, all routes of exposure.May cause severe burns, blindness and/or permanent damage. May cause burns, deep penetrating ulcerations of the skin, delayed tissue destruction, redness, pain. May cause gastrointestinal irritation with nausea, vomiting and diarrhea;

Indication of any immediate medical attention and special treatment needed:

If seeking medical attention, provide SDS document to physician.

SECTION 5 : Firefighting measures

Extinguishing media

Suitable extinguishing agents: Does not burn. Use extinguishing media appropriate for surrounding fire.If in laboratory setting, follow laboratory fire suppression procedures. Use appropriate fire suppression agents for adjacent combustible materials or sources of ignition

For safety reasons unsuitable extinguishing agents:

Special hazards arising from the substance or mixture:

Combustion products may include carbon oxides or other toxic vapors.Nitrogen oxides (NOx)

Advice for firefighters:

Protective equipment:

Additional information (precautions): Move product containers away from fire or keep cool with water spray as a protective measure, where feasible.

SECTION 6 : Accidental release measures

Personal precautions, protective equipment and emergency procedures:

Wear protective equipment. Use respiratory protective device against the effects of fumes/dust/aerosol. Keep unprotected persons away. Ensure adequate ventilation.Keep away from ignition sources. Protect from heat.Stop the spill, if possible. Contain spilled material by diking or using inert absorbent. Transfer to a disposal or recovery container.

Environmental precautions:

Prevent from reaching drains, sewer or waterway. Collect contaminated soil for characterization per Section 13

Methods and material for containment and cleaning up:

If in a laboratory setting, follow Chemical Hygiene Plan procedures.Collect liquids using vacuum or by use of absorbents. Place into properly labeled containers for recovery or disposal. If necessary, use trained response staff/contractor.

Reference to other sections:

SECTION 7 : Handling and storage

Precautions for safe handling:

Prevent formation of aerosols. Follow good hygiene procedures when handling chemical materials. Do not eat, drink, smoke, or use personal products when handling chemical substances. If in a laboratory setting, follow Chemical Hygiene Plan.Use only in well ventilated areas.Avoid splashes or spray in enclosed areas.No smoking.Keep away from heat and sources of ignition.

Conditions for safe storage, including any incompatibilities:

Store in a cool location. Provide ventilation for containers. Avoid storage near extreme heat, ignition sources or open flame. Store away from foodstuffs. Store away from oxidizing agents.Store in cool, dry conditions in well sealed containers. Keep container tightly sealed.Store with like hazards. Storage class (TRGS 510): Oxidizing

hazardous materials

SECTION 8 : Exposure controls/personal protection




Control Parameters: 7697-37-2, Nitric Acid, NIOSH 4 ppm STEL; 10 mg/m3 STEL
7697-37-2, Nitric Acid , NIOSH 2 ppm TWA; 5 mg/m3 TWA
7697-37-2 , Nitric Acid , ACGIH 4 ppm STEL
7697-37-2, Nitric Acid , ACGIH 2 ppm TWA

Appropriate Engineering controls: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use/handling.Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor or mists below the applicable workplace exposure limits (Occupational Exposure Limits-OELs) indicated above.

Respiratory protection: Not required under normal conditions of use. Use suitable respiratory protective device when high concentrations are present. Use suitable respiratory protective device when aerosol or mist is formed. For spills, respiratory protection may be advisable.

Protection of skin: The glove material has to be impermeable and resistant to the product/ the substance/ the preparation being used/handled.Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation.

Eye protection: Safety glasses with side shields or goggles.

General hygienic measures: The usual precautionary measures are to be adhered to when handling chemicals. Keep away from food, beverages and feed sources. Immediately remove all soiled and contaminated clothing. Wash hands before breaks and at the end of work. Do not inhale gases/fumes/dust/mist/vapor/aerosols. Avoid contact with the eyes and skin.

SECTION 9 : Physical and chemical properties

Appearance (physical state,color):	colorless liquid	**Explosion limit lower**: **Explosion limit upper**:	Not Determined Not Determined
Odor:	strong acrid	**Vapor pressure**:	49 hPa (37 mmHg) at 50 °C (122 °F)
Odor threshold:	0.29 ppm	**Vapor density**:	2.5 (Air = 1)
pH-value:	<1.0	**Relative density**:	1.413 g/cm3 at 20 °C (68 °F)
Melting/Freezing point:	-41.6°C (-42.9°F)	**Solubilities**:	Soluble
Boiling point/Boiling range:	120.5 °C (248.9 °F)	**Partition coefficient (n-octanol/water)**:	Not Determined
Flash point (closed cup):	Not Determined	**Auto/Self-ignition temperature**:	Not Determined

Evaporation rate:	Not Determined	**Decomposition temperature**:	Not Determined
Flammability (solid,gaseous):	Not Determined	**Viscosity**:	a. Kinematic:Not Determined b. Dynamic: Not Determined
Density: Not Determined			

SECTION 10 : Stability and reactivity

Reactivity: Oxidizer.Reacts violently with alcohol, organic material, turpene, charcoal. Violent reaction with Nitric acid + Acetone and Sulfuric acid. Nitric Acid will react with water or steam to produce heat and toxic, corrosive and flammable vapors. (Nitric acid, fuming)
Chemical stability: No decomposition if used and stored according to specifications.
Possible hazardous reactions: Oxidizer: Contact with combustible/organic material may cause fire
Conditions to avoid:excess heat.combustible materials.Incompatible Materials.
Incompatible materials: Highly reactive with alkalis.Reactive with reducing agents. combustible materials. organic materials,metals. Acids.Reducing agents.aldehydes.
Hazardous decomposition products: Nitrogen oxides (NOx)

SECTION 11 : Toxicological information

Acute Toxicity:		
Inhalation:	67 ppm 4 h	Inhalation LC50 Rat
Chronic Toxicity: No additional information.		
Corrosion Irritation:		
Dermal:		Rabbit: Corrosive
Ocular:		Rabbit: Corrosive to eyes
Dermal:	Section 2	Classified as causing severe skin burns and eye damage.
Ocular:	Section 2	Classified as causing serious eye damage
Sensitization:		No additional information.
Single Target Organ (STOT):		No additional information.
Numerical Measures:		No additional information.
Carcinogenicity:		No additional information.
Mutagenicity:		No additional information.
Reproductive Toxicity:		Experiments have shown reproductive toxicity effects on laboratory animals.

SECTION 12 : Ecological information

Ecotoxicity Persistence and degradability: Readily degradable in the environment.
Bioaccumulative potential:
Mobility in soil: Aqueous solution has high mobility in soil.

Other adverse effects:

SECTION 13 : Disposal considerations

Waste disposal recommendations:

Product/containers must not be disposed together with household garbage. Do not allow product to reach sewage system or open water.It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities (US 40CFR262.11). Consult federal state/ provincial and local regulations regarding the proper disposal of waste material that may incorporate some amount of this product.

SECTION 14 : Transport information

UN-Number

2031

UN proper shipping name

Nitric Acid

Transport hazard class(es)

Class:
8 Corrosive substances

Packing group:II
Environmental hazard:
Transport in bulk:
Special precautions for user:

SECTION 15 : Regulatory information

United States (USA)

SARA Section 311/312 (Specific toxic chemical listings):

Acute, Chronic

SARA Section 313 (Specific toxic chemical listings):

7697-37-2 Nitric Acid

RCRA (hazardous waste code):

None of the ingredients is listed

TSCA (Toxic Substances Control Act):

All ingredients are listed.

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act):

7697-37-2 Nitric acid 1000 lbs

Proposition 65 (California):

Chemicals known to cause cancer:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed

Chemicals known to cause developmental toxicity:

None of the ingredients is listed

Canada

Canadian Domestic Substances List (DSL):

All ingredients are listed.

Canadian NPRI Ingredient Disclosure list (limit 0.1%):

None of the ingredients is listed

Canadian NPRI Ingredient Disclosure list (limit 1%):

7697-37-2 Nitric Acid

SECTION 16 : Other information

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.Note:. The responsibility to provide a safe workplace remains with the user.The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment.The information contained herein is, to the best of our knowledge and belief, accurate.However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material.It is the responsibility of the user to comply with all applicable laws and regulations applicable to this material.

GHS Full Text Phrases:

Abbreviations and acronyms:

IMDG: International Maritime Code for Dangerous Goods
PNEC: Predicted No-Effect Concentration (REACH)
CFR: Code of Federal Regulations (USA)
SARA: Superfund Amendments and Reauthorization Act (USA)
RCRA: Resource Conservation and Recovery Act (USA)
TSCA: Toxic Substances Control Act (USA)
NPRI: National Pollutant Release Inventory (Canada)
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
DNEL: Derived No-Effect Level (REACH)

Effective date : 12.29.2014
Last updated : 03.23.2015

Hydrochloric Acid,ACS

SECTION 1 : Identification of the substance/mixture and of the supplier

Product name : **Hydrochloric Acid,ACS**

Manufacturer/Supplier Trade name:

Manufacturer/Supplier Article number: **S25358**

Recommended uses of the product and uses restrictions on use:

Manufacturer Details:

AquaPhoenix Scientific
9 Barnhart Drive, Hanover, PA 17331

Supplier Details:

Fisher Science Education
15 Jet View Drive, Rochester, NY 14624

Emergency telephone number:

Fisher Science Education Emergency Telephone No.: 800-535-5053

SECTION 2 : Hazards identification

Classification of the substance or mixture:

Corrosive
Serious eye damage, category 1
Corrosive to metals, category 1
Skin corrosion, category 1B

Irritant
Specific target organ toxicity following single exposure, category 3

Corr. Metals 1
Corr. Skin 1B
Eye Damage 1
STOT. SE 3

Signal word :Danger

Hazard statements:
May be corrosive to metals
Causes severe skin burns and eye damage
May cause respiratory irritation

Precautionary statements:
If medical advice is needed, have product container or label at hand
Keep out of reach of children
Read label before use
Use only outdoors or in a well-ventilated area
Wear protective gloves/protective clothing/eye protection/face protection
Keep only in original container
Do not get in eyes, on skin, or on clothing
Wash skin thoroughly after handling
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting

IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing
Immediately call a POISON CENTER or doctor/physician
Specific treatment (see supplemental first aid instructions on this label)
Wash contaminated clothing before reuse
Absorb spillage to prevent material damage
Store in a well ventilated place. Keep container tightly closed
Store locked up
Store in corrosive resistant stainless steel container with a resistant inner liner
Dispose of contents and container to an approved waste disposal plant

Other Non-GHS Classification:

WHMIS

D1A 

E 

NFPA/HMIS

NFPA SCALE (0-4)

Health	3
Flammability	0
Physical Hazard	1
Personal Protection	**X**

HMIS RATINGS (0-4)

SECTION 3 : Composition/information on ingredients

Ingredients:		
CAS 7647-01-0	Hydrochloric Acid, ACS	30-50 %
CAS 7732-18-5	Water	50-70 %
		Percentages are by weight

SECTION 4 : First aid measures

Description of first aid measures

After inhalation: Move exposed individual to fresh air. Loosen clothing as necessary and position individual in a comfortable position.Seek medical attention if irritation or coughing persists.

After skin contact: Wash affected area with soap and water. Immediately remove contaminated clothing and shoes.Rinse thoroughly with plenty of water for at least 15 minutes.Immediately seek medical attention.

After eye contact: Protect unexposed eye. Flush thoroughly with plenty of water for at least 15

minutes.Remove contact lenses while rinsing.Continue rinsing eyes during transport to hospital.

After swallowing: Rinse mouth thoroughly. Do not induce vomiting. Have exposed individual drink sips of water. Immediately seek medical attention.

Most important symptoms and effects, both acute and delayed:

Inhalation may cause irritation to nose and upper respiratory tract, ulceration, coughing, chest tightness and shortness of breath. Higher concentrations cause tachypnoea, pulmonary oedema and suffocation . Ingestion may cause corrosion of lips, mouth, oesophagus and stomach, dysphagia and vomiting.Pain, eye ulceration, conjunctival irritation, cataracts and glaucoma may occur following eye exposure.Erythema and skin irritation, as well as chemical burns to skin and mucous membranes may arise following skin exposure.;Potential sequelae following ingestion of hydrochloric acid include perforation, scarring of the oesophagus or stomach and stricture formation causing dysphagia or gastric outlet obstruction. In some cases, RADS may develop. Respiratory symptoms may take up to 36 hours to develop.Symptoms of burning sensation, cough, wheezing, laryngitis, shortness of breath, spasm, inflammation, edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin.

Indication of any immediate medical attention and special treatment needed:

Provide SDS to Physician.Physician should treat symptomatically.

SECTION 5 : Firefighting measures

Extinguishing media

Suitable extinguishing agents: Use water, dry chemical, chemical foam, carbon dioxide, or alcohol-resistant foam.

For safety reasons unsuitable extinguishing agents:

Special hazards arising from the substance or mixture:

Combustion products may include carbon oxides or other toxic vapors.If in contact with metals toxic fumes may be released.

Advice for firefighters:

Protective equipment: Wear protective eyeware, gloves, and clothing. Refer to Section 8. Wear respiratory protection.

Additional information (precautions): Thermal decomposition can produce poisoning chlorine. Hydrochloric acid reacts also with many organic materials with liberation of heat.Avoid inhaling gases, fumes, dust, mist, vapor, and aerosols. Avoid contact with skin, eyes, and clothing.

SECTION 6 : Accidental release measures

Personal precautions, protective equipment and emergency procedures:

Ensure adequate ventilation. Ensure that air-handling systems are operational.

Environmental precautions:

Should not be released into environment. Prevent from reaching drains, sewer, or waterway.

Methods and material for containment and cleaning up:

Always obey local regulations. If necessary use trained response staff or contractor. Evacuate personnel to safe areas. Containerize for disposal. Refer to Section 13. Keep in suitable closed containers for disposal. Soak up with inert absorbent material and dispose of as hazardous waste. Cover spill with soda ash or calcium carbonate. Mix and add water to form slurry.Wear protective eyeware, gloves, and clothing. Refer to Section 8.

Reference to other sections:

SECTION 7 : Handling and storage

Precautions for safe handling:

Prevent formation of aerosols. Never use hot water and never add water to the acid.Do not allow contact between hydrochloric acid, metal, and organics.Follow good hygiene procedures when handling chemical materials. Refer to Section 8. Prevent contact with skin, eyes, and clothing. Follow proper disposal methods. Refer to Section 13. Do not eat, drink, smoke, or use personal products when handling chemical substances. Use only in well ventilated areas.Avoid splashes or spray in enclosed areas.

Conditions for safe storage, including any incompatibilities:

Store in a cool location. Keep away from food and beverages. Protect from freezing and physical damage. Store away from incompatible materials. Provide ventilation for containers. Keep container tightly sealed.Containers for hydrochloric acid must be made from corrosion resistant materials: glass, polyethylene, polypropylene, polyvinyl chloride, carbon steel lined with rubber or ebonite.

SECTION 8 : Exposure controls/personal protection




Control Parameters: 7647-01-0, Hydrochloric Acid, ACGIH: 2 ppm Ceiling
7647-01-0, Hydrochloric Acid, NIOSH: 5 ppm Ceiling; 7 mg/m3 Ceiling

Appropriate Engineering controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor and mists below the applicable workplace exposure limits (Occupational Exposure Limits-OELs) indicated above. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of handling.

Respiratory protection: Not required under normal conditions of use. Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. When necessary use NIOSH approved breathing equipment.

Protection of skin: Select glove material impermeable and resistant to the substance. Select glove material based on rates of diffusion and degradation. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Use proper glove removal technique without touching outer surface. Avoid skin contact with used gloves. Wear protective clothing.

Eye protection: Faceshield (8-inch minimum).Tightly fitting safety goggles.

General hygienic measures: Perform routine housekeeping. Wash hands before breaks and immediately after handling the product. Avoid contact with skin, eyes, and clothing. Before rewearing wash contaminated clothing.

SECTION 9 : Physical and chemical properties

Appearance (physical state,color):	Clear, colorless liquid.	**Explosion limit lower**: **Explosion limit upper**:	Non Explosive Non Explosive
Odor:	Pungent odor	**Vapor pressure**:	5.7mmHg @ 0C
Odor threshold:	0.3 – 14.9 mg/m3	**Vapor density**:	1.27 (Air=1)
pH-value:	< 1	**Relative density**:	1.0 - 1.2

Melting/Freezing point:	- 74 C	**Solubilities**:	Miscible
Boiling point/Boiling range:	81.5 - 110 C	**Partition coefficient (n-octanol/water)**:	Not Determined
Flash point (closed cup):	Not Applicable	**Auto/Self-ignition temperature**:	Not Determined
Evaporation rate:	>1.00	**Decomposition temperature**:	Not Determined
Flammability (solid,gaseous):	non combustible	**Viscosity**:	a. Kinematic:Not Determined b. Dynamic: Not Determined
Density: Not Determined **Hydrochloric Acid:**MW is36.46			

SECTION 10 : Stability and reactivity

Reactivity: Reacts violently with bases and is corrosive.
Chemical stability: No decomposition if used and stored according to specifications.
Possible hazardous reactions: Attacks many metals in the presence of water forming flammable explosive gas (hydrogen).Reacts violently with oxidants forming toxic gas (chlorine).
Conditions to avoid: Incompatible materials.
Incompatible materials: Bases, Amines, Alkali metals, Metals, permanganates (potassium permanganate), Fluorine, Metal acetylides, Hexalithium disilicide.
Hazardous decomposition products: Hydrogen chloride gas.Carbon oxides.

SECTION 11 : Toxicological information

Acute Toxicity:		
Inhalation:	7647-01-0	LD50 Rat 3124 ppm/hour
Oral:	7647-01-0	LD50 Rat 238 - 277 mg/kg
Dermal:	7647-01-0	LD50 Rabbit >5010 mg/kg
Chronic Toxicity: No additional information.		
Corrosion Irritation:		
Dermal:	7647-01-0	Skin - rabbit Result: Causes burns.
Ocular:	7647-01-0	Eyes - rabbit Result: Corrosive to eyes
Sensitization:		No additional information.
Single Target Organ (STOT):		7647-01-0: The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.
Numerical Measures:		No additional information.
Carcinogenicity:		No additional information.
Mutagenicity:		No additional information.

Reproductive Toxicity:	No additional information.

SECTION 12 : Ecological information

Ecotoxicity

7647-01-0: Toxicity to fish LC50 - Gambusia affinis (Mosquito fish) - 282 mg/l - 96 h (Hydrochloric acid)

Persistence and degradability:
Bioaccumulative potential:
Mobility in soil:
Other adverse effects:

SECTION 13 : Disposal considerations

Waste disposal recommendations:

Do not allow product to reach sewage system or open water.It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities (US 40CFR262.11). Contact a licensed professional waste disposal service to dispose of this material. Dispose of empty containers as unused product. Product or containers must not be disposed together with household garbage. Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations. Ensure complete and accurate classification.

SECTION 14 : Transport information

UN-Number

1789

UN proper shipping name

HYDROCHLORIC ACID

Transport hazard class(es)

Class:
8 Corrosive substances

Packing group:II
Environmental hazard:
Transport in bulk:
Special precautions for user:

SECTION 15 : Regulatory information

United States (USA)

SARA Section 311/312 (Specific toxic chemical listings):

Acute

SARA Section 313 (Specific toxic chemical listings):

7647-01-0 Hydrochloric Acid

RCRA (hazardous waste code):

None of the ingredients is listed

TSCA (Toxic Substances Control Act):

All ingredients are listed.

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act):

7647-01-0 Hydrochloric Acid 5000 lbs

Proposition 65 (California):

Chemicals known to cause cancer:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed

Chemicals known to cause developmental toxicity:

None of the ingredients is listed

Canada

Canadian Domestic Substances List (DSL):

All ingredients are listed.

Canadian NPRI Ingredient Disclosure list (limit 0.1%):

None of the ingredients is listed

Canadian NPRI Ingredient Disclosure list (limit 1%):

7647-01-0 Hydrochloric Acid

SECTION 16 : Other information

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.Note:. The responsibility to provide a safe workplace remains with the user.The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment.The information contained herein is, to the best of our knowledge and belief, accurate.However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material.It is the responsibility of the user to comply with all applicable laws and regulations applicable to this material.

GHS Full Text Phrases:

Abbreviations and acronyms:

IMDG: International Maritime Code for Dangerous Goods
PNEC: Predicted No-Effect Concentration (REACH)
CFR: Code of Federal Regulations (USA)
SARA: Superfund Amendments and Reauthorization Act (USA)
RCRA: Resource Conservation and Recovery Act (USA)
TSCA: Toxic Substances Control Act (USA)
NPRI: National Pollutant Release Inventory (Canada)
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)

HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
DNEL: Derived No-Effect Level (REACH)

Effective date : 01.08.2015
Last updated : 03.20.2015

Methanol, Lab Grade, 4L

SECTION 1 : Identification of the substance/mixture and of the supplier

Product name : **Methanol, Lab Grade, 4L**

Manufacturer/Supplier Trade name:

Manufacturer/Supplier Article number: **S25426A**

Recommended uses of the product and uses restrictions on use:

Manufacturer Details:

AquaPhoenix Scientific
9 Barnhart Drive, Hanover, PA 17331

Supplier Details:

Fisher Science Education
15 Jet View Drive, Rochester, NY 14624

Emergency telephone number:

Fisher Science Education Emergency Telephone No.: 800-535-5053

SECTION 2 : Hazards identification

Classification of the substance or mixture:

Flammable
Flammable liquids, category 2

Toxic
Acute toxicity (oral, dermal, inhalation), category 3

Health hazard
Specific target organ toxicity following single exposure, category 1

AcTox Dermal. 3
Flammable liq. 2
AcTox Oral. 3
AcTox Inhaln. 3
Stot SE. 1

Signal word :Danger

Hazard statements:
Highly flammable liquid and vapour
Toxic if swallowed
Toxic in contact with skin
Toxic if inhaled
Causes damage to organs

Precautionary statements:
If medical advice is needed, have product container or label at hand
Keep out of reach of children
Read label before use

Wear protective gloves/protective clothing/eye protection/face protection
Wash skin thoroughly after handling
Do not eat, drink or smoke when using this product
Avoid breathing dust/fume/gas/mist/vapours/spray
Keep away from heat/sparks/open flames/hot surfaces. No smoking
Do not breathe dust/fume/gas/mist/vapours/spray
Specific treatment (see supplemental first aid instructions on this label)
IF ON SKIN: Wash with soap and water
Call a POISON CENTER or doctor/physician if you feel unwell
Specific measures (see supplemental first aid instructions on this label)
Take off contaminated clothing and wash before reuse
Wash contaminated clothing before reuse
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
IF exposed: Call a POISON CENTER or doctor/physician
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Store locked up
Store in a well ventilated place. Keep cool
Dispose of contents and container as instructed in Section 13

Other Non-GHS Classification:

WHMIS

B2 

D1B 

D2B 

NFPA/HMIS

NFPA SCALE (0-4)

HMIS RATINGS (0-4)

SECTION 3 : Composition/information on ingredients

Ingredients:		
CAS 67-56-1	Methanol	>90 %

Percentages are by weight

SECTION 4 : First aid measures

Description of first aid measures

After inhalation: Move exposed individual to fresh air. Loosen clothing as necessary and position individual in a comfortable position.Get medical assistance.If breathing is difficult, give oxygen

After skin contact: Wash affected area with soap and water. Rinse/flush exposed skin gently using water for 15-20 minutes. Seek medical attention if irritation persists or if concerned.

After eye contact: Protect unexposed eye. Rinse or flush eye gently with water for at least 15-20 minutes, lifting upper and lower lids.Seek medical attention if irritation persists or if concerned

After swallowing: Rinse mouth thoroughly. Do not induce vomiting. Have exposed individual drink sips of water. Dilute mouth with water or milk after rinsing.Get medical assistance.

Most important symptoms and effects, both acute and delayed:

Poison. Toxic by ingestion, absorption through skin and inhalation, potentially causing irreversible effects. Irritating to eyes, skin, and respiratory tract. Irritation- all routes of exposure.Shortness of breath.Nausea.Headache.May be fatal or cause blindness if swallowed. Cannot be made non-poisonous. May cause gastrointestinal irritation, vomiting, and diarrhea. Central nervous system disorders. Skin disorders, preexisting eye disorders, gastrointestinal tract;Toxic: danger of very serious irreversible effects by inhalation, ingestion or absorption through skin. Experiments have shown reproductive toxicity effects on laboratory animals. May cause adverse kidney and liver effects

Indication of any immediate medical attention and special treatment needed:

If seeking medical attention, provide SDS document to physician.Physician should treat symptomatically.

SECTION 5 : Firefighting measures

Extinguishing media

Suitable extinguishing agents: Dry chemical, foam, dry sand, or Carbon Dioxide.Water spray can keep containers cool.

For safety reasons unsuitable extinguishing agents: Water may be ineffective.

Special hazards arising from the substance or mixture:

Risk of ignition. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Containers may explode when heated

Advice for firefighters:

Protective equipment: Wear protective eyeware, gloves, and clothing. Refer to Section 8.

Additional information (precautions): Remove all sources of ignition. Avoid contact with skin, eyes, and clothing.Ensure adequate ventilation.Take precautions against static discharge.

SECTION 6 : Accidental release measures

Personal precautions, protective equipment and emergency procedures:

Use spark-proof tools and explosion-proof equipment.Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor and mists below the applicable workplace exposure limits (Occupational Exposure Limits-OELs) indicated above.Ensure adequate ventilation.

Environmental precautions:

Prevent from reaching drains, sewer or waterway. Should not be released into environment.

Methods and material for containment and cleaning up:

If necessary use trained response staff or contractor. Remove all sources of ignition. Contain spillage and then

collect. Do not flush to sewer.Absorb with a noncombustible absorbent material such as sand or earth and containerize for disposal. Ventilate area of leak or spill.Use spark-proof tools and explosion-proof equipment.Follow proper disposal methods. Refer to Section 13.

Reference to other sections:

SECTION 7 : Handling and storage

Precautions for safe handling:

Use in a chemical fume hood. Wash hands before breaks and immediately after handling the product.Avoid contact with skin, eyes, and clothing.Take precautions against static discharge.

Conditions for safe storage, including any incompatibilities:

Store in a cool location. Provide ventilation for containers. Avoid storage near extreme heat, ignition sources or open flame. Keep container tightly sealed.Store with like hazards. Protect from freezing and physical damage.

SECTION 8 : Exposure controls/personal protection



Control Parameters:	67-56-1, Methanol, ACGIH: 250 ppm STEL; 200 ppm TWA 67-56-1, Methanol, NIOSH: 250 ppm STEL; 325 mg/m3 STEL 67-56-1, Methanol, NIOSH: 200 ppm TWA; 260 mg/m3 TWA
Appropriate Engineering controls:	Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use or handling. Ensure that dust-handling systems (exhaust ducts, dust collectors, vessels, and processing equipment) are designed to prevent the escape of dust into the work area.
Respiratory protection:	Use in a chemical fume hood. If exposure limit is exceeded, a full-face respirator with organic cartridge may be worn.
Protection of skin:	Select glove material impermeable and resistant to the substance.Select glove material based on rates of diffusion and degradation.
Eye protection:	Safety glasses with side shields or goggles.
General hygienic measures:	Wash hands before breaks and at the end of work. Avoid contact with the eyes and skin.Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices.Perform routine housekeeping.

SECTION 9 : Physical and chemical properties

Appearance (physical state,color):	Clear colorless liquid	**Explosion limit lower**: **Explosion limit upper**:	6 31
Odor:	Alcohol	**Vapor pressure**:	128 hPa @ 20°C
Odor threshold:	Not Available	**Vapor density**:	1.11
pH-value:	Not Available	**Relative density**:	0.79
Melting/Freezing point:	-98°C	**Solubilities**:	Miscible at 20 °C

Boiling point/Boiling range:	64.7°C @ 760mmHg	**Partition coefficient (n-octanol/water)**:	Not Available
Flash point (closed cup):	12°C	**Auto/Self-ignition temperature**:	455°C
Evaporation rate:	5.2	**Decomposition temperature**:	Not Available
Flammability (solid,gaseous):	Flammable	**Viscosity**:	a. Kinematic:Not Available b. Dynamic: Not Available
Density: Not Available			

SECTION 10 : Stability and reactivity

Reactivity: Vapours may form explosive mixture with air.
Chemical stability: Stable under normal conditions.
Possible hazardous reactions: None under normal processing.
Conditions to avoid: Excess heat, Incompatible Materials, flames, or sparks.
Incompatible materials: Oxidizing agents, reducing agents, alkali metals, acids, sodium, potassium, metals as powders, acid chlorides, acid anhydrides, powdered magnesium, and aluminum.
Hazardous decomposition products:carbon monoxide, formaldehyde.

SECTION 11 : Toxicological information

Acute Toxicity:		
Dermal:	(rabbit)	LD-50 15800 mg/kg
Oral:	(rat)	LD-50 5628 mg/kg
Inhalation:	(rat)	LC-50 130,7 mg/l
Chronic Toxicity: No additional information.		
Corrosion Irritation:		
Ocular:		Irritating to eyes
Dermal:		Irritating to skin
Sensitization:		No additional information.
Single Target Organ (STOT):		Classified as causing damage to organs:Eyes, skin, optic nerve, gastrointestinal tract, central nervous system, respiratory system, liver, spleen, kidney, blood
Numerical Measures:		No additional information.
Carcinogenicity:		Teratogenicity : has occurred in experimental animals.
Mutagenicity:		Mutagenetic effects have occurred in experimental animals.

Reproductive Toxicity:	Developmental Effects (Immediate/Delayed) have occurred in experimental animals

SECTION 12 : Ecological information

Ecotoxicity

Freshwater Fish: 96 Hr LC50 Pimephales promelas: 28200 mg/L

Freshwater Fish: 96 Hr LC50 Oncorhynchus mykiss: 19500 - 20700 mg/L

Freshwater Fish: 96 Hr LC50 Pimephales promelas: >100 mg/L

Freshwater Fish: 96 Hr LC50 Oncorhynchus mykiss: 18 - 20 mL/L

Freshwater Fish: 96 Hr LC50 Lepomis macrochirus: 13500 - 17600 mg/L

Persistence and degradability: Not persistant.
Bioaccumulative potential: Not Bioaccumulative.
Mobility in soil: Aqueous solution has high mobility in soil.
Other adverse effects:

SECTION 13 : Disposal considerations

Waste disposal recommendations:

Methanol RCRA waste code U154. Do not allow product to reach sewage system or open water.It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities (US 40CFR262.11). Absorb with a noncombustible absorbent material such as sand or earth and containerize for disposal. Provide ventilation. Have fire extinguishing agent available in case of fire. Eliminate all sources of ignition.Use spark-proof tools and explosion-proof equipment.Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations. Ensure complete and accurate classification.

SECTION 14 : Transport information

UN-Number

UN1230

UN proper shipping name

Methanol

Transport hazard class(es)

Class:
3 Flammable liquids

Class:
6.1 Toxic substances

Packing group:II
Environmental hazard:
Transport in bulk:
Special precautions for user:

SECTION 15 : Regulatory information

United States (USA)

SARA Section 311/312 (Specific toxic chemical listings):

Acute, Chronic, Fire

SARA Section 313 (Specific toxic chemical listings):

67-56-1 Methanol

RCRA (hazardous waste code):

67-56-1 Methanol RCRA waste code U154

TSCA (Toxic Substances Control Act):

All ingredients are listed.

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act):

67-56-1 Methanol 5000 lbs

Proposition 65 (California):

Chemicals known to cause cancer:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed

Chemicals known to cause developmental toxicity:

67-56-1 Methanol

Canada

Canadian Domestic Substances List (DSL):

All ingredients are listed.

Canadian NPRI Ingredient Disclosure list (limit 0.1%):

None of the ingredients is listed

Canadian NPRI Ingredient Disclosure list (limit 1%):

67-56-1 Methanol

SECTION 16 : Other information

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.Note:. The responsibility to provide a safe workplace remains with the user.The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment.The information contained herein is, to the best of our knowledge and belief, accurate.However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material.It is the responsibility of the user to comply with all applicable laws and regulations applicable to this material.

GHS Full Text Phrases:

Abbreviations and acronyms:

IMDG: International Maritime Code for Dangerous Goods
PNEC: Predicted No-Effect Concentration (REACH)

CFR: Code of Federal Regulations (USA)
SARA: Superfund Amendments and Reauthorization Act (USA)
RCRA: Resource Conservation and Recovery Act (USA)
TSCA: Toxic Substances Control Act (USA)
NPRI: National Pollutant Release Inventory (Canada)
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
DNEL: Derived No-Effect Level (REACH)

Effective date : 01.08.2015
Last updated : 03.27.2015

Sodium Hydroxide, 0.5M

SECTION 1 : Identification of the substance/mixture and of the supplier

Product name : **Sodium Hydroxide, 0.5M**

Manufacturer/Supplier Trade name:

Manufacturer/Supplier Article number: **S25881**

Recommended uses of the product and uses restrictions on use:

Manufacturer Details:

AquaPhoenix Scientific
9 Barnhart Drive, Hanover, PA 17331

Supplier Details:

Fisher Science Education
15 Jet View Drive, Rochester, NY 14624

Emergency telephone number:

Fisher Science Education Emergency Telephone No.: 800-535-5053

SECTION 2 : Hazards identification

Classification of the substance or mixture:

Corrosive
Serious eye damage, category 1
Corrosive to metals, category 1
Skin corrosion, category 1B

Skin Corr. 1B
Eye corr. 1
Metal Corr. 1

Signal word :Danger

Hazard statements:
May be corrosive to metals
Causes severe skin burns and eye damage
Causes serious eye damage
Precautionary statements:
If medical advice is needed, have product container or label at hand
Keep out of reach of children
Read label before use
Keep only in original container
Do not breathe dust/fume/gas/mist/vapours/spray
Wash ... thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection
Absorb spillage to prevent material damage
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
Wash contaminated clothing before reuse
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

Immediately call a POISON CENTER or doctor/physician
Store in a corrosive resistant/... container with a resistant inner liner
Store locked up
Dispose of contents/container to ...

Other Non-GHS Classification:

WHMIS

E

NFPA/HMIS

NFPA SCALE (0-4)

HMIS RATINGS (0-4)

SECTION 3 : Composition/information on ingredients

Ingredients:		
CAS 1310-73-2	Sodium Hydroxide	2 %
CAS 7732-18-5	Deionized Water	98 %
		Percentages are by weight

SECTION 4 : First aid measures

Description of first aid measures

After inhalation: Move exposed individual to fresh air. Loosen clothing as necessary and position individual in a comfortable position.Seek medical advice if discomfort or irritation persists.If breathing difficult, give oxygen.

After skin contact: Take off contaminated clothing and shoes immediately.Wash affected area with soap and water.Seek medical attention if irritation, discomfort persist.

After eye contact: Protect unexposed eye. Rinse/flush exposed eye(s) gently using water for 15-20 minutes. Remove contact lens(es) if able to do so during rinsing. Immediately get medical assistance.

After swallowing: Rinse mouth thoroughly. Do not induce vomiting. Have exposed individual drink sips of water. Seek medical attention if irritation, discomfort or vomiting persists.

Most important symptoms and effects, both acute and delayed:

Irritation, Nausea,Headache, Shortness of breath.;

Indication of any immediate medical attention and special treatment needed:

If seeking medical attention, provide SDS document to physician.

SECTION 5 : Firefighting measures

Extinguishing media

Suitable extinguishing agents: If in laboratory setting, follow laboratory fire suppression procedures. Use appropriate fire suppression agents for adjacent combustible materials or sources of ignition

For safety reasons unsuitable extinguishing agents:

Special hazards arising from the substance or mixture:

Combustion products may include carbon oxides or other toxic vapors.Thermal decomposition can lead to release of irritating gases and vapors.Sodium oxides.

Advice for firefighters:

Protective equipment: Use NIOSH-approved respiratory protection/breathing apparatus.

Additional information (precautions): Move product containers away from fire or keep cool with water spray as a protective measure, where feasible.

SECTION 6 : Accidental release measures

Personal precautions, protective equipment and emergency procedures:

Wear protective equipment. Transfer to a disposal or recovery container.Use respiratory protective device against the effects of fumes/dust/aerosol. Keep unprotected persons away. Ensure adequate ventilation.Keep away from ignition sources. Protect from heat.

Environmental precautions:

Prevent from reaching drains, sewer or waterway. Collect contaminated soil for characterization per Section 13

Methods and material for containment and cleaning up:

If in a laboratory setting, follow Chemical Hygiene Plan procedures.Place into properly labeled containers for recovery or disposal. If necessary, use trained response staff/contractor.Collect liquid and dilute with water. Neutralize with dilute acid solutions. Decant water to drain with excess water. Absorb with suitable material. Dispose of remaining solid as normal refuse. Always obey local regulations.

Reference to other sections:

SECTION 7 : Handling and storage

Precautions for safe handling:

Absorb spillage to prevent material damage due to corrosiveness to metal. Avoid contact with eyes, skin, and clothing. Wash hands after handling. Do not mix with acids.Follow good hygiene procedures when handling chemical materials. Use only in well ventilated areas.

Conditions for safe storage, including any incompatibilities:

Protect from freezing and physical damage.Provide ventilation for containers. Avoid storage near extreme heat, ignition sources or open flame. Store away from foodstuffs. Store away from oxidizing agents.Store in cool, dry conditions in well sealed containers. Store with Corrosives.

SECTION 8 : Exposure controls/personal protection

Control Parameters: 1310-73-2, Sodium Hydroxide, OSHA PEL TWA 2 mg/m3
1310-73-2, Sodium Hydroxide, ACGIH TLV TWA 2 mg/m3

Appropriate Engineering controls: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use/handling.Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor or dusts (total/respirable) below the applicable workplace exposure limits (Occupational Exposure Limits-OELs) indicated above.

Respiratory protection: Not required under normal conditions of use. Use suitable respiratory protective device when high concentrations are present. Use suitable respiratory protective device when aerosol or mist is formed. For spills, respiratory protection may be advisable.

Protection of skin: The glove material has to be impermeable and resistant to the product/ the substance/ the preparation being used/handled.Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation.

Eye protection: Safety glasses with side shields or goggles.

General hygienic measures: The usual precautionary measures are to be adhered to when handling chemicals. Keep away from food, beverages and feed sources. Immediately remove all soiled and contaminated clothing. Wash hands before breaks and at the end of work. Do not inhale gases/fumes/dust/mist/vapor/aerosols. Avoid contact with the eyes and skin.

SECTION 9 : Physical and chemical properties

Appearance (physical state,color):	Clear, colorless liquid	**Explosion limit lower**: **Explosion limit upper**:	Non Explosive Non Explosive
Odor:	Odorless	**Vapor pressure**:	14mmHg @ 20C
Odor threshold:	Not Determined	**Vapor density**:	>1
pH-value:	Alkaline	**Relative density**:	Approx 1
Melting/Freezing point:	Approx 0°C	**Solubilities**:	Soluble in Water
Boiling point/Boiling range:	Approx 100°C	**Partition coefficient (n-octanol/water)**:	Not Determined
Flash point (closed cup):	Not Determined	**Auto/Self-ignition temperature**:	Not Determined
Evaporation rate:	Not Determined	**Decomposition temperature**:	Not Determined
Flammability (solid,gaseous):	Not Determined	**Viscosity**:	a. Kinematic:Not Determined b. Dynamic: Not Determined
Density: Not Determined			

SECTION 10 : Stability and reactivity

Reactivity:
Chemical stability: No decomposition if used and stored according to specifications.
Possible hazardous reactions:
Conditions to avoid: Incompatible materials, excess heat

Incompatible materials:acids, Organic materials, Chlorinated solvents, Aluminum, Phosphorus, Tin/tin oxides, Zinc
Hazardous decomposition products:sodium oxides, hydrogen. Carbon oxides (CO, CO2).

SECTION 11 : Toxicological information

Acute Toxicity: No additional information.	
Chronic Toxicity: No additional information.	
Corrosion Irritation: No additional information.	
Sensitization:	No additional information.
Single Target Organ (STOT):	No additional information.
Numerical Measures:	No additional information.
Carcinogenicity:	No additional information.
Mutagenicity:	No additional information.
Reproductive Toxicity:	No additional information.

SECTION 12 : Ecological information

Ecotoxicity Persistence and degradability: Readily degradable in the environment.
Bioaccumulative potential: Not Bioaccumulative.
Mobility in soil:
Other adverse effects:

SECTION 13 : Disposal considerations

Waste disposal recommendations:

Product/containers must not be disposed together with household garbage. Do not allow product to reach sewage system or open water.It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities (US 40CFR262.11). Consult federal state/ provincial and local regulations regarding the proper disposal of waste material that may incorporate some amount of this product.Neutralize with dilute acid solutions.

SECTION 14 : Transport information

UN-Number

1824

UN proper shipping name

Sodium hydroxide solution

Transport hazard class(es)

Class:
8 Corrosive substances

Packing group:II
Environmental hazard:
Transport in bulk:

Special precautions for user:

SECTION 15 : Regulatory information

United States (USA)

SARA Section 311/312 (Specific toxic chemical listings):

None of the ingredients is listed

SARA Section 313 (Specific toxic chemical listings):

None of the ingredients is listed

RCRA (hazardous waste code):

None of the ingredients is listed

TSCA (Toxic Substances Control Act):

All ingredients are listed.

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act):

1310-73-2 Sodium Hydroxide 1000 lb

Proposition 65 (California):

Chemicals known to cause cancer:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed

Chemicals known to cause developmental toxicity:

None of the ingredients is listed

Canada

Canadian Domestic Substances List (DSL):

All ingredients are listed.

Canadian NPRI Ingredient Disclosure list (limit 0.1%):

None of the ingredients is listed

Canadian NPRI Ingredient Disclosure list (limit 1%):

1310-73-2 Sodium Hydroxide

SECTION 16 : Other information

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.Note:. The responsibility to provide a safe workplace remains with the user.The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment.The information contained herein is, to the best of our knowledge and belief, accurate.However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material.It is the responsibility of the user to comply with all applicable laws and regulations applicable to this material.

GHS Full Text Phrases:

Abbreviations and acronyms:
IMDG: International Maritime Code for Dangerous Goods
PNEC: Predicted No-Effect Concentration (REACH)
CFR: Code of Federal Regulations (USA)
SARA: Superfund Amendments and Reauthorization Act (USA)
RCRA: Resource Conservation and Recovery Act (USA)
TSCA: Toxic Substances Control Act (USA)
NPRI: National Pollutant Release Inventory (Canada)
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
DNEL: Derived No-Effect Level (REACH)

Effective date : 12.14.2014
Last updated : 03.25.2015

SAFETY DATA SHEET

1. Identification

Product identifier: SODIUM BISULFATE

Other means of identification
Product No.: 7432, 3534

Recommended use and restriction on use

Recommended use: Not available.
Restrictions on use: Not known.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer

Company Name:	Avantor Performance Materials, Inc.
Address:	3477 Corporate Parkway, Suite 200 Center Valley, PA 18034
Telephone:	Customer Service: 855-282-6867
Fax:	
Contact Person:	Environmental Health & Safety
e-mail:	info@avantormaterials.com

Emergency telephone number:
24 Hour Emergency: 908-859-2151

Chemtrec: 800-424-9300

2. Hazard(s) identification

Hazard classification

Health hazards

Serious eye damage/eye irritation Category 1

Label elements

Hazard symbol:

Signal word: Danger

Hazard statement: Causes serious eye damage.

Precautionary statement

Prevention: Wear eye protection/face protection.

Response: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.

Other hazards which do not result in GHS classification: None.

3. Composition/information on ingredients

Mixtures

Chemical identity	Common name and synonyms	CAS number	Content in percent (%)*
SODIUM BISULFATE (HYDRATED FORM)		10034-88-5	90 - 100%

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

General information: Get medical advice/attention if you feel unwell. Show this safety data sheet to the doctor in attendance.

Ingestion: Rinse mouth thoroughly. Get medical attention if symptoms occur.

Inhalation: Move to fresh air. Get medical attention if symptoms occur.

Skin contact: Wash skin thoroughly with soap and water. Get medical attention if irritation persists after washing.

Eye contact: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.

Most important symptoms/effects, acute and delayed

Symptoms: Causes serious eye damage.

Indication of immediate medical attention and special treatment needed

Treatment: Treat symptomatically.

5. Fire-fighting measures

General fire hazards: No unusual fire or explosion hazards noted.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media: Use fire-extinguishing media appropriate for surrounding materials.

Unsuitable extinguishing media: Avoid water in straight hose stream; will scatter and spread fire.

Specific hazards arising from the chemical: During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters

Special fire fighting procedures: Move containers from fire area if you can do so without risk. Use water spray to keep fire-exposed containers cool. Cool containers exposed to flames with water until well after the fire is out.

Special protective equipment for fire-fighters:	Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures:	Keep unauthorized personnel away. Use personal protective equipment. See Section 8 of the MSDS for Personal Protective Equipment.
Methods and material for containment and cleaning up:	Sweep up and place in a clearly labeled container for chemical waste. Clean surface thoroughly to remove residual contamination.
Notification Procedures:	Prevent entry into waterways, sewer, basements or confined areas. Inform authorities if large amounts are involved.
Environmental precautions:	Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling:	Use personal protective equipment as required. Avoid contact with eyes, skin, and clothing. Avoid inhalation of dust. Wash thoroughly after handling.
Conditions for safe storage, including any incompatibilities:	Keep containers tightly closed. Store in cool, dry place. Store in a well-ventilated place.

8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

None of the components have assigned exposure limits.

Appropriate engineering controls	No data available.

Individual protection measures, such as personal protective equipment

General information:	Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.
Eye/face protection:	Wear safety glasses with side shields (or goggles).
Skin protection	
Hand protection:	Use suitable protective gloves if risk of skin contact.
Other:	Wear suitable protective clothing.
Respiratory protection:	In case of inadequate ventilation, use respiratory protection.
Hygiene measures:	Provide eyewash station and safety shower. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing to remove contaminants. Discard contaminated footwear that cannot be cleaned.

9. Physical and chemical properties

Appearance

Physical state:	Solid
Form:	Crystals or powder.
Color:	Colorless
Odor:	Odorless
Odor threshold:	No data available.
pH:	1.4
Melting point/freezing point:	58 °C
Initial boiling point and boiling range:	No data available.
Flash Point:	No data available.
Evaporation rate:	No data available.
Flammability (solid, gas):	No data available.
Upper/lower limit on flammability or explosive limits	
Flammability limit - upper (%):	No data available.
Flammability limit - lower (%):	No data available.
Explosive limit - upper (%):	No data available.
Explosive limit - lower (%):	No data available.
Vapor pressure:	No data available.
Vapor density:	No data available.
Relative density:	2.1 (20 °C)
Solubility(ies)	
Solubility in water:	670 g/l
Solubility (other):	No data available.
Partition coefficient (n-octanol/water):	No data available.
Auto-ignition temperature:	No data available.
Decomposition temperature:	No data available.
Viscosity:	No data available.

Other information

Molecular weight:	138.08 g/mol

10. Stability and reactivity

Reactivity:	No dangerous reaction known under conditions of normal use.
Chemical stability:	Material is unstable under normal conditions.
Possibility of hazardous reactions:	Hazardous polymerization does not occur. The substance is hygroscopic and will absorb water by contact with the moisture in the air.
Conditions to avoid:	Contact with incompatible materials. Moisture. Avoid conditions which create dust.
Incompatible materials:	Strong bases.
Hazardous decomposition products:	Sulfur dioxide gas may be liberated from the product.

11. Toxicological information

Information on likely routes of exposure

Ingestion:	May cause irritation of the gastrointestinal tract.

Inhalation: May cause irritation to the respiratory system.

Skin contact: May cause irritation.

Eye contact: Causes serious eye damage.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral
Product: No data available.

Dermal
Product: No data available.

Inhalation
Product: No data available.

Repeated dose toxicity
Product: No data available.

Skin corrosion/irritation
Product: May cause skin irritation.

Serious eye damage/eye irritation
Product: Causes serious eye damage.

Respiratory or skin sensitization
Product: Not a skin sensitizer.

Carcinogenicity
Product: This substance has no evidence of carcinogenic properties.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:
No carcinogenic components identified

US. National Toxicology Program (NTP) Report on Carcinogens:
No carcinogenic components identified

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):
No carcinogenic components identified

Germ cell mutagenicity

In vitro
Product: No mutagenic components identified

In vivo
Product: No mutagenic components identified

Reproductive toxicity
Product: No components toxic to reproduction

Specific target organ toxicity - single exposure
Product: No data available.

Specific target organ toxicity - repeated exposure
Product: No data available.

Aspiration hazard
Product: Not classified

Other effects: None known.

12. Ecological information

Ecotoxicity:

Acute hazards to the aquatic environment:

Fish
Product: No data available.

Aquatic invertebrates
Product: No data available.

Chronic hazards to the aquatic environment:

Fish
Product: No data available.

Aquatic invertebrates
Product: No data available.

Toxicity to Aquatic Plants
Product: No data available.

Persistence and degradability

Biodegradation
Product: There are no data on the degradability of this product.

BOD/COD ratio
Product: No data available.

Bioaccumulative potential
Bioconcentration factor (BCF)
Product: No data available on bioaccumulation.

Partition coefficient n-octanol / water (log Kow)
Product: No data available.

Mobility in soil: The product is water soluble and may spread in water systems.

Other adverse effects: The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

13. Disposal considerations

Disposal instructions: Discharge, treatment, or disposal may be subject to national, state, or local laws.

Contaminated packaging: Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

UN number:	UN 3260
UN proper shipping name:	Corrosive solid, acidic, inorganic, n.o.s.(SODIUM BISULFATE)
Transport hazard class(es)	
Class(es):	8
Label(s):	8
Packing group:	III
Marine Pollutant:	No

IMDG

UN number:	UN 3260
UN proper shipping name:	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.(SODIUM BISULFATE)
Transport hazard class(es)	
Class(es):	8
Label(s):	8
EmS No.:	F-A, S-B
Packing group:	III
Marine Pollutant:	No

IATA

UN number:	UN 3260
Proper Shipping Name:	Corrosive solid, acidic, inorganic, n.o.s.(SODIUM BISULFATE)
Transport hazard class(es):	
Class(es):	8
Label(s):	8
Marine Pollutant:	No
Packing group:	III

15. Regulatory information

US federal regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4):

None present or none present in regulated quantities.

Superfund amendments and reauthorization act of 1986 (SARA)

Hazard categories

X	Acute (Immediate)		Chronic (Delayed)		Fire		Reactive		Pressure Generating

SARA 302 Extremely hazardous substance

None present or none present in regulated quantities.

SARA 304 Emergency release notification

None present or none present in regulated quantities.

SARA 311/312 Hazardous chemical

Chemical identity	Threshold Planning Quantity

SARA 313 (TRI reporting)

None present or none present in regulated quantities.

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)

None present or none present in regulated quantities.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):

None present or none present in regulated quantities.

US state regulations

US. California Proposition 65

No ingredient regulated by CA Prop 65 present.

US. New Jersey Worker and Community Right-to-Know Act

No ingredient regulated by NJ Right-to-Know Law present.

US. Massachusetts RTK - Substance List

No ingredient regulated by MA Right-to-Know Law present.

US. Pennsylvania RTK - Hazardous Substances

No ingredient regulated by PA Right-to-Know Law present.

US. Rhode Island RTK

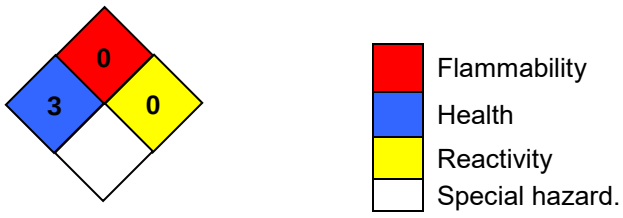
No ingredient regulated by RI Right-to-Know Law present.

Inventory Status:

Australia AICS:	On or in compliance with the inventory
Canada DSL Inventory List:	On or in compliance with the inventory
EINECS, ELINCS or NLP:	On or in compliance with the inventory
Japan (ENCS) List:	Not in compliance with the inventory.
China Inv. Existing Chemical Substances:	On or in compliance with the inventory
Korea Existing Chemicals Inv. (KECI):	Not in compliance with the inventory.
Canada NDSL Inventory:	Not in compliance with the inventory.
Philippines PICCS:	On or in compliance with the inventory
US TSCA Inventory:	On or in compliance with the inventory
New Zealand Inventory of Chemicals:	On or in compliance with the inventory
Japan ISHL Listing:	Not in compliance with the inventory.
Japan Pharmacopoeia Listing:	Not in compliance with the inventory.

16.Other information, including date of preparation or last revision

NFPA Hazard ID



Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe

Issue date: 05-16-2014

Revision date:	No data available.
Version #:	1.0
Further information:	No data available.
Disclaimer:	THE INFORMATION PRESENTED IN THIS MATERIAL SAFETY DATA SHEET (MSDS/SDS) WAS PREPARED BY TECHNICAL PERSONNEL BASED ON DATA THAT THEY BELIEVE IN THEIR GOOD FAITH JUDGMENT IS ACCURATE. HOWEVER, THE INFORMATION PROVIDED HEREIN IS PROVIDED "AS IS," AND AVANTOR PERFORMANCE MATERIALS MAKES AND GIVES NO REPRESENTATIONS OR WARRANTIES WHATSOEVER, AND EXPRESSLY DISCLAIMS ALL WARRANTIES REGARDING SUCH INFORMATION AND THE PRODUCT TO WHICH IT RELATES, WHETHER EXPRESS, IMPLIED, OR STATUTORY, INCLUDING WITHOUT LIMITATION, WARRANTIES OF ACCURACY, COMPLETENESS, MERCHANTABILITY, NON-INFRINGEMENT, PERFORMANCE, SAFETY, SUITABILITY, STABILITY, AND FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES ARISING FROM COURSE OF DEALING, COURSE OF PERFORMANCE, OR USAGE OF TRADE. THIS MSDS/SDS IS INTENDED ONLY AS A GUIDE TO THE APPROPRIATE PRECAUTIONARY HANDLING OF THE MATERIAL BY A PROPERLY TRAINED PERSON USING THIS PRODUCT, AND IS NOT INTENDED TO BE COMPREHENSIVE AS TO THE MANNER AND CONDITIONS OF USE, HANDLING, STORAGE, OR DISPOSAL OF THE PRODUCT. INDIVIDUALS RECEIVING THIS MSDS/SDS MUST ALWAYS EXERCISE THEIR OWN INDEPENDENT JUDGMENT IN DETERMINING THE APPROPRIATENESS OF SUCH ISSUES. ACCORDINGLY, AVANTOR PERFORMANCE MATERIALS ASSUMES NO LIABILITY WHATSOEVER FOR THE USE OF OR RELIANCE UPON THIS INFORMATION. NO SUGGESTIONS FOR USE ARE INTENDED AS, AND NOTHING HEREIN SHALL BE CONSTRUED AS, A RECOMMENDATION TO INFRINGE ANY EXISTING PATENTS OR TO VIOLATE ANY FEDERAL, STATE, LOCAL, OR FOREIGN LAWS. AVANTOR PERFORMANCE MATERIALS REMINDS YOU THAT IT IS YOUR LEGAL DUTY TO MAKE ALL INFORMATION IN THIS MSDS/SDS AVAILABLE TO YOUR EMPLOYEES.

ATTACHMENT B
Community Air Monitoring Plan (CAMP)

Community Air Monitoring Plan

This Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress during remedial activities at the site. The CAMP is not intended for use in establishing action levels for workers respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air. The CAMP was developed in accordance with Appendices 1A & 1B of DER-10, included at the end of this CAMP.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Depending on the nature of known or potential contaminants at the site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary.

Continuous monitoring will be required for all ground intrusive activities. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and groundwater samples. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuing monitoring may be required during sampling activities.

Particulate Monitoring, Response Levels, and Actions

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

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than the background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work may continue with dust suppression techniques provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work will be stopped and a re- evaluation of activities initiated. Work can resume provided that dust suppression measures

and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

- All readings will be recorded and be available for State (DEC and DOH) personnel to review.

VOC Monitoring, Response Levels, and Actions

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 will be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work will be performed using a photo ionization detector (PID) equipped with a 10.2 eV bulb. The PID will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15- minute average, work activities 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 will be halted, the source of the 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 will be shutdown.

- All 15-minute readings will be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of sufficient sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels (response actions should also be predetermined). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.

- If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m3, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m3 or less at the monitoring point.

- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

Special Requirements for Indoor Work with Co-Located Residences or Facilities

Unless a self-contained, negative-pressure enclosure with proper emission controls will encompass the work area, all individuals not directly involved with the planned work must be absent from the room in which the work will occur. Monitoring requirements shall be as stated above under "Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures" except that in this instance "nearby/occupied structures" would be adjacent occupied rooms. Additionally, the location of all exhaust vents in the room and their discharge points, as well as potential vapor pathways (openings, conduits, etc.) relative to adjoining rooms, should be understood and the monitoring locations established accordingly. In these situations, it is strongly recommended that exhaust fans or other engineering controls be used to create negative air pressure within the work area during remedial activities. Additionally, it is strongly recommended that the planned work be implemented during hours (e.g. weekends or evenings) when building occupancy is at a minimum.

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must 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, particularly if wind direction changes. 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.

1. 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.

2. 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.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

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

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix 1B
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50^{o} C (14 to 122^{o} F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.