



MOVE YOUR ENVIRONMENT FORWARD

SITE CHARACTERIZATION WORK PLAN - ADDENDUM

473 President Street Off-Site - Site #C224220A

473 President Street
Brooklyn, New York 11215

Prepared For:

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

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HRP #: DEC1035.P3

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1.0 INTRODUCTION

On May 16, 2022, HRP Associates, Inc. (HRP) was authorized to complete this New York State Department of Environmental Conservation (NYSDEC) Work Assignment (WA) No. 35 (D009808-35) for Site Characterizations (SC) at seven 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 473 President Street Off-Site SC (Site No. C224220A). This document is intended to supplement information provided in HRP's SC Work Plan prepared for the Region 2 P-Sites and dated August 8, 2022. The focus of the 473 President Street Off-Site SC is to characterize potential impacts to off-site receptors related to chlorinated volatile organic compound (CVOC) contamination which has been identified in on-site soil, groundwater, and soil vapor. The scope of work discussed herein was developed based on HRP's review of previous investigations conducted between 2014 and 2020 as well as discussions and planning with NYSDEC staff.

1.1 Site Description and Background Information

The 473 President Street Off-Site SC will focus on the area surrounding three active Brownfield Cleanup Program (BCP) Sites (referred to hereinafter as "the Sites") located on adjoining parcels in the Gowanus neighborhood of Brooklyn, New York:

- 473 President Street (Site No. C224220) located at 473 President Street, identified as Block 440, Lot 1. The Site is approximately 0.46 acres in area and consists of an unoccupied single-story warehouse.
- President Street Portfolio (Site No. C224309), includes two non-contiguous parcels located at 469 President Street (E Waste Parcel) and 532 Union Street (Pontone Parcel), separated by 473 President Street. In 2020 the two parcels were merged with the 473 President Street Site and are now part of Block 440, Lot 1. The E Waste Parcel is approximately 0.29 acres in area and consists of an unoccupied single-story warehouse. The Pontone Parcel is approximately 0.43 acres in area and consists of a one to three-story unoccupied building.
- 514 Union Street (Site No. C224318) located at 514 Union Street, identified as Block 440, Lot 12. The Site is approximately 0.39 acres in area and consists of a single-story building occupied by the Royal Palms Shuffleboard Club.

The location of the Sites is depicted on **Figure 1**. A Site Plan showing the Sites, surrounding off-site area, and proposed investigation locations is included in **Figure 2**.

The Sites are each zoned M-1-2 – commercial to light industrial zoning district. Properties surrounding the Site are a mix of industrial, commercial, and residential use. At present the areas surrounding the Sites (within 300 ft of site boundaries) include:

- North: An ice cream wholesaler with commercial ice cream parlor space (immediately adjacent, at intersection of Union Street and Nevins Street), Union Street, followed by an automotive repair garage (80 ft), mixed commercial and residential properties (80 ft), and the 585 Union Street Site (NYSDEC Site No. C224329).
- South: President Street, followed by a candle wholesaler (60 ft) and mixed commercial and residential properties (60 ft).
- East: Mixed commercial and residential properties (immediately adjacent), Dolly's Park (20 ft), and 3rd Avenue.

West: Nevins Street, followed by the 318 Nevins Street Site (NYSDEC Site No. C224350), and the Gowanus Canal (NYSDEC Site No. 224133 and a United States Environmental Protection Agency [USEPA] National Priority List [NPL] site, 280 ft).

Site history was detailed in various reports prepared by Langan Engineering, Environmental, Surveying, Landscape Architecture, and Geology, D.P.C. (Langan). Site operations at the three Sites included the following (dates are approximate based on available listings):

- Sash and door manufacturing (1886-1915)
- Soda bottling (1938-1950)
- Painting (1938-1950)
- Automotive repair (1938-1965)
- Casket manufacturing (1938-2020)
- Engraving (1945)
- Dental manufacturing (1949-1960)
- Die cutting (1959-2014)
- Metal manufacturing (1969-1992)
- An electronic waste recycling warehouse (2014-2020)
- Multi-tenant commercial warehousing (1990s to 2020)

The Site buildings are currently vacant with the exception of 514 Union Street which is occupied by the Royal Palms Shuffleboard Club, a bar with shuffleboard courts. Following planned remedial action (described below), the 473 President Street Site and the two parcels of the President Street Portfolio Site are to be redeveloped as multi-story, mixed-use residential and commercial building with ground floor retail and parking. Current and historic property use at the sites and surrounding area are summarized on **Table 1** and are depicted on **Figure 3**.

1.2 Site Geology and Hydrogeology

The Sites are relatively flat and lie at an elevation of approximately 12 ft above mean sea level (amsl). Regional topography slopes west towards the Gowanus Canal and Raritan Bay.

The 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 Sites is part of the Hartland Formation, a mica-schist and quartz feldspar granulite. Bedrock has not been encountered in any of the on-site investigations reviewed by HRP. Bedrock is overlain by unconsolidated coastal plain deposits belonging to the Upper Cretaceous Monmouth Group, Matawan Group, and Magothy Formation which consist of silty clay, glauconitic sandy clay, sand, and gravel (Fisher et al., 1970).

Based on soil borings installed during previous investigations, Langan identified the upper 6-14 ft of soils as historic fill material consisting of brown fine sand with varying amounts of medium sand, brick, coal, coal ash, concrete, slag, glass, tar, and wood. Native soils underlying historic fill were described by Langan as brown fine sand with varying amounts of silt and clay.

During previous investigations, groundwater was encountered at depths of approximately 8.5 to 13 feet below grade (ft bg) within Site buildings, corresponding to elevations of 2-3 ft amsl, or 10 ft

below sidewalk grade. Groundwater contour maps prepared for the Site indicate groundwater flow is in a westerly direction toward the Gowanus Canal.

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 for a larger area inclusive of the 473 President Street Site, the 514 Union Street Site, and the E Waste Parcel of the President Street Portfolio Site, prepared by Carlin, Simpson & Associates (CSA), dated July 2014.
- Remedial Investigation Report for 473 President Street, prepared by Langan, dated August 2019.
- Remedial Action Work Plan for 473 President Street, prepared by Langan, dated October 2020.
- Remedial Investigation Report for President Street Portfolio, prepared by Langan, dated October 2020.
- Remedial Action Work Plan for President Street Portfolio, prepared by Langan, dated February 2021.
- Limited Subsurface Investigation Report for 514 Union Street, prepared by Langan, dated April 2020.
- Draft Remedial Investigation Work Plan for 514 Union Street, prepared by Langan, dated March 2022.
- Phase II Environmental Site Investigation for 300-344 Nevins Street (later known as 318 Nevins Street Site No. C224350), prepared by Langan and dated July 2019.
- Supplemental Investigation Report, 577-599 Union Street (later known as 585 Union Street Site No. C224329), prepared by Impact Environmental and dated October 2020.

In 2014 CSA conducted a Phase I ESA for an area inclusive of the 473 President Street Site, the 514 Union Street Site, and the E Waste Parcel of the President Street Portfolio Site. The Phase I ESA identified historical Site uses (including metal manufacturing), the presence of open NYSDEC Spill No. 9412605, and contamination from surrounding properties (including the Gowanus Canal) as recognized environmental conditions (RECs).

Between 2015 and 2020, several subsurface investigations were conducted at the Sites by Langan. The investigations included the completion of geophysical surveys to locate potential USTs and other subsurface structures, the installation of soil borings, groundwater monitoring wells and sub-slab soil vapor points within on-site buildings, and the collection of soil, groundwater, and soil vapor samples for laboratory analysis. Additional investigation is planned for the 514 Union Street Site. Findings of the investigations are summarized below:

- CVOCs were detected in groundwater and sub-slab soil vapor at concentrations exceeding applicable NYSDEC standards, criteria, and guidance (SCGs) at each of the Sites (with the exception of groundwater at the Pontone Parcel) and in a limited number of soil samples at concentrations exceeding Unrestricted Use Soil Cleanup Objectives (UU SCOs). The presence of the CVOCs, which consisted primarily of trichloroethylene (TCE), and its breakdown products cis-1,2-dichloroethylene (cis-1,2-DCE), and vinyl chloride, was attributed to

historical releases associated with the former industrial uses of the Sites as metal manufacturing, soda bottling, and/or die cutting. CVOC concentrations detected in soil were not indicative of a source area.

- CVOCs were detected in groundwater at concentrations exceeding Technical and Operational Guidance Series (TOGS) 1.1.1 Class GA criteria on the 473 President Street Site, 514 Union Street Site, and the E-Waste Parcel of the President Street Portfolio. CVOC groundwater concentrations were highest in the northwestern portion of the 473 President Street Site (MW-07D) and in the northeastern portion of the E Waste Parcel (MW-37). CVOC concentrations were generally higher in deep wells (screened approximately, 20-25 or 20-30 ft bg) than in wells screened at the groundwater table interface (approximately 10-20 ft bg). The presence of the TCE breakdown products cis-1,2-DCE and vinyl chloride indicate some dechlorination has occurred over time. Total CVOC concentrations in on-site groundwater are depicted on **Figure 4A**.
- CVOCs were detected in sub-slab soil vapor and indoor air in each of the Site buildings. CVOCs including tetrachloroethylene (PCE), TCE, and cis-1,2-DCE were detected in sub-slab soil vapor at concentrations at which mitigation is recommended by the New York State Department of Health (NYSDOH) Soil Vapor/Indoor Air Matrices in each of the four Site buildings. CVOC soil vapor concentrations were highest in the central and northeast portions of the 473 President Street Site (SV-04, SV03), in the southwest portion of the 514 Union Street Site (SSV04), and the west-central portion of the Pontone Parcel (SV-11, SV-12). Total CVOC concentrations in sub-slab soil vapor are depicted on **Figure 4B**.
- A geophysical survey identified two anomalies suspected to be USTs located in the northwest (suspected gasoline UST) and southwest (suspected fuel oil UST) portions of the 473 President Street Site. The fuel oil UST associated with Spill No. 9412605 (which was reportedly closed in-place) was not identified by the geophysical survey. Based on available records, the UST is believed to be in the southeast portion of the 473 President Street Site.
- Petroleum impacted soils, as evidenced by odor, staining, and elevated photoionization detector (PID) readings, were observed in the northwest portion of the 473 President Street Site near the suspected gasoline UST. Petroleum impacted soils were also identified on the southern portion of the 514 Union Street Site, north of the property boundary with 473 President Street. The locations of the suspected USTs are depicted on **Figures 4C** and **4D**.
- The petroleum related "BTEX" VOCs, benzene, toluene, ethyl benzene, and xylenes, were detected in groundwater at concentrations exceeding Class GA criteria in the area of the UST on the northwest portion of 473 President Street Site and on the southern portion of the 514 Union Street Site. BTEX compounds were not detected above Class GA criteria in groundwater samples collected from the E Waste and Pontone Parcels. Total BTEX concentrations in groundwater are depicted on **Figure 4C**.
- BTEX VOCs were detected in sub-slab soil vapor and indoor air in each of the Site buildings. BTEX concentrations were highest in sub-slab soil vapor samples collected from the E Waste Parcel. Total BTEX concentrations in sub-slab soil vapor are depicted on **Figure 4D**.
- Historic fill material was identified at depths ranging from 6-14 ft bg. Semivolatile organic compounds (SVOCs), metals, and pesticides were detected in fill samples at concentrations exceeding UU SCOs at each of the Sites. PCBs were detected in fill material on the E Waste and Pontone Parcels. Additionally, a tar-like substance was observed in fill material in the northeast portion of the Pontone Parcel at depths of 7-10 ft bg. Metals, SVOCs, pesticides, and PCBs attributed to fill material were detected in groundwater at concentrations exceeding their respective Class GA criteria.

Based on the investigation findings, Langan prepared separate Remedial Action Work Plans (RAWPs) for the 473 President Street and President Street Portfolio sites which evaluated remedial alternatives and subsequently recommended Track 4 remedies at each Site, to be implemented in conjunction with redevelopment of the Sites into a multi-story, mixed-use residential and commercial building with ground floor retail and parking. The final remedies were detailed in Decision Documents for each Site and consist of the following:

- Asbestos abatement and demolition of Site buildings at 473 President Street, 469 President Street (E Waste Parcel) and 532 Union Street (Pontone Parcel).
- Excavation and off-site disposal of soil/ historic fill material in the following areas:
 - Locations of suspected USTs at the 473 President Street Site to depths of 4-8 ft bg.
 - Location of tar-impacted soils in the northeast portion of the Pontone Parcel to a depth of 7-10 ft bg.
 - Site-wide excavation at each Site to 2 ft bg for the purpose of installing a Site cover system.
- Decommissioning and removal of any USTs encountered, including disposal of UST contents, and associated impacted material.
- Installation of Site-wide composite cover systems at each of the sites, to consist of concrete building foundation and/or 2 ft of acceptable fill material.
- Installation of an air sparge/ soil vapor extraction system (AS/SVE) and/or implementation of in-situ chemical reduction (ISCR) to address CVOC and petroleum related VOC impacts to soil, groundwater, and soil vapor. AS/SVE or ISCR will be implemented pending results of pilot testing and other pre-design investigation.
- Installation of sub-membrane depressurization (SMD) systems to mitigate soil vapor intrusion (SVI) in occupied areas of the lowest levels of the proposed buildings.
- Establishment of institutional controls including restrictions on Site use and groundwater use through an environmental easement and Site Management Plan (SMP).

Remedial action is currently underway at the 473 President Street, and President Street Portfolio (E Waste and Pontone Parcel) Sites.

In addition to on-site investigations HRP reviewed available investigation reports from two nearby NYSDEC remediation sites: 585 Union Street (Site No. C224329), located 80 ft northeast of the nearest Site boundary, and 318 Nevins Street (Site No. C224350), located 55 ft west of the nearest Site boundary. The 585 Union Street Site and 318 Nevins Street Site are depicted on **Figure 3**. The following findings were identified relevant to the 473 President Street Off-Site SC:

585 Union Street

- Analytical results from three groundwater monitoring wells, each installed in the lowest level of the Site buildings and screened across the water table interface, indicate CVOCs were not detected at concentrations exceeding Class GA criteria.
- Analytical results from four sub-slab soil vapor points each installed in the lowest level of the Site buildings at a depth of 4 ft bg, indicate CVOCs were not detected in soil vapor concentrations at which mitigation is recommended by the NYSDOH Soil Vapor/Indoor Air Matrices, with the exception of one location on the southwest portion of the Site (SV-1). TCE

was detected at a concentration of 48.1 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) at SV-1, above the minimum recommended mitigation concentration of 6 $\mu\text{g}/\text{m}^3$. The southwest portion of the Site building borders a former machine shop (**Figure 3**).

318 Nevins Street

- Analytical results from four groundwater monitoring wells each installed in the Site parking area and screened across the water table interface indicate CVOCs were not detected above Class GA criteria.
- Analytical results from three temporary soil vapor points each installed in the Site parking area at a depth of 4 ft bg indicate CVOCs were not detected above minimum soil vapor concentrations at which mitigation is recommended by the NYSDOH Soil Vapor/Indoor Air Matrices, with the exception of one location on the southeast portion of the Site (SV01). Cis-1,2-DCE was detected at a concentration of 6.26 $\mu\text{g}/\text{m}^3$ at SV01, above the minimum concentration of 6 $\mu\text{g}/\text{m}^3$.

1.4 Areas of Concern

Based on the findings of previous investigations, and discussion with NYSDEC and NYSDOH, the following areas of concern (AOCs), were identified and require further investigation to characterize the nature and extent of contamination and evaluate potential pathways of exposure.

- Groundwater analytical results from the Site indicate TCE and other CVOCs may be migrating off-site at concentrations exceeding SCGs. Specifically, TCE and cis-1,2-DCE were detected at concentrations of 2,400 micrograms per liter ($\mu\text{g}/\text{L}$) and 2,500 $\mu\text{g}/\text{L}$ respectively (a total CVOC concentration of 4,962 $\mu\text{g}/\text{L}$) in a groundwater sample collected from MW-37 located on the northern portion of the E Waste Parcel (**Figure 4A**). Off-site groundwater has not been characterized by previous investigations.
- Analytical results from sub-slab soil vapor samples collected as part of the on-site investigations indicate CVOCs are present in soil vapor at concentrations exceeding SCGs across the on-site properties (**Figure 4B**). Off-site SVI exposure pathways have not been evaluated.

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 soil vapor points and monitoring wells in the right of way (sidewalks) around the Site. Based on the results of investigation described in this scope of work, additional investigation activities, including soil vapor point and groundwater monitoring well installation and sampling, and sub-slab SVI/indoor air investigations, may be recommended.

The work summarized below is to be completed in accordance with the Region 2 P-Sites SC Work Plan dated August 8, 2022, HRP's generic field activities plan (FAP), Health and Safety Plan (HASP), Quality Assurance Project Plan (QAPP) on-file with the NYSDEC, and DER-10 *Technical Guidance for Site Investigation and Remediation (May 2010)*. 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.

Proposed investigation locations are depicted on **Figure 2**. Sample types and locations are summarized on **Table 2** and sample QA/QC details (analyses, containers, hold times etc.) are summarized on **Table 3**. Site-specific HASP, including the project Community Air Monitoring Plan (CAMP) that details procedures for air monitoring during intrusive activities, is provided in **Attachment A**.

The scope of work for the 473 President Street Off-Site SC is summarized below.

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).
- Call in underground utility clearance through NYS Code Rule 753/Dig Safe System.
- Complete a ground penetrating radar (GPR) survey 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 **Groundwater Characterization**

In order to delineate the extent of CVOC contamination in groundwater from the Site, and obtain groundwater flow information, HRP proposes the following activities:

- Install up to five permanent overburden groundwater monitoring wells in the right-of-way. As part of the initial phase of investigation, one monitoring well is proposed for installation on Union Street, crossgradient of CVOC impacts detected in MW-37 on the northern portion of the E Waste Parcel. The remaining four monitoring wells may be recommended for installation based on analytical results from the initial phase of groundwater and soil vapor sampling. The location of the monitoring well proposed for installation for the first phase of investigation is depicted on **Figure 2**.

- Each monitoring well will be installed to an estimated depth of 20 ft bg. 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.
- The wells will be constructed of 2-inch PVC with PVC slotted screens, and screened across the water table with an appropriately sized sand pack. The wells will be installed using flush-mounted protective casings and locking covers or a locking protective steel stick-up as appropriate.
- Develop each of the monitoring wells a minimum of 24 hours after installation. Each well will be developed by pumping and surging until the field parameters stabilize for a minimum of three consecutive readings of 10 percent variability of 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 groundwater obtained during well development and sampling will be disposed of in accordance with DER-10.
- Collect groundwater samples from each of the monitoring wells for laboratory analysis. Groundwater samples will be collected in general accordance with low-flow groundwater sampling procedures. Up to 10 groundwater samples (5 primary samples, 1 duplicate, 1 MS, 1 MSD, 1 field blank, and 1 trip blank) be analyzed for total compound list (TCL) VOCs +10 by Method 8260. Sample locations and totals are summarized on **Table 2**. Sample quality assurance details are summarized by analysis and matrix on **Table 3**.

2.3 Soil Vapor Characterization

In an effort to assess the migration of gaseous vadose zone contamination and investigate potential impacts to off-site receptors HRP proposes the following activities:

- Install up to 15 soil vapor points in the right-of-way. A direct push drill rig will be used to advance soil borings to a maximum depth of 10 ft bg. Proposed soil vapor point locations are depicted on **Figure 2**.
- For the purpose of determining depth to water (if present) and 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-ft bentonite seal and an 8-inch road box. Soil vapor points will be set at a depth of one foot above the water table or 10 ft bg, whichever comes first.
- Collect soil vapor samples from each of the 15 soil vapor points for laboratory analysis. 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. Up to 17 air samples (15 soil vapor, 1 duplicate soil vapor, 1 outdoor air) will be analyzed for VOCs via EPA Method TO-15 by an ELAP laboratory selected from the NYSDEC call-out contract. Sample locations and totals are summarized on **Table 2**. Sample quality assurance details are summarized by analysis and matrix on **Table 3**.

2.4 Survey of Investigation Locations

Monitoring well, soil vapor point, and soil boring locations and elevations will be surveyed according to a horizontal and vertical datum by a New York State licensed land surveyor. Field surveying will include establishing project horizontal control and the collection of soil borings, monitoring wells, soil vapor samples and other relevant Site features. 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, to provide a reference point for all future groundwater elevation measurements.

2.5 Analytical Data Quality Evaluation

As per the Region 2 P-Sites SC Work Plan, all laboratory analysis will be completed by an Environmental Laboratory Approval Program (ELAP) laboratory selected by 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-Sites SC Work Plan and HRP's Generic QAPP.

2.6 Site Characterization Report

A 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.

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.

3.0 REFERENCES

Carlin, Simpson & Associates, July 2014, Phase I Environmental Site Assessment, NYSDEC BCP Site C224220.

Fisher, D.W., et. al., 1970, Geologic Map of New York, New York State Museum and Science Service, Map and Chart Series No. 15.

Impact Environmental, October 2020, Supplemental Investigation Report, 577-599 Union Street, Brooklyn, NY Block 433, Lots 28 and 46.

Langan Engineering, Environmental, Surveying, Landscape Architecture, and Geology, D.P.C., July 2019, Phase II Environmental Site Investigation for 300-344 Nevins Street Brooklyn, New York 1215.

Langan Engineering, Environmental, Surveying, Landscape Architecture, and Geology, D.P.C., August 2019, Remedial Investigation Report, NYSDEC C224220.

Langan Engineering, Environmental, Surveying, Landscape Architecture, and Geology, D.P.C., October 2020, Remedial Action Work Plan, NYSDEC BCP Site No. C224220.

Langan Engineering, Environmental, Surveying, Landscape Architecture, and Geology, D.P.C., October 2020, Remedial Investigation Report, NYSDEC C224309.

Langan Engineering, Environmental, Surveying, Landscape Architecture, and Geology, D.P.C., April 2020, Limited Subsurface Investigation Report, NYSDEC BCP Site No. C224318.

Langan Engineering, Environmental, Surveying, Landscape Architecture, and Geology, D.P.C., February 2021, Remedial Action Work Plan, NYSDEC BCP Site No. C224309.

Langan Engineering, Environmental, Surveying, Landscape Architecture, and Geology, D.P.C., March 2022, Draft Remedial Investigation Work Plan, NYSDEC BCP Site No. C224318.

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

New York State Department of Environmental Conservation, Division of Environmental Remediation, October 2020, Decision Document, 473 President Street, NYSDEC BCP Site No. C224220.

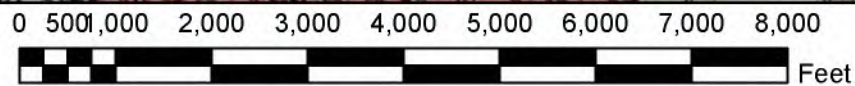
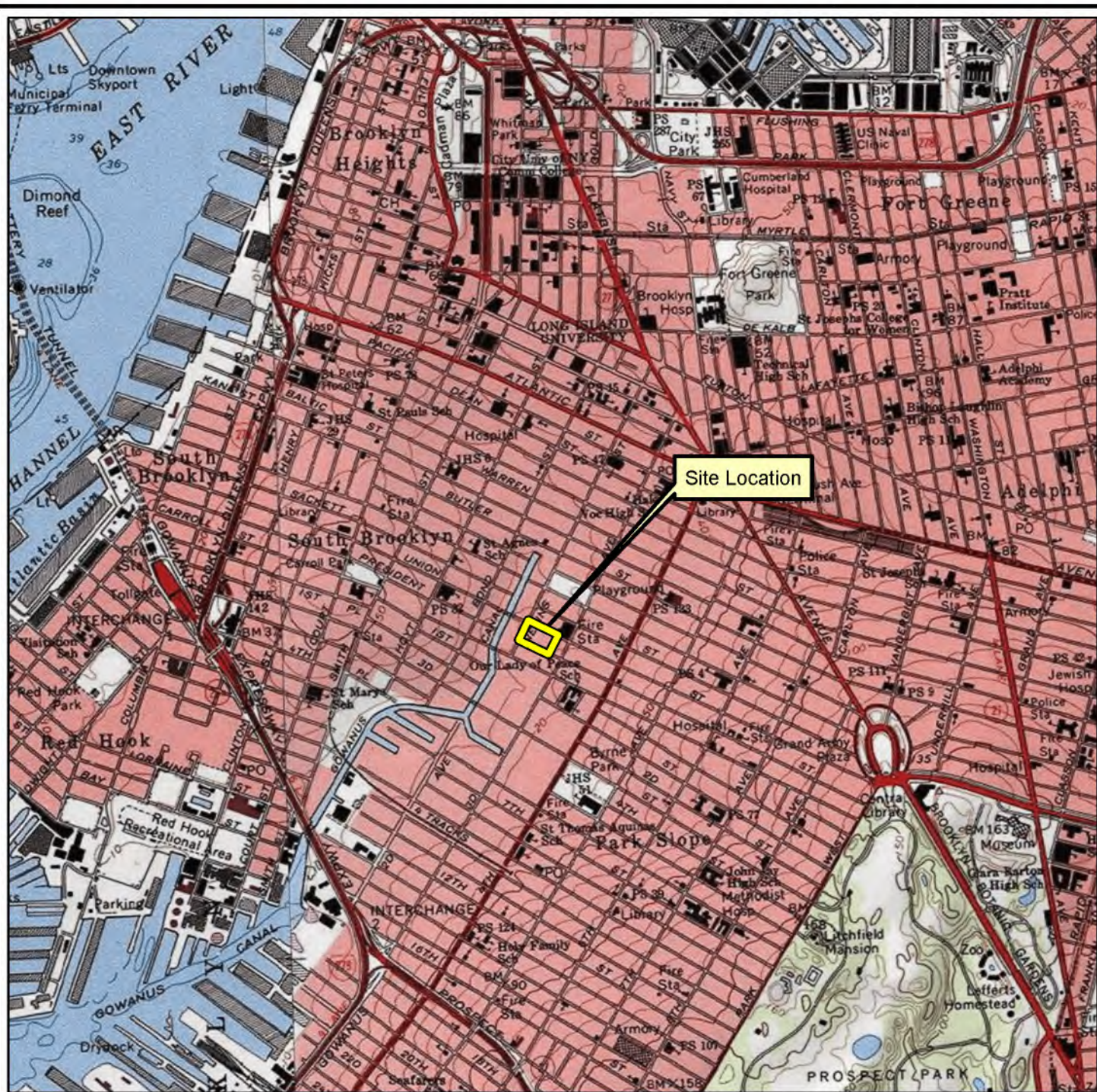
New York State Department of Environmental Conservation, Division of Environmental Remediation, February 2021, Decision Document, President Street Portfolio, NYSDEC BCP Site No. C224309.

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

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.

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].

FIGURES



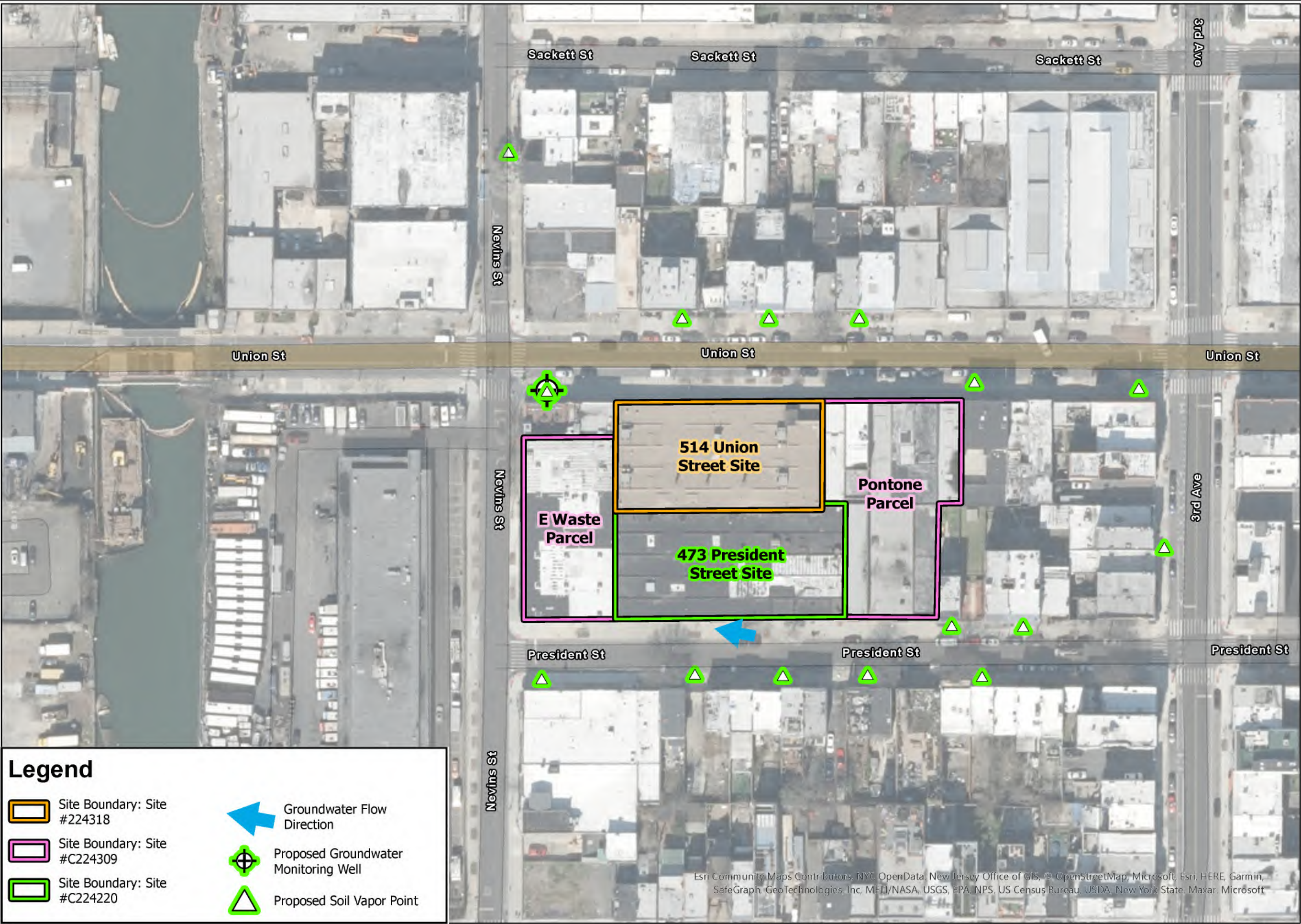
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Figure 1
Site Location
473 President Street Off-Site
Site: C224220A
473 Presidents Street
Brooklyn, New York
HRP # DEC1035.P2
Scale 1" = 2,000'

USGS Quadrangle Information
 Quad ID: 40073-F8
 Name: Brooklyn, New York
 Date Rev: 1995
 Date Pub: 1999



ONE FAIRCHILD SQUARE
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Legend

- Site Boundary: Site #224318
- Site Boundary: Site #C224309
- Site Boundary: Site #C224220
- Groundwater Flow Direction
- Proposed Groundwater Monitoring Well
- Proposed Soil Vapor Point

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North

0 40 80

Feet

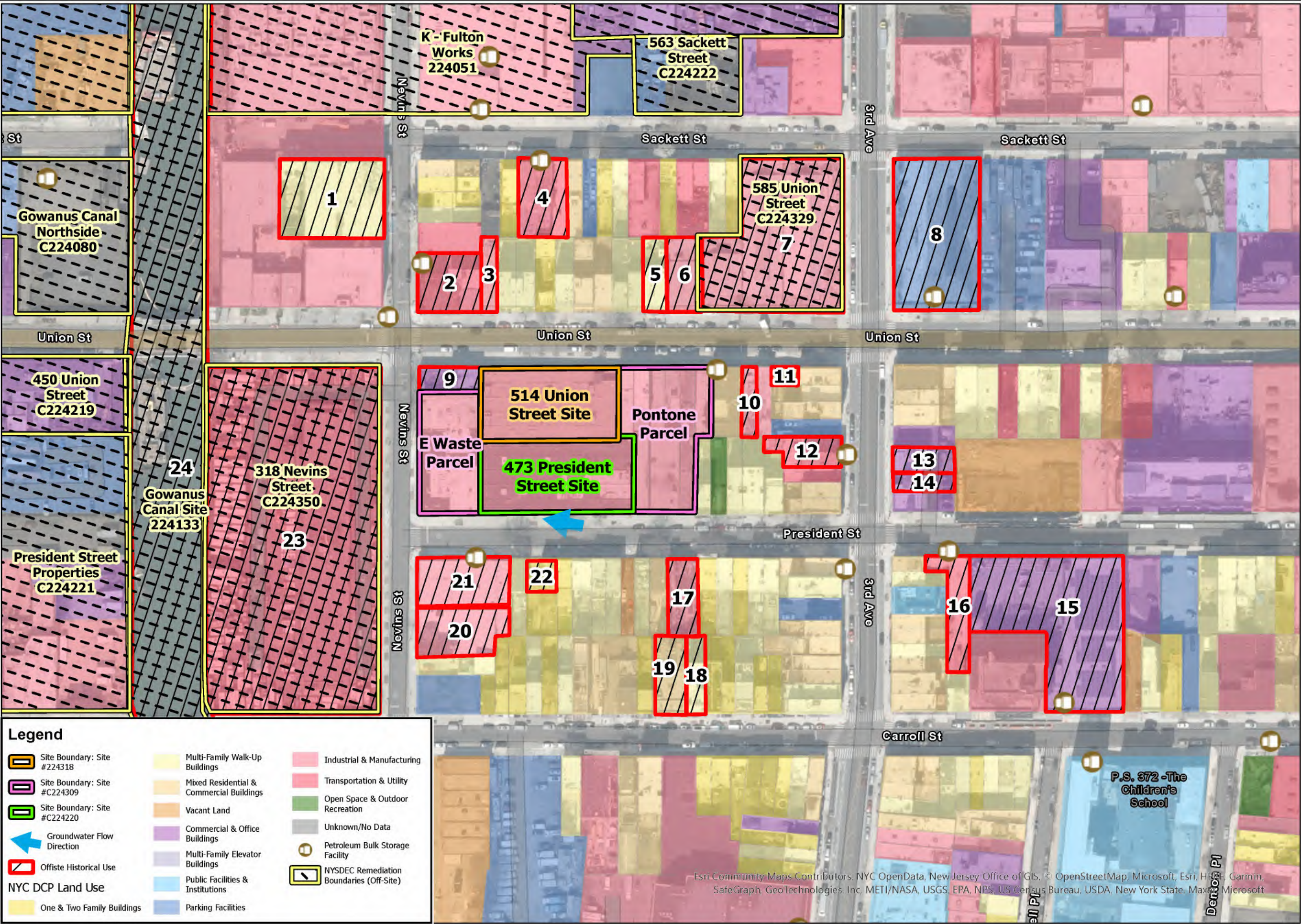
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			Issue Date: 7/21/2022	Project No: DEC1035.P2
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Site Plan and Proposed Investigation Locations

473 President Street Site Off-Site
Site #C224220A
473 President Street
Brooklyn, New York

Figure No.
2

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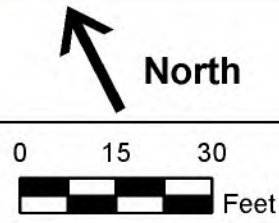
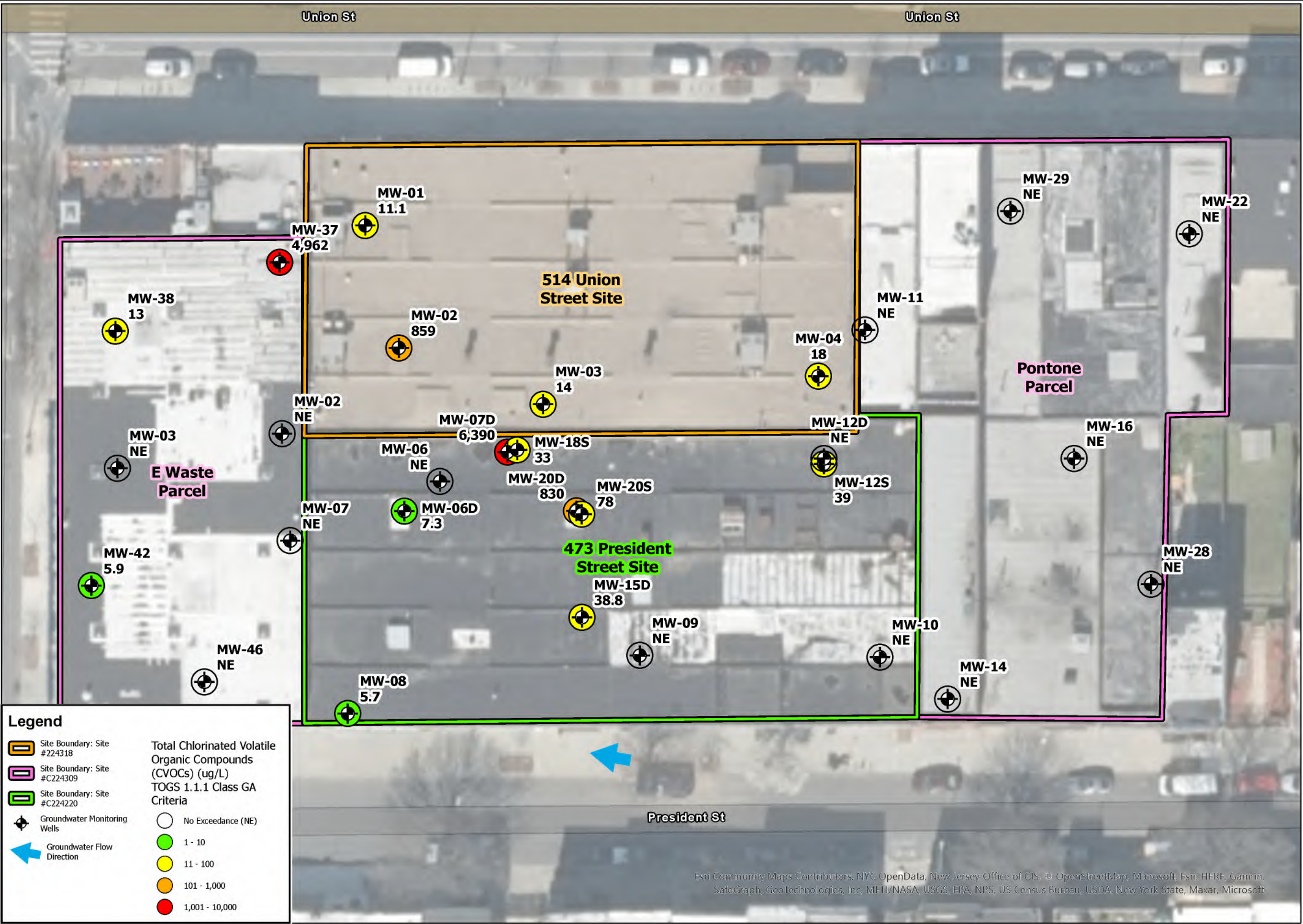
President Street Sites
Surrounding Property Use

473 President Street Site Off-Site
Site #C224220A
473 President Street
Brooklyn, New York

Figure No.
3

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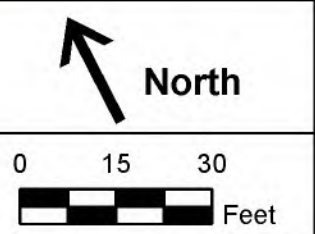
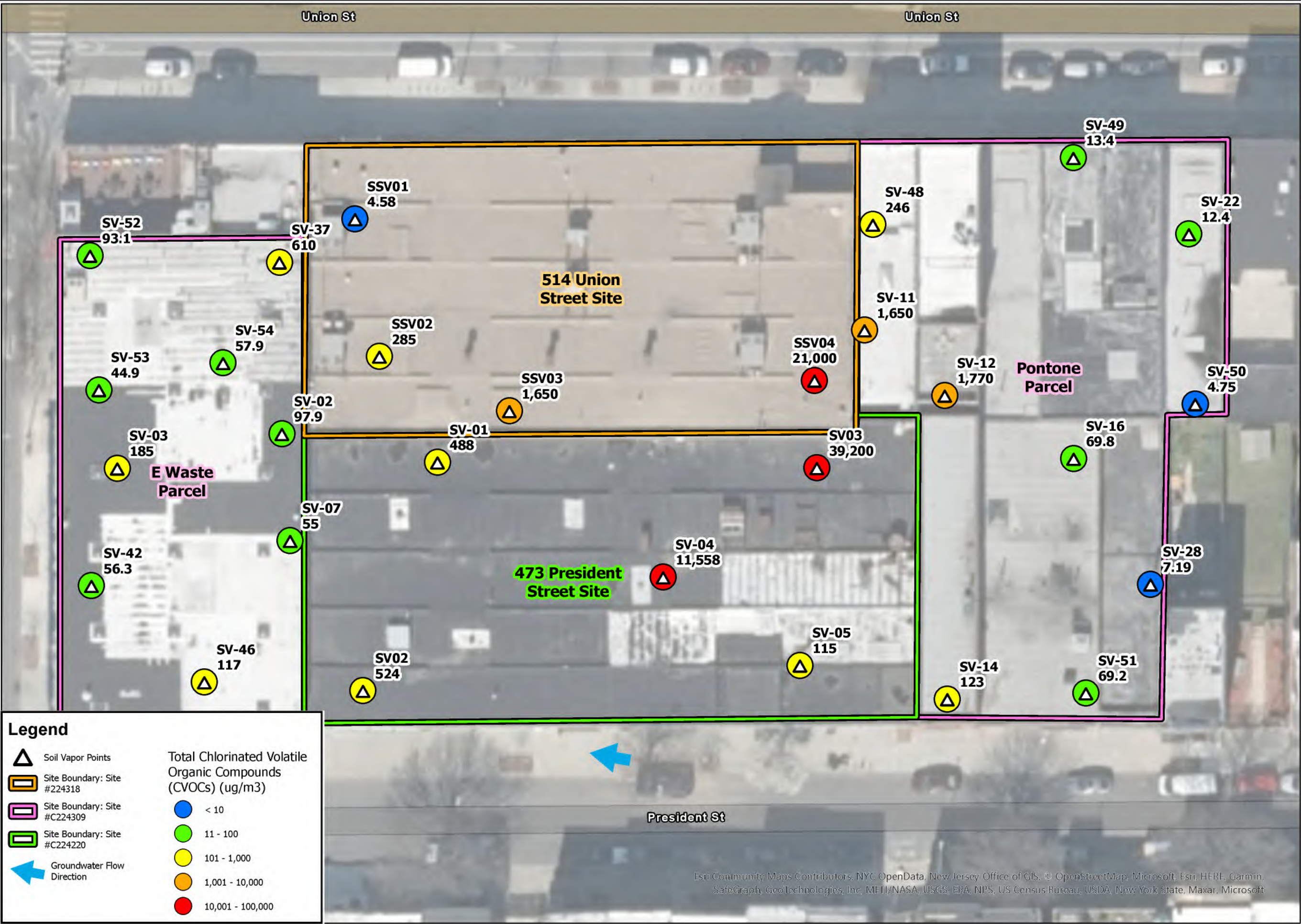
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Reviewed By:	PWM	
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President Street Sites
Groundwater
Total CVOCs (2017-2019)
473 President Street Off-Site
Site #C224220A
473 President Street
Brooklyn, New York

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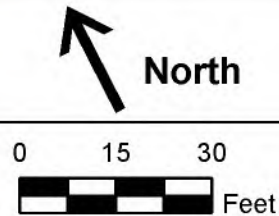
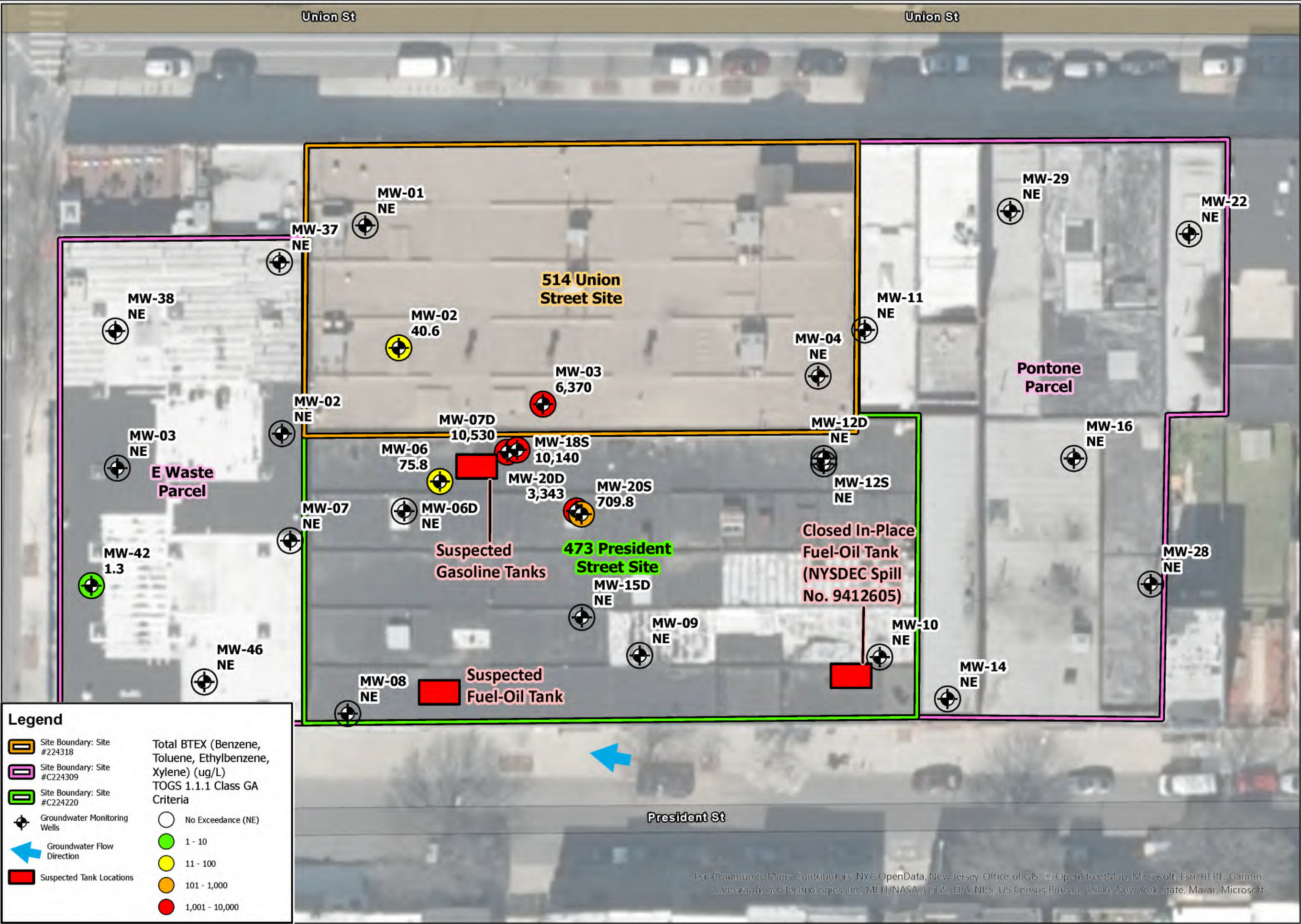


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President Street Sites
Soil Vapor - Total CVOs
473 President Street Off-Site
Site #C224220A
473 President Street
Brooklyn, new York

Figure No.
4B

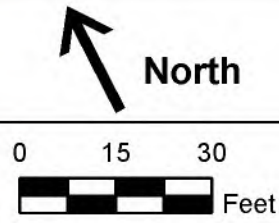
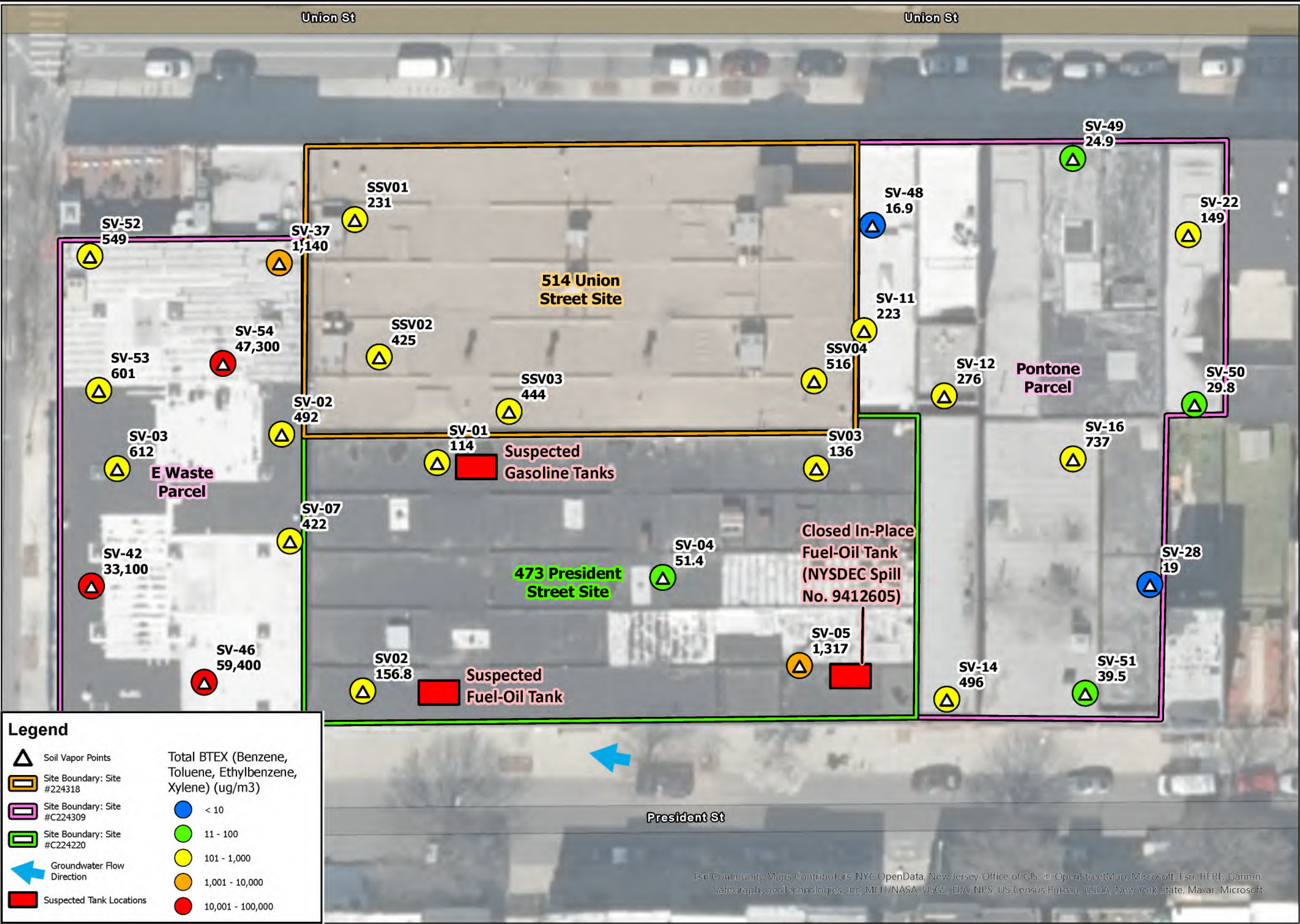
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President Street Sites
Groundwater
Total BTEX (2017-2019)
473 President Street Off-Site
Site #C224220A
473 President Street
Brooklyn, New York

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President Street Sites
Soil Vapor - Total BTEX
473 President Street Off-Site
Site #C224220A
473 President Street
Brooklyn, New York

TABLES

473 President Street Off-Site

NYSDEC Site No. C224220A

473 President Street

Brooklyn, New York 11215

Map ID	Distance from Site Boundary (ft)	Address	Historic Use	Years Listed	Relevant Regulatory Findings
On-Site					
-	-	473 President St (Site No. C224220)	Door/Trim Mfg./Lumberyard	1886-1915	NYSDEC Site No. C224220 NYSDEC Spill No. 9412605 - Open LQG - 2017, 2021, 2022 (Remediation) Historic generator of D040, F002
			Bottling/Distribution	1938-1950	
			Die Cutting	1960	
			Metals Manufacturing	1969-1992	
-	-	469 President Street (Site No C224309, E Waste Parcel)	Blacksmith	1886-1904	NYSDEC Site No C224309
			Rag Storage	1915	
			Dental Manufacturing	1949-1960	
			Parking	1969-1982	
			Warehouse	1986-2007	
			Electronics Recycling Facility	2014-2020	
-	-	532 Union Street (Site No. C224309, Pontone Parcel)	Unspecified Manufacturing	1915	NYSDEC Site No. C224318
			Engraving	1945	
			Painting	1938-1950	
			Automotive Repair	1938-1965	
			Casket Mfg./Woodworking	1938-2020	
-	-	514 Union St (Site No. C224318)	Door/Trim Mfg.	1886-1915	NYSDEC Site No. C224318 LQG - 2021, 2022 (Remediation) Historic generator of D040, F002
			Bottling/Distribution	1938-1950	
			Metals Manufacturing	1969-1992	
			Manufacturing/Storage	1993-2007	
			Shuffleboard Club	2014-Present	

Notes:

Distance from Site boundary to off-site locations measured from nearest point of each property line/site boundary
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
D039 = Tetrachloroethylene (PCE)
D040 = Trichloroethylene (TCE)
F002 = Halogenated Solvents
PBS = Petroleum Bulk Storage, NYSDEC Database

Table 1
Historical Property Use and Relevant Regulatory Findings

473 President Street Off-Site
NYSDEC Site No. C224220A
473 President Street
Brooklyn, New York 11215

Map ID	Distance from Site Boundary (ft)	Address	Historic Use	Years Listed	Relevant Regulatory Findings
Off-Site (within 300 ft)					
1	220	280 Nevins St	Dry Cleaning	1985-2006	Non-Generator - 2007 Historic generator of F002
2	80	301 Nevins St	Filling Station	1938-1950	PBS 2-452483
			Automotive Repair	1950-Present	
3	80	553 Union St	Painting/Furniture Repair	1997-2009	SQG - 2009 Historic generator of F002
4	170	560 Sackett St	Automotive Repair	1950-2007	PBS 2-604492
5	80	575 Union St	Machine Shop	1950-2007	-
6	80	577 Union St	Machine Shop	1950	-
7	80	585 Union St (Site No. C224329)	Lumber Yard	1889	NYSDEC Site No. C224329 Non-Generator - 2015 No historical wastes listed
			Paint Shop	1889	
			Water Distilling	1938	
			NY Fire Department (Automotive Repair)/Telegraph Bureau (Storage)	1938-1982	
			Casket Mfg./Woodworking	1982	
8	260	601 Union St	Fuel Oil Distributor	1990-Present	PBS 2-601627
9	0	506-512 Union St/ 305-307 Nevins St	Automotive Repair	1982-1987	-
			Iron Works	1988-2007	
10	40	546 Union St	Dry Cleaning/ Rug Cleaners	1975-1993	-
11	80	552 Union St	Automotive Repair/Iron Works	1938/1950-2007	-
12	60	262-264 3rd Ave	Iron Works	1938	PBS 2-611243
			Automotive Repair	1950-Present	
13	255	259 3rd Ave	Automotive Repair	1979-2007	-
14	255	263 3rd Ave	Dry Cleaning/ Rug Cleaners	1976-2008	-
15	360	540 President St	Air Conditioning Mfg.	1979-1987	NYSDEC Spill No. 9211878- Closed
			Knitting Mill	1987-1993	
16	310	528 President St	Waste Paper	1979-1993	PBS 2-610816
			Automotive Repair	2001-2007	
17	60	500 President St	Welding	1950	-
			Woodworking	1969	
18	160	459 Carroll St	Metals Manufacturing	1993-2007	CESQG - 2006, 2007 VSQG - 1993 Historic generator of D001, D008, D018, D039
19	160	455-457 Carroll St	Machine Shop	1950	-
			Woodworking	1969	
20	120	331 Nevins St	Automotive Repair	1938-2007	-
21	60	325 Nevins St	Candle Manufacturing	1938-Present	SQG - 2015 CESQG - 2006, 2007 Non-Generator - 1999 Historic generator of D001, D018, D039 PBS 2-344265
22	60	480-482 President St	Automotive Repair	1986-2007	-
23	55	318 Nevins St (Site No. C224350)	Lumber Yard	1886-1910s	NYSDEC Site No. C224350 SQG - 1993 CESQG - 2006, 2007 Historic generator of D001, D008, D018, D039 Six closed NYSDEC Spills
			Coke Stge. + Dist. Yard	1922-1950s	
			Motor Freight Station	1960s-1970s	
			Telephone Comm.	1970s-2000s	
			Food Truck Parking	Present	
24	280	Gowanus Canal (Site No. 224133)	Canal	N/A	NYSDEC Site No. 224133 USEPA National Priority List site

Notes:

Distance from Site boundary to off-site locations measured from

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

D039 = Tetrachloroethylene (PCE)

D040 = Trichloroethylene (TCE)

F002 = Halogenated Solvents

PBS = Petroleum Bulk Storage,

NYSDEC Database

**Table 2
Sampling Summary
Site Characterization**

**473 President Street Off- Site
NYSDEC Site #C224220A
473 President St.
Brooklyn, NY 11215**

Activity/ Matrix	Number of Sample Locations	Proposed Sample Locations	Number of Samples to be Collected	Analyses
Groundwater	5	5 Proposed monitoring wells	10 (5 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
Soil Vapor	15	15 Proposed permanent vapor point locations; 1 soil vapor grab sample per location; 1 outdoor ambient air sample per day of sampling	17 (15 soil vapor, 1 outdoor ambient air, 1 duplicate)	VOCs by EPA Method TO-15 QA/QC: 1 duplicate soil vapor sample per 20 samples

Acronym List:

MS/MSD: Matrix spike/matrix spike duplicate

TCL: Total compound list

VOCs: Volatile organic compounds

Table 3
Analytical Methods/Quality Assurance Summary
Site Characterization

473 President Street Off-Site
 NYSDEC Site #C224220A
 473 President St.
 Brooklyn, NY 11215

					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
GROUNDWATER											
VOCs by GC/MS	Aqueous	10	5035	SW-846 Method 8260B	3	40 ml	glass vial	2-6° C	No	HCL	14 days
SOIL VAPOR/AMBIENT AIR											
VOCs	Soil Vapor, Air	17	NA	EPA TO-15	1	6-Liter	summa canister, 2-hour regulator	NA	No	NA	30 days (summa canister)



ATTACHMENT A

Site-Specific Health and Safety Plan



MOVE YOUR ENVIRONMENT FORWARD

SITE-SPECIFIC HEALTH AND SAFETY PLAN (HASP)

473 President Street – Site #C224220A
Brooklyn, New York, 11215

Prepared For:

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

Prepared By:

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

HRP #: DEC1035.P3

Issued On: August 8, 2022



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, a Certified Safety Professional (CSP) certified by the Board of Certified Safety Professionals.



Alisa Werst, CSP
BCSP # 36431

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Figure 3	Route and Map to Nearest Hospital and Medical Center

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Table 1a	Chemical Hazards Known or Suspected On-Site
Table 1b	Physical Hazards Known or Suspected On-Site
Table 2	HASP Acceptance and Site Visitor Log

Appendices

Appendix A	Safety and Logistics Planning Call Log
Appendix B	Personnel Log
Appendix C	Supervisor's Investigation Report
Appendix D	Daily Job Brief Record
Appendix E	Equipment Calibration Log
Appendix F	Community Air Monitoring Plan
Appendix G	HRP Safe Work Permit
Appendix H	COVID-19 Health and Safety Guidelines
Appendix I	Safety Data Sheets (for chemicals brought to the site)

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.

<u>Emergency Phone Numbers</u> 473 President Street Brooklyn, NY	
Emergency Contact	Phone Number
Fire, Ambulance, Police Emergency:	911
NYCPD 78 th Precinct Police Department (routine calls):	718-399-3197
FDNY EMS Station 32- Fire Department (routine calls):	718-222-1290
The Brooklyn Hospital Center	718-250-8000
Poison Control Center:	1-800-222-1222
DEC spills hotline:	1-800-457-7362
National Response Center:	800-424-8802
Project Manager: David Stoll	518-526-2322
Site Safety Officer: Patrick Montuori	845-531-9490
NYSDEC Project Manager: Marnie Chancey	518-402-3262

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

- **The Brooklyn Hospital Center-** located at 121 DeKalb Avenue, Brooklyn, NY (approximately 1.3 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

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.

Site Information and Areas of Environmental Concern

2.1.1 Site Information and Description

Site Name: 473 President Street
Site Address: 473 President Street, Brooklyn, NY
Site Contact: Marnie Chancey, NYSDEC
Phone Number: 518-402-3262

Background and Project Description

The 473 President Street Off-Site SC will focus on the area surrounding three active Brownfield Cleanup Program (BCP) Sites (referred to hereinafter as "the Sites") located on adjoining parcels in the Gowanus neighborhood of Brooklyn, New York. The Sites include 473 President Street (Block 440, Lot 1), which is approximately 0.46 acres and consists of an unoccupied single-story warehouse. As well as President Street Portfolio (Site No. C224309), which includes two non-contiguous parcels and is located at 469 President Street (E Waste Parcel) and 532 Union Street (Pontone Parcel), separated by 473 President Street. In 2020 the two parcels were merged with the 473 President Street Site and are now part of Block 440, Lot 1. The E Waste Parcel is

approximately 0.29 acres in area and consists of an unoccupied single-story warehouse. The Pontone Parcel is approximately 0.43 acres in area and consists of a one to three-story unoccupied building. These Site buildings are currently vacant.

The 473 President Street Site and the two parcels of the President Street Portfolio Site are to be redeveloped as multi-story, mixed-use residential and commercial building with ground floor retail and parking.

514 Union Street (Site No. C224318) is included in the Sites and is located at 514 Union Street, identified as Block 440, Lot 12. The Site is approximately 0.39 acres in area and consists of a single-story building occupied by the Royal Palms Shuffleboard Club, a bar with shuffleboard courts.

The location of the Sites is depicted on **Figure 1**.

According to available historical records and previous environmental reports (discussed below), the Site operations at the three Sites included the following (dates are approximate based on available listings):

- Sash and door manufacturing (1886-1915)
- Soda bottling (1938-1950)
- Painting (1938-1950)
- Automotive repair (1938-1965)
- Casket manufacturing (1938-2020)
- Engraving (1945)
- Dental manufacturing (1949-1960)
- Die cutting (1959-2014)
- Metal manufacturing (1969-1992)
- an electronic waste recycling warehouse (2014-2020)
- Multi-tenant commercial warehousing (1990s to 2020)

Previous investigations identified the presence of CVOCs (primarily trichloroethylene or TCE) in groundwater and sub-slab soil vapor on the Sites above applicable NYSDEC standards, criteria, and guidance (SCGs).

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.

2.1.2 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)	<p>HSO – HRP Associates, Inc.</p> <ul style="list-style-type: none"> - 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) Jessica Kruczek (Alternate Site Supervisor)	<p>Site Supervisor/Project Manager – HRP Associates, Inc.</p> <ul style="list-style-type: none"> - 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)	<p>Site Workers</p> <ul style="list-style-type: none"> - 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
<p>A complete list of HRP employee and subcontractor responsibilities (as applicable) can be found in the HRP Generic Health and Safety Plan.</p> <p><u>1</u> A list of site workers will be maintained in the Personnel Log (Appendix B)</p> <p><u>2</u> Supervisors Investigation Report included as (Appendix C)</p>	

3.0 AREAS OF ENVIRONMENTAL CONCERN

Scope of Work

The scope of work for the 473 President Street Off-Site SC is summarized below.

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

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) will be obtained by HRP and/or their drilling contractor.
- Call in underground utility clearance through NYS Code Rule 753/Dig Safe System.
- Complete a ground penetrating radar (GPR) survey within a 10-foot radius of each proposed boring location to ensure boring areas are clear of obstructions and identify any other potential AOCs.

Groundwater Characterization

In order to delineate the extent of CVOC contamination in groundwater beneath the Site, and obtain groundwater flow information, HRP proposes the following activities:

- Install up to five permanent overburden groundwater monitoring wells in the right-of-way. As part of the initial phase of investigation, one monitoring well is proposed for installation on Union Street, crossgradient of CVOC impacts detected in MW-37 on the northern portion of the E Waste Parcel. The remaining five monitoring wells may be recommended for installation based on analytical results from the initial phase of groundwater and soil vapor sampling. The location of the monitoring well proposed for installation for the first phase of investigation is depicted on **Figure 2**.
- Each monitoring well will be installed to an estimated depth of 20 ft bg. 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.
- The wells should be constructed of 2-inch PVC with PVC slotted screens, and screened across the water table with an appropriately sized sand pack. The wells should be installed using flush-mounted protective casings and locking covers or a locking protective steel stick-up as appropriate.
- Develop each of the five monitoring wells a minimum of 24 hours after installation. Each well should be developed by pumping and surging until the field parameters stabilize for a minimum of three consecutive readings of 10 percent variability of less. Field parameters should 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 groundwater obtained during well development and sampling should be disposed of in accordance with DER-10.

- Collect groundwater samples from each of the five monitoring wells for laboratory analysis. Groundwater samples will be collected in general accordance with low-flow groundwater sampling procedures. It is recommended that a total of 10 groundwater samples (5 primary samples, 1 duplicate, 1 MS, 1 MSD, 1 field blank, and 1 trip blank) be analyzed for total compound list (TCL) VOCs +10 by Method 8260.

Soil Vapor Characterization

In an effort to assess the migration of gaseous vadose zone contamination and investigate potential impacts to off-site receptors HRP proposes the following activities:

- Install up to 15 soil vapor points in the right-of-way. A direct push drill rig will be used to advance soil borings to a maximum depth of 10 ft bg. The soil vapor point locations are depicted on **Figure 2**.
- For the purpose of determining depth to water (if present) and 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-ft bentonite seal and an 8-inch road box. Soil vapor points will be set at a depth of one foot above the water table or 10 ft bg, whichever comes first.
- Collect soil vapor samples from each of the 15 soil vapor points for laboratory analysis. Duplicate soil vapor samples will be collected at a frequency of one per 20 samples, per site. Ambient outdoor air samples will be collected at a frequency of one sample per day. Up to 17 air samples will be analyzed for VOCs via EPA Method TO-15 by an ELAP laboratory selected from the NYSDEC call-out contract.

Survey of Investigation Locations

Monitoring well, soil vapor point, and soil boring locations and elevations will be surveyed according to a horizontal and vertical datum by a New York State licensed land surveyor. Field surveying will include establishing project horizontal control and the collection of soil borings, monitoring wells, soil vapor samples and other relevant Site features. 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, to provide a reference point for all future groundwater elevation measurements.

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	<input type="checkbox"/> Electricity <input checked="" type="checkbox"/> Trips/Falls/Floor openings <input checked="" type="checkbox"/> Holes/Pits <input checked="" type="checkbox"/> Inclement weather <input checked="" type="checkbox"/> Heat <input type="checkbox"/> Cold <input type="checkbox"/> Vibration <input checked="" type="checkbox"/> Flying particles	<input type="checkbox"/> Ionizing radiation <input type="checkbox"/> Non-Ionizing radiation <input type="checkbox"/> Lasers <input checked="" type="checkbox"/> Overhead hazards <input checked="" type="checkbox"/> Noise <input type="checkbox"/> Visible dust <input checked="" type="checkbox"/> Falling objects <input type="checkbox"/> Other _____
Health/Chemical Hazards Present ¹	<input checked="" type="checkbox"/> Dust/Fumes/Particulates <input type="checkbox"/> Flammable/Combustible <input type="checkbox"/> Compressed gas <input type="checkbox"/> Explosive <input type="checkbox"/> Water reactive <input type="checkbox"/> Unstable <input checked="" type="checkbox"/> Contact with contaminated media	<input type="checkbox"/> Oxidizer <input type="checkbox"/> Corrosive <input type="checkbox"/> Toxic <input type="checkbox"/> Highly Toxic <input type="checkbox"/> Irritant <input type="checkbox"/> Sensitizer <input type="checkbox"/> Carcinogen/Mutagen <input type="checkbox"/> Other _____
Environmental/Equipment Hazards Present	<input checked="" type="checkbox"/> Heavy machinery <input checked="" type="checkbox"/> Drilling <input type="checkbox"/> Water operations <input checked="" type="checkbox"/> Mobile equipment <input checked="" type="checkbox"/> Road work <input type="checkbox"/> Railroad work <input type="checkbox"/> Forklifts <input checked="" type="checkbox"/> Power tools <input type="checkbox"/> Welding <input type="checkbox"/> Gas cylinders <input checked="" type="checkbox"/> Overhead/underground utilities	<input type="checkbox"/> Trenching/excavation <input type="checkbox"/> Elevated heights/man lifts <input type="checkbox"/> Scaffolding <input type="checkbox"/> Ladders <input type="checkbox"/> Confined spaces <input type="checkbox"/> Energized equipment <input checked="" type="checkbox"/> Overhead hazards <input checked="" type="checkbox"/> Drums/container handling <input checked="" type="checkbox"/> Insects/rodents/snakes <input type="checkbox"/> Biological hazards <input type="checkbox"/> Other _____
Personal Safety Considerations	<input type="checkbox"/> Security Issues <input type="checkbox"/> Remote setting <input type="checkbox"/> Employees working alone <input type="checkbox"/> Limited lighting	<input type="checkbox"/> Off hour shifts <input type="checkbox"/> Dangerous wildlife/animals <input type="checkbox"/> Limited cell phone service <input type="checkbox"/> 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**).

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.

Changes in Conditions or Scope

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

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

Photoionization Detector (PID)
 in the breathing zone

Sampling Interval

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	<ul style="list-style-type: none"> No action required. Continue PID monitoring. (Modified) Level D protection.
PID	Up to 5 ppm above background	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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**.

Community Air Monitoring

To ensure the protection of receptors surrounding the site HRP has developed and will implement a Community Air Monitoring Program (CAMP), which requires real time monitoring of volatile organics and dust during the remedial investigation. The CAMP, included as **Appendix F** will be implemented during all intrusive activities.

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/m³) 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/m³ 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/m³ of the upwind level and in preventing visible dust migration.

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

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 of this plan for specific air monitoring procedures/action levels.

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 corner of Nevins Street and President Street (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)

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		

Description	Level of Protection ¹	
	D	C
Work Gloves	R	O ²
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
<u>Site Mobilization</u> - Surveying, fence and barrier installation, hay bale installation, decon and work zone set up, soil staging areas preparation	N	Level D
<u>Soil and Water Sampling</u> - 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
<u>Soil Excavation, Staging and Load-Out</u>	Y	Modified Level D – or Upgrade to Level C dependent on monitoring
<u>Decontamination</u> - Truck dry sweeping, decon pressure wash of equipment, PPE change out	Y	Modified Level D – or Upgrade to Level C dependent on monitoring
<u>Waste Management</u> - 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
<u>Site Control (Exclusion, Decontamination, Support Zones)</u>	N	Modified Level D – or Upgrade to Level C dependent on monitoring
<u>Communications</u> - Use of hand signals, backup alarms, and voice	N	NA
<u>Site Restoration</u>	Y	Level D

7.0 DECONTAMINATION

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.

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.

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 H**.

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

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.

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.

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**.

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."

[illegible]

12.0 APPROVALS

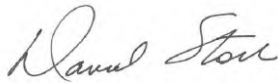
This plan meets the minimum requirements of 29 CFR 1910.120 and 29 CFR 1929.65 and has been written for specified site conditions, dates, and personnel, and must be amended if conditions change. By their signature, the undersigned certify that this HASP is approved and will be utilized during activities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



Patrick Montuori
On-Site Health and Safety Officer

8/4/22

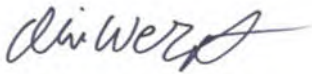
Date



David Stoll, PG
Project Manager

8/4/22

Date



Alisa Werst, CSP
Office Health and Safety Manager

8/4/22

Date

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

_____.

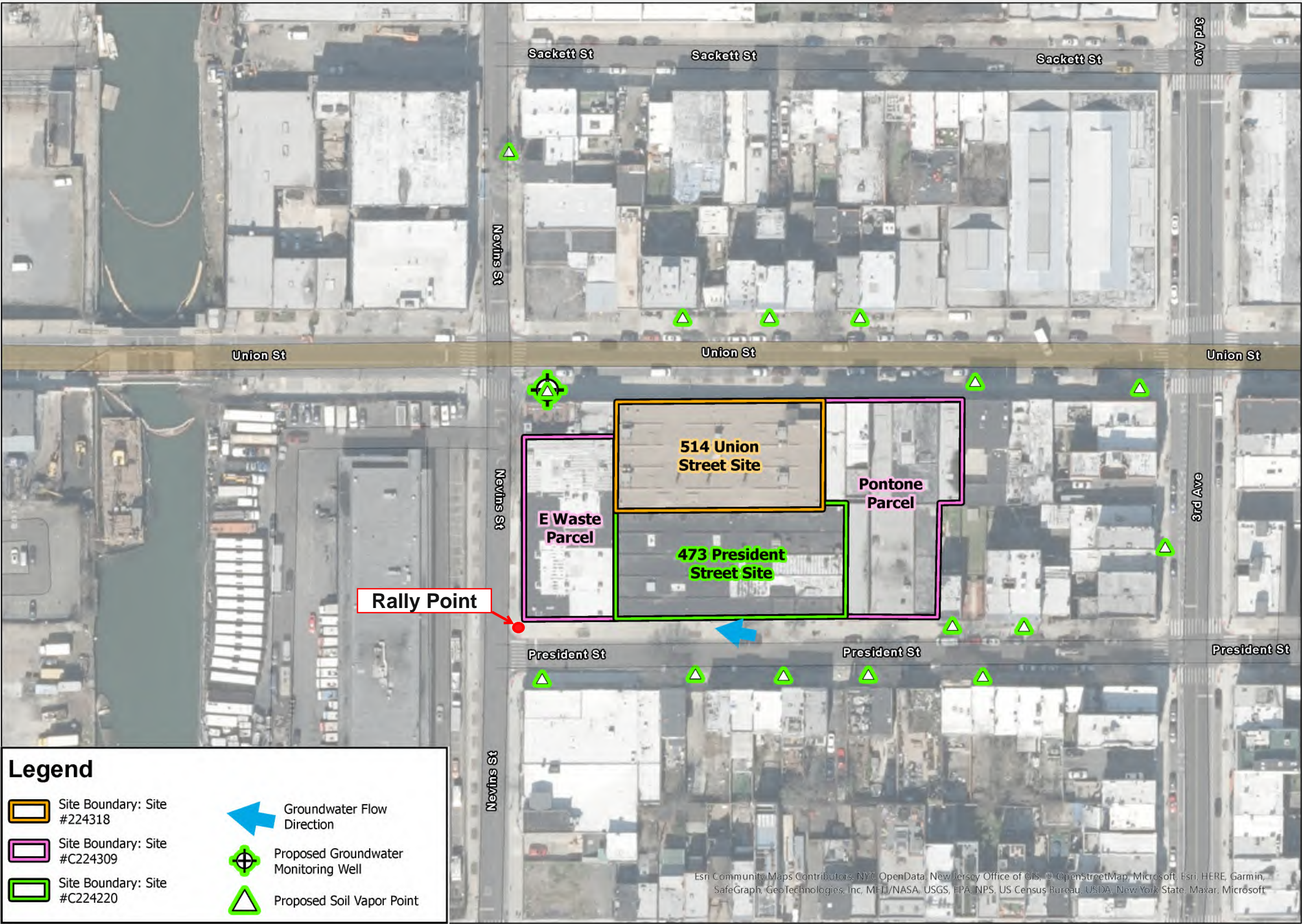
Any alternate Competent Person will be noted in the Daily Job Brief Record (**Appendix D**).


[illegible]

FIGURES

USGS Quadrangle Information
Quad ID: 40073-E8
Name: Coney Island, New York
Date Rev: 1977
Date Pub: 1979






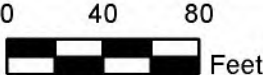


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Designed By:	CMS	Drawn By:	CMS	Reviewed By:	PWM
Issue Date:	7/21/2022	Project No:	DEC1035.P2	Sheet Size:	11x17

Site Plan and Proposed Investigation Locations

473 President Street Site Off-Site
Site #C224220A
473 President Street
Brooklyn, New York

Figure No.

2

Figure 3: Route and Map to Nearest Hospital and Medical Center

Directions to The Brooklyn Hospital Center

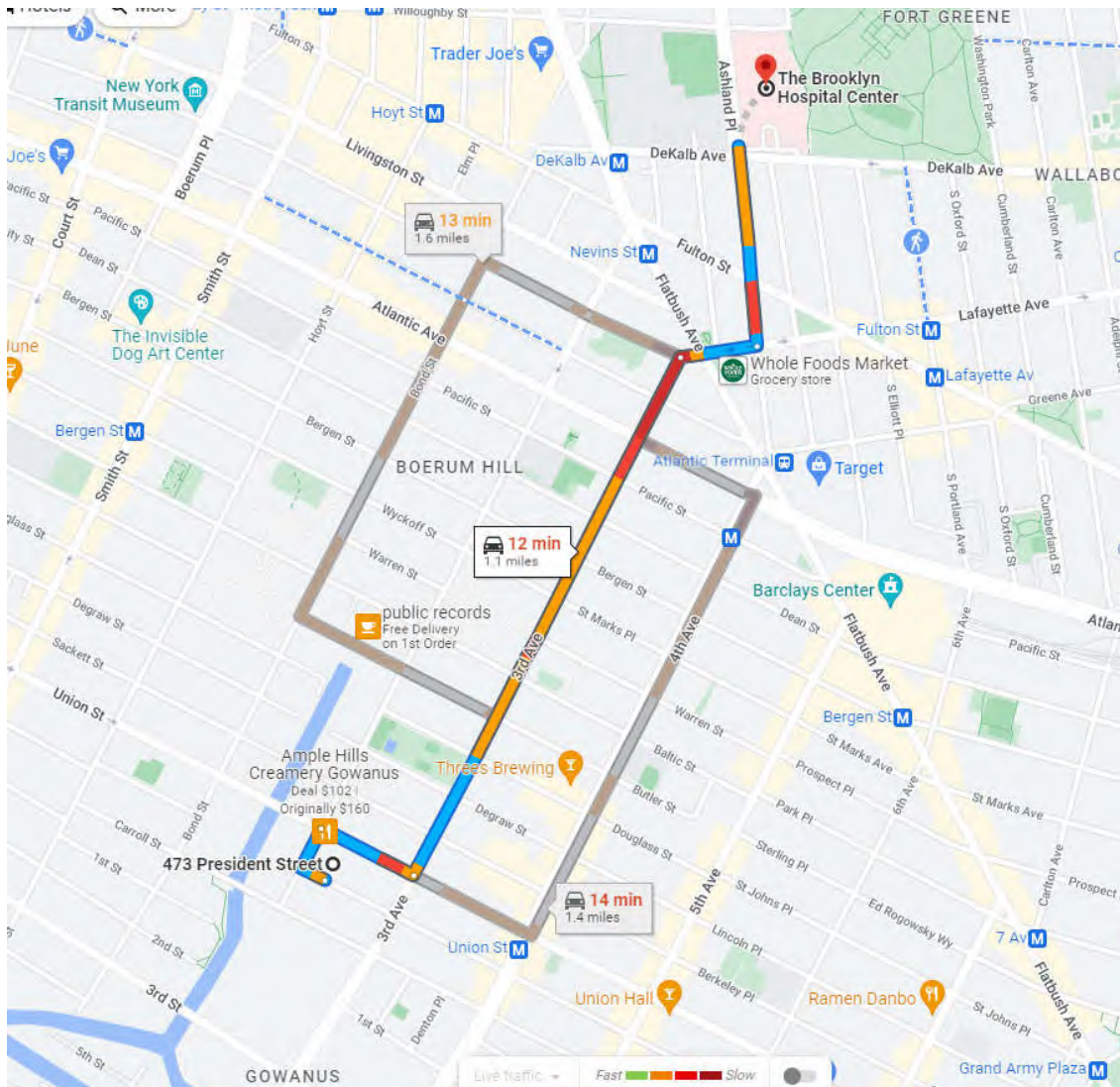
Total Estimated Time: 12 minutes

Total Estimated Distance: 1.1 miles

Begin at 473 President Street, Brooklyn, NY

End at to The Brooklyn Hospital Center

121 DeKalb Avenue, Brooklyn, 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
Acenaphthene	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	---
Dimethylphthalate	---	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

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
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
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	---	---	---	---	---	---	---

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
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]
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

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 (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]
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]

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
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 pain, 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	---
Endrin	1.8 x 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 x 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

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
<p>NOTES</p> <p>* = Constituent found in ETPH</p> <p>**=Constituent found in Acid/Base/Neutral Extractable Compounds</p> <p>***=Constituent found in Volatile Organic Compounds</p> <p>****=Constituent found in Leaching Lead</p> <p>¹PEL = Permissible Exposure Limit. If no PEL is available, then the NIOSH Threshold Limit Value (TLV) should be used, if available.</p> <p>²Ceiling limit or Short Term Exposure Limit (STEL), if available. Again, the NIOSH TLV may be used if no OSHA standard exists.</p> <p>³Abbreviations are contained on the next page</p> <p>[] = Potential Occupational Carcinogen</p> <p>ND = Not Been Determined</p>							

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

irrt = 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 = Myoclonic (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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Wear appropriate high visibility clothing • Block off the work area to prevent vehicles from entering 	Moderate	High Traffic areas
7. Inhalation of Volatiles	<ul style="list-style-type: none"> • 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
8. Skin contact with volatile organic compounds, semi volatile organic compounds, metals, TPHs, PCBs, pesticides, cyanide	<ul style="list-style-type: none"> • 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

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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.

Logistics:

Date of Work: _____
Time to Meet: _____
Site Contact (phone): _____
Notification of Site Contact made by: _____
Describe any unusual 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, Utilities, etc.): _____
Anticipated Depth to Groundwater: _____
Will NAPL/Product be Present: Y / N Describe: _____

Safety and Logistics Call Log
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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: VOCs SVOCs PFAS 1,4-Dioxane
(circle) HVOCs
AVOCs
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

HRP Health and Safety Plan
473 President Street Off-Site, Site #C224220A
473 President Street, Brooklyn, NY 11215
Brooklyn, NY

[illegible]

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:	Age:	Time employee began work:	Weather Conditions:
Employee Title/Position:	Sex: <input type="checkbox"/> Female	Date of Incident:	Date of Report:
Department:	<input type="checkbox"/> Male	Time of Incident:	Time Report Completed:
Office Location:			
Supervisor:			
Employee Address:	Location of Incident:		
Street:	Address:		
City/Town:	City/Town:		
Zip Code:	State:		
Phone Number:			
Type of Incident: <input type="checkbox"/> Motor Vehicle Accident or <input type="checkbox"/> Near Miss or <input type="checkbox"/> Injury occurred during routine work <input type="checkbox"/> Company or <input type="checkbox"/> 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?		Describe what took place?	
WHAT WAS THE EMPLOYEE DOING WHEN THE INCIDENT OCCURRED?		Who was at fault for vehicle accidents, citation?	
WHAT WAS THE EMPLOYEE DOING AFTER THE INCIDENT OCCURRED?		Was power equipment involved, if so, describe?	

WHAT WAS THE NATURE OF THE INJURY OR ILLNESS?		<p>Tell us the body part that was affected and how it was affected – be specific Examples: strained lower back; chemical burn on hand</p>
WHAT WAS THE ROOT CAUSE OF THE INCIDENT? List other individual involved in Section 3. COULD INCIDENT HAVE BEEN AVOIDED? HOW?		<p>Get all the facts by studying the Job and situation involved. Question by use of WHY - WHAT – WHERE – WHEN – WHO – HOW</p> <p>Were there other factors (e.g., noise, ventilation, illumination, fatigue, age, medical conditions) that contributed to the accident?</p>
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? <input type="checkbox"/> Yes <input type="checkbox"/> No	Was employee hospitalized overnight as an in-patient? <input type="checkbox"/> Yes <input type="checkbox"/> No If so, for how many days? _____

APPENDIX D

Daily Job Brief Record

JOB BRIEF RECORD

Person Conducting	473 President Street, Brooklyn, NY Site Name/Address	DEC1035.P2 HRP Client Name/Job #
Steve Walsh (518) 402-9824 Client Contact/Phone	HRP H&S Rep.	David Stoll (518) 526-2322 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

Hospital Name & Location:
NYSDEC Spill Line: 1-518-457-7362
Health & Safety Manager:

FIRE / POLICE / AMBULANCE: 911
The Brooklyn Hospital Center, 121 DeKalb Avenue, Brooklyn, NY
National Response Center: 800-424-8802 CBYD: 800-922-4455
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

HRP Health and Safety Plan
473 President Street Off-Site, Site #C224220A
473 President Street, Brooklyn, NY 11215
Brooklyn, NY

[illegible]

APPENDIX F

Community Air Monitoring Plan

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.

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 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/m³ 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.

APPENDIX G

HRP Safe Work Permit

**HRP SAFE WORK PERMIT****GENERAL SOP****No: SOP #**

Rev: 00

Page 1 of 2

General Information:			
Project Description: 437 President Street – Site No. 224220A		Project Location: 473 President Street, Brooklyn New York	
Client: NYSDEC	Marnie Chancey, NYSDEC PM		518-402-3262
	Contact Name		Contact Phone
Summary of Work:			
Monitoring well installation and sampling; Soil vapor point installation and sampling.			
Created By:	Patrick Montuori	Approved by:	Alisa Werst, CSP
Reviewed with affected employee	Signature	Date	

Check if Project Involves:	Yes	No	Initial to Verify Completion	Criteria
Hot Work (<i>Welding, Grinding, etc.</i>)	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Hot Work Permit Issued – Fire Watch Required
Electrical Work	<input type="checkbox"/>	<input checked="" type="checkbox"/>		LOTO, confirm zero energy
Rigging or Heavy Lifting	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Load Ratings, Employee Certification
Scaffolds	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Competent Person Inspection Required
Confined Space Entry	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Permit or Reclassification Form Required
Hazardous Chemicals	<input type="checkbox"/>	<input type="checkbox"/>		Chemical Names and SDS review with Employees Spill kit available, Secondary containment provided
Ladders	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Proper Rating, No Metal Ladders, Current Inspection
Work at Heights	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Training (verified), Approved Anchor Pts. or Fall Protection
Lockout Tagout	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Training (verified), site first lock on
Excavation/Ground Penetration	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Line Locate performed
Roof Work	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Fall protection within 6 feet of edge
Portable Electrical Tools, cords	<input checked="" type="checkbox"/>	<input type="checkbox"/>		GFCI used, No damaged cords, Inspected
Fire System Impairment	<input type="checkbox"/>	<input checked="" type="checkbox"/>		External notifications made
Blocked Exits	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Post signs and alternate exits
Other (<i>list</i>):	<input type="checkbox"/>	<input type="checkbox"/>		

Required Permits		PPE Required for Job or Required by Client	
<input type="checkbox"/> None	<input checked="" type="checkbox"/> Ground Disturbance	<input checked="" type="checkbox"/> Safety Glasses	<input checked="" type="checkbox"/> Hearing Protection
<input type="checkbox"/> Confined Space	<input type="checkbox"/> Scaffold Inspection	<input checked="" type="checkbox"/> Safety Toe Shoes	<input checked="" type="checkbox"/> Hard Hats
<input type="checkbox"/> Hot Work	<input type="checkbox"/> Working At Heights	<input type="checkbox"/> Metatarsal Guards	<input checked="" type="checkbox"/> Nitrile Gloves
<input type="checkbox"/> Emergency Medical Care Provisions		<input type="checkbox"/> Cut Resistant Gloves/Sleeves	<input type="checkbox"/> Other:
<input type="checkbox"/> Other Permits:		<input type="checkbox"/> Respirator	

Special Considerations				
<input type="checkbox"/> Chemical	<input type="checkbox"/> Tight/Crowded Area	<input type="checkbox"/> Laceration/Abrasion	<input type="checkbox"/> Struck By	<input type="checkbox"/> Press
<input type="checkbox"/> Explosion	<input type="checkbox"/> Fire	<input type="checkbox"/> Falling Debris/Loads	<input type="checkbox"/> Struck Against	<input type="checkbox"/> Security
<input checked="" type="checkbox"/> Slip/Trip/Fall	<input type="checkbox"/> High Pressure	<input checked="" type="checkbox"/> Noise	<input type="checkbox"/> Automated Equip.	<input type="checkbox"/> Other:
<input type="checkbox"/> Exposed Movement	<input type="checkbox"/> Lighting	<input type="checkbox"/> Caught in/on	<input type="checkbox"/> Conveyors	<input type="checkbox"/> Other:
<input type="checkbox"/> Ergonomics	<input type="checkbox"/> Animals, bees, pests	<input type="checkbox"/> poisonous plants	<input type="checkbox"/> PCBs, Pb, asbestos	



HRP SAFE WORK PERMIT

GENERAL SOP
No: SOP #

Rev: 00

Page 2 of 2

REVISION APPROVAL LOG			
REV. #	PREPARED BY	REVIEWED BY	APPROVED BY
00	Date: Name: Scot Frost Sign: <i>Scot Frost</i>	Date: Name: Jackie Baxley Sign: <i>Jackie Baxley</i>	Date: Name: Tad Goetcheus Sign: <i>Tad A. Goetcheus</i>
01	Date: Name: Sign:	Date: Name: Sign:	Date: Name: Sign:
02	Date: Name: Sign:	Date: Name: Sign:	Date: Name: Sign:

CHANGE / REVIEW RECORDS			
REVISION DATE	REVISION LEVEL	REASON / REVISION DESCRIPTION	APPROVED BY

APPENDIX H

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 goggles 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 I

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**Alconox, Inc.
30 Glenn Street
White Plains, NY 10603
1-914-948-4040**Supplier**

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.

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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.

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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**

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

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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: Danger code (Kemler): EMS number: Segregation groups:	None None None 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: Tunnel restriction code: UN "Model Regulation":	
	None None 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.

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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

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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 H₂O

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) Evaporation 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/cm ³ 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

Water

CAS-No.
7732-18-5

Revision Date

New Jersey Right To Know Components

Water

CAS-No.
7732-18-5

Revision Date

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

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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

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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

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Hydrochloric Acid,ACS

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



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

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Hydrochloric Acid,ACS

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 eyewear, 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 eyewear, gloves, and clothing. Refer to Section 8.

Reference to other sections:

SECTION 7 : Handling and storage

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Hydrochloric Acid,ACS

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 reworking 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

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Hydrochloric Acid,ACS

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.

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Hydrochloric Acid,ACS

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.

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Hydrochloric Acid,ACS

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)

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Hydrochloric Acid,ACS

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

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Effective date : 12.29.2014

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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

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Nitric Acid, 3M

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



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)

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Nitric Acid, 3M

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

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Nitric Acid, 3M

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 acid	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/cm ³ 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

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Nitric Acid, 3M

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.

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Nitric Acid, 3M

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

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Nitric Acid, 3M

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

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according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 01.08.2015

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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

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Methanol, Lab Grade, 4L

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



NFPA/HMIS



NFPA SCALE (0-4)

Health	2
Flammability	3
Physical Hazard	0
Personal Protection	X

HMIS RATINGS (0-4)

SECTION 3 : Composition/information on ingredients

Ingredients:

CAS 67-56-1	Methanol	>90 %
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Methanol, Lab Grade, 4L

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 eyewear, 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

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Methanol, Lab Grade, 4L

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

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Methanol, Lab Grade, 4L

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.

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Methanol, Lab Grade, 4L

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 persistent.

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

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Methanol, Lab Grade, 4L

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)

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Methanol, Lab Grade, 4L

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

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Effective date : 12.14.2014

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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

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Sodium Hydroxide, 0.5M

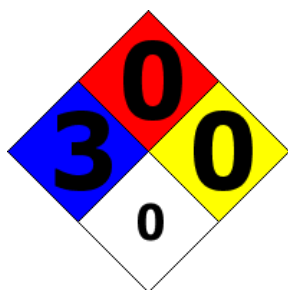
Immediately call a POISON CENTER or doctor/physician
Store in a corrosive resistant/... container with a resistant inner liner
Store locked up
Dispose of contents/container to ...

Other Non-GHS Classification:

WHMIS



NFPA/HMIS



NFPA SCALE (0-4)

Health	3
Flammability	0
Physical Hazard	0
Personal Protection	X

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 persists.

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:

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Sodium Hydroxide, 0.5M

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



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Sodium Hydroxide, 0.5M

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

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Sodium Hydroxide, 0.5M

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:

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Sodium Hydroxide, 0.5M

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:

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Sodium Hydroxide, 0.5M

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
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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.
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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.
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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 K_{ow})****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

☒ 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

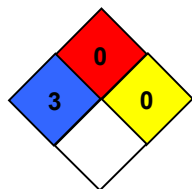
No ingredient regulated by RI Right-to-Know Law present.

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



	Flammability
	Health
	Reactivity
	Special hazard.

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.

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