Remedial Design / Remedial Action Work Plan

24 Seneca Avenue, Site No. 828132
Rochester, New York

Prepared for:

Stanley Black & Decker, Inc.

Prepared by:

EHS Support
GNARUS ADVISORS LLC

May 2025

Certification

I, Kristin A. VanLandingham, P.E., certify that I am currently a NYS-registered professional engineer and that this *Remedial Design/Remedial Action (RD/RA) Work Plan* was prepared in accordance with all applicable statutes and regulations, and in substantial conformance with the DER *Technical Guidance for Site Investigation and Remediation* (DER-10) and *Green Remediation* (DER-31).

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Date: May 9, 2025

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Acronyms

µg/m^3	microgram per cubic meter
API	American Petroleum Institute
AROD	*Amended Record of Decision*
bgs	below ground surface
btoc	below top of casing
CAMP	Community Air Monitoring Plan
CCR	Construction Completion Report
COC	constituent of concern
CPP	Citizen Participation Plan
CVOC	chlorinated volatile organic compounds
cy	cubic yards
ERH	electrical resistance heating
FER	Final Engineering Report
ft	foot or feet
GAC	granular activated carbon
gpm	gallon per minute
HASP	Health and Safety Plan
ISMP	Interim Site Management Plan
ISTT	in situ thermal treatment
msl	mean sea level
NYCRR	New York Codes, Rules, and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O&M	operation and maintenance
OM&M	operation, maintenance, and monitoring
PCB	polychlorinated biphenyl
PDI	pre-design investigation
PE	professional engineer
PFAS	per- and polyfluoroalkyl substances
QAPP	Quality Assurance Project Plan
QA/QC	quality assurance/quality control
RA	remedial action
RAO	remedial action objective
RAWP	Remedial Action Work Plan
RD	remedial design
RIR	Remedial Investigation Report
SCO	soil cleanup objective

SCG	contaminant-specific standards, criteria, and guidance
sf	square foot
SMP	Site Management Plan
SSD	sub-slab depressurization
SVOC	semivolatile organic compound
TCE	trichloroethene
TCH	thermal conductive heating
UST	underground storage tank
USGS	United State Geological Survey
VI	vapor intrusion
VOC	volatile organic compound

1 Introduction

This Remedial Design/Remedial Action (RD/RA) Work Plan (Work Plan) presents the scope of work for the RD and implementing the RA at the former Sargent & Greenleaf manufacturing facility located at 24 Seneca Avenue, City of Rochester, Monroe County, New York (Site), as shown on **Figure 1**. EHS Support LLC (EHS Support) and Gnarus Advisors LLC (Gnarus) have prepared this Work Plan on behalf of Stanley Black & Decker, Inc. ("Stanley Black & Decker") for the Site. This Work Plan has been developed based on the *Amended Record of Decision* (AROD) issued by New York State Department of Environmental Conservation (NYSDEC) on June 22, 2023, and Stanley Black & Decker's letters dated August 10, 2023, and September 5, 2023, in which it agreed to implement the AROD.

This Work Plan was prepared in accordance with the NYSDEC *Remediation Program Regulations* (6 New York Codes, Rules and Regulations [NYCRR] Part 375) requirements, including those specifically outlining work plans at 6 NYCRR §375-1.6(a), 375-3.6, and 375-6. In addition, this Work Plan incorporates the guidance provided in *DER-10/Technical Guidance for Site Investigation and Remediation* (NYSDEC, 2010a), specifically Chapter 5 of DER-10 which specifies the requirements for remedial work plans and in *Green Remediation* (DER-31). In addition, this Work Plan and the associated Quality Assurance Project Plan (QAPP; **Appendix A**) includes the quality assurance/quality control (QA/QC) requirements set forth in Subchapter 2.3 of DER-10.

1.1 RD/RA Work Plan Organization

This Work Plan is designed to be used in concert with the QAPP (**Appendix A**) and describes the activities to be conducted during the RD, and the means and methods for collecting representative data during the RD and RA.

Following this introductory section, the Work Plan consists of the following sections:

- **Section 2 – Design Scope:** Provides descriptions of each element of the RD, excavation and backfill, existing cover system, cleaning and closure of underground structures, in situ thermal treatment (ISTT), vapor mitigation and monitoring, and engineering and institutional controls.
- **Section 3 – Permits:** Summarizes the processes required for the permits for the cover system construction, underground storage tank (UST) abandonment, vapor mitigation installation, and ISTT.
- **Section 4 – RD/RA Project Schedule:** Provides an overview of the project schedule to implement the RD and RA for the project.
- **Section 5 – References:** Provides a list of reference materials used in the preparation of this Work Plan.

The following attachments are provided as appendices:

- **Appendix A** – Quality Assurance Project Plan (QAPP)
- **Appendix B** – Nature and Extent of Contamination Figures
- **Appendix C** – Community Air Monitoring Plan (CAMP)
- **Appendix D** – Sub-Slab Depressurization System Diagnostic Test Method
- **Appendix E** – Health and Safety Plan (HASP)

1.2 Site Background

This section describes the Site location and provides a summary of property ownership and operational history and investigations. A chronology of Site investigations and remedial actions is provided in **Table 1**.

1.2.1 Site Location and Physical Setting

The Site is an L-shaped parcel with tax ID: 91.83-01.10. According to the Monroe County property assessment system, the parcel is owned by 24 Seneca Avenue, Inc. The overall Site is approximately 2.29 acres in size. The Site is bounded by Norton Street to the south, Seneca Avenue to the west, Bremen Street to the east, and a one-story masonry building (occupied by Van Hook Service Company, Inc.) to the north (**Figure 2**). In addition, there is a contiguous parcel at 574 Norton Street that is owned by Rock Environmental, Inc. Although there are monitoring wells on the 574 Norton Street parcel, this parcel is not part of the Site.

The primary on-Site structure consists of an approximately 121,000-square-foot (sf) building. This building is a brick and masonry primarily one-floor structure with slab on grade construction. A second floor, which encompasses approximately 9,500 sf, is located on the south end of the Site building.

The footprint of the main building occupies the majority of the Site surface, except for the following areas: the gravel parking lot on the south side of the Site, grass and paved areas along two narrow areas on the eastern and western Site boundaries, and the paved loading dock area on the east side of the Site that is accessed from Bremen Street.

1.2.2 Site History

Based on historical documents and internet research conducted for the Pre-Design Investigation (PDI) Work Plan (EHS Support and Nathan, 2019) and information provided by the current tenant (Dock Hardware and Surplus Select), the Site is currently occupied by the following businesses:

- Extra Packaging (packaging supplier, no manufacturing)
- Dock Hardware (dock components manufacturer)
- Surplus Select (industrial equipment surplus sales)
- AWR Rigging (building equipment installation)
- Iglesia Pentecostal Church (leased; southeast corner of parcel)

Based on a March 12, 2007, *Phase I Environmental Site Assessment* (SGD Environmental, 2007), the Site has been used for various commercial and industrial purposes since the early 1920s. Before 1920, the Site was vacant land. A 1920 map shows the planned construction of a foundry, machine shop, and mill for Sargent & Greenleaf (a lock manufacturer). Sargent & Greenleaf occupied the Site until 1975. During Sargent & Greenleaf's occupancy, the following operations were documented:

- Manufacturing of non-ferrous castings (zinc, aluminum, and brass)
- Heat treating operations
- Welding and machining operations
- Coating processes
- Incineration activities

- Use of USTs which reportedly contained gasoline and heating oil
- Numerous additions to the original 1920s building structure.

Following the sale of the property by Sargent & Greenleaf in 1976, available information indicates that the Site occupants included the following:

- W.P. Stein (metal stamping): 1977 – 1984 (assumed)
- Jay-Ve Tackle: 1982 to at least 2007
- Quality Packaging and Flexseal Packaging (manufacturing, ink and die applications): 1986 – 1997
- 4 Fathoms: 1990 – 1993
- Monroe Window and Door (manufacturing/service): 1991 – 1995
- Motorcycle repair shop: 1995 – 1997
- Seneca Machine (machining): 1997 to at least 201
- Phoenix Machine Repair (janitorial equipment): 1997 – unknown.
- Buckman Equipment: 1997 – unknown
- School House Travel: 1997 – unknown
- Great Northern Association: 1997 – unknown
- Fresh Pasta: 1997 to no later than 2006
- KLS Wood Products (manufacturing): 1998 – 2000
- Dock Hardware and Surplus Select (dock component manufacturer and surplus warehousing and distribution of industrial equipment): 1999 – present
- Tae Kwon-Do Gold School: 2006 – unknown
- Bread of Life Church: 2006 – to at least 2011 (no longer present)
- Extra Packaging (packaging supplier, no manufacturing): 2006 – to at least 2011 (no longer present)
- AWR Rigging (building equipment installation): 2011 – present
- Iglesia Pentecostal Church: 2023 – present
- Coin Services: 2011 – no longer present
- ENEROC Partners (labor provider): unknown occupancy date – no longer present

Note: All of the above dates are approximate and are based on best available information from historical reports and internet research for the PDI Work Plan (EHS Support and Nathan, 2019) and information provided by the current tenant (Dock Hardware and Surplus Select).

1.3 Site Characterization Summary

This section summarizes the Site's physical setting (surface topography, regional and Site geology and hydrogeology) and nature and extent of constituents of concern (COCs) in soil, soil vapor, indoor air, shallow unconsolidated groundwater, and bedrock groundwater at the Site. This summary is based on the current understanding of the general physical, geological, hydrogeological, soil quality, soil vapor, indoor air, and groundwater quality conditions at the Site based on data collected during the previous Site investigations and the PDI.

1.3.1 Site Topography and Drainage

The Site is located at approximately 455 feet (ft) above mean sea level (msl). The local topography is relatively flat and generally dips to the northwest toward the Genesee River Gorge west of the Site.

Surface water runoff at the Site predominantly drains to catch basins located at the curbs of the surrounding streets and conveys to the Monroe County Storm Water Collection System.

The Site also has four dry wells that receive stormwater runoff, which Anson Environmental Ltd. (AEL) reported as "…closed structures with solid bottoms which are connected to the Monroe County sewage system." (AEL 1997)

1.3.2 Geology

1.3.2.1 Regional Geology

The geologic units underlying the Site formed approximately 430 million and 450 million years ago (during the Middle Silurian and Late Ordovician Periods). The underlaying bedrock is exposed at the nearby Rochester Gorge (approximately 4,000 ft west of the Site). Several environmental changes occurred during deposition ranging from marine intertidal, deep basin, and anoxic water conditions. The stratigraphic column is divided into four bedrock units (from youngest to oldest): Lockport Group and Clinton Group of the Middle Silurian, Medina Group (Early Silurian), and Queenston Formation (Late Ordovician). During this time, highlands rose to the east as the Taconic orogeny, which created the Taconic Mountains along the eastern boundary of the State of New York. New rivers formed from this orogeny and created a large deltaic complex that prograded east to west across the State of New York, resulting in the Queenston Formation (Grasso and Liebe, 1994).

During the Pleistocene Epoch, glacial ice sheets covered the area. The last glacial event was the Wisconsinan Stage at the maximum extent approximately 19,000 to 22,000 years ago and covered almost all of New York State except a southwestern portion. Sediment transported beneath, within, and on the glacier was deposited by ice or meltwater to form glacial till. Retreating glaciers also deposited and washed away various sediments during this period. When the ice of the glacier moved gradually northward, its waters formed a lake or lakes covering the Mohawk Valley at different levels as the outlets were raised or lowered by water action.

1.3.2.2 Site Geology

The overburden geology at the Site can generally be characterized as a dark brown sandy loam topsoil from approximately 0 to 1 ft below ground surface (bgs) at unpaved areas, grading to fine/medium grained silty sand alternating with dense clay/silty clay that contain some coarse lenses of sand and gravel lenses observed at depths generally from 1 to 8 ft bgs, grading to finer grained dense silt and clay and dense till observed generally above bedrock at depths of 8 to 10 f bgs. Bedrock is encountered at the Site at a depth of approximately 10 ft bgs.

During the PDI, the unconsolidated soils were primarily observed as sandy silt with intermittent lenses of sand and clay:

- Concrete / gravel cover and fill from 0 to 1 ft
- Sand and silt, sometimes with gravel between ~1 ft and ~4 ft
- Sandy silt, sometimes with 3–4 feet of clay between ~4 and ~10 ft
- Weathered shale and clay between ~9.5 ft and ~11 ft
- Weathered shale between ~10.5 ft and ~15 ft

Beyond the weathered shale, a competent dolomitic shale was encountered in the three bedrock borings at approximately 25 ft bgs to the total depth of 35 ft bgs. Fractured dolomitic shale was observed between approximately 30 and 35 ft bgs. Further details on the Site geology are provided in the Revised Chlorinated Volatile Organic Compound Pre-Design Investigation Report and Remedy Evaluation ("PDI Report") (EHS Support and Gnarus, 2022a).

1.3.3 Hydrogeology

1.3.3.1 Regional Hydrogeology

The Site is located within the Genesee River Basin in western New York State extending from Lake Ontario to the north to approximately 10 miles into northwestern Pennsylvania to the south, with a drainage area of 2,494 square miles (United State Geological Survey [USGS], 2010). Lake Ontario and two finger lakes (Lake Hemlock and Lake Canadice) supply the City of Rochester with water for municipal use (City of Rochester, 2020).

Two wells identified on the USGS Groundwater Watch are located 11.4 miles northeast of the Site and 12 miles southeast of the Site (USGS, 2021). The northeast well is installed 30 ft bgs into an Upper Ordovician aquifer and the southeast well was installed 14.5 ft bgs into sand and gravel glacial deposits. Glaciofluvial deposits of sand and gravel from meltwater streams are the most productive groundwater aquifers in the Genesee River Basin but are limited to buried valleys. Sand and gravel water supply wells in this area generally range from 5 to 263 ft bgs with groundwater yields of 10 to 1,016 gallons per minute (gpm) with an average yield of 287 gpm (USGS, 1953).

In areas where sand and gravel aquifers are absent, bedrock aquifers are used for water supply. The bedrock aquifers in the Genesee River Basin are sedimentary units of shale, siltstone, and sandstone. (USGS, 2012). Bedrock water supply wells generally range from 8 to 280 ft bgs. The most productive bedrock aquifer is the Lockport dolomite with groundwater yields of 5 to 500 gpm, with an average of 108 gpm. Groundwater yields in wells screened into the underlaying Rochester Shale range from 10 to 125 gpm, with an average of 52 gpm (USGS, 1953).

1.3.3.2 Site Hydrogeology

Unconsolidated groundwater monitoring wells installed during previous investigations (prior to the PDI) were generally completed to depths of approximately 10 ft bgs at the soil/bedrock contact. During the PDI, perched water was encountered in soil borings between 5.83 ft and 12.86 ft bgs, but many of the borings were dry upon completion of drilling. The depth to water or presence of water in the unconsolidated zone was not consistent throughout the Site. Two remaining unconsolidated wells from the remedial investigation (RIZ-7 and RIZ-9) were gauged during the PDI. The depth to water in RIZ-7 was observed between 8.82 ft below top of casing (btoc) on April 27, 2021, and 8.95 ft btoc on May 12, 2021 (between 446.98 and 447.11 ft above msl). The depth to water in RIZ-9 was observed between 7.10 ft btoc in October 2020, 6.58 ft btoc on April 27, 2021, and 7.79 ft btoc on May 12, 2021 (between 450.51 and 451.72 ft above msl) (EHS Support and Gnarus, 2022). The groundwater elevation measurements collected between October 2020 and May 2021 are provided in **Table 2**.

In bedrock groundwater, the groundwater-bearing zone is likely encountered between 30 and 35 ft bgs or approximately 423 to 428 ft above msl where fractures were observed in the bedrock cores and while

drilling. However, the static water levels (collected on May 12, 2021) ranged from 9.43 to 17.64 ft btoc or 440.05 to 447.54 ft above msl. Water circulation loss while drilling in a fractured zone could be interpreted as a water-bearing zone. During well development of the three recently installed wells (MW-13, MW-14, and MW-15), slow recharge was observed in MW-14, and a very rapid groundwater recharge was observed in MW-13 and MW-15. The PDI Report provides further details on the Site hydrogeology (EHS Support and Gnarus, 2022a).

1.3.3.3 Groundwater Flow Direction

Based on the bedrock groundwater water levels measured on May 12, 2021, the bedrock groundwater-bearing zone shows an apparent groundwater flow to the northwest and west toward Seneca Avenue, as shown in **Figure 3** (EHS Support and Gnarus, 2022a). Due to the variability in perched groundwater in the soil borings and minimal groundwater monitoring wells in the unconsolidated groundwater-bearing zone, a potentiometric surface map could not be accurately developed for the unconsolidated groundwater-bearing zone. The PDI Report provides further details on the groundwater flow direction (EHS Support and Gnarus, 2022a).

1.3.4 Soil

The primary COCs in soil at the Site are trichloroethene (TCE) and its degradation byproducts. The warehouse portion of the former Sargent & Greenleaf building was identified and investigated as part of the PDI for chlorinated volatile organic compound (CVOC) remediation (EHS Support and Gnarus, 2022a). In addition, metals and semi-volatile organic compounds (SVOCs) have been identified above commercial restricted use soil cleanup objectives (SCOs) for protection of public health and protection of groundwater[1] in soil outside of the building.

Surface soil sampling and analysis indicated SVOCs and one metal (copper) exceeded the commercial restricted use and protection of groundwater SCOs. As stated in the AROD, surface soil data do not indicate a potential for off-site impacts in soil. Subsurface sampling indicated volatile organic compounds (VOCs) and SVOCs were detected above the protection of groundwater SCOs. SVOCs and copper were detected above the commercial use and protection of groundwater SCOs.

Historical and PDI soil concentrations are provided on the nature and extent of contamination figures in **Appendix B**.

The following chart lists the maximum concentration of each COC with an exceedance of either protection of public health and protection of groundwater SCOs and the associated sample location.

[1] The Commercial Restricted Use SCOs for Protection of Human Health and Protection of Groundwater are provided in 6 NYCRR Part 375-6.8, Table 375-6.8(b) – Restricted Use Soil Cleanup Objectives; and *CP-51/Soil Cleanup Guidance*, NYSDEC, October 21, 2010.

Maximum COC Concentrations in Soil (mg/kg)[2]

COC	Commercial SCO	Groundwater SCO	Maximum Concentration	Sample Location
Trichloroethene	200	0.47	340	SP-31 (0.5-1.0)
Cis-1,2-dichloroethene	500	0.25	7.7	SP-30 (0.5-1.0)
Trans-1,2-dichloroethene	500	0.19	0.29	SP-30 (0.5-1.0)
Acetone	500	0.05	0.13	SP-14 (0.5-1.0)
Benz(a)anthracene	11	1.0	3,810	SB-43 (0-2)
Benzo(a)pyrene	1.0	2.6	6,800	SB-03 (10.7-11)
Benzo(b)fluoranthene	11	1.7	10,000	SB-03 (10.7-11)
Benzo(k)fluoranthene	56	1.7	5,400	SB-03 (10.7-11)
Indeno(1,2,3-cd)pyrene	5.6	8.2	3,900	SB-03 (10.7-11)
Copper	270	1,720	3,660[3]	TP-6 (6.5)

SCO – soil cleanup objective

1.3.5 Groundwater

Similar to the soil, the primary COCs in groundwater at the Site are TCE and its degradation byproducts. Groundwater sampling conducted on Site and off Site indicated CVOCs, petroleum-related VOCs, SVOCs, and metals that exceeded NYSDEC groundwater quality standards established at 6 NYCRR 703.5 in overburden and bedrock groundwater. A summary of the detected analytes in groundwater between April and May 2021 is provided in **Table 3**.

Historical and PDI groundwater concentrations are provided on site nature and extent of contamination figures in **Appendix B**.

The following charts lists the maximum concentration of each COC that exceeded the NYSDEC groundwater quality standards in unconsolidated groundwater grab samples collected from temporary wells, Geoprobe boreholes, and also groundwater samples collected from monitoring wells along with the associated sample location. Neither groundwater sample collected in the April 2021 event from the two monitoring wells screened in the discontinuous unconsolidated formation contained detectable VOCs.

Maximum COC Concentrations in Groundwater Grab Samples (µg/L)[4]

COC	NYSDEC Groundwater Quality Standard	Maximum Concentration	Sample Location
Benzene	1.0	2.4 J	SP29
Chloroform	7.0	510	SP14
1,1-Dichloroethene	5.0	6.8 J	SP41
Cis-1,2-Dichloroethene	5.0	2,500 D	SP30
Toluene	5.0	56 J	SP18

[2] VOCs from PDI investigation (EHS Support and Gnarus 2022, Table 4), semi-volatiles and copper reported in Remedial Investigation Report (O'Brien & Gere, 2011b, Table 9) and Supplemental Remedial Investigation Report (O'Brien & Gere, 2012, Table 3). Note: all maximum SVOC and copper exceedances from O'Brien & Gere (2011b), except for SB-43 from O'Brien & Gere (2012).

[3] Copper concentration qualified as "N" which indicates presumptive evidence of a compound (O'Brien & Gere, 2011, Table 9).

[4] VOCs from PDI investigation (EHS Support and Gnarus 2022, Table 4); other parameters were not analyzed for.

COC	NYSDEC Groundwater Quality Standard	Maximum Concentration	Sample Location
Tetrachloroethene	5.0	150	SP18
Trichloroethene	5.0	290,000 J	SP14
Vinyl Chloride	2.0	3,400 D	SP30

J – Estimated value between the method detection limit and laboratory reporting limit
D – Concentration is a result of a dilution

Maximum COC Concentrations in Groundwater Monitoring Well Samples (µg/L)[5]

COC	NYSDEC Groundwater Quality Standard	Maximum Concentration	Sample Location
Benzene	1.0	4.1	MW-3
Chloroform	7.0	180 J	MW-10
1,2-DIchloroethane	5.0	3.9	MW-14
1,1-Dichloroethene	5.0	140 J	MW-13
Cis-1,2-Dichloroethene	5.0	11,000 J	MW-14
Trans-1,2-Dichloroethene	5.0	100 J	MW-14
1,4-Dioxane	1.0	3.3	MW-10
Isopropylbenzene	5.0	7.7	MW-3
Trichloroethene	5.0	92,000 J	MW-14
Vinyl Chloride	2.0	1,600	MW-13
Antimony	3.0	8 J	RIZ-4
Arsenic	25	73.4	MW-1
Beryllium	1,000	3.9	MW-9
Cadmium	5.0	11.4	MW-1
Chromium	50	212	RIZ-9
Copper	200	599	MW-1
Iron	300	85,900	MW-1
Lead	25	111	MW-1
Magnesium	35,000	192,000	MW-1
Manganese	300	3,190	MW-1
Nickel	100	129	MW-1
Sodium	20,000	563,000 J	RIZ-4
Thallium	0.5	0.52	MW-1
Zinc	2,000	3,490	RIZ-9
Aldrin	ND	0.026 J	MW-1
Endrin	ND	0.021 J	MW-3
Alpha-BHC	0.01	0.047J	MW-9
Delta-BHC	0.04	0.047J	MW-9
Dieldrin	0.004	0.047J	MW-9
Heptachlor	0.04	0.047J	MW-9
Heptachlor Epoxide	0.03	0.047J	MW-9

J – Estimated value between the method detection limit and laboratory reporting limit

[5] VOCs from PDI investigation (EHS Support and Gnarus 2022, Table 4), semi-volatiles, metals, and pesticides/herbicides reported in Remedial Investigation Report (O'Brien & Gere, 2011b, Table 11) and Supplemental Remedial Investigation Report (O'Brien & Gere, 2012, Table 3).

1.3.6 Sub-Slab Soil Vapor and Indoor Air

An initial soil vapor intrusion (VI) investigation was completed as part of the remedial investigation and reported in the Vapor Intrusion Report (O'Brien & Gere, 2011a). A subsequent VI Investigation was completed between March 28 and 31, 2023, in accordance with the Chlorinated Volatile Organic Compound Vapor Intrusion Investigation Work Plan (EHS Support and Gnarus, 2022b) and the NYSDEC conditional approval letter (NYSDEC, 2023). The VI investigation involved collecting indoor air and sub-slab vapor samples to evaluate the potential risk for VI at the former Sargent & Greenleaf building and the Van Hook Service building at 76 Seneca Avenue.

Sub-slab vapor samples were collected at eleven locations within a concrete slab. Ten sub-slab vapor samples were collected in the former Sargent & Greenleaf building, and one sample was collected in the Van Hook building on the first floor in the maintenance area. Indoor air samples were collected at twelve locations in the former Sargent & Greenleaf building and at two locations of the Van Hook Service building. Ten of the twelve indoor air sample locations were co-located with the ten sub-slab vapor locations in the former Sargent & Greenleaf building.

All indoor air and sub-slab vapor sample results were compared with the New York State Department of Health's (NYSDOH's) Soil Vapor/Indoor Air Decision Matrices (NYSDOH, 2017).[6] The co-located indoor air and sub-slab vapor samples located on the first floor of the Van Hook Service building indicate no further action for all matrix compounds. The indoor air sample collected from the basement indicates a detection of TCE; however, the basement is only used for storage and, thus, is not considered an occupied space. The indoor air samples collected in the former Sargent & Greenleaf building indicate further monitoring and mitigation for select compounds (primarily TCE). Further details regarding the VI sampling and results are provided in the Chlorinated Volatile Organic Compound Vapor Intrusion Investigation Report (EHS Support and Gnarus, 2022b). Current and historical indoor air and soil vapor concentrations are provided on site nature and extent of contamination figures in **Appendix B**.

The following chart lists the maximum concentration of each COC detected in the sub-slab vapor or indoor air samples and the associated sample location.

Maximum VOC Concentrations in Sub-slab Vapor and Indoor Air Samples (µg/m^3)[7]

COC	Sub-slab Vapor	Sample Location	Indoor Air	Sample Location
Carbon Tetrachloride	0.67	SUB-SG-03	0.39	IA-SG-07
1,1-Dichloroethene	380	SUB-SG-04	0.15 J	IA-SG-04
Cis-1,2-Dichloroethene	67,000 D	SUB-SG-04	0.87	IA-SG-02
Methylene Chloride	150	SUB-SG-02	27	IA-SG-07
Tetrachloroethene	1,100	SUB-SG-04	0.41	IA-SG-04
1,1,1-Trichloroethane	460	SUB-SG-01	3.8	IA-SG-04 & IA-SG-11
Trichloroethene	62,000 D	SUB-SG-04	6.6	IA-SG-07
Vinyl Chloride	34	SUB-SG-04	ND	NA

[6] The February 2024 updates to the NYSDOH's Soil Vapor/Indoor Air Decision Matrices Data were not included because the vapor intrusion investigation only involved analyzing for CVOCs and the 2024 updates were for non-chlorinated VOCs and, thus, not applicable.

[7] Data from March 2023 vapor intrusion investigation (EHS Support and Gnarus, 2023, Table 3); the chart only lists parameters in the screening decision matrices (NYSDEC, 2017).

D – Concentration is a result of a dilution
J – Estimated value between the method detection limit and laboratory reporting limit
ND = Not detected
NA = Not applicable

1.4 Remedial Action Objectives

DER-10, Subchapter 4.1, indicates that site remedy selection should be based on remedial action objectives (RAOs), which represent medium- or area-specific objectives for the protection of public health and the environment, and are developed based on contaminant-specific standards, criteria, and guidance (SCGs) to address contamination at a site. The RAOs presented in this section are from the NYSDEC's AROD. The Site is currently zoned industrial, and it is reasonable to assume that the Site will remain industrial or commercial for the foreseeable future. However, as discussed in **Section 2.8**, an environmental easement restricting the property land use and prohibiting groundwater extraction, except for environmental testing and remediation purposes, will be needed.

1.4.1 Soil RAOs

Soil RAOs for Public Health Protection:

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

Soil RAOs for Environmental Protection:

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

1.4.2 Groundwater RAOs

RAOs for Public Health Protection:

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

RAOs for Environmental Protection:

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

1.4.3 Soil Vapor RAOs

RAOs for Public Health Protection:

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

1.5 Description of Selected Remedy

The following discussion repeats the elements of NYSDEC's amended remedy provided in the AROD verbatim.

1.5.1 Remedial Design

An RD program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31 (NYSDEC, 2010b). The major green remediation components from DER-31 (NYSDEC, 2010b) are as follows:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic, and social goals;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and,
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this Site, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve energy efficiency as an element of construction.

1.5.2 Excavation

All soils, outside the cover systems to remain in place, in the upper 1 foot that exceed the commercial SCOs will be excavated and transported off-site for disposal.

1.5.3 Backfill

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil and establish the designed grades at the site. Section 2.1 provides an Import Fill Plan.

1.5.4 Cleaning and Closure of Underground Structures

Two USTs and associated piping will be cleaned and closed in place in accordance with NYSDEC guidance and regulations. The drainage structures will be cleaned.

1.5.5 Cover System

A site cover currently exists in areas not occupied by buildings and will be maintained to allow for commercial use of the Site. Any site redevelopment will maintain the existing site cover. The site cover may include paved surface parking areas, sidewalks, or soil where the upper 1 foot of exposed surface soil meets the applicable SCOs for commercial use. Any fill material brought to the Site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d).

1.5.6 In Situ Thermal Treatment

ISTT will be implemented to destroy or volatilize VOCs in the source area located in the central portion of the site building. The gases produced by the thermal treatment will be collected by vapor extraction wells and treated in an ex situ treatment unit.

1.5.7 Vapor Mitigation

Any on-site buildings and off-site buildings impacted by the Site will be required to have a sub-slab depressurization (SSD) system, or other acceptable measures, to mitigate the migration of vapors into the building(s) from soil and/or groundwater.

1.5.8 Engineering and Institutional Controls/Post Construction Plans

Imposition of an institutional control in the form of an environmental easement and an Interim Site Management Plan (ISMP), as described below and quoted[8] from the Record of Decision (NYSDEC, 2016), will be required. The remedy will meet the achieve a restricted commercial cleanup.

1.5.8.1 Institutional Control

Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

- Require the remedial party or site owner to complete and submit to the Department an annual periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- Allow the use and development of the controlled property for commercial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- Restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH; and,
- Require compliance with the Department-approved ISMP.

1.5.8.2 Interim Site Management Plan

An ISMP is required, which includes the following:

- An Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:
- Institutional Controls: the Environmental Easement discussed above.
- Engineering Controls: the soil cover and the SSD system discussed above.

This plan includes, but may not be limited to:

- An Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;

[8] The engineering and institutional controls listed in this report are verbatim from the AROD, except that the SMP is referenced as an ISMP to be consistent with NYSDEC's comments on the RD/RA Work Plan, dated February 19, 2025.

- Descriptions of the provisions of the environmental easement including any land use, and/or groundwater use restrictions;
- A provision for further investigation and remediation should large scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible. The nature and extent of contamination in areas where access was previously limited or unavailable will be immediately and thoroughly investigated pursuant to a plan approved by the Department. Based on the investigation results and the Department determination of the need for a remedy, a Remedial Action Work Plan (RAWP) will be developed for the final remedy for the site, including removal and/or treatment of any source areas to the extent feasible. Citizen Participation Plan (CPP) activities will continue through this process. Any necessary remediation will be completed prior to, or in association with, redevelopment;
- A provision should redevelopment occur to ensure no soil exceeding protection of groundwater concentrations will remain below storm water retention basin or infiltration structures;
- A provision for demolition of the onsite building if and when it becomes unsafe or inactive or vacant;
- A provision for evaluation of the potential for soil vapor intrusion for any occupied buildings on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- A provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in above will be placed in any areas where the upper one foot of exposed surface soil exceeds the applicable SCOs;
- Provisions for the management and inspection of the identified engineering controls;
- Maintaining site access controls and Department notification; and,
- The steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

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

- Monitoring of groundwater and indoor air to assess the performance and effectiveness of the remedy;
- A schedule of monitoring and frequency of submittals to the Department; and,
- Monitoring for vapor intrusion for any buildings on the site as may be required by the Institutional and Engineering Control Plan discussed above.

2 Design Scope

As described in **Section 1.5**, the AROD requires the RA to include the following components:

- Excavation and Backfill
- Existing Cover Systems
- Cleaning and Closure of Underground Structures
- Vapor Mitigation
- ISTT
- Engineering and Institutional Controls

Due to sequencing issues, the design scope for the vapor mitigation and ISTT, and associated operation and/or monitoring, of these two remedial action components will require distinct component-specific designs to be developed by specialized contractors who have not yet been selected to perform the work. Thus, separate RAWPs including detailed designs will be required in the future. Therefore, the process of developing these component-specific RAWPs is provided in this section without providing the specifics of the designs. In addition, a diagnostic test, which is described in this Work Plan, is required for the SSD system design.

Access agreements with the building owner and the tenant are required before implementing any of the remedial actions specified in this Work Plan.

2.1 Import Fill Plan

All imported soils used to backfill excavated areas will meet the backfill and cover soil quality standards established in 6 NYCRR 375-6.7(d) and DER-10 Section 5.4(e), as follows:

The backfill brought to the Site for use as a cover will be comprised of soil or other unregulated material as set forth in 6 NYCRR Part 360.

For each source of backfill that is considered for import to the Site, samples of the fill will be collected for laboratory analysis in accordance with DER-10 Section 5.4(e)10, including Table 5.4(e)10 of DER-10, unless the fill meets the chemical testing exemption listed in DER-10 Section 5.4(e)(5). The imported soil will not exceed the applicable SCOs for the use of the Site (commercial), as set forth in DER-10 Section 5.4(e) and DER-10 Appendix 5 based on the lower of the protection of groundwater or the protection of public health SCOs (commercial) as the regulatory standard for soil backfill.

No material will be brought to the Site without NYSDEC review and approval of an appropriate Request to Import/Reuse Fill or Soil submitted with all necessary supporting data (sieve gradation and chemical data from samples collected at the frequency outlined in Table 5.4(e)10 of DER-10). A Request to Import/Reuse Fill or Soil Form[9] will be submitted to NYSDEC for each fill material source for the Department's review and approval. An evaluation table comparing the laboratory results to the values listed in DER-10 Appendix 5 will be submitted with the Request to Import/Reuse Fill or Soil Forms (the values for ecological resources will not be used because there are no ecological resources present at the Site). For constituents not included in the Appendix 5 table, the supplemental SCOs in the NYSDEC Policy *CP-51 / Soil Cleanup Guidance*, dated October 21, 2010 (NYSDEC, 2010d), will be used. If an SCO is

[9] The Request to Import/Reuse Fill or Soil Form, dated April 2023, can be accessed at: https://extapps.dec.ny.gov/docs/remediation_hudson_pdf/requesttoreusesoil.pdf.

not provided for a detected constituent, a Stanley Black & Decker representative will contact the NYSDEC project manager to determine a site-specific level.

In addition, imported fill shall be tested in accordance with NYSDEC's *Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS)* guidance, dated April 2023.[10] If either perfluorooctanoic acid or perfluorooctane sulfonic acid are above the protection of groundwater guidance values listed in the aforementioned NYSDEC guidance, the source of imported backfill shall be rejected, unless a site-specific exemption, based on the synthetic precipitation leaching procedure or other approved testing method, is received from NYSDEC.

Based on the excavation volumes and backfill requirements provided below, the following number of backfill samples is anticipated: nine discrete samples for VOC analysis and three composite samples for SVOC, inorganics, pesticides, polychlorinated biphenyl (PCB), and PFAS analyses. The composite samples will consist of three to five discrete samples from the fill source that will be homogenized to create a representative sample of the fill material.

2.2 Excavation and Backfill

The excavation and backfill design includes the following activities:

- Confirming backfill sources meet the requirements specified in Section 2.1 above and receive NYSDEC approval.
- Retain a New York State-licensed surveyor to conduct a pre-excavation survey to establish baseline ground surface elevations in areas designated for excavation.
- Retain an underground utility locator service to identify buried utilities.
- Contact New York 811 a minimum of 2 days, but not longer than 10 days, before initiating excavation through the ITIC portal at https://newyork-811.com/excavators/itic/.
- Mobilize to the Site and install a temporary fence around each work area before the work begins in that area.
- Install gravel decontamination pads on the western and southern areas (these decontamination pads will also be used for the dry well cleaning and underground storage tank abandonment remedial actions).
- Pre-characterize the soil designated for off-site disposal in accordance with applicable laws and regulations and the landfill facility's requirements. It is anticipated that the excavated soil will be a non-hazardous waste; however, this will be confirmed through waste characterization sampling and analysis in compliance with 40 CFR 261.20 through 40 CFR 261.24 and 6 NYCRR Part 371. The characterization samples will be analyzed for PFAS by USEPA Method 1633 and the aforementioned NYSDEC PFAS guidance, and 1,4-dioxane by USEPA Method 8260.
- A contained-in determination from NYSDEC could allow much, but not necessarily all, of the excavated soil to be disposed of as non-hazardous waste. Contained-in determination requests will be sent to the NYSDEC Division of Materials Management dedicated mailbox (Contained-InRequest@dec.ny.gov) with a copy to Division of Environmental Remediation staff.
- **Figure 4** and **Table 2-1** show the excavation areas and volumes:

[10] NYSDEC's Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) guidance can be accessed at: https://extapps.dec.ny.gov/docs/remediation_hudson_pdf/pfassampanaly.pdf

Table 2-1 Excavation Areas and Volumes

Excavation Area	Location	Area	Volume*
Area A	Northwest side of building	1,600 sf	74 cy
Area B	Southwest side of building	4,200 sf	194 cy
Area C	Southeast parking area	20,400 sf	944 cy

Notes:
cy = cubic yards
sf = square feet
*Areas measured using Google Earth; volumes assume a 1.25 feet excavation depth.

- Based on the above volumes, the total estimated volume to be excavated, including a 25 percent buffer zone to ensure the 1-ft excavation requirement in each area, is 1,212 cubic yards (cy). Assuming a 30 percent compaction factor, the volume of backfill to be placed following the excavations is approximately 1,576 cy.
- The excavation area is less than 1 acre; therefore, a NYSDEC State Pollutant Discharge Elimination System General Permit for Construction Activity is not required. However, erosion and sedimentation control measures will be established on the Site to prevent soil particles from migrating from the excavation areas via rainfall and runoff. Control measures may include, but are not limited to, silt fencing, hay bales, diversion berms, erosion control blankets, and booms, which will be installed around the excavations, stockpiles, and catch basins as needed to inhibit particulate migration.
- In the areas designated for excavation shown on **Figure 4**, the Contractor will excavate a minimum of 1 ft depth, which is to be confirmed by post-excavation and post-backfill surveys. Note: the Contractor will determine the means and methods relative to the following: excavating soil, stockpiling the soil (if necessary), loading the soil, and sequencing the excavation due to space constraints.
- As stated above, soil will be pre-characterized for waste disposal and accepted at the selected landfill for disposal before the work begins. This will minimize or eliminate the need to stockpile soil on-site. However, if soil needs to be stockpiled, the stockpiles will be located in the south parking lot as shown on **Figure 4**. Stockpiles will be placed on and covered with polyethylene sheeting that is secured in placed.
- There will be no off-site queuing of trucks during loadout of excavated soils. Trucks will be queued in the south parking lot as shown on **Figure 4**.
- Trucks will be decontaminated by washing the wheels in the decontamination area before leaving the Site (**Figure 4**).
- Following the excavation, the surveyor will conduct a second survey to confirm that a minimum of 1 ft of soil was removed. This will involve comparing the excavated surface elevation to the pre-excavation elevation. The surveyor will prepare a post-excavation survey plot with the elevations. If necessary, additional soil will be excavated to achieve the 1-ft depth.
- After the post-excavation survey confirms that a minimum of 1 ft of soil was removed, the excavated area surface will be covered with an orange or white geotextile fabric to serve as a demarcation layer and then, for Areas A and B, backfilled with 8 inches of select fill and 4 inches of topsoil. Area C will be backfilled with 8 inches of select fill and 4 inches of gravel to serve as the parking lot surface (the existing parking lot is comprised of gravel). The backfill surface will be compacted with a roller or tamper to inhibit settling in the future. A post-backfill survey will then be conducted to confirm that the surface elevation is a minimum of 1 ft above the post

excavation surface elevation throughout each excavated area. After confirmation is received that the 1-ft minimum depth is achieved, Area A and Area B will then be seeded with a native grass seed mixture. The Contractor will water the seeded areas as necessary to promote grass growth. The sediment erosion and control measures will remain in place until the grass vegetation is established.

- During the work, the Engineer's Representative[11] will inspect the Site at the beginning and end of each workday to ensure that appropriate erosion and sediment controls are established and functioning as designed.
- During the work, the Engineer's Representative will implement the CAMP **(Appendix C**) and, as necessary, instruct the Contractor to spray the Site with water or other dust suppressant as necessary to minimize dust being generated at the Site.
- Site traffic will be controlled through designated points of access along Seneca Avenue, Norton Street, and Bremen Avenue. During active excavation and loading, access points will be continuously monitored, and a flagging system will be used to protect workers, pedestrians, and authorized guests. Traffic control will also adhere to applicable local, state, and federal laws and regulations.
- Soil and other waste generated during the soil excavation will be loaded into a truck and then covered with a tight-fitting opaque cover (per 6 NYCRR 364-3.3(d)) for transportation by a licensed waste hauler to a permitted landfill in accordance with applicable laws and regulations. The Engineer's Representative will sign bills of ladings and/or manifests as the responsible party's agent.

2.2.1 Remedial Action Construction Completion Report

The excavation and backfill, cover systems, and underground structure abandonment/cleaning work will be described in a Remedial Action Construction Completion Report (Remedial Action CCR) to be prepared in accordance with DER-10 Subchapter 5.8 (NYSDEC, 2010a) and submitted to NYSDEC for review. The Remedial Action CCR and subsequent Final Engineering Report (FER) will include field notes detailing any odors, soil staining, and/or elevated PID readings encountered during site work. The responsible party or its representative will respond to the NYSDEC's comments and resubmit the Remedial Action CCR and continue to respond to NYSDEC's comments until the Remedial Action CCR is approved.

2.3 Existing Cover System

Portions of the Site currently covered with concrete or asphalt pavement will serve as a cover system in accordance with the AROD with the following procedures:

- Each portion of the existing cover system will be inspected for damage by the Engineer's Representative.
- Damaged areas will be either removed and replaced with an in-kind surface or be repaired to ensure the cover systems are intact.
- Following removal/replacement or repair, the Engineer's Representative will photographically document the integrity of the cover system.

[11] The Engineer's Representative will work under the direction of a New York State licensed Professional Engineer (PE) and will also meet the minimum requirements for a Qualified Environmental Professional, as defined in DER-10 Chapter 1.3(b)(49).

- A New York-licensed surveyor will spatially locate the cover systems and plot them on a site plan to be included in the Remedial Action CCR.

2.4 Cleaning and Closure of Underground Structures (Dry Wells)

As described in the AROD, there are two underground structures serving as dry wells, DW-1 and DW-2 (**Figure 4**), that require cleaning. These two dry wells will be cleaned by the following procedure:

- Remove the dry well cover.
- Remove debris from the base of the structure.
- Confirm that the structure has a concrete base and, if so, pressure wash the sides and bottom of the dry well and vacuum any remaining liquid. Visually inspect the base of the structure and photographically document that the structure is clean and, if not, conduct additional cleaning. The structure will be considered cleaned provided this determination is supported by the photographic documentation.
- If the structure has an earthen base, remove a minimum of 3 inches of soil and collect a soil verification sample for laboratory analysis for VOCs, SVOCs, inorganics, pesticides, and PCBs in accordance with the QAPP (**Appendix A**).
  - Compare the soil verification data with the commercial SCOs.
  - If the soil verification data exceed any of the applicable Commercial SCOs, remove additional soil and collect another verification soil sample; continue this removal and reanalysis process until all the soil verification data are less than the applicable Commercial SCOs.
- Document the dry well structure cleaning for inclusion in the Remedial Action CCR.
- The dry wells will continue to be used to manage stormwater runoff.

2.5 Underground Storage Tanks Abandonment

According to the Remedial Investigation Report (RIR; O'Brien & Gere, 2011b), there are two out-of-service USTs that reportedly formerly contained heating oil (a 10,000-gallon UST and an adjacent 6,000-gallon UST) (**Figure 4**). The RIR included the following test pit investigation results with respect to the two tanks:

> TP-05 was also installed on the west side of the Site to investigate the presence of a historic UST mapped in the area and to further evaluate Anomaly B detected in the area by the EMS and GPR equipment during the Geophysical Survey. A UST was encountered approximately 5 feet bgs during excavation of the test pit. Portions of the sidewall of the tank were observed to be rusted through and water was observed exiting the tank from the holes. No odors or sheen were observed by O'Brien & Gere from the water. The tank was reportedly abandoned in place by filling the tank with concrete (SGD, 2007), however at least portions of the tank still had void space as evidenced by the presence of water observed exiting the tank through the perforated side.
>
> TP-06 was installed perpendicular to TP-05 to investigate the presence of a second UST, presumably located in this area based on evidence provided in historic reports, and a second large anomaly (Anomaly A) that was detected, during the Geophysical Survey. A second UST was encountered approximately 2 feet bgs during excavation of the test pit. The second tank was approximately 7 feet in diameter and appeared to be competent (e.g., rust through or tank perforations were not observed by O'Brien & Gere on the

portion of the tank exposed during excavation). It could not be determined if the tank was filled with concrete as reported in previous investigations. (O'Brien & Gere, 2011b)

Based on the test pit logs for TP-05 and TP-06, there was no evidence of petroleum product in either tank.

The AROD requires that the two USTs and associated piping be cleaned and closed in place in accordance with NYSDEC guidance and regulations. The applicable NYSDEC regulation for tank closure is 6 NYCRR Part 613-3.5. This regulation refers to four "codes of practice" and states that one must be adhered to. For purposes of the tank abandonment specified in this Work Plan, American Petroleum Institute (API) Publication 1604, Closure of Underground Petroleum Storage Tanks (API 1604; API, 2021) will be followed.

Neither tank appears to be registered with NYSDEC. Therefore, before the tank abandonments, the responsible party will work with the property owner to complete, sign, and submit the appropriate permanent tank closure abandonment form in accordance with 6 NYCRR 613-1.9(f). In addition, at least 30 days prior to the closure, the NYSDEC pre-work notification for tank closure will be submitted to NYSDEC.

Based on API 1604 and the Site conditions, abandoning the USTs will entail the following procedures:

- Cut and remove the pavement overlying the tank.
- Excavate soil until the top of the tank is uncovered following the soil excavation procedure in **Section 2.1** above.
- Cut the top of the tank using safe cold cutting procedures and explosion-proof, non-sparking tools in accordance with Section 7.5.3 of API 1604.
- As a precaution, purge the tank of vapors using carbon dioxide, nitrogen, or dry ice, as described in Section 7.3 of API 1604.
- Vacuum product, sludge, or water remaining in the tank. In accordance, with Section 5.3.2 of API 1604 and 40 CFR 280.70, the tank will be considered empty if it contains less than 1 inch of residue or less than 0.3 percent by weight of the maximum weight of product that can be stored in the tank system.
- Cap and secure all openings, including product lines, fill pipes, gauge pipes, tank truck recovery fittings, and vapor returns, as described in Section 5.3.5 of API 1604.
- Introduce a suitable solid inert material through openings in the top of the tank in accordance with Section 7.5.4 of API 1604. The tank will be filled as full as possible. Multiple types of inert or non-combustible granular or flowable materials can be used, including sand, soil, and concrete slurries.
- After the tank is filled with inert material, cover, plug, or cap all tank openings to prevent access and accidental deliveries, and backfill the excavation as described in Section 7.5.5 of API 1604. **Section 2.1** of this Work Plan specifies backfill procedures.
- Disconnect and remove the vent line, if present and accessible, in accordance with Section 7.5.6 of API 1604.
- Liquid waste materials generated during the tank closure will be containerized and stored in the south parking lot and secured. Soil and other solid waste generated during the tank closure shall either be placed in a roll-off or truck with a tight-fitting opaque cover (per 6 NYCRR 364-3.3(d)), or on top of and covered with polyethylene sheeting secured at the base and along the top of

the pile with heavy objects (e.g., concrete blocks) in the south parking lot pending waste characterization and landfill approval.

- Soil and liquids (if any) will be disposed of off-site in accordance with **Section 2.1** above. In addition, wastes not previously characterized (e.g., sludge or liquids encountered in the tanks, if any) will be characterized through sampling and analysis in compliance with 40 CFR 261.20 through 40 CFR 261.24 and 6 NYCRR Part 371.
- Note: The tanks will not be entered for any reason as part of the tank abandonment.

2.6 Vapor Mitigation and Monitoring

The vapor mitigation process involves installing an SSD system that uses a fan-powered vent and piping to draw vapors from the soil beneath the building's slab (i.e., essentially creating a vacuum beneath the slab) and discharging the vapors to the atmosphere. This results in lower sub-slab air pressure relative to indoor air pressure, which prevents the infiltration of sub-slab vapors into the building. The goal of an SSD system is to create a sufficient pressure differential to reverse the flow of sub-slab soil vapor into the building. The current building is relatively open and, therefore, likely does not draw as much negative pressure as a well-sealed residential or office building structure. However, the fans need to draw sufficient pressure to overcome the swing in barometric pressures.

Implementing the vapor mitigation and monitoring element of the Site remedy will involve the following:

- The tenant will need to move stored materials and products to enable the SSD system Contractor to access the areas for the SSD system piping installation and for the floor to be inspected.
- Inspect the concrete floor throughout the first floor of the building for cracks, and seal substantial cracks identified.
- Solicit contractor bids and retain a contractor.
- Conduct a design investigation in the form of a diagnostic test to determine the radius of influence of a large SSD system fan. **Appendix D** describes the diagnostic test method.
- Based on the results of the diagnostic test, design the SSD system.
- Submit an SSD System Supplemental Remedial Design/Remedial Action Work Plan ("SSD System Supplemental RD/RAWP"), including design drawings and a schedule, to NYSDEC and NYSDOH for review and respond to NYSDEC's/NYSDOH's comments until receipt of regulatory approval. Upon NYSDEC's and NYSDOH's approval of the SSD System Supplemental RD/RAWP, install the SSD system. The initial system will be installed within the main warehouse (source area). The SSD fans will be equipped with a remote sensor to alert the operation and maintenance (O&M) contractor when a fan is not operational.
- After 4 weeks of SSD system operation, conduct a building-wide indoor air investigation to determine whether the SSD system reduced TCE concentrations to acceptable TCE concentrations (2 micrograms per cubic meter [$\mu g/m^3$] or less) or if the SSD system warrants expansion. The post-installation investigation and recommendations for the SSD system expansion will be summarized in a post-installation investigation report for NYSDEC's review, which, if deemed warranted, will include the SSD system expansion design. The post-installation data will be evaluated to assess whether an additional vapor investigation is warranted for the Van Hook Service building north of the Site.
- If system expansion is deemed necessary, expand the SSD system to cover additional areas of the building.

- Conduct a second confirmatory round of indoor air sampling during the heating season.
- Following the post-installation investigation and, if necessary, SSD system expansion, prepare an SSD System Construction Completion Report (CCR), including an SSD System O&M Plan, for NYSDEC review. Respond to NYSDEC's comments on the SSD System CCR until receipt of regulatory approval. At a minimum, the SSD System O&M Plan shall include inspecting the floor seals, ensuring the fans are operating, and preparing a Vapor Intrusion Monitoring Plan (as an appendix). Further details of the SSD System O&M Plan are provided in **Section 2.8.4**.
- Implement the SSD System O&M Plan, including the aforementioned inspection and monitoring program.
- Incorporate the SSD System O&M Plan into an updated ISMP (i.e., incorporate the SSD System O&M Plan into the ISMP prepared as part of the Remedial Action CCR).

2.7 In Situ Thermal Treatment

ISTT is a common remediation technology used to destroy or volatilize CVOCs in soil and groundwater. The treatment area will be an 8,000 sf area as described in the PDI Report (EHS Support and Gnarus, 2022b), as shown on **Figure 4**.

The current tenant stores equipment and supplies throughout the central warehouse of the Site where the ISTT is to be implemented, which, unless the inventory is moved, will make it impracticable to implement ISTT. In addition, access to the building must be provided by the building owner before implementing ISTT. Therefore, based on the access restrictions, it is uncertain when the ISTT will be able to be implemented. As such, this Work Plan provides an overview of the ISTT process and, when access is foreseeable, the steps to be taken to solicit proposals, retain an ISTT contractor, prepare an ISTT-specific Supplemental Remedial Design/Remedial Action Work Plan (the "ISTT Supplemental RD/RAWP"), implement the remedy, and begin the associated groundwater monitoring.

2.7.1 In Situ Thermal Treatment Overview

Although there are various methods to apply heat to the subsurface for purposes of VOC remediation, the two most common are electrical resistance heating (ERH) and thermal conductive heating (TCH), which are each briefly described below.

2.7.1.1 ERH Overview

ERH produces an electrical current between electrodes installed vertically into the subsurface. The electrical current generates heat as movement of the current meets resistance from the soil. The gases produced by the thermal treatment are collected by vapor extraction wells and treated in an ex situ treatment unit typically using granular activated carbon (GAC) or thermal oxidation. The treatment continues until soil and groundwater remedial goals or asymptotic conditions are met. The technology is effective in fractured bedrock and also is more effective in less permeable soil than other in situ technologies.

2.7.1.2 TCH Overview

As with ERH, in the TCH process heat is generated with electricity using resistive principles. However, the TCH process relies on the resistive properties of a metal rod rather than the bulk soil. A typical

heater assembly consists of a U-shaped metal rod approximately 0.5 inch in diameter that is installed in a section of sealed well casing. The heating element is electrically isolated from the steel well casing using ceramic insulators. The hot heater element transfers radiant heat to the steel casings that are installed with sealed bottoms within the formation. Heat transfers by conduction from the casing to the surrounding soil and groundwater. The temperature is raised to above the boiling point of water to generate steam, which rises due to density differences. A vapor recovery system is used to capture the steam, which is then condensed. Upon condensation, the steam's latent heat is then transferred to the cooler media, thereby resulting in convective heat transfer. Heating continues until steam condensation no longer occurs. The gases produced by the thermal treatment are collected by vapor extraction wells and treated in an ex situ treatment unit typically using GAC or thermal oxidation. The treatment continues until soil and groundwater remedial goals or asymptotic conditions are met. The heating process is effective in both saturated and unsaturated portions of the subsurface.

2.7.2 Contractor Solicitation and Retention

After Site access is procured, the responsible party or its representative will prepare a request for proposal with contractual and technical requirements for distribution to prospective contractors. The contractor proposal requirements will include a description of the proposed ISTT installation and operation and costs to install, operate, monitor, and remove the treatment system for each element of the ISTT RAWP outlined below. Based on the contractor proposal evaluation, the responsible party will retain an ISTT contractor and enter into a contract for the work.

2.7.3 In Situ Thermal Treatment Supplemental Remedial Design/Remedial Action Work Plan

The responsible party will retain a New York State-licensed professional engineer (PE) to prepare the ISTT Supplemental RD/RAWP in concert with the ISTT Contractor. At a minimum, the ISTT Supplemental RD/RAWP will include the following information:

- ISTT Contractor Work Plan, including design drawings, to provide:
  - Equipment description
  - ISTT equipment layout, including utility installation
  - Utility clearance
  - Heating element and extraction well installation procedures
  - Thermal components and piping
  - Vapor recovery system
  - Liquid and vapor treatment
  - Temperature, vacuum, and, if necessary, electrical resistivity monitoring
  - System controls
  - Sitewide evaluation of preferential pathways that potentially may allow vapor to migrate to other parts of the building or off-site during the ISTT implementation
  - ISTT operation, including equipment prove-out, startup, operations, hazard mitigation, monitoring, inspections, and maintenance)
  - Details for indoor air sampling and/or screening during active treatment to ensure that unacceptable exposures to Site workers is not occurring
  - Recordkeeping and reporting
- Inspection of the concrete floor throughout the first floor of the building for cracks, and seal substantial cracks identified.

- Permit requirements (e.g., air permit, wastewater discharge permit, and, if necessary, an underground injection control permit)
- Site preparation and mobilization
- Remedial action goals, which may be contractual-specified standards (e.g., 1 milligram per kilogram total CVOCs in soils within the treatment area)
- Confirmation soil and groundwater sampling, including procedures described in an ISTT QA Project Plan to be appended to the ISTT RAWP
- Company- and site-specific HASPs for consultants and contractors implementing ISTT
- Decommissioning and Site restoration
- Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and Site management of the remedy as per DER-31 (NYSDEC, 2010b). The ISTT Supplemental RD/RAWP will incorporate the major green remediation components from DER-31 (NYSDEC, 2010b) as outlined in Section 1.5.1.

The ISTT Supplemental RD/RAWP will be submitted to NYSDEC for review. The responsible party or its representative will respond to the NYSDEC's comments and resubmit the ISTT Supplemental RD/RAWP and continue to respond to NYSDEC's comments until the ISTT Supplemental RD/RAWP is approved.

2.7.4 ISTT Implementation and Construction Completion Report

The ISTT contractor will implement the ISTT in accordance with the NYSDEC-approved ISTT Supplemental RD/RAWP under a New York State-licensed PE's oversight. The ISTT work will be described in an ISTT CCR that complies with DER-10 Subchapter 5.8 to be submitted to NYSDEC for review. The responsible party or its representative will respond to the NYSDEC's comments and resubmit the ISTT CCR and continue to respond to NYSDEC's comments until the ISTT CCR is approved. The ISTT CCR will include an updated ISMP, including a Groundwater Monitoring Plan. Further details of the Groundwater Monitoring Plan are provided in **Section 2.8.3** below.

If the ISTT is the final step in the remediation, the responsible party will submit a FER, in compliance with DER-10 Section 5.8, describing all elements of the remedy instead of the ISTT-specific CCR. The FER will include an updated environmental easement and site-wide SMP covering all aspects of the remedy, as described in **Section 2.8.2** below. If the ISTT is not the final step in the remediation (e.g., ISTT is implemented before the SSD system installation), then an ISMP will be prepared instead of an SMP.

2.8 Engineering and Institutional Controls/Post Construction Plans

The AROD requires an institutional control in the form of an environmental easement and an ISMP, as described below. The environmental easement must be signed by the property owner before it can be recorded in the Monroe County Clerk's Office.

2.8.1 Institutional and Engineering Controls

The responsible party will prepare institutional and engineering controls in the form of an environmental easement for the Site that will:

- Require the responsible party or the Site owner to complete and submit to NYSDEC a periodic certification of institutional and engineering controls in accordance with 6 NYCRR Part 375-1.8 (h)(3).

- Limit the use and development of the controlled property to commercial and/or industrial use, as defined by 6 NYCRR Part 375-1.8(g), although land use is subject to local zoning laws.
- Prohibit the use of groundwater as a source of potable or process water.
- Require engineering controls to be operated, maintained, and inspected on at least an annual basis, which will be specified in the ISMP and will include the Site cover system, SSD system components, groundwater monitoring wells, and Site land use.
- Require groundwater and vapor intrusion monitoring to be conducted on at least an annual basis in accordance with the Groundwater Monitoring Plan and SSD System O&M Plan, which will include a Vapor Intrusion Monitoring Plan, to be appended to the updated ISMP.
- Require data and information pertinent to Site management to be reported at the frequency and manner defined in the ISMP.
- Require future activities on the Site that will disturb remaining contaminated material to be conducted in accordance with the ISMP.
- Operation, maintenance, and monitoring (OM&M) of the site cover systems and SSD system as defined in the ISMP.
- Require access to the Site to agents, employees, or other representatives of the State of New York with reasonable prior notice to assure compliance with the environmental easement.
- Include a legal description of the Site.

The responsible party or its representative will prepare the environmental easement following the NYSDEC's environmental easement template that can be accessed at:

- https://www.dec.ny.gov/docs/remediation_hudson_pdf/easement.pdf.

2.8.2 Site Management Plan

After completing all aspects of the remedy, the responsible party or its representative will prepare a Site-wide SMP that will supersede the ISMP. At a minimum, the Site-wide SMP will include an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the Site and details the steps and media-specific requirements necessary to ensure the following institutional and engineering controls remain in place and effective:

- Institutional Controls: The Environmental Easement discussed in **Section 2.8.1**.
- Engineering Controls: The soil cover and the SSD system discussed in **Section 2.3** and **Section 2.6**, respectively.

The Institutional and Engineering Control Plan shall include, but may not be limited to:

- An Excavation Work Plan which details the provisions for management of future excavations in areas of remaining contamination
- Descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions
- A provision for further investigation and remediation should large-scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible; the nature and extent of contamination in areas where access was previously limited or unavailable will be immediately and thoroughly investigated pursuant to a plan approved by NYSDEC
- Requirement to follow the CPP through any ongoing remediation and OM&M
- Any necessary remediation will be completed prior to, or in association with, redevelopment

- A provision, should redevelopment occur, to ensure the property owner does not allow soil exceeding Protection of Groundwater SCOs to remain below storm water retention basin or infiltration structures
- A provision for the property owner to demolish the on-site building if and when it becomes unsafe or inactive or vacant
- A provision for the responsible party or the property owner to operate the SSD system in accordance with the SSD System O&M Plan
- A provision that, should a building foundation or building slab be removed in the future, for the property owner to design and install a cover system consistent with that described in **Section 2.3** of this Work Plan in areas where the upper 1 ft of exposed surface soil exceeds the applicable SCOs
- Provisions for the management and inspection of the cover systems and SSD system (engineering controls) in accordance with the ISMP
- Maintaining Site access controls and NYSDEC notification
- The steps necessary for periodic reviews and certification of the institutional and/or engineering controls

The responsible party or its representatives will prepare two monitoring plans to be appended to the ISMP and Site-wide SMP, as applicable: (1) Groundwater Monitoring Plan to assess the performance and effectiveness of the ISTT remedy; and (2) SSD System O&M Plan (including the Vapor Intrusion Monitoring Plan) to assess the performance and effectiveness of the vapor mitigation system. The following discussion describes the contents of each plan.

2.8.3 Groundwater Monitoring Plan

The Groundwater Monitoring Plan shall include, but may not be limited to:

- Site background, geology, and hydrogeology
- Purpose of the Groundwater Monitoring Plan
- Groundwater sample collection locations
- Scope of the groundwater sampling
- A schedule of monitoring and frequency of monitoring report submittals to NYSDEC
- A QAPP that includes project organization, data quality objectives, well installation and sampling procedures, sample custody and management, analytical parameters and methods, field and laboratory QC checks, data reduction/assessment, data validation, and reporting. Appendices to the QAPP will include but not be limited to a CAMP and chain-of-custody forms

2.8.4 Vapor Intrusion O&M Plan

The Vapor Intrusion O&M Plan shall include, but may not be limited to:

- SSD system description
- Plan objectives
- SSD system operational requirements
- A schedule of monitoring and frequency of monitoring report submittals to NYSDEC
- A Vapor Intrusion Monitoring Plan, to include the following:
  - Procedures for inspecting the floor seals and, if necessary, making necessary repairs
  - Sub-slab vapor and indoor air sample locations

- Scope of sampling
- A QAPP that includes: project organization, data quality objectives, well installation and sampling procedures, sample custody and management, analytical parameters and methods, field and laboratory quality control checks, data reduction/assessment, data validation, and reporting. Appendices to the QAPP will include but not be limited to a chain-of-custody form

2.9 Health and Safety

The consultant overseeing the work and the remedial contractors conducting the work will prepare HASPs in accordance with 29 CFR 1910.120. At a minimum, the HASPs will include the following information required by the OSHA Hazardous Waste Operations and Emergency Response Standard (40 CFR 1910.120[b][4]):

- A safety and health risk or hazard analysis for each Site task and operation required as part of the remedial activities
- Personal protective equipment to be used by employees for each of the Site tasks being conducted
- Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment to be used
- Site control measures
- Decontamination procedures
- An emergency response plan for safe and effective responses to emergencies, including the necessary personal protective equipment and other equipment
- Pre-entry briefing to be held prior to initiating any Site activity, and at such other times as necessary to ensure that workers are apprised of the HASP and that the HASP is being followed
- Provisions for inspections by the Site safety and health supervisor and, to the extent required, mechanisms in place to correct deficiencies in the effectiveness of the HASP

The HASP(s) will be reviewed by all on-site personnel and will be maintained on-site at all times when the PDI or related activities are conducted. Both the contractors and the consulting firm overseeing the work will have HASPs. A copy of the Site HASP for the work described in this Work Plan is provided as **Appendix E**. HASPs will need to be prepared for future work to ensure compliance with applicable OSHA regulations.

3 Permits

This section includes the permits, if any, for the cover system construction, dry well cleaning, UST closure, SSD system installation, and ISTT.

3.1 Soil Removal, Cover Systems, and Dry Well Cleaning Permits

The Contractor shall confirm that no permits are required for the soil removal, cover systems, and dry well cleaning.

3.2 UST Closure Permit

Before and following the tank abandonments, the responsible party will work with the property owner to complete, sign, and submit the appropriate permanent tank closure abandonment forms in accordance with 6 NYCRR 613-1.9.

3.3 Vapor Mitigation Installation Permits

The Contractor will obtain an electrical permit before the SSD system installation. In addition, the responsible party or its representative will verify that neither a NYSDEC air registry permit nor a Monroe County Short-term Discharge air permit is required. If either (or both) permits are required, either the Contractor or the responsible party will obtain the necessary permits for the SSD system before the installation commences.

3.4 In Situ Thermal Treatment Permits

The following permits will be required for the ISTT installation and operation:

- Electrical permit
- Extraction and monitoring well permits
- An NYSDEC air permit
- A Monroe County Specialty Short-term Discharge Permit for the discharge of treated condensate

4 RD/RA Project Schedule

The draft project schedule, contingent on access and coordination with the Site owner and tenant, is attached as **Table 4**.

The optimum sequence for the work, as shown in **Table 4**, is to conduct the ISTT before the SSD system installation for two reasons:

1. The ISTT will remove the source of the VOCs and, thereby, potentially limit the extent of the SSD system.
2. The SSD system involves excavating sumps beneath the building floor and installing vertical extraction piping surrounded by gravel. These sumps and piping could act as preferential flow pathways during the ISTT implementation; thereby, reducing the efficacy of the ISTT.

In addition, the extraction wells installed for the ISTT could potentially be incorporated into the SSD system design. Therefore, if access from the property owner and tenant can be obtained to enable ISTT to be implemented before the SSD system, then the responsible party will submit a post-ISTT vapor intrusion investigation work plan to NYSDEC for review and approval that will propose collecting vapor intrusion data to determine the extent of the SSD system. In addition, if the SSD system is installed before implementing ISTT, the schedule will be updated and submitted to NYSDEC for review and approval.

5 References

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Tables

Table 1
Chronology of Site Investigations and Remedial Actions
Former Sargent and Greenleaf Site 828132
24 Seneca Avenue, Rochester, NY

Investigation	Consultant / Agency	Date of Report
Oil and Hazardous Materials Site Evaluation	Haley & Aldrich	July 1989
Analytical Data Report	General Testing Corporation	February 2, 1993
Level 2 Environmental Site Assessment	Rizzo Associates, Inc.	April 13, 1993
Report on Environmental Investigations	Haley & Aldrich	September 14, 1993
Groundwater Monitoring Well Sampling Results	GZA GeoEnvironmental	September 30, 1996
Bedrock Supply Well Sampling Results	GZA GeoEnvironmental	September 30, 1996
Phase II Environmental Investigation	Anson Environmental Ltd.	October 1996
Voluntary Cleanup Program Investigation Report for July 1998 Field Work	Anson Environmental Ltd.	December 9, 1988
Remedial Investigation, Environmental Restoration Project	O'Brien & Gere	February 2011
Supplemental Remedial Investigation, Environmental Restoration Project	O'Brien & Gere	May 2012
Supplemental Soil and Vapor Intrusion Sampling, Environmental Restoration Project	O'Brien & Gere	October 2014
Record of Decision	NYSDEC	March 2016
Chlorinated Volatile Organic Compound Pre-Design Investigation and Remedy Evaluation	EHS Support, LLC and Gnarus Advisors, LLC	December 14, 2022
Amended Record of Decision	NYSDEC	June 22, 2023
Chlorinated Volatile Organic Compound Vapor Intrusion Investigation	EHS Support, LLC and Gnarus Advisors, LLC	July 14, 2023

Note:
NYSDEC = New York State Department of Environmental Conservation

Table 2
Groundwater Elevation Measurements
Former Sargent and Greenleaf Site 828132
24 Seneca Avenue, Rochester, NY

							2/25/2020		October 2020		4/27/2021			5/12/2021		
Monitoring Well ID	Screened Unit	Northing	Easting	Ground Surface Elevation (ft amsl)	Historical Reference Elevation (TOC) ft amsl	Reference Elevation (TOC) ft amsl	DTW ft	Groundwater Elevation ft amsl	DTW	Groundwater Elevation ft amsl	DTW	DTB	Groundwater Elevation ft amsl	DTW	DTB	Groundwater Elevation ft amsl
MW-1[1]	Bedrock				454.58	454.58		454.58		454.58	Inaccessible			Inaccessible		
MW-3	Bedrock	1162646.16	1408353.14		459.13	459.39		459.39		459.39	17.17	34.85	442.22	17.64	34.85	441.75
MW-4	Bedrock	1162983.03	1408327.57		455.96	456.09		456.09	16.4	439.69	15.83	34.51	440.26	16.04	34.51	440.05
MW-5	Bedrock				452.37	452.37		452.37		452.37	11.91	34.35	440.46	12.19	34.35	440.18
MW-6	Bedrock				453.96	453.96		453.96		453.96	11.90	34.60	442.06	13.14	34.60	440.82
MW-7	Bedrock	1162781.99	1408609.02		457.70	457.88		457.88		457.88	9.94	34.57	447.94	10.34	34.57	447.54
MW-8	Bedrock				454.20	454.20		454.20		454.20	8.69	34.45	445.51	9.43	34.45	444.77
MW-9	Bedrock	1162621.91	1408519.2		460.54	462.62		462.62	17.49	445.13	17.21	30.80	445.41	17.22	30.80	445.40
MW-10	Bedrock	1162752.75	1408450.16	458.76	458.49	458.81	16.39	442.42	17	441.81	16.69	34.69	442.12	17.13	34.69	441.68
MW-11	Bedrock	1162609.992	1408696.355	458.81	458.49	458.49		458.49		458.49	Paved Over			Paved Over		
MW-12	Bedrock	1162453.26	1408642.15	461.47	461.19	461.49		461.49		461.49	15.49	34.71	446.00	16.35	34.71	445.14
MW-13	Bedrock	1162906.52	1408492.28	458.091		457.907								16.34	35.07	441.57
MW-14	Bedrock	1162840.75	1408440.03	458.243		457.991								17.22	34.70	440.77
MW-15	Bedrock	1162912.32	1408403.29	458.126		457.844								17.24	34.56	440.60
RIZ-1	Unconsolidated Material				NA	NA										
RIZ-2	Unconsolidated Material				NA	NA										
RIZ-3	Unconsolidated Material				453.64	453.64										
RIZ-4[1]	Unconsolidated Material				454.55	454.55										
RIZ-5	Unconsolidated Material				NA	NA										
RIZ-6	Unconsolidated Material				458.61	458.61										
RIZ-7	Unconsolidated Material				455.93	455.93					8.82	14.45	447.11	8.95	14.45	446.98
RIZ-8	Unconsolidated Material				455.97	455.97					Destroyed			Destroyed		
RIZ-9[2]	Unconsolidated Material				458.30	458.30			7.1	451.20	6.58	10.45	451.72	7.79	10.45	450.51
OW101	Unconsolidated Material				457.74	457.74										

Notes:
DTB = depth to bottom
DTW = depth to water
ft = feet
ft amsl = feet above mean sea level
NA = information not available
NG = not gauged
TOC = top of casing
Elevation data provided by the City of Rochester from topographic and boundary survey completed at the Site November 12, 2008.
1 = Top of Curb Box elevation used for RIZ-4 and MW-1 because access was not available to survey the top of riser elevation at the time of the City's survey.
2 = Approximate elevation provided by O'Brien & Gere by measuring difference between top of steel standpipe casing and top of PVC riser.

Table 3
Detected Analytes in Groundwater – April and May 2021
Former Sargent and Greenleaf Site 828132
24 Seneca Avenue, Rochester, NY

	Well Location	MW-3		MW-4	MW-5	MW-6	MW-7	MW-8	MW-9
	Sample ID	MW-3_20210428	DUP-1_20210428	MW-4_20210428	MW-5_20210428	MW-6_20210428	MW-7_20210427	MW-8_20210427	MW-9_20210428
	Sample Collection Date	28 Apr 2021	28 Apr 2021	28 Apr 2021	28 Apr 2021	28 Apr 2021	27 Apr 2021	27 Apr 2021	28 Apr 2021
	Sample Type Code	N	FD	N	N	N	N	N	N
Chemical Name	NYSDEC Groundwater Quality Standard (GQS)	Result (µg/L) Qual	Result (µg/L) Qual	Result (µg/L) Qual	Result (µg/L) Qual	Result (µg/L) Qual	Result (µg/L) Qual	Result (µg/L) Qual	Result (µg/L) Qual
VOLATILE ORGANIC COMPOUNDS									
1,1-Dichloroethane	**5**	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U	0.2 U	0.4 U
1,1-Dichloroethene	**5**	0.2 U	0.2 U	**1.0 J**	0.2 U	0.2 U	1 U	0.2 U	0.4 U
1,2-Dichloroethane	**0.6**	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U	0.2 U	0.4 U
1,4-Dioxane	**1**[1]	13 U	13 U	13 U	13 U	13 U	65 U	13 U	26 U
2-Hexanone	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U	0.2 U	0.4 U
Acetone	--	5 U	5 U	5 UJ	5 UJ	5 U	25 UJ	5 UJ	10 U
Benzene	**1**	**4.1**	**4.1**	**1.0**	0.2 U	0.2 U	1 U	0.2 U	0.4 U
Bromodichloromethane	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U	0.2 U	0.4 U
Carbon Disulfide	**60**	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	2.1 U	0.42 U	0.84 U
Chloroform	**7**	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	1.2 U	0.24 U	0.52 J
Chloromethane	**5**	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	1.4 U	0.28 U	0.56 U
cis-1,2-Dichloroethene	**5**	**1.1**	**1.1**	**190**	0.23 U	0.23 U	**270**	**25**	**91**
Cyclohexane	--	**18**	**16**	0.26 UJ	0.26 UJ	0.26 U	1.3 UJ	0.26 UJ	0.52 U
Ethylbenzene	**5**	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U	0.2 U	0.4 U
Isopropylbenzene (Cumene)	**5**	**7.6**	**7.7**	0.2 U	0.2 U	0.2 U	1 U	0.2 U	0.4 U
M,P-Xylene	--	**2.5**	**2.4**	0.2 U	0.2 U	0.2 U	1 U	0.2 U	0.4 U
Methyl Ethyl Ketone	--	0.78 U	**1.1 J**	0.78 U	0.78 U	0.78 U	3.9 U	0.78 U	1.6 U
Methyl Isobutyl Ketone	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U	0.2 U	0.4 U
Methyl Tert-Butyl Ether	--	**98**	**96**	**2.4**	**48**	0.2 U	1 U	0.2 U	0.4 U
Methylcyclohexane	--	**17**	**15**	0.2 UJ	0.2 UJ	0.2 U	1 UJ	0.2 UJ	0.4 U
Methylene Chloride	**5**	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	3.3 U	0.65 U	1.3 U
O-Xylene (1,2-Dimethylbenzene)	**5**	**0.48 J**	**0.51 J**	0.2 U	0.2 U	0.2 U	1 U	0.2 U	0.4 U
Styrene	**5**	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U	0.2 U	0.4 U
Tetrachloroethylene	**5**	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	1.1 U	**0.3 J**	0.42 U
Toluene	**5**	**1.1**	**0.97 J**	0.2 U	0.2 U	0.2 U	1 U	0.2 U	0.4 U
trans-1,2-Dichloroethene	**5**	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**1 J**	**0.31 J**	3.1
Trichloroethylene	**5**	0.2 U	0.2 U	**15**	0.2 U	0.2 U	**440**	**31**	**140**
Vinyl Chloride	**2**	**0.86 J**	**0.9 J**	**100**	0.2 U	0.2 U	1 U	1.7	1.1 J

Table 3
Detected Analytes in Groundwater – April and May 2021
Former Sargent and Greenleaf Site 828132
24 Seneca Avenue, Rochester, NY

Well Location		**MW-10**	**MW-12**	**MW-13**	**MW-14**	**MW-15**		**RIZ-7**	**RIZ-9**
Sample ID		**MW-10_20210428**	**MW-12_20210427**	**MW-13_20210512**	**MW-14_20210512**	**MW-15_20210512**	**DUP-01_20210512**	**RIZ-7_20210427**	**RIZ-9_20210428**
Sample Collection Date		**28 Apr 2021**	**27 Apr 2021**	**12 May 2021**	**12 May 2021**	**12 May 2021**	**12 May 2021**	**27 Apr 2021**	**28 Apr 2021**
Sample Type Code		**N**	**N**	**N**	**N**	**N**	**FD**	**N**	**N**
Chemical Name	**NYSDEC Groundwater Quality Standard (GQS)**	**Result (µg/L) Qual**	**Result (µg/L) Qual**	**Result (µg/L) Qual**	**Result (µg/L) Qual**	**Result (µg/L) Qual**	**Result (µg/L) Qual**	**Result (µg/L) Qual**	**Result (µg/L) Qual**
VOLATILE ORGANIC COMPOUNDS									
1,1-Dichloroethane	**5**	40 U	0.2 U	**0.24 J**	**2.1**	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloroethene	**5**	40 U	0.2 U	**140 J**	**60** J	**7.9 J**	**8.3 J**	0.2 U	0.2 U
1,2-Dichloroethane	**0.6**	40 U	0.2 U	0.2 U	**3.9**	0.2 U	0.2 U	0.2 U	0.2 U
1,4-Dioxane	**1**[1]	**3.3**	13 U	13 U	13 U	**0.52**	**0.5**	13 U	13 U
2-Hexanone	--	40 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Acetone	--	1000 UJ	5 UJ	5 U	**7.4**	5 U	5 U	5 UJ	5 UJ
Benzene	**1**	40 U	0.2 U	**0.98 J**	2.3	0.2 U	0.2 U	0.2 U	0.2 U
Bromodichloromethane	--	40 U	0.2 U	**0.2 U**	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Carbon Disulfide	**60**	84 U	0.42 U	0.42 U	**0.45 J**	0.42 U	0.42 U	0.42 U	0.42 U
Chloroform	**7**	**180 J**	0.24 U	**0.24 U**	**0.26 J**	**0.24 U**	**0.24 U**	0.24 U	0.24 U
Chloromethane	**5**	56 U	0.28 U	0.28 U	**0.28 J**	**0.42 J**	**0.42 J**	0.28 U	0.28 U
cis-1,2-Dichloroethene	**5**	**670**	0.23 U	**9200**	**11000 J**	**890**	**840**	0.23 U	0.23 U
Cyclohexane	--	52 UJ	0.26 UJ	0.26 U	0.26 U	0.26 U	0.26 U	0.26 UJ	0.26 UJ
Ethylbenzene	**5**	40 U	0.2 U	0.2 U	**0.25 J**	0.2 U	0.2 U	0.2 U	0.2 U
Isopropylbenzene (Cumene)	**5**	40 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
M,P-Xylene	--	40 U	0.2 U	**0.2 U**	**1.2 J**	0.2 U	0.2 U	0.2 U	0.2 U
Methyl Ethyl Ketone	--	160 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U
Methyl Isobutyl Ketone	--	40 U	0.2 U	0.2 U	**3.6 J**	0.2 U	0.2 U	0.2 U	0.2 U
Methyl Tert-Butyl Ether	--	40 U	**0.62 J**	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Methylcyclohexane	--	40 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U	0.2 UJ	0.2 UJ
Methylene Chloride	**5**	130 U	0.65 U	0.65 U	**5.1**	0.65 U	0.65 U	0.65 U	0.65 U
O-Xylene (1,2-Dimethylbenzene)	**5**	40 U	0.2 U	0.2 U	**0.6 J**	0.2 U	0.2 U	0.2 U	0.2 U
Styrene	**5**	40 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Tetrachloroethylene	**5**	42 U	0.21 U	**0.56 J**	5.3	**0.52 J**	**0.51 J**	0.21 U	0.21 U
Toluene	**5**	40 U	0.2 U	**0.34 J**	2.8	0.2 U	0.2 U	0.2 U	0.2 U
trans-1,2-Dichloroethene	**5**	40 U	0.2 U	**72 J**	**100** J	**9.6 J**	**9.4 J**	0.2 U	0.2 U
Trichloroethylene	**5**	**16000**	0.2 U	**3800**	**92000 J**	**770**	**710**	0.2 U	0.2 U
Vinyl Chloride	**2**	40 U	0.2 U	**1600**	**170**	**80**	**87**	0.2 U	0.2 U

Table 3
Detected Analytes in Groundwater – April and May 2021
Former Sargent and Greenleaf Site 828132
24 Seneca Avenue, Rochester, NY

Notes:
Bold = analyte detected above laboratory reporting limit or method detection limit
= result exceeds a NYSDEC GQS
-- = indicates no screening criteria for compound or not analyzed
µg/L = microgram per liter
B = Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
D = Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range.
FD = Indicates Field Duplicate
GQS = Groundwater Quality Standards and Guidance Values
J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
MDL = Method Detection Limit
N = Normal field sample
NYSDEC = New York State Department of Environmental Conservation
RL = Reporting Limit
Qual = Indicates Qualifier Flag
U = Indicates the analyte was analyzed for but not detected.

[1] Indicates screening value is the New York State Maximum Contaminant Level (MCL) adopted on August 26, 2020.

Table 4
Remedial Design/Remedial Action Schedule
Former Sargent and Greenleaf Site 828132
24 Seneca Avenue, Rochester, NY

Activity	Triggering Event	Duration	Comments
Excavation and Backfill; Site Cover System; Cleaning and Closure of Underground Structures; Underground Storage Tank Abandonment			
Contractor Solicitation	NYSDEC RD/RA Approval and Site Access	3 months	RFP, site visit, proposal preparation, selection and contracting
Remedial Action Construction	Contract Execution	4 months	Can only implement from March through October
Remedial Action Construction Completion Report and ISMP	Site Cover System Construction Completion	2 months	
In Situ Thermal Treatment			
ISTT Contractor Solicitation	NYSDEC RD/RA Approval and Site Access	3 months	RFP, site visit, proposal preparation, selection and contracting
ISTT System Design/RAWP	Contract Execution	3 months	ISTT RAWP to be submitted to NYSDEC for review
ISTT Installation and Implementation	NYSDEC ISTT RAWP Approval	9 to 12 months	
Groundwater Monitoring	Demobilization	Ongoing	Monitoring as specified in Groundwater Monitoring Plan (included with RAWP)
ISTT Construction Completion Report	Demobilization	2 months	
SSD System Installation, Commissioning, and Startup			
Post-ISTT Vapor Intrusion Monitoring	ISTT Demobilization	1 month	If first round does not indicate mitigation following NYSDOH decision matrices for chlorinated VOCs, a second round will be conducted in the opposite season as the first.
Diagnostic Test	Vapor Intrusion Testing Indicating Mitigation	2 months	Compare chlorinated VOC results to NYSDOH Decision Matrices and conduct diagnostic test if mitigation is necessary based on matrices comparison.
SSD System Design	Diagnostic Test Completion	3 months	SSD System RAWP to be submitted to NYSDEC for review after test
SSD Contractor Solicitation	NYSDEC Approval of SSD System Design	3 months	RFP, site visit, proposal preparation, selection and contracting
SSD Contractor Installation	Contract Execution	4 months	Includes building and electrical permits
SSD Commissioning and Startup	SSD System Design Construction Completion	1 month	Includes SSD O&M Plan
SSD System Operation and Monitoring	SSD System Startup	Immediately	As specified in SSD O&M Plan
SSD System Evaluation and Expansion	3 Months After Startup	6 months	Conduct investigation 3 months following startup; Prepare report for NYSDEC review; Expand system if necessary
SSD Construction Completion Report	SSD System Design Startup Completion	2 months	
Institutional Controls and Site Management Plan			
Final Engineering Report	SSD System Startup	3 months	Submitted following full remedy completion
Draft Environmental Easement and ISMP	SSD System Startup	3 months	Submitted with Final Engineering Report
Record Environmental Easement	NYSDEC Environmental Easement & ISMP Approval	2 months	

Notes:

ISMP = Interim Site Management Plan
ISTT = in situ thermal treatment
NYSDEC = New York State Department of Environmental Conservation
O&M = operation and maintenance
RAWP = Remedial Action Work Plan
RFP = Request for Proposal
RD/RA = remedial design/remedial action
SMP = Site Management Plan

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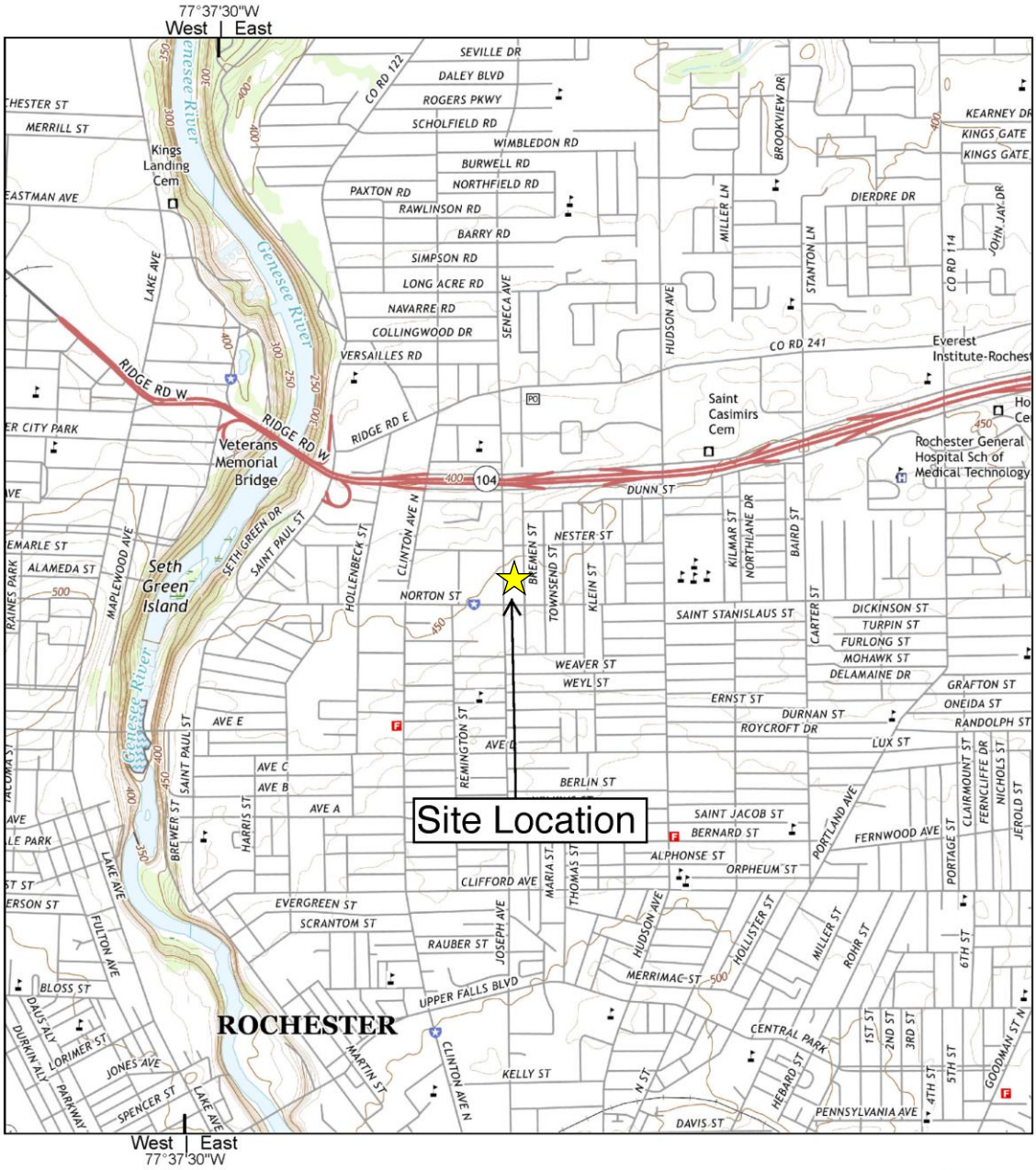
Figures



2016	0 Distance in Miles 1 1: 24,000 (1"=2,000') NAD 1983 UTM Zone 18N	Site information: Former Sargent & Greenleaf 24 Seneca Avenue Rochester, NY 14621
Unified maps show subdued modern topo features where corresponding maps of the same year were not published.	Gnarus Advisors project #SGROCNY-18023.00 HIG #2015773 completed: 05/07/2018	

Zone	Topographic Map Name	Publisher	Map Size	Base Map	Aerial Photo Topo Updates Photo Year	Inspected	Revised
East	Rochester East, NY	USGS	7½' x 7½'	2016	--	--	--
West	Rochester West, NY	USGS	7½' x 7½'	2016	--	--	--

FIGURE 1

Site Location Map

24 Seneca Avenue, Rochester, New York

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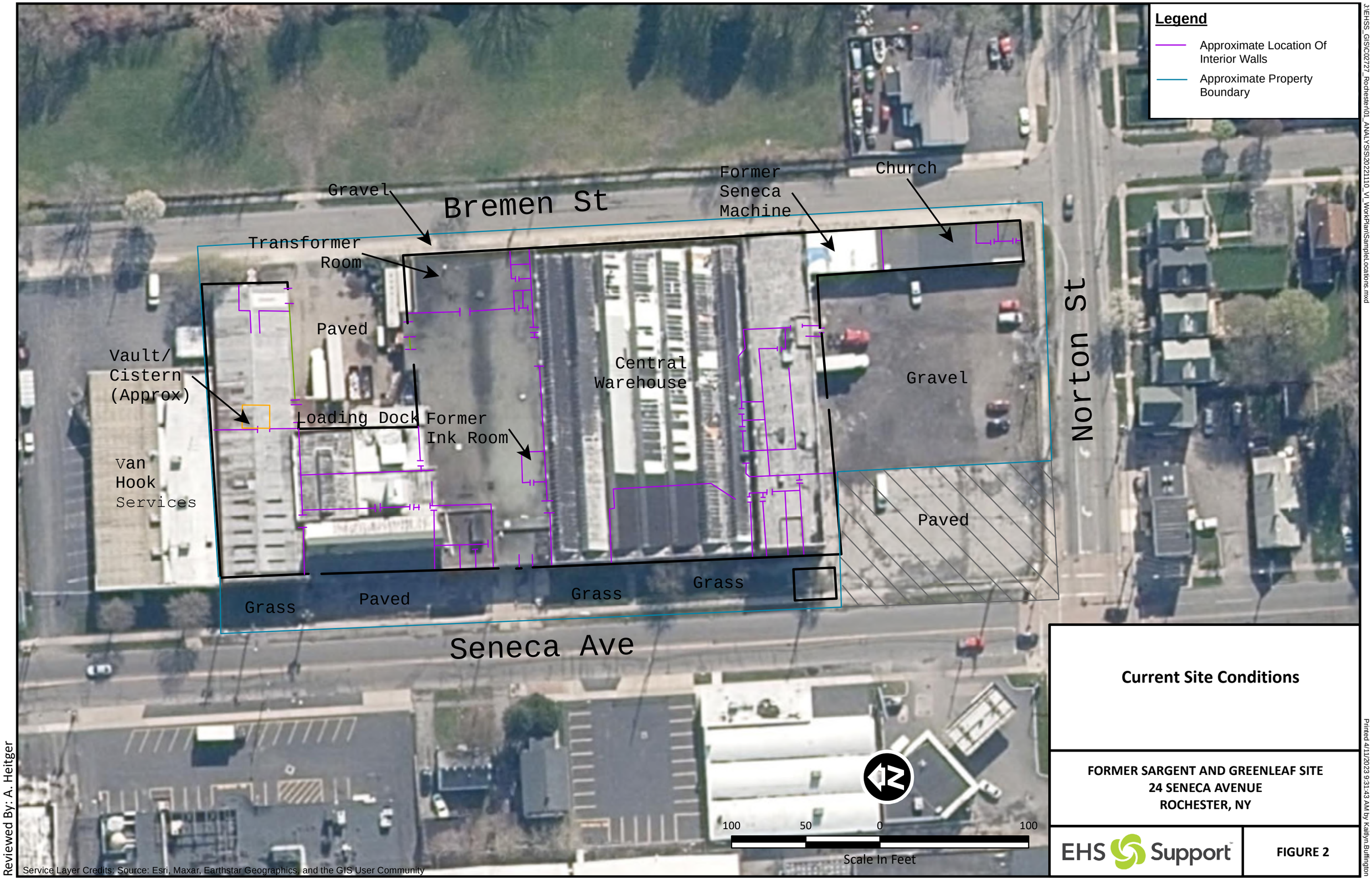

Current Site Conditions

FORMER SARGENT AND GREENLEAF SITE
24 SENECA AVENUE
ROCHESTER, NY

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FIGURE 2

Reviewed By: A. Heitger

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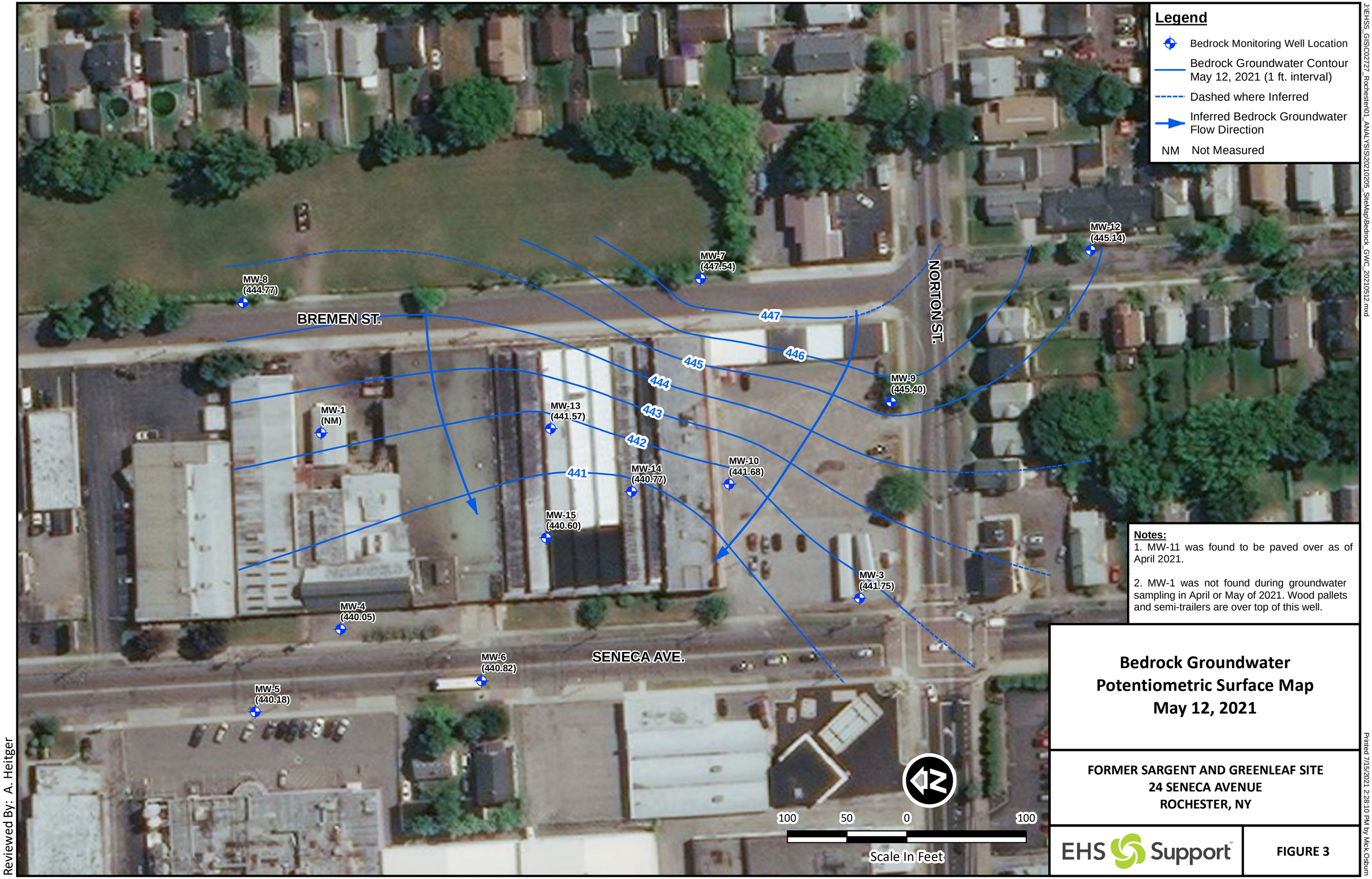

Notes:

1. MW-11 was found to be paved over as of April 2021.

2. MW-1 was not found during groundwater sampling in April or May of 2021. Wood pallets and semi-trailers are over top of this well.

Bedrock Groundwater Potentiometric Surface Map May 12, 2021

FORMER SARGENT AND GREENLEAF SITE
24 SENECA AVENUE
ROCHESTER, NY

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FIGURE 3

Reviewed By: A. Heitger

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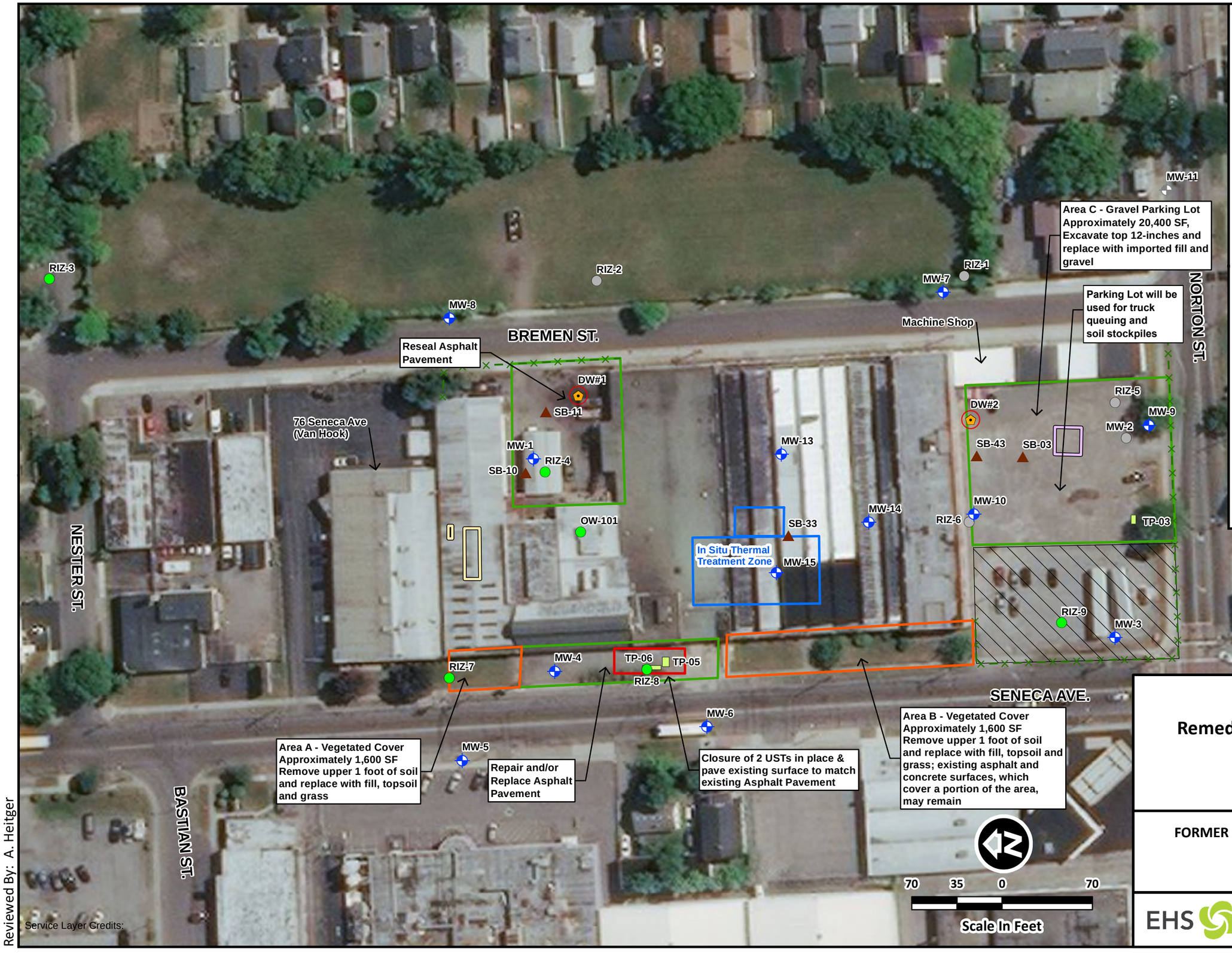

Legend

- Bedrock Monitoring Well Location
- Destroyed Bedrock Monitoring Well Location
- Shallow Monitoring Well Location
- Destroyed Shallow Soil Monitoring Well
- Grossly Impacted Soil Borings (Remediate)
- Cover System Area
- Existing Chain Link Fence
- Remove & Replace Existing Topsoil Cover (1')
- Closure of 2 USTs in place & pave existing surface to match exising Asphalt Pavement
- Test Pits
- SSD System Location (TBD)
- In Situ Thermal Treatment
- 574 Norton Street Parcel

Impacted Storm Drain Features

- Dry Well Structure to be cleaned and sampled

Underground Features

- Vault
- Former UST/Gas Station

Remedial Action, SSD System, and ISTT Areas

FORMER SARGENT AND GREENLEAF SITE
24 SENECA AVENUE
ROCHESTER, NY

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FIGURE 4

Reviewed By: A. Heitger

Service Layer Credits:

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Appendix A Quality Assurance Project Plan (QAPP)

Quality Assurance Project Plan

24 Seneca Avenue, Site No. 828132
Rochester, New York

Prepared for:

Stanley Black & Decker

Prepared by:

EHS Support℠
GNARUS ADVISORS LLC

May 2025

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Acronyms

µg/kg	microgram per kilogram
CAMP	community air monitoring program
CFR	Code of Federal Regulations
DUSR	data usability summary report
EDD	electronic data deliverable
ELAP	Environmental Laboratory Accreditation Program
EQuIS	Environmental Quality Information System
GC/MS	gas chromatography/mass spectrometry
GPS	global positioning system
HASP	health and safety plan
MS/MSD	matrix spike/matrix spike duplicate
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
PFAS	per- and polyfluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PID	photoionization detector
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RA	remedial action
RD	remedial design
RPD	relative percent difference
SCO	soil cleanup objectives
SVOC	semi-volatile organic compound
USEPA	United States Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

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1 Introduction

EHS Support LLC ("EHS Support"), in cooperation with Gnarus Advisors LLC ("Gnarus"), on behalf of Stanley Black & Decker, Inc. ("Stanley Black & Decker"), plans to implement the Remedial Design/Remedial Action (RD/RA) Work Plan ("Work Plan") at the former Sargent & Greenleaf building located at 24 Seneca Avenue in Rochester, New York ("Site"). A Site location map is provided in **Figure 1** of the Work Plan. This Quality Assurance Project Plan (QAPP) is being provided as an appendix to that Work Plan and has been prepared for the implementation of sampling conducted for RD or RA in accordance with the Work Plan. The sampling will involve collecting soil samples to be analyzed by an off-site laboratory to evaluate the concentrations of chemical constituents in soil at the Site, at the off-site location(s) to be used for backfill, and to characterize solid waste to be disposed of off-site.

As detailed in the Work Plan, the activities are anticipated to include the following components:

- Mobilizing equipment and personnel
- Collecting soil samples with a hand auger and/or drill rig
- Removing an upper 12 inches of asphalt and gravel
- Removing and replacing the upper 12 inches of topsoil and grass
- Closing two underground storage tanks (USTs) in place
- Installing a sub-slab depressurization system and monitoring of sub-slab vapor and indoor air (to be addressed in a separate work plan with a dedicated QAPP)
- Installing an in situ thermal treatment system (to be addressed in a separate work plan with a dedicated QAPP)
- Cleaning and confirmation sampling of two dry wells
- Demobilizing equipment and personnel

These activities are described in the Work Plan and will be conducted in accordance with applicable New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) guidance and regulations.

This QAPP sets forth the quality assurance/quality control (QA/QC) procedures to be followed during the execution of the RD/RA work, including procedures for sampling, chain of custody, laboratory analysis, data reduction and reporting, internal quality control, preventive maintenance, and corrective action. The purpose of the QAPP is to ensure the generation of valid data or, if the data are not valid, to identify the validity issues and determine appropriate corrective actions.

2 Project Organization

A flowchart depicting the project organization, including the flow of information from the client, project management team, field team, and laboratory, is provided in **Figure 1**.

2.1 Project Participants

The personnel responsible for the QA of the field sampling and analysis portion of the project are as follows:

- Stanley Black & Decker Project Representative – Amanda Gonzalez
- Project Director/Manager – John Simon, Gnarus
- Project Hydrogeologist – Anton Heitger, EHS Support
- Project Site-Specific Health and Safety Officer – Michael Burge, EHS Support
- Project Health and Safety Director – Gregg Hicks, EHS Support
- Project Engineer – Kristin A. VanLandingham, P.E., EHS Support
- Sampling Personnel – Anton Heitger and or designee, EHS Support
- Quality Assurance Chemist – Amanda Cover or designee, Environmental Standards, Inc.
- Laboratory Project Manager – Meghan Pedro
- Laboratory Custodian – Greg LaForce or designee

2.2 Participant Responsibilities

This section describes the relationships among the project participants.

2.2.1 Stanley Black & Decker Project Representative

Amanda Gonzalez is the Stanley Black & Decker Project Representative for the RD/RA activities. Ms. Gonzalez will review documents and provide comments to the project team. She is also responsible for coordinating the field activities with the project director and ensuring that the work area is available for the necessary field activities.

2.2.2 Project Director/Manager

John Simon will serve as the Project Director/Manager and, as such, will work with the project team to develop the overall project strategy. Mr. Simon will also serve as the primary point of contact with the client. He will be responsible for ensuring the field activities are conducted in accordance with the Work Plan and that the appropriate personnel are assigned to complete the project tasks. Mr. Simon and Ms. VanLandingham will be responsible for the quality of documents submitted to NYSDEC.

2.2.3 Project Hydrogeologist

Anton Heitger will be responsible for managing the contractors to ensure that the fieldwork is performed in accordance with the Work Plan and QAPP. Mr. Heitger or his designee will be responsible for the following activities:

- RD/RA activities and tasks

- Coordinating with the laboratory project manager before shipping sample containers from and to the laboratory
- Either directly collecting or overseeing the collection of the soil or waste characterization samples
- Supervising or serving as the field sample custodian
- Ensuring that field measurements and sample collection follow the Work Plan and this QAPP
- Identifying and resolving problems occurring during the fieldwork

2.2.4 Site-Specific Health and Safety Officer

Michael Burge will serve as the project Site-specific health and safety officer. As the Site-specific health and safety officer, Mr. Burge is responsible for ensuring that the Site-specific health and safety plan (HASP) is adhered to by all field personnel under his direction. In addition, Mr. Burge is responsible for overall compliance with the Occupational Safety and Health Administration (OSHA) Hazardous Site Worker Regulations (40 Code of Federal Regulations [CFR] 1910.126) and other applicable regulations.

Each day of field activities must begin with a "tailgate" meeting to discuss the planned activities, the job safety risks involved, and precautions to be taken. The Site-specific health and safety officer or an appropriate designee must record the time of the tailgate meeting and attendees in the field notebook.

2.2.5 Project Health and Safety Director

Gregg Hicks will serve as the project health and safety director and will be responsible for developing the HASP and directing EHS Support's health and safety program.

2.2.6 Project Engineer

Kristin A. VanLandingham, P.E., is a registered professional engineer in the state of New York and will serve as the project engineer. Ms. VanLandingham will be responsible for ensuring that the project design and implementation are performed in accordance with accepted engineering practices and New York State laws, regulations, and guidance. In addition, Ms. VanLandingham will be responsible for the quality of documents submitted to NYSDEC.

2.2.7 Sampling Personnel

Experienced engineers, geologists, hydrogeologists, environmental scientists, and/or environmental technicians employed by EHS Support will conduct the sampling tasks set forth in the RD/RA Work Plan and this QAPP. Their responsibilities will include following sample collection, documentation, shipment, chain of custody, and health and safety procedures during all aspects of the field activities. The sampling personnel will report to the Project Hydrogeologist.

2.2.8 Quality Assurance Chemist

Amanda Cover of Environmental Standards, Inc. will serve as an independent third-party consultant, specializing in evaluating the quality of laboratory data, and will be retained to review the data packages produced by the laboratory and validate the data. Environmental Standards, Inc. will prepare a

validation report discussing the usability of the data and identify any concerns, issues, and, if warranted, corrective measures.

2.2.9 Laboratory Project Manager

Meghan Pedro of ALS Global Laboratory (Rochester, New York) will serve as the laboratory project manager. Ms. Pedro will be responsible for the laboratory's adherence to this QAPP (which will be provided to the laboratory). She will coordinate the shipment, acceptance, and laboratory analyses with Mr. Heitger. The laboratory project manager or her designee will be responsible for ensuring the laboratory assesses the data and prepares the required analytical data package.

2.2.10 Laboratory Custodian

Greg LaForce of ALS Global Laboratory (Rochester, New York) will designate an individual to be responsible for properly logging and handling the samples delivered to ALS Global Laboratory.

The intent is that ALS Global Laboratory will provide analytical services. If technical or logistical issues necessitate the use of other laboratories, appropriate laboratories will be selected, and relevant certifications will be provided in subsequent submissions.

Data will be reported by via an electronic data deliverable (EDD) that is compatible with EHS Support's Environmental Quality Information System (EQuIS) database. A full data package, including raw data, will also be provided by the laboratory in electronic PDF format. Summary tables of data results accompanied by the PDF data reports will be provided to NYSDEC in applicable reports.

3 Data Quality Objectives

The data quality objectives and data assessment techniques will follow relevant United States Environmental Protection Agency (USEPA) guidance titled *Guidance on Systematic Planning Using the Data Quality Objectives Process* (USEPA, 2006). This guidance outlines seven steps for developing data quality objectives. Each step is provided below with a description of how the step will be applied to the RD/RA implementation.

1. State the Problem – Soil at the Site contains volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCS), and inorganics at concentrations above the NYSDEC Restricted Use Commercial Soil Cleanup Objectives for Protection of Public Health (Commercial SCOs).[1]
2. Identify the Goal of the Study (Project) – Confirm that soil remaining in the dry wells after cleaning meet Commercial SCOs, verify that the soil obtained for backfill meets the requirements specified in 6 NYCRR Part 375-6.7(d) and DER-10 Table 5.4(e)10, and the solid waste are characterized in accordance with analysis in compliance with 40 CFR 261.20 through 40 CFR 261.24 and 6 NYCRR Part 371.
3. Identify Information Inputs – The Work Plan scope identifies the approximate number of confirmation soil samples, but the number of samples will be determined once the RD is implemented. In addition, the Work Plan scope specifies the number of backfill samples. The number of waste characterization samples will be determined by the solid waste disposal facility's requirements.
4. Define the Boundaries of the Study (Project) – The project boundaries extend from the northern portion of the building to the southern parking lot between Seneca Avenue and Breman Street.
5. Develop the Analytical Approach – Samples will be collected in accordance with industry guidance, as described in this QAPP, and will be analyzed by an Environmental Laboratory Accreditation Program (ELAP)-certified laboratory for VOCs, SVOCs, 1,4-dioxane, per- and polyfluoroalkyl substances (PFAS), inorganics, pesticides, and polychlorinated biphenyls (PCBs). In addition, waste characterization samples will be analyzed for parameters listed in 40 CFR 261.20 through 40 CFR 261.24 and 6 NYCRR Part 371, and as required by the solid waste disposal facility's requirements.
6. Specify Performance or Acceptance Criteria – Acceptance criteria will be satisfied by the development of valid data that can be used to compare with the Commercial SCOs for soil samples used for confirmation purposes and also to ensure the backfill material meets Commercial SCOs, PFAS guidance values[2] for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) and, for waste characterization samples, the hazardous waste characteristics specified 40 CFR 261.20 through 40 CFR 261.24 and 6 NYCRR Part 371.
7. Develop Plan for Obtaining Data – The procedures for field sampling, sample management, laboratory analysis, documenting field activities, and reporting, consistent with NYSDEC guidance, are specified in this QAPP.

[1] The Commercial Restricted Use SCOs for Protection of Human Health are provided in *Table 375-6.8(b)*; and *CP-51 / Soil Cleanup Guidance*, NYSDEC, October 21, 2010.

[2] Guidance Values for Anticipated Site Use are provided in the Soil Samples Results table in the *Sampling, Analysis, and Assessment of per- and polyfluoroalkyl substances (PFAS) Under NYSDEC's Part 375 Remedial Programs*. NYSDEC. April 2023.

4 Soil Sampling Procedures

This section describes the sampling of soil that the Project Hydrogeologist or Sampling Personnel will collect for analyses in accordance with the attached **Table 1** and described below.

4.1 Confirmation, Waste Characterization, and Backfill Soil Samples

Soil samples will be collected with new, disposable sampling equipment on a one-time use basis. The soil samples will be described for lithology and the description will be recorded in a field notebook. The horizontal location of each soil sample will be measured using a tape measure from two fixed points and recorded in the field notebook or with a hand-held device equipped with global positioning system (GPS).

The Project Hydrogeologist or Sampling Personnel will collect the soil samples for the parameters listed in the Work Plan and placed into the containers specified in **Table 1**. Samples designated for VOC analysis will be using preservation techniques established by the USEPA in SW 846 Method 5035 and following NYSDEC guidance issued on October 17, 2012 (NYSDEC, 2012). The samples will be analyzed for low-level VOCs (detection limits below 200 microgram per kilogram [µg/kg]) following USEPA Method 8260, and unless there are issues with interferences, the laboratory will use sodium bisulfite as a preservative. Samples for other the analytes listed in **Table 1** will be placed in laboratory-provided sample containers as listed in the table. All samples will be placed into a laboratory cooler chilled with ice.

The soil samples will be designated by the letters “CS” for confirmation samples, “WC” for waste characterization samples, or “BS” for backfill samples and then a two-digit number beginning with soil sample number 01 (CS01 will be the first soil confirmation sample). The soil samples will be numbered by location and the sample depth interval in feet within parenthesis. Thus, a sample collected from the base of a dry well from a depth of 0 to 1.0 foot will be designated as sample number “CS01 (0-1.0)”.

The samples will be handled and shipped in accordance with the QA protocol provided in **Section 5**, including trip blanks and equipment blanks, and analyzed for the parameters following the methods listed in **Table 1**.

4.5 Waste Characterization and Backfill Source Samples

The Work Plan specifies collecting waste characterization and backfill source samples. Two types of waste characterization and backfill source samples will be collected: composite samples and discrete samples (for VOC analysis only). The composite soil samples will be comprised of three to five discrete samples placed into a new stainless-steel mixing bowl to be used on a one-time use basis. The sample aliquots will be thoroughly mixed with a new stainless-steel spoon. The composite sample will be designated as “WC01.” In addition, a sample from the interval deemed to have the highest VOC concentration, as determined by photoionization detector (PID) measurements, will be submitted for VOC analysis for waste characterization purposes (it is not appropriate to composite samples for VOC analysis). This sample will be designated as “WC-SOIL 02 (VOCs).”

4.6 Particulate Air Monitoring

As part of the community air monitoring program (CAMP), real-time monitoring equipment capable of continuously measuring particulate matter less than 10 micrometers in size and VOCs will be used (Appendix C of the Work Plan). The monitoring equipment will be equipped with a data logger, and the logs will be provided as an appendix to the CAMP monitoring documentation included with the PDI and pilot-scale study report. As required by New York State guidance, the equipment must be equipped with an audible alarm to indicate exceedance of the action level set forth in the generic CAMP. The CAMP sampling will be conducted immediately downwind of the drilling area. In addition, CAMP sampling will be conducted at an upwind location. Field personnel will also note whether there are olfactory indications of odors emanating off-site and, if so, stop field activities and implement corrective measures to control odors.

The samples will be handled and shipped in accordance with the QA protocol provided in **Section 5** and analyzed for VOCs following the method listed in **Table 1**.

5 Sample Custody and Management

5.1 Sample Containers, Preservation, and Holding Times

The sample containers, preservation methods, and laboratory holdings times for soil samples are provided in **Table 1**. The holding times begin when the sample is received at the laboratory.

The laboratory will provide pre-cleaned sample containers, including preservative when necessary, sent in the same coolers used for the samples. The coolers will be chilled with a minimum of 1 gallon of ice placed into double-bagged Zip-lock bags to prevent leakage.

After sampling, each sample container shall be wiped clean with a disposable paper towel. Then each sample container will be labeled with the following information:

- Project name
- Sample number (described above)
- Analysis
- Date
- Time
- Sampler's name
- Preservative

5.2 Chain-of-Custody Procedures

A person will be deemed to have custody of samples when the samples are in their possession or control. The sampling crew will retain the chain-of-custody forms until the samples are shipped or hand delivered to the laboratory. If a situation arises where the samples will not be within sight of the person, the samples must be stored in a secured area, such as a locked vehicle, to prevent tampering by third parties.

A chain-of-custody form will be completed for each sample shipment. At a minimum, the chain-of-custody form will include the following information in the title block:

- Project name
- Project number
- Contact person and telephone number

In addition, the chain-of-custody form will include the following information:

- Environmental media sampled
- Sample identification number
- Sample time
- Sample date
- Analytical procedure
- Sample preservative
- Sampler's name

Entries on the chain-of-custody form must be made in indelible ink and not pencil or other erasable marking. If an incorrect entry is made, the information will be crossed out with a single strike mark with initials and the date next to the marked-out text.

A signature block with the sample custodian's signature, printed name, and date must be included on the form. In addition, the chain-of-custody form will include signature blocks for subsequent custodians.

Before shipping from the project site, a copy of the chain-of-custody form will be made and placed in the project files. Then the original form will be placed in the shipping box. Each box will then be sealed with a chain-of-custody seal, which will be signed and dated. Finally, each shipping box will be taped shut.

The samples will be delivered to the analytical laboratory by hand delivery, ground courier, or overnight shipping service. The receiving party must sign the chain-of-custody form and provide a copy of the signed form with the laboratory report. An example of the ALS Global chain-of-custody form is provided in **Appendix A**.

The Project Hydrogeologist will develop a project-specific database of anticipated sample collection as chain-of-custody forms are prepared at the end of each day in which samples are shipped. The Project Hydrogeologist will communicate with the Laboratory Custodian during the sampling event to verify that each group of samples that are shipped are received at the laboratory. Immediately after sample receipt, the laboratory will provide the Project Hydrogeologist with a summary of the samples received at the laboratory and assigned analytical methods. The Project Hydrogeologist will review the sample receipt documentation to verify that all samples and analytical methods were identified by the laboratory. Missing samples or incorrect information will be conveyed to the Laboratory Custodian by the Project Hydrogeologist.

5.3 Field Documentation

The purpose of field documentation is to record the activities and Site conditions to enable a third party who is not present to understand both the Site conditions, such as weather and other nearby activities, and RD/RA activities that took place on-Site. The overall objective of field documentation is to avoid relying on a person's memory to be able to retrospectively understand the field activities.

Each field supervisor or technician will make daily notes in the individual's own field notebook dedicated to the project. Entries must be made in indelible ink and not pencil or other erasable marking. If an incorrect entry is made, the information will be crossed out with a single strike mark with initials and the date next to the marked-out text.

The field notebook must be stored in a secured, locked location when not in use and should be placed in the project files at the end of that stage of the field activities. In addition, electronic copies of each page used should be made and stored in secure, redundant computer files (such as a cloud-based file system or corporate server with an off-site backup).

The cover or the first page of the field notebook should contain the following information:

- Professional's name
- Professional's employer

- Project name
- Project number
- Contact information (in case the field notebook is lost and recovered)

The notes made for each day must begin on a fresh page and must include, but are not limited to, the following information:

- Date
- Outdoor weather conditions (temperature, barometric pressure, cloud cover, humidity, and precipitation)
- Indoor weather conditions (temperature, barometric pressure, humidity)
- Personnel present on-Site, including name and affiliation
- Nearby activities (such as construction)
- Time log of the field activities as the day progresses with new entries as locations or activities move from one location or activity to another
- Sample information, including location, sample identification, time, type, and field measurements
- Field duplicate designations
- Equipment used to make field measurements, along with the date and time of calibration, if required
- Information related to sample documentation, including:
    - Dates and method of sample shipments
    - Chain-of-custody record numbers
    - Courier air bill number
    - Other pertinent information and activities

6 Laboratory Analytical Methods

For the chemical analyses, the laboratory will follow the October 2016 NYSDEC Analytical Services Protocol document, including the required method detection limits (NYSDEC, 2016). **Table 1** provides laboratory methods for soil analyses.

If difficulties arise in achieving the specified method detection limits due to a particular sample matrix, the Laboratory Manager must notify the Project Manager. To achieve those detection limits, the laboratory must use all appropriate cleanup procedures in an attempt to retain the project required detection limits. If a sample requires dilution due to high levels of target analytes or interferences, the laboratory must document all initial analyses (if possible) and secondary dilution results. Dilution will be permitted only to bring target analytes within the linear range of calibration; however, in the case of metals analysis, dilution may be required for non-target analytes that interfere with target analytes.

Analytical methods cited in this QAPP will be used unless future information suggests that other methods may be more beneficial for accomplishing the project goals. Different analytical methods may be evaluated and used in cases such as:

- Lower limits are needed for comparison with screening criteria
- Technical or logistical issues necessitate the use of other methods
- Another method seems the most technically sound choice in the future
- Other project-specific reasons

If analytical methods not cited in this QAPP are used, pertinent information regarding the reason for the method change will be provided to the NYSDEC, as will relevant laboratory certifications. Note that the method used is included along with the sample name and date in the analytical records in the database.

Analytical methods cited in this QAPP may also have been updated since the QAPP was prepared. Using a newer, approved version of an existing method (e.g., using Method 8260C rather than Method 8260B) is common. This updated version is **not** considered a new analytical method; therefore, documentation noting the updated method version is not required.

7 Quality Control Requirements

This section outlines the QC requirements and includes the QA indicators.

7.1 Quality Assurance Indicators

The data quality indicators used to evaluate conformance with the project data quality objectives are generally defined in terms of six parameters: precision, accuracy, representativeness, completeness, comparability, and sensitivity. This section provides a brief overview of these parameters.

7.1.1 Precision

Precision is a measure of the reproducibility of sample results; it is maximized by consistent adherence to sampling and analytical procedures. Precision can be assessed by comparing duplicate matrix spike recoveries, duplicate laboratory control spike recoveries, laboratory replicates, and/or field duplicate sample results.

Checks for field measurement precision will include obtaining duplicate field measurements.

7.1.2 Accuracy

Accuracy is the deviation of a measurement from the true value. Both field and analytical accuracy will be monitored through initial and continuing calibration of instruments. In addition, internal standards, blank spikes, and surrogates (system monitoring compounds) will be used to assess the accuracy of the laboratory analytical data.

7.1.3 Representativeness

Representativeness is the degree to which data accurately represent Site conditions. It is dependent on variability in sampling and analysis, as well as in the environmental media at the site. This QAPP presents the rationale for sample locations and quantities and includes field sampling and laboratory analytical methods. Adherence to the sampling plan and to specified field and laboratory analytical methods is intended to provide representative data. This parameter cannot be directly evaluated during data validation.

7.1.4 Completeness

Completeness is defined as the percentage of valid data in a data set. Completeness of a data set will be calculated by comparing the number of valid sample results generated with the total number of results generated. The measurement performance criterion specified in this QAPP is 90 percent.

7.1.5 Comparability

Comparability is the degree of confidence with which one data set can be compared with another. Comparability will be maintained by consistently using the same sampling methods, analytical methods,

and QA/QC procedures as well as by using appropriately trained personnel. This parameter cannot be directly evaluated during data validation.

7.1.6 Sensitivity

Sensitivity refers to the capability of a method and/or instrument to reliably quantitate a given analyte at a given concentration. It is important that this concentration (at which the instrument and/or method is capable of reliable quantitation) not be greater than the applicable standard or guidance value.

8 Field and Laboratory Quality Control Checks

This section outlines the field QC samples and analytical laboratory QC checks.

8.1 Field Quality Control Samples

The field analytical equipment will be calibrated immediately before use each day. The calibration procedures will conform to the manufacturer's standard instructions. This calibration will ensure that the equipment is functioning within the allowable tolerances established by the manufacturer and required by the project. The Project Hydrogeologist or Sampling Personnel will maintain records of all instrument calibration in the field notebook.

Calibration procedures for the instruments used for monitoring health and safety hazards (e.g., PID and explosimeter) will be provided in the HASP. More frequent calibration may be needed depending on conditions encountered in the field.

The CAMP (Appendix C of the Work Plan) requires the use of a real-time particulate monitoring instrument capable of measuring 10-micron particulate matter. This equipment is factory-calibrated and thus does not require calibration in the field.

8.1.1 Field Duplicates

A field duplicate will be collected at a minimum frequency of 1 for every 20 samples (5 percent) per type of sample (i.e., 1 duplicate per 20 soil samples).

8.1.2 Equipment Rinse Blanks

Only dedicated, disposable sampling equipment will be used, therefore, equipment blanks are not required.

8.1.3 Trip Blanks

The laboratory will place a VOC trip blank in the sample cooler with the other VOC sample containers before being sent to the Site. The trip blank will consist of 40-milliliter vials containing distilled, deionized water, which accompanies the other water sample bottles into the field and back to the laboratory. A trip blank will be included with each shipment of water samples for VOC analysis. The trip blank will be analyzed for VOCs to assess any contamination from sampling, transport, storage, and internal laboratory procedures. The trip blank samples will be analyzed at a frequency of one per each shipment of VOC samples.

8.2 Analytical Laboratory Quality Control Checks

Internal laboratory QC checks will be used to monitor data integrity. These checks will include method blanks, blank spikes, internal standards, surrogate samples, calibration standards, and reference standards.

8.2.1 Method Blanks

Method blanks will be used to assess potential sources of contamination in the analytical process. The method blank is prepared at the start of the analytical process and includes all phases of the laboratory analysis. One method blank will be analyzed with each associated analytical series with no more than 20 samples.

8.2.2 MS/MSDs

Matrix spike/matrix spike duplicates (MS/MSDs) will be used to measure the accuracy of analyte recovery from the sample matrices and will be site-specific. MS/MSD pairs will be analyzed by the laboratory at a minimum frequency of one MS/MSD for every 20 samples or once per week, whichever is more frequent.

If the laboratory results indicate that the matrix spike recoveries are outside of the quality control limits, the control sample and surrogate spike recoveries will be evaluated to identify the reason for the deviation and assess the effect on the reported sample results.

8.2.3 Surrogate Spikes

A surrogate compound is a chemical that is not naturally occurring (or rarely occurs in nature) but has properties that are similar to the analytes of interest. Surrogates are principally used as an internal check for samples analyzed by gas chromatography/mass spectrometry (GC/MS) and GC methods. The surrogate spike is added to the samples before purging or extraction. The surrogate spike provides information related to the accuracy of an analytical method on a sample-specific basis.

If the laboratory results indicate that the surrogate spike recoveries are outside the specified QC limits, the recoveries will be evaluated to identify the potential sources of the deviation, possibly considering other control information. Surrogate spike compounds will be determined based on the information provided by the USEPA analytical methods for the chemicals specified for analysis.

8.2.4 Laboratory Duplicates

Laboratory duplicates separate aliquots of a sample that are then analyzed as a separate sample.

8.2.5 Calibration Standards

The laboratory will use calibration standards to assess the stability of the instrument and to provide information regarding the ability of the instrument to provide valid quantification results. The laboratory will analyze calibration standards at the beginning and end of each analytical series, as well as throughout a series containing a large number of samples (i.e., over 20 samples).

In general, the need for calibration standards analysis is specified by the analytical method. In analyses where internal standards are used, a calibration check standard will only be analyzed at the beginning of an analytical series. If results of the calibration check standard exceed specified tolerances, then all samples analyzed since the last acceptable calibration check standard will be reanalyzed. Laboratory

instrument calibration standards will be determined utilizing the guidance provided in the analytical methods.

8.2.6 Internal Standards

The laboratory will monitor internal standard areas and retention times for organic analyses performed by GC/MS methods. Method-specified internal standard compounds will be spiked into all field samples, calibration standards, and QC samples after preparation and before analysis.

If internal standard areas in one or more samples exceed the tolerances specified in the analytical method, the cause will be investigated, and if warranted, the instrument will be recalibrated. In this case, all affected samples will be reanalyzed.

8.2.7 Reference Standards

Reference standards are standards of known concentration and independent in origin from the calibration standards. The intent of reference standard analysis is to provide insight into the analytical proficiency within an analytical series. This includes preparation of calibration standards, validity of calibration, sample preparation, instrument setup, and the premises inherent in quantitation. Reference standards will be analyzed at the frequencies specified within the analytical methods.

9 Data Precision Assessment Procedures

This section includes the procedures for assessing the data precision.

9.1 Field Precision

Field precision is difficult to measure because of temporal variations in field parameters. However, precision will be controlled through the use of experienced field personnel, properly calibrated meters, and duplicate field measurements. Field duplicates will be used to assess the precision for the measurement system.

9.2 Laboratory Precision

Laboratory data precision for organic analyses will be monitored through the use of MS/MSD and laboratory duplicates. The precision of data will be measured by calculating the relative percent difference (RPD) by the following equation:

$$RPD = 100*(A-B) /((A+B)/2)$$

Where:
A = Analytical result from one of two duplicate measurements
B = Analytical result from the second measurement

Precision objectives for laboratory duplicate analyses are identified in the NYSDEC Analytical Services Protocol (NYSDEC, 2016).

9.3 Data Accuracy Assessment Procedures

Experienced field personnel, properly calibrated field meters, and adherence to established protocols will control the accuracy of field measurements. The accuracy of field meters will be assessed by reviewing calibration and maintenance logs.

Laboratory accuracy will be assessed via the use of surrogate spikes, internal standards, and reference standards. Where available and appropriate, QA performance standards will be analyzed periodically to assess laboratory accuracy.

Accuracy will be calculated in terms of percent recovery as follows:

$$\% Recovery = 100*(A-X)/B$$

Where:
A = Value measured in spiked sample or standard
B = True value of amount added to sample or true value of standard
X = Value measured in original sample

This formula is derived under the assumption of constant accuracy over the original and spiked measurements. If any accuracy calculated by this formula falls outside the acceptable levels, data will be evaluated to determine whether the deviation represents unacceptable accuracy, or variable, but acceptable accuracy. Accuracy objectives for surrogate recovery objectives are identified in the NYSDEC Analytical Services Protocol (NYSDEC, 2016).

9.4 Data Completeness Assessment Procedures

The laboratory will calculate the completeness of laboratory data sets by comparing the number of valid sample results generated with the total number of results generated.

Completeness = 100 x (Number valid results/Total number of results generated)

As a general guideline, overall project completeness is expected to be at least 90 percent.

9.5 Corrective Action

The corrective actions typically taken by the laboratory are described below. If the calibration, instrument performance, or blank criteria are not met, the cause of the problem will be investigated and corrected. The analytical system then will be recalibrated. As part of the laboratory's operating protocol, sample analysis does not begin until calibration, instrument performance, and blank criteria are met. If matrix spike, reference standard, or duplicate analyses are found to fall outside the acceptable limits, the cause of the issue must be researched. Then, depending on the results of the overall QC program for the sample set, the data may be accepted, accepted with qualification, or determined to be unusable. If deemed unusable, the samples either must be reanalyzed, or a new set of samples must be collected and analyzed.

9.6 Preventive Maintenance

Preventive maintenance procedures must be performed by the laboratory on all equipment used for the sample analyses. The maintenance activities must be documented in the laboratory's records.

10 Data Reduction, Assessment, and Reporting

This section outlines the data reduction, data quality assessment, data validation and data usability summary report, and data reporting.

10.1 Data Reduction

The laboratory will reduce the data produced in accordance with SW-846 protocols. The criteria used to reduce the data are specified in the analytical methods.

10.2 Data Quality Assessment

The laboratory deliverables will be NYSDEC Analytical Services Protocol Category B (NYSDEC, 2016). Data for this investigation will be evaluated and qualified in accordance with USEPA's *Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (USEPA, 2020).

The validated analytical results reported by the laboratory and validated by the third-party validator will be assigned one of the following USEPA-defined data usability qualifiers:

- U – Not detected at given value
- UJ – Estimated, not detected at given value (applied by third-party validator)
- J – Estimated value
- R – Result not useable (applied by third-party validator)
- No Flag – Result accepted without qualification

10.3 Data Validation and Data Usability Summary Report

An independent third-party QA chemist will review the laboratory data package and prepare a data validation report. The validation will conform to USEPA's *Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (USEPA, 2020). A Data Usability Summary Report (DUSR) is not required for the waste characterization sample data.

The analytical data review will be summarized by a third-party validator in a DUSR that will include a review and evaluation of all the analytical results. The DUSR will also present the results of the QC review. Reported results for QC elements will be reviewed to ensure compliance with the analytical method protocols. Not all QC elements are applicable or included for every data set. A quality check will be performed on any of the following that are relevant:

- Initial and continuing calibrations
- Blanks
- Laboratory control standards and matrix spikes
- Surrogate recoveries
- Matrix interference checks
- Field and laboratory duplicates
- Sample data
- Chain-of-custody forms
- Holding times

Any deficiencies identified during the review will be noted, and the effect on the generated data will be discussed. If warranted, the DUSR will include recommendations for resampling or reanalysis. The validated data deliverable and the DUSR will be included as appendices to the completion reports.

10.4 Data Reporting

The data package provided by the laboratory will contain all the items discussed in **Section 10.1** through **Section 10.3**. Data quality issues will be discussed in a case narrative included with the data report. A photocopy of the completed chain-of-custody forms accompanying each sample shipment will be included with the data package. The analytical data package will be accompanied by an EDD.

Data generated during the RD/RA work will be uploaded to NYSDEC's Environmental Information Management System in accordance with the NYSDEC Electronic Data Deliverable Manual, V. 4 (NYSDEC, 2018). To avoid transcription errors, data will be loaded directly into the ASCII format from the laboratory information management system. The laboratory will perform a QC check on the EDD before delivery. The original data, tabulations, and electronic media must be stored in a secure and retrievable fashion.

Data will be reported by ALS Global to EHS Support and Gnarus via an EDD that is compatible with EHS Support's EQuIS database. A full data package, including raw data, will also be provided by the laboratory in electronic PDF format. Summary tables of data results accompanied by the PDF data reports will be provided to NYSDEC in applicable reports.

11 References

NYSDEC. 2010. DER-10 / Technical Guidance for Site Investigation and Remediation. May 3.

NYSDEC. 2012. New York State (NYS) Environmental Laboratory Approval Program (ELAP) accreditation for EPA 5035 and 5035A Guidance. October 17.

NYSDEC. 2016. Analytical Services Protocol. October.

NYSDEC. 2018. Electronic Data Deliverable Manual, V. 4. November.

NYSDEC and NYSDOH. 2006. New York State Brownfield Cleanup Program, Development of Soil Cleanup Objectives, Technical Support Document, Section 7. September.

USEPA. 2006. *Guidance on Systematic Planning Using the Data Quality Objectives Process*. EPA QA/G-4. February.

USEPA. 2020. Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review. USEPA-540-R-20-005. November.

Table

Table 1
Analytical Methods and Requirements for Containers, Preservation, Volumes, and Holding Times for Soil Samples
Quality Assurance Project Plan – Former Sargent & Greenleaf Site 828132
24 Seneca Avenue, Rochester, NY

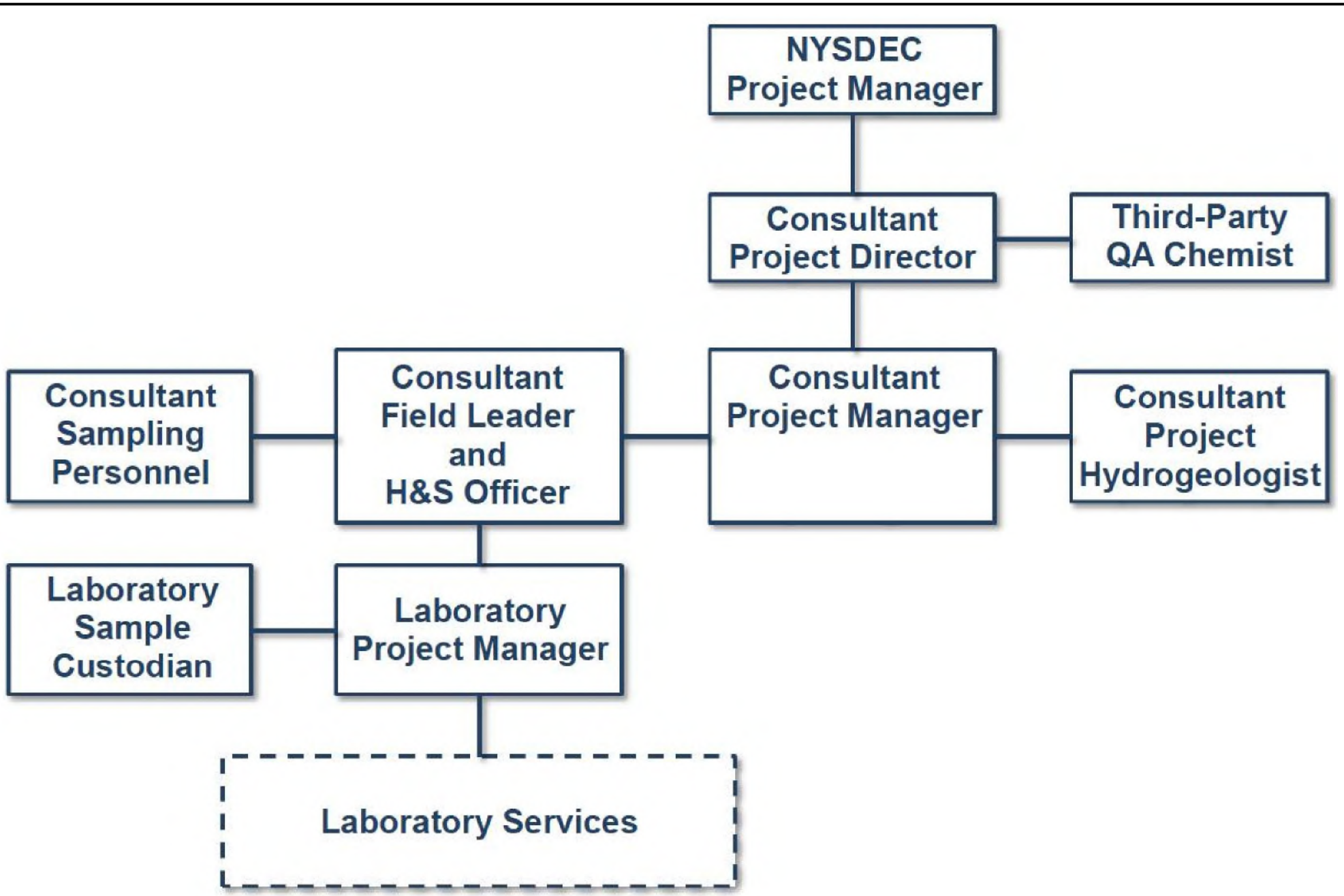
Name	Analytical Methods	Container	Preservation	Minimum Sample Volume or Weight	Maximum Holding Time
VOCs	USEPA 8260C	TerraCore samplers plus 3 x 40 mL glass vials	Methanol, DI water, and/or sodium bisulfate; Cool/4°C	15 grams	14 days
SVOCs including 1,4-dioxane	USEPA 8270D	8-oz glass jar with Teflon®-lined lid	4°C	160 grams	14 days for extraction; 40 days for analysis
Metals	USEPA 6020A	4-oz glass jar with Teflon®-lined lid	4°C	100 grams	180 days for extraction; 40 days for analysis
PFAS	USEPA 1633	250mL HDPE Container	4°C	100 grams	14 days
RCRA Waste Characteristics (VOCs)	USEPA 8260C	TerraCore samplers plus 3 x 40 mL glass vials	Methanol, DI water, and/or sodium bisulfate; Cool/4°C	40 mL	14 days
RCRA Waste Characteristics (SVOCs)	USEPA SW 846 TCLP 8270D	8-oz glass jar with Teflon®-lined lid	4°C	100 grams	14 days for extraction; 40 days for analysis
RCRA Waste Characteristics (RCRA Metals)	USEPA SW 846 TCLP 6020A and 7471B	8-oz glass jar with Teflon®-lined lid	4°C	200 grams	28 days for Mercury (7471A) and 180 days for all other metals (6020A)
RCRA Waste Characteristics (Pesticides)	USEPA SW 846 TCLP 8081B	4-oz glass jar with Teflon®-lined lid	4°C	100 grams	14 days for extraction; 40 days for analysis

Table 1
Analytical Methods and Requirements for Containers, Preservation, Volumes, and Holding Times for Soil Samples
Quality Assurance Project Plan – Former Sargent & Greenleaf Site 828132
24 Seneca Avenue, Rochester, NY

Name	Analytical Methods	Container	Preservation	Minimum Sample Volume or Weight	Maximum Holding Time
RCRA Waste Characteristics (Herbicides)	USEPA SW 846 TCLP 8151A	4-oz glass jar with Teflon®-lined lid	4°C	100 grams	14 days for extraction; 40 days for analysis
RCRA Waste Characteristics (PCBs)	USEPA SW 846 TCLP 8082A	4-oz glass jar with Teflon®-lined lid	4°C	100 grams	365 days for extraction; 40 days for analysis
RCRA Waste Characteristics (Reactive Cyanide)	USEPA SW 846 TCLP 9012A	4-oz glass jar with Teflon®-lined lid	4°C	100 grams	N/A
RCRA Waste Characteristics (Reactive Sulfide)	USEPA SW 846 TCLP 9034	4-oz glass jar with Teflon®-lined lid	4°C	100 grams	N/A
RCRA Waste Characteristics (Flashpoint)	USEPA SW 846 TCLP 1010A	4-oz glass jar with Teflon®-lined lid	4°C	200 grams	N/A
RCRA Waste Characteristics (pH)	USEPA SW 846 TCLP 9045C	4-oz glass jar with Teflon®-lined lid	4°C	25 grams	N/A

Notes:
°C = degree Celsius
DI = deionized water
mL = milliliter
N/A = not applicable
oz = ounce
PCB = polychlorinated biphenyl
PFAS = perfluoroalkyl substances
RCRA = Resource Conservation and Recovery Act
SIM = Selected ion monitoring
SVOC = semi-volatile organic compound
TCLP = toxicity characteristic leaching procedure
VOC = volatile organic compound
USEPA = United States Environmental Protection Agency

Figure


NYSDEC
Project Manager
Consultant
Project Director
Third-Party
QA Chemist
Consultant
Sampling
Personnel
Consultant
Field Leader
and
H&S Officer
Consultant
Project Manager
Consultant
Project
Hydrogeologist
Laboratory
Sample
Custodian
Laboratory
Project Manager
Laboratory Services

Appendix A ALS Environmental Chain-of-Custody Form

ALS Environmental

Field Chain-of-Custody Record

Page _____ of _____

Client Name & Address:	Project No.:	Preservation Code	Sample Matrix Code	Sample for Matrix QC	Analyses Requested								No. of Containers	Matrix Codes: W) Water B) Bulk L) Liquid F) Filter S) Soil G) Wipe C) Solid M) Media Preservation Codes: 1) Cool to 4°C 2) HCl to pH<2, 4°C 3) H_2SO_4 to pH<2, 4°C 4) HNO_3 to pH<2, 4°C 5) NaOH to pH>12, 4°C 6) ZnOAc/NaOH to pH>9, 4°C
	Project Name:													
Phone:														
FAX:	Sampler: *(Signature)*													
e-mail:														

Field Sample Number	Site ID	Date	Time	Depth	ALS Sample Number											Remarks

Possible Hazard Identification

☐ Non-Hazard ☐ Skin Irritant ☐ Rad
☐ Flammable ☐ Poison ☐ Unknown

Sample Disposal

☐ Return to Client ☐ Archive for _____ Months
☐ Disposal by Lab
(fees may be assessed if samples are retained longer than 3 months)

Requested Turn Around Time

☐ 2 Days (Rush) ☐ 7 Days (Rush) ☐ 21 Days
☐ 3 Days (Rush) ☐ 14 Days ☐ Other
(Rush = email data by COB on day due. Surcharges assessed.)

Carrier/Airbill #:

Relinquished by: *(Signature)*	Received by: *(Signature)*	Date	Time
Relinquished by: *(Signature)*	Received by: *(Signature)*	Date	Time
Relinquished by: *(Signature)*	Received by: *(Signature)*	Date	Time

Shipped to:

ALS Environmental
960 West LeVoy Drive
Salt Lake City, UT 84123
Phone: (800) 356-9135
Phone: (801) 266-7700
FAX: (801) 268-9992

White - Laboratory Copy ***Yellow - Client Copy***

Appendix B Nature and Extent of Contamination

PATH: I:\Rochester-C.11862\47362.24-Seneca-Suppl\Docs\DWG\MXD\SRI_RptSo_Excd_Restricted_SVOC.mxd

PLOT DATE: 05/01/12 10:18:25 AM ReidLS

FIGURE 2D

SB-11

Date	Depth	Analyte	Part 375 Restricted SCO: Commercial Use	Protection of Groundwater	Result	Unit
9/19/2008	8 - 9 ft	Pentachlorophenol	6,700	800	1,900 UJ1	µg/kg

SB-10

Date	Depth	Analyte	Part 375 Restricted SCO: Commercial Use	Protection of Groundwater	Result	Unit
9/19/2008	4 - 8 ft	Pentachlorophenol	6,700	800	2,300 UJ1	µg/kg

SB-43

Date	Depth	Analyte	Part 375 Restricted SCO: Commercial Use	Protection of Groundwater	Result	Unit
8/1/2011	0 - 2 ft	1,2-Benzphenanthracene	56,000	1,000	3,810	µg/kg
8/1/2011	0 - 2 ft	Benzo[a]anthracene	5,600	1,000	3,130	µg/kg
8/1/2011	0 - 2 ft	Benzo[a]pyrene	1,000	1,000	2,710	µg/kg
8/1/2011	0 - 2 ft	Benzo[b]fluoranthene	5,600	1,700	2,670	µg/kg
8/1/2011	0 - 2 ft	Benzo[k]fluoranthene	56,000	1,700	2,620	µg/kg

SB-03

Date	Depth	Analyte	Part 375 Restricted SCO: Commercial Use	Protection of Groundwater	Result	Unit
9/18/2008	10.7 - 11 ft	1,2-Benzphenanthracene	56,000	1,000	7,000	µg/kg
9/18/2008	10.7 - 11 ft	Benzo[a]anthracene	5,600	1,000	6,800	µg/kg
9/18/2008	10.7 - 11 ft	Benzo[a]pyrene	1,000	1,000	10,000	µg/kg
9/18/2008	10.7 - 11 ft	Benzo[b]fluoranthene	5,600	1,000	15,000	µg/kg
9/18/2008	10.7 - 11 ft	Benzo[k]fluoranthene	56,000	800	5,400	µg/kg

SS-01

Date	Depth	Analyte	Part 375 Restricted SCO: Commercial Use	Protection of Groundwater	Result	Unit
9/15/2008	0 - 2 in	Benzo[a]anthracene	5,600	1,000	1,400 J	µg/kg
9/15/2008	0 - 2 in	Benzo[a]pyrene	1,000	22,000	1,800 J	µg/kg
9/15/2008	0 - 2 in	Benzo[b]fluoranthene	5,600	1,700	2,600 J	µg/kg

SS-02

Date	Depth	Analyte	Part 375 Restricted SCO: Commercial Use	Protection of Groundwater	Result	Unit
9/15/2008	0 - 2 in	Benzo[a]pyrene	1,000	22,000	1,300 J	µg/kg
9/15/2008	0 - 2 in	Benzo[b]fluoranthene	5,600	1,700	1,700 J	µg/kg

SS-03

Date	Depth	Analyte	Part 375 Restricted SCO: Commercial Use	Protection of Groundwater	Result	Unit
9/15/2008	0 - 2 in	Benzo[a]anthracene	5,600	1,000	4,900	µg/kg
9/15/2008	0 - 2 in	Benzo[a]pyrene	1,000	1,000	5,800	µg/kg
9/15/2008	0 - 2 in	Benzo[b]fluoranthene	5,600	1,000	8,400	µg/kg
9/15/2008	0 - 2 in	Benzo[k]fluoranthene	56,000	1,700	3,100 J	µg/kg

TP-3

Date	Depth	Analyte	Part 375 Restricted SCO: Commercial Use	Protection of Groundwater	Result	Unit
9/17/2008	4.5 ft	1,2-Benzphenanthracene	56,000	1,000	1,800 J	µg/kg
9/17/2008	4.5 ft	Benzo[a]anthracene	5,600	1,000	2,000 J	µg/kg
9/17/2008	4.5 ft	Benzo[a]pyrene	1,000	22,000	2,000 J	µg/kg
9/17/2008	4.5 ft	Benzo[b]fluoranthene	5,600	1,700	2,100 J	µg/kg

LEGEND

- AUGUST 2011 GEOPROBE® SOIL BORING
- SURFACE SOIL SAMPLE LOCATION
- SEPTEMBER 2008 GEOPROBE® SOIL BORING
- TEST PIT

TOTAL SVOC RESULTS (ppb)

48000
36000
24000
12000
0

- 574 NORTON STREET PARCEL
- APPROXIMATE PROPERTY BOUNDARY

NOTES:

1. SCO: NYSDEC PART 375 RESTRICTED COMMERCIAL USE AND/OR PROTECTION OF GROUNDWATER
2. ONLY ANALYTICAL RESULTS EXCEEDING SCO WERE USED FOR INTERPOLATION; DATA USED FOR INTERPOLATION ARE SHOWN IN DATABOX.
3. ALL LOCATIONS ARE APPROXIMATE
4. 574 NORTON STREET PARCEL IS NOT PART OF THE 24 SENECA AVENUE PARCEL BUT IS INCLUDED IN THE RI.
5. AERIAL IMAGERY SOURCE: NYS GIS CLEARINGHOUSE, DATE APRIL 2009.

CITY OF ROCHESTER
SUPPLEMENTAL
RI REPORT
24 SENECA AVENUE
ROCHESTER, NEW YORK

GEOPROBE® SOIL BORING LOCATIONS AND SUBSURFACE SOIL SAMPLE SEMI-VOLATILE ORGANIC COMPOUND ANALYTICAL EXCEEDANCES (PART 375 RESTRICTED USE)

0 40 80 160
Feet

MAY 2012
11862.47362

O'BRIEN & GERE

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NOTE:
All sub-slab and indoor air samples co-located unless otherwise noted.

Results shown are in micrograms per cubic meter (ug/m3)

Letter before analyte name indicates NYSDOH VI Matrix Group (A, B, or C)

NYSDOH VI Matrix Group A:
1,1-DCE = 1,1-dichloroethene
cis-1,2-DCE = cis-1,2-dichloroethene
CCl4 = carbon tetrachloride
TCE = trichloroethene

NYSDOH VI Matrix Group B:
DCM = Methylene Chloride
1,1,1-TCA = 1,1,1-Trichloroethane
PCE = tetrachloroethene

NYSDOH VI Matrix Group C:
VC = Vinyl Chloride

Legend

- 2023 VI Sampling Locations
- Approximate Location Of Interior Walls
- Approximate Property Boundary
- Indoor air sample results
- Sub-slab sample results

SG-03	03/29/2023
A) 1,1-DCE	0.6
A) CCl4	0.67
A) TCE	500D
A) cis-12-DCE	0.71
B) 1,1,1-TCA	12
B) DCM	9.3
B) PCE	11
C) VC	0.17U

SG-03	03/29/2023
A) 1,1-DCE	0.18U
A) CCl4	0.39
A) TCE	3
A) cis-12-DCE	0.49
B) 1,1,1-TCA	0.91
B) DCM	1.6
B) PCE	0.28
C) VC	0.18U

SG-04	03/29/2023
A) 1,1-DCE	380
A) CCl4	18U
A) TCE	62000D
A) cis-12-DCE	67000D
B) 1,1,1-TCA	100
B) DCM	87U
B) PCE	1100
C) VC	34

SG-04	03/29/2023
A) 1,1-DCE	0.15J
A) CCl4	0.39
A) TCE	5.3
A) cis-12-DCE	1.4
B) 1,1,1-TCA	3.8
B) DCM	2
B) PCE	0.41
C) VC	0.18U

SG-05	03/29/2023
A) 1,1-DCE	0.21U
A) CCl4	0.38
A) TCE	5
A) cis-12-DCE	0.64
B) 1,1,1-TCA	3.2
B) DCM	1.9
B) PCE	0.35
C) VC	0.21U

SG-05	03/29/2023
A) 1,1-DCE	0.3
A) CCl4	0.23U
A) TCE	8.6
A) cis-12-DCE	0.85
B) 1,1,1-TCA	8.3
B) DCM	0.57J
B) PCE	4.2
C) VC	0.13J

SG-11	03/30/2023
A) 1,1-DCE	0.13J
A) CCl4	0.28
A) TCE	4.3
A) cis-12-DCE	0.33
B) 1,1,1-TCA	3.8
B) DCM	23
B) PCE	0.18J
C) VC	0.18U

SG-11	03/30/2023
A) 1,1-DCE	0.2U
A) CCl4	0.22
A) TCE	3.8
A) cis-12-DCE	0.2U
B) 1,1,1-TCA	5.4
B) DCM	0.38J
B) PCE	5.2
C) VC	0.2U

SG-12	03/30/2023
A) 1,1-DCE	0.17U
A) CCl4	0.36
A) TCE	3.1
A) cis-12-DCE	0.21
B) 1,1,1-TCA	1.5
B) DCM	12
B) PCE	0.3
C) VC	0.17U

SG-09	03/30/2023
A) 1,1-DCE	0.2U
A) CCl4	0.32
A) TCE	3.4
A) cis-12-DCE	0.23
B) 1,1,1-TCA	2.1
B) DCM	15
B) PCE	0.15J
C) VC	0.2U

SG-09	03/30/2023
A) 1,1-DCE	0.71
A) CCl4	0.33
A) TCE	38
A) cis-12-DCE	0.23U
B) 1,1,1-TCA	20
B) DCM	0.62J
B) PCE	14
C) VC	0.23U

OA-02	03/30/2023
A) 1,1-DCE	0.17U
A) CCl4	0.42
A) TCE	0.17U
A) cis-12-DCE	0.17U
B) 1,1,1-TCA	0.17U
B) DCM	0.6J
B) PCE	0.23U
C) VC	0.23U

OA-01	03/29/2023
A) 1,1-DCE	0.23U
A) CCl4	0.32
A) TCE	0.23U
A) cis-12-DCE	0.23U
B) 1,1,1-TCA	0.23U
B) DCM	3.6
B) PCE	0.23U
C) VC	0.23U

SG-01	03/30/2023
A) 1,1-DCE	3
A) CCl4	1.1U
A) TCE	12000D
A) cis-12-DCE	340
B) 1,1,1-TCA	460
B) DCM	1.7J
B) PCE	330
C) VC	1.1U

SG-01	03/30/2023
A) 1,1-DCE	0.22U
A) CCl4	0.38
A) TCE	1.6
A) cis-12-DCE	0.22U
B) 1,1,1-TCA	2.6
B) DCM	15
B) PCE	0.31
C) VC	0.22U

VH-01	03/30/2023
A) 1,1-DCE	0.16U
A) CCl4	0.37
A) TCE	1.8
A) cis-12-DCE	0.16U
B) 1,1,1-TCA	0.46
B) DCM	6.2
B) PCE	0.17
C) VC	0.16U

VH-02	03/30/2023
A) 1,1-DCE	0.17U
A) CCl4	0.28
A) TCE	0.69
A) cis-12-DCE	0.17U
B) 1,1,1-TCA	0.52
B) DCM	0.58J
B) PCE	0.55
C) VC	0.17U

VH-02	03/30/2023
A) 1,1-DCE	0.16U
A) CCl4	0.35
A) TCE	0.85
A) cis-12-DCE	0.16U
B) 1,1,1-TCA	0.42
B) DCM	5.4
B) PCE	0.16U
C) VC	0.16U

SG-02	03/30/2023
A) 1,1-DCE	0.21U
A) CCl4	0.36
A) TCE	5.9
A) cis-12-DCE	0.87
B) 1,1,1-TCA	0.93
B) DCM	150
B) PCE	0.36
C) VC	0.21U

SG-02	03/30/2023
A) 1,1-DCE	0.32
A) CCl4	0.25
A) TCE	16
A) cis-12-DCE	0.62
B) 1,1,1-TCA	11
B) DCM	1.3
B) PCE	16
C) VC	0.25U

SG-06	03/29/2023
A) 1,1-DCE	0.2J
A) CCl4	0.33
A) TCE	5000D
A) cis-12-DCE	0.32
B) 1,1,1-TCA	5.5
B) DCM	0.53J
B) PCE	2.5
C) VC	0.23U

SG-06	03/29/2023
A) 1,1-DCE	0.21U
A) CCl4	0.37
A) TCE	6.3
A) cis-12-DCE	0.65
B) 1,1,1-TCA	2.7
B) DCM	2.2
B) PCE	0.36
C) VC	0.21U

SG-08	03/29/2023
A) 1,1-DCE	0.25U
A) CCl4	0.57
A) TCE	4.9
A) cis-12-DCE	0.43
B) 1,1,1-TCA	2.3
B) DCM	2
B) PCE	0.32
C) VC	0.25U

SG-08	03/29/2023
A) 1,1-DCE	0.25U
A) CCl4	0.25U
A) TCE	150
A) cis-12-DCE	0.25U
B) 1,1,1-TCA	4.5
B) DCM	1.2U
B) PCE	2.2
C) VC	0.25U

SG-07	03/30/2023
A) 1,1-DCE	0.18U
A) CCl4	0.39
A) TCE	6.6
A) cis-12-DCE	0.44
B) 1,1,1-TCA	2.3
B) DCM	27
B) PCE	0.23
C) VC	0.18U

SG-07	03/30/2023
A) 1,1-DCE	0.29
A) CCl4	0.3
A) TCE	360D
A) cis-12-DCE	0.28
B) 1,1,1-TCA	9.8
B) DCM	0.89J
B) PCE	3.7
C) VC	0.19U

SG-10	03/30/2023
A) 1,1-DCE	0.21U
A) CCl4	0.24
A) TCE	3.1
A) cis-12-DCE	0.24
B) 1,1,1-TCA	1.6
B) DCM	12
B) PCE	0.17J
C) VC	0.21U

Bremen St
Seneca Ave
Gravel
Transformer Room
Former Seneca Machine
Church
Paved
Central Warehouse
Loading Dock
Former Ink Room
Van Hook
Vault/ Cistern (Approx)
Grass
Paved
Grass
Grass
Paved
Gravel

SUB-SG-03/IA-SG-03
SUB-SG-05/IA-SG-05
SUB-SG-11/IA-SG-11
IA-SG-12
OA-01
SUB-SG-01/IA-SG-01
SUB-SG-04/IA-SG-04
SUB-SG-06/IA-SG-06
SUB-SG-09/IA-SG-09
IA-SG-10
SUB-SG-07/IA-SG-07
SUB-SG-02/IA-SG-02
SUB-VH-01/IA-VH-01
SUB-VH-02
IA-VH-02
SUB-SG-08/IA-SG-08

100 50 0 100
Scale In Feet

March 2023 Indoor Air and Sub-Slab Sampling Results (NYSDOH Matrix Compounds)

FORMER SARGENT AND GREENLEAF SITE
24 SENECA AVENUE
ROCHESTER, NY

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FIGURE 2

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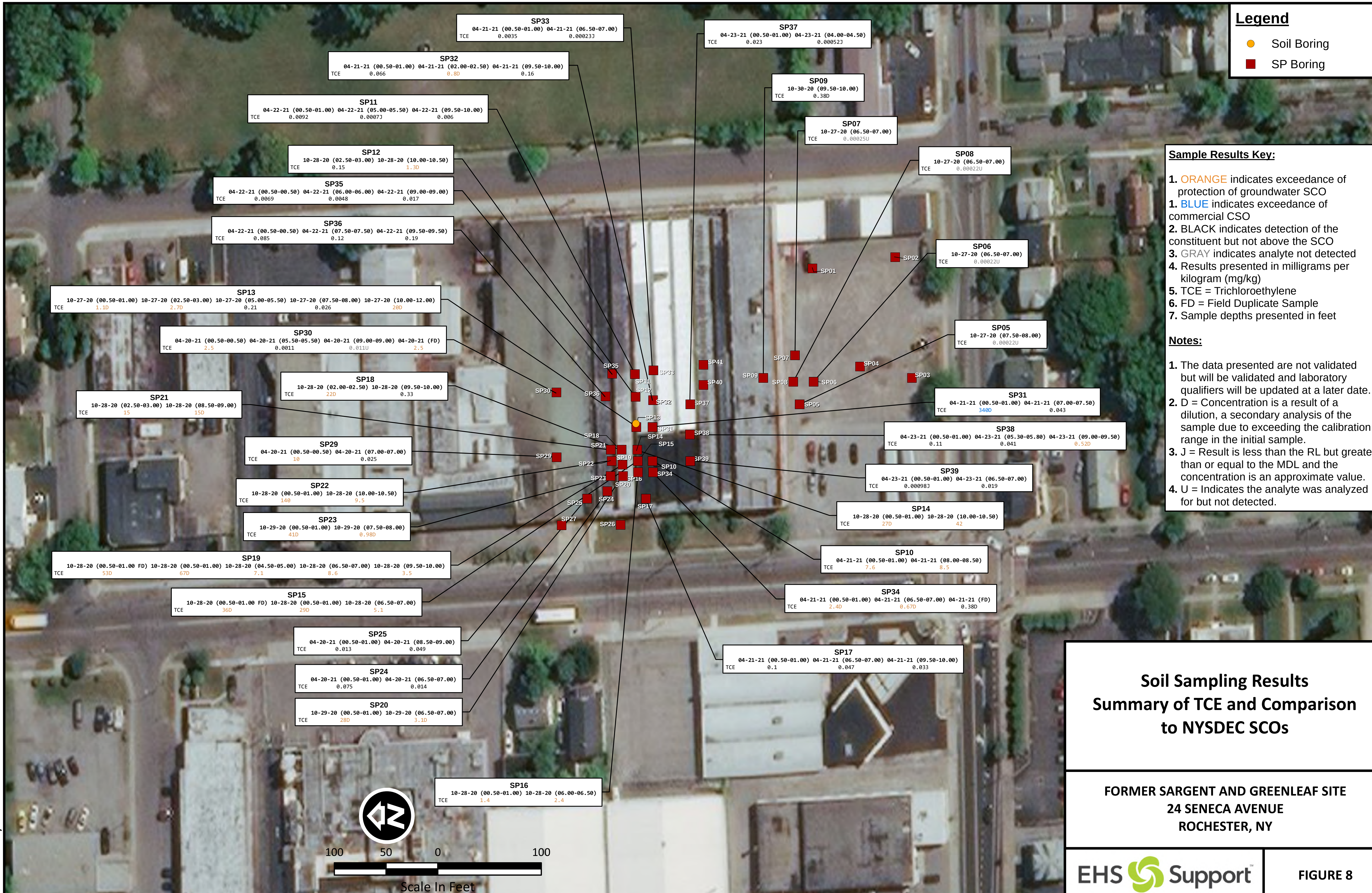

Soil Sampling Results Summary of TCE and Comparison to NYSDEC SCOs

FORMER SARGENT AND GREENLEAF SITE
24 SENECA AVENUE
ROCHESTER, NY

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FIGURE 8

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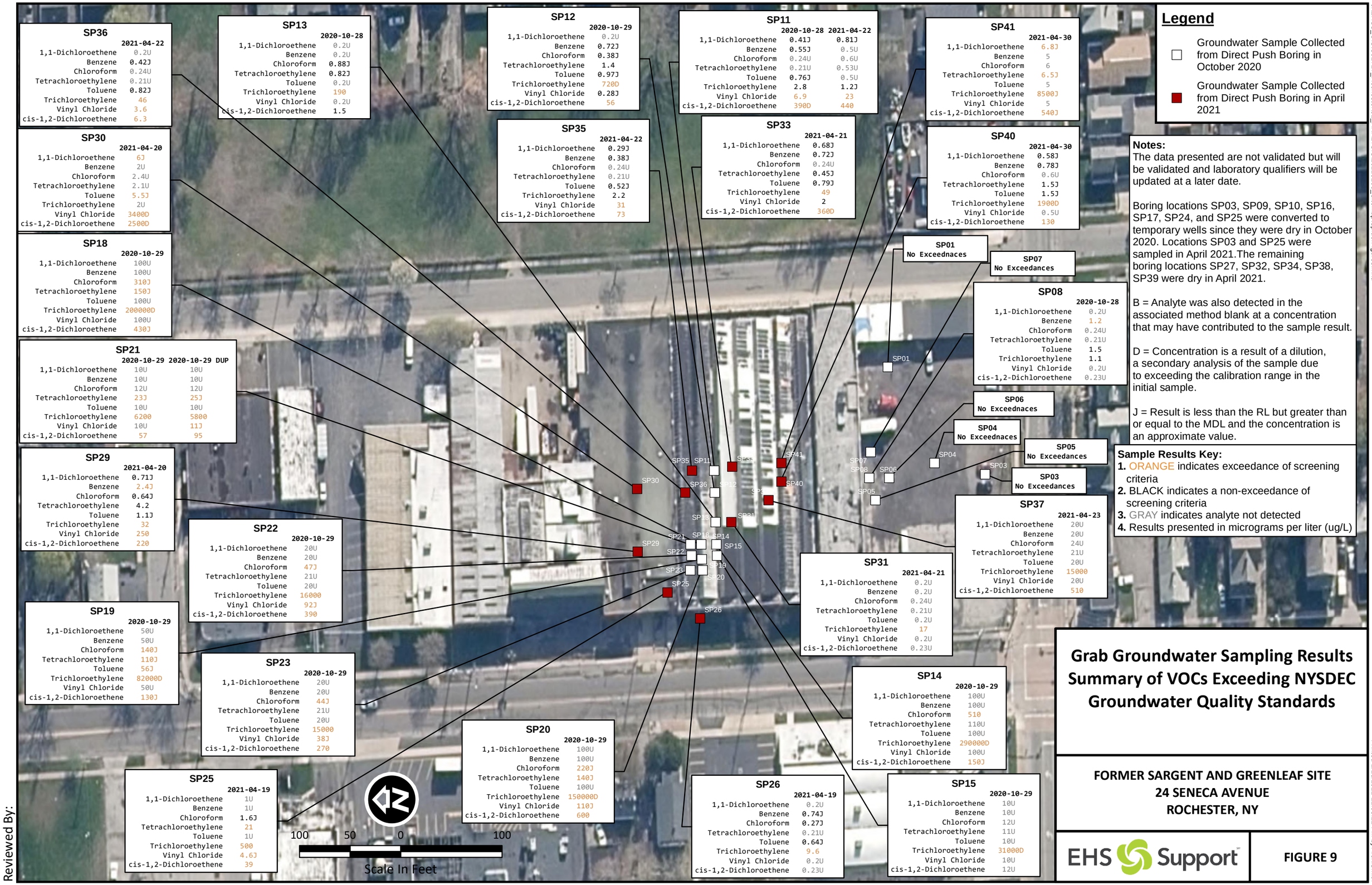

SP36

	2021-04-22
1,1-Dichloroethene	0.2U
Benzene	0.42J
Chloroform	0.24U
Tetrachloroethylene	0.21U
Toluene	0.82J
Trichloroethylene	46
Vinyl Chloride	3.6
cis-1,2-Dichloroethene	6.3

SP30

	2021-04-20
1,1-Dichloroethene	6J
Benzene	2U
Chloroform	2.4U
Tetrachloroethylene	2.1U
Toluene	5.5J
Trichloroethylene	2U
Vinyl Chloride	3400D
cis-1,2-Dichloroethene	2500D

SP18

	2020-10-29
1,1-Dichloroethene	100U
Benzene	100U
Chloroform	310J
Tetrachloroethylene	150J
Toluene	100U
Trichloroethylene	200000D
Vinyl Chloride	100U
cis-1,2-Dichloroethene	430J

SP21

	2020-10-29	2020-10-29 DUP
1,1-Dichloroethene	10U	10U
Benzene	10U	10U
Chloroform	12U	12U
Tetrachloroethylene	23J	25J
Toluene	10U	10U
Trichloroethylene	6200	5800
Vinyl Chloride	10U	11J
cis-1,2-Dichloroethene	57	95

SP29

	2021-04-20
1,1-Dichloroethene	0.71J
Benzene	2.4J
Chloroform	0.64J
Tetrachloroethylene	4.2
Toluene	1.1J
Trichloroethylene	32
Vinyl Chloride	250
cis-1,2-Dichloroethene	220

SP19

	2020-10-29
1,1-Dichloroethene	50U
Benzene	50U
Chloroform	140J
Tetrachloroethylene	110J
Toluene	56J
Trichloroethylene	82000D
Vinyl Chloride	50U
cis-1,2-Dichloroethene	130J

SP25

	2021-04-19
1,1-Dichloroethene	1U
Benzene	1U
Chloroform	1.6J
Tetrachloroethylene	21
Toluene	1U
Trichloroethylene	500
Vinyl Chloride	4.6J
cis-1,2-Dichloroethene	39

SP13

	2020-10-28
1,1-Dichloroethene	0.2U
Benzene	0.2U
Chloroform	0.88J
Tetrachloroethylene	0.82J
Toluene	0.2U
Trichloroethylene	190
Vinyl Chloride	0.2U
cis-1,2-Dichloroethene	1.5

SP22

	2020-10-29
1,1-Dichloroethene	20U
Benzene	20U
Chloroform	47J
Tetrachloroethylene	21U
Toluene	20U
Trichloroethylene	16000
Vinyl Chloride	92J
cis-1,2-Dichloroethene	390

SP23

	2020-10-29
1,1-Dichloroethene	20U
Benzene	20U
Chloroform	44J
Tetrachloroethylene	21U
Toluene	20U
Trichloroethylene	15000
Vinyl Chloride	38J
cis-1,2-Dichloroethene	270

SP12

	2020-10-29
1,1-Dichloroethene	0.2U
Benzene	0.72J
Chloroform	0.38J
Tetrachloroethylene	1.4
Toluene	0.97J
Trichloroethylene	720D
Vinyl Chloride	0.28J
cis-1,2-Dichloroethene	56

SP35

	2021-04-22
1,1-Dichloroethene	0.29J
Benzene	0.38J
Chloroform	0.24U
Tetrachloroethylene	0.21U
Toluene	0.52J
Trichloroethylene	2.2
Vinyl Chloride	31
cis-1,2-Dichloroethene	73

SP11

	2020-10-28	2021-04-22
1,1-Dichloroethene	0.41J	0.81J
Benzene	0.55J	0.5U
Chloroform	0.24U	0.6U
Tetrachloroethylene	0.21U	0.53U
Toluene	0.76J	0.5U
Trichloroethylene	2.8	1.2J
Vinyl Chloride	6.9	23
cis-1,2-Dichloroethene	390D	440

SP33

	2021-04-21
1,1-Dichloroethene	0.68J
Benzene	0.72J
Chloroform	0.24U
Tetrachloroethylene	0.45J
Toluene	0.79J
Trichloroethylene	49
Vinyl Chloride	2
cis-1,2-Dichloroethene	360D

SP20

	2020-10-29
1,1-Dichloroethene	100U
Benzene	100U
Chloroform	220J
Tetrachloroethylene	140J
Toluene	100U
Trichloroethylene	150000D
Vinyl Chloride	110J
cis-1,2-Dichloroethene	600

SP26

	2021-04-19
1,1-Dichloroethene	0.2U
Benzene	0.74J
Chloroform	0.27J
Tetrachloroethylene	0.21U
Toluene	0.64J
Trichloroethylene	9.6
Vinyl Chloride	0.2U
cis-1,2-Dichloroethene	0.23U

SP31

	2021-04-21
1,1-Dichloroethene	0.2U
Benzene	0.2U
Chloroform	0.24U
Tetrachloroethylene	0.21U
Toluene	0.2U
Trichloroethylene	17
Vinyl Chloride	0.2U
cis-1,2-Dichloroethene	0.23U

SP14

	2020-10-29
1,1-Dichloroethene	100U
Benzene	100U
Chloroform	510
Tetrachloroethylene	110U
Toluene	100U
Trichloroethylene	290000D
Vinyl Chloride	100U
cis-1,2-Dichloroethene	150J

SP15

	2020-10-29
1,1-Dichloroethene	10U
Benzene	10U
Chloroform	12U
Tetrachloroethylene	11U
Toluene	10U
Trichloroethylene	31000D
Vinyl Chloride	10U
cis-1,2-Dichloroethene	12U

SP41

	2021-04-30
1,1-Dichloroethene	6.8J
Benzene	5
Chloroform	6
Tetrachloroethylene	6.5J
Toluene	5
Trichloroethylene	8500J
Vinyl Chloride	5
cis-1,2-Dichloroethene	540J

SP40

	2021-04-30
1,1-Dichloroethene	0.58J
Benzene	0.78J
Chloroform	0.6U
Tetrachloroethylene	1.5J
Toluene	1.5J
Trichloroethylene	1900D
Vinyl Chloride	0.5U
cis-1,2-Dichloroethene	130

SP01
No Exceednaces

SP07
No Exceedances

SP08

	2020-10-28
1,1-Dichloroethene	0.2U
Benzene	1.2
Chloroform	0.24U
Tetrachloroethylene	0.21U
Toluene	1.5
Trichloroethylene	1.1
Vinyl Chloride	0.2U
cis-1,2-Dichloroethene	0.23U

SP06
No Exceednaces

SP04
No Exceednaces

SP05
No Exceedances

SP03
No Exceedances

SP37

	2021-04-23
1,1-Dichloroethene	20U
Benzene	20U
Chloroform	24U
Tetrachloroethylene	21U
Toluene	20U
Trichloroethylene	15000
Vinyl Chloride	20U
cis-1,2-Dichloroethene	510

Legend

- ☐ Groundwater Sample Collected from Direct Push Boring in October 2020
- ■ Groundwater Sample Collected from Direct Push Boring in April 2021

Notes:
The data presented are not validated but will be validated and laboratory qualifiers will be updated at a later date.

Boring locations SP03, SP09, SP10, SP16, SP17, SP24, and SP25 were converted to temporary wells since they were dry in October 2020. Locations SP03 and SP25 were sampled in April 2021.The remaining boring locations SP27, SP32, SP34, SP38, SP39 were dry in April 2021.

B = Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.

D = Concentration is a result of a dilution, a secondary analysis of the sample due to exceeding the calibration range in the initial sample.

J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Sample Results Key:
1. ORANGE indicates exceedance of screening criteria
2. BLACK indicates a non-exceedance of screening criteria
3. GRAY indicates analyte not detected
4. Results presented in micrograms per liter (ug/L)

Grab Groundwater Sampling Results Summary of VOCs Exceeding NYSDEC Groundwater Quality Standards

FORMER SARGENT AND GREENLEAF SITE
24 SENECA AVENUE
ROCHESTER, NY

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FIGURE 9

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Monitoring Well Groundwater Sampling Results Summary of VOCs Compared to NYSDEC Groundwater Quality Standards

FORMER SARGENT AND GREENLEAF SITE
24 SENECA AVENUE
ROCHESTER, NY

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FIGURE 10

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Appendix C Community Air Monitoring Plan (CAMP)

Community Air Monitoring Plan (CAMP)

24 Seneca Avenue, Site No. 828132
Rochester, New York

Prepared for:

Stanley Black & Decker, Inc.

Prepared by:

EHS Support℠
GNARUS ADVISORS LLC

May 2025

Table of Contents

Attachment

Acronyms

mg/m^3	milligrams per cubic meter
CAMP	community air monitoring plan
ISTT	in situ thermal treatment
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PID	photoionization detector
PM10	particulate matter less than 10 micrometers in size
ppm	parts per million
RA	remedial action
RD	remedial design
RD/RA	remedial design/remedial action
sf	square-foot
SSD	sub-slab depressurization
UST	underground storage tank
VOC	volatile organic compound

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1 Introduction

This Community Action Monitoring Plan (CAMP) was prepared to describe the real-time air monitoring to be implemented during intrusive activities at the former Sargent & Greenleaf manufacturing facility (Site #828132) located at 24 Seneca Avenue, City of Rochester, Monroe County, New York ("Site"). This CAMP shall be implemented during intrusive activities (disturbance of the subsurface) within the boundaries of the Site.

As detailed in the Remedial Design/Remedial Action (RD/RA) Work Plan ("Work Plan"), the activities are anticipated to include the following components:

- Mobilizing equipment and personnel
- Collecting soil samples with a hand auger and/or drill rig
- Removing an upper 12 inches of asphalt and gravel
- Removing and replacing the upper 12 inches of topsoil and grass
- Closure of two underground storage tanks (USTs) in place
- Installing a sub-slab depressurization (SSD) system and monitoring of sub-slab vapor through vapor pins in the concrete.
- Installing of an in situ thermal treatment (ISTT) system
- Cleaning and confirmation sampling of two dry wells
- Demobilizing equipment and personnel

Continuous air monitoring for particulate matter less than 10 micrometers in size (PM10) will be performed during intrusive activities in known remediated areas or suspected zones of contamination. The CAMP has been developed to provide a measure of protection for the downwind community (i.e., off-site receptors including residences, businesses, and off-site workers not directly involved with construction activities) from potential airborne particulate releases as a direct result of these activities. Additionally, the CAMP will provide the necessary data to help confirm that these activities did not result in particulate releases through the air to the off-site receptors.

The CAMP has been prepared in accordance with New York State Department of Environmental Conservation (NYSDEC) Technical Guidance for Site Investigation and Remediation (DER-10; NYSDEC, 2010), specifically including the New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan in Appendix 1A and the Fugitive Dust and Particulate Monitoring in Appendix 1B. The NYSDOH Generic CAMP is included in **Attachment A**.

1.1 Site Description

The Site is an L-shaped parcel with tax ID: 91.83-01.10. According to the Monroe County property assessment system, the parcel is owned by 24 Seneca Avenue, Inc. The overall Site is approximately 2.29 acres in size. The Site is bounded by Norton Street to the south, Seneca Avenue to the west, Bremen Street to the east, and a one-story masonry building (occupied by Van Hook Service Company, Inc.) to the north.

The primary on-Site structure consists of an approximately 121,000-square-foot (sf) building. This building is a brick and masonry primarily one-floor structure with slab on grade construction. A second floor, that encompasses approximately 9,500 sf, is located on the south end of the Site building.

The footprint of the main building occupies the majority of the Site surface, except for the following areas: the gravel parking lot on the south side of the Site, grass and paved areas along two narrow areas on the eastern and western Site boundaries, and the paved loading dock area on the east side of the Site that is accessed from Bremen Street.

1.2 RD/RA Schedule

The RD/RA at the Site is contingent on access and coordination with the Site owner and tenant. A draft schedule is included as Section 4 of the Work Plan.

2 Air Monitoring Program

The air monitoring program for former Sargent & Greenleaf manufacturing facility during remedial design investigations and remedial action and will include continuous particulate air monitoring and volatile organic compound (VOC) monitoring by photoionization detector (PID). Continuous air monitoring (monitoring for PM10 and VOCs) will be initiated at the start of intrusive activities and will be evaluated against corrective action criteria described below. Visual observation of dust will also be performed, implementing dust suppression techniques when necessary. Periodic monitoring for VOCs will be conducted during non-intrusive activities (collection of soil samples or groundwater samples from existing wells).

2.1 Air Monitoring Stations

Two fixed air monitoring stations for PM10 will be set-up based on the location of intrusive activities, potential receptor locations, and consideration of daily wind direction. An upwind (AIR1) and downwind (AIR2) station will be placed accordingly at the start of intrusive activities, which is dependent on the wind direction to monitor for PM10. The locations of the air monitoring stations will be documented on each daily report, as well as the predominant wind direction obtained from the Greater Rochester International Airport, NY Meteorological Station.

Volatile organic compounds will also be monitored since they are known as the predominant Site constituents (**Section 2.3**).

2.2 Particulates

Particulate monitoring will be conducted using real-time meters for PM10 (i.e., DustTrak II Aerosol Monitor Model 8530 by TSI, Inc. or equivalent). The meters selected for use during these monitoring activities will be capable of calculating 15-minute running average concentrations. The meters will be equipped with alarms that will indicate if concentrations exceed an established level. Data from these meters will be checked at least once daily during activities. If visible dust is observed leaving the work area, the appropriate meters will be checked and corrective actions taken in accordance with the 2010 NYSDOH Generic CAMP (**Attachment A**), if necessary.

2.2.1 Corrective Action Level and Actions for Particulates

The corrective action level has been established with respect to of the New York State Department of Health Generic Community Air Monitoring Plan provided in DER-10 (NYSDEC, 2010; **Attachment A**). The corrective action level will apply at the downwind location only. A summary of the corrective action level is provided below.

- Particulate (PM10) – 0.10 milligrams per cubic meter (mg/m^3) above upwind station for a 15-minute period:
  - If the downwind PM10 level is 0.10 mg/m^3 above the upwind station for the 15-minute period or if airborne dust is observed leaving the work area, then dust-suppression techniques must be employed. Work may continue with dust-suppression techniques provided that downwind PM10 particulate levels do not exceed 0.15 mg/m^3 above the upwind level and no visible dust is migrating from the work area.

    - If, after implementation of dust-suppression techniques, the downwind PM10 levels are greater than 0.15 mg/m^3 above the upwind station, work must be stopped, and site activities must be evaluated. Work may resume only if dust-suppression measures and other controls are successful in reducing PM10 levels to less than 0.15 mg/m^3 above the upwind levels and if no visible dust is observed leaving the site.
- An initial level of 0.10 mg/m^3 at any of the monitoring stations will be established as a conservative assessment level. Readings greater than this conservative assessment level will result in on-Site personnel performing a review of the background (upwind perimeter) site level. If the downwind level is determined to be greater than 0.10 mg/m^3 above the upwind level, dust-suppression techniques will be employed to avoid an exceedance of the corrective action level.

Exceedances of the criteria will result in an immediate review of investigative activities with adjustments made as needed in consultation with the selected contractor. The first step of this review will be to evaluate the result to determine whether it is site related or an issue with the meter (e.g., high humidity impacting the meter and readings) or local conditions (e.g., mowing in the vicinity of the meter). Once an exceedance has been verified to be site related, the site lead will immediately be notified and an investigation will be performed to identify the conditions causing the exceedance (e.g., site conditions, contractor site activities, and weather conditions).

If initial monitoring results indicate no exceedances of the corrective action triggers listed above, a request may be made to NYSDEC/NYSDOH to modify the frequency or duration of monitoring at certain locations.

2.3 VOCs

VOCs will be monitored in accordance with the 2010 NYSDOH Generic CAMP (**Attachment A**) and is summarized below. Periodic monitoring of VOCs is required during non-intrusive activities which may consist of the following:

- Taking a reading upon arrival at a sample location
- Monitoring while opening a well cap
- Overturning soil
- Monitoring during well bailing/purging
- Taking a reading prior to leaving a sample location

Continuous monitoring may be required based on proximity of potentially exposed individuals or during all intrusive activities. VOCs will be monitored at the downwind perimeter of the immediate work area on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes.

The monitoring will be performed with an individual PID or a multi-gas meter with an appropriate PID. The monitoring equipment will be calibrated at least daily using isobutylene gas provided by the equipment rental company. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the corrective action level and actions detailed below.

2.3.1 Corrective Action Level and Actions for VOCs

The corrective action level has been established with respect to of the New York State Department of Health Generic Community Air Monitoring Plan provided in DER-10 (NYSDEC, 2010; **Attachment A**). The corrective action level will apply at the downwind location only. A summary of the corrective action level is provided below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.
- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.
- All 15-minute readings must be recorded and be available for State (NYSDEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

2.4 Reporting

A daily summary of the air monitoring results will be maintained onsite and available to NYSDEC and NYSDOH personnel upon request.

2.4.1 Particulates

The report will include the monitoring period, predominant wind direction, identification of the upwind and downwind stations, daily wind rose, daily maximum 15-minute levels for PM10 at each station, and an assessment of the corrective action level, and any comments or notes.

2.4.2 VOCs

The report will include the monitoring period, identification of the downwind station, sample result, an assessment of the corrective action level, and any comments or notes.

3 References

EHS Support and Gnarus. 2023. Remedial Design/Remedial Action (RD/RA) Work Plan, 24 Seneca Avenue, Site No. 828132, Rochester, NY. November 6.

NYSDEC. 2010. DER-10, Technical Guidance for Site Investigation and Remediation, Division of Environmental Remediation. Appendix 1A – New York State Department of Health Generic Community Air Monitoring Plan; Appendix 1B – Fugitive Dust and Particulate Monitoring.

Attachment A New York State Department of Health – Generic Community Air Monitoring Plan

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

Overview

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

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

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

Community Air Monitoring Plan

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

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

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

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

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

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

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

Particulate Monitoring, Response Levels, and Actions

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

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

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

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

December 2009

Appendix D Sub-Slab Depressurization System Diagnostic Test Method

Diagnostic Test Purpose

The purpose of diagnostics is to obtain the necessary information needed to design an SSDS capable of depressurizing the sub-slab soils to a predefined sub-slab pressure differential requirement. A diagnostic survey includes a visual inspection of the building to examine physical routes of soil gas entry and a series of mechanical tests to determine the volume of air and applied vacuum needed to influence the slab areas of concern. Once completed, a report is generated providing the results of the diagnostic tests and the design of the mitigation system. The design will include a drawing showing all relevant suction point(s), fan(s), and pipe locations. Fan selection is made by comparing the diagnostic data to the flow rate and vacuum of blowers used specifically for mitigation systems. The diagnostics will also provide necessary data and information to make a determination as to whether the concrete slab will need to be sealed to effectively mitigate the sub-slab soil vapor exceedances.

Diagnostic Test Method

The method used for diagnostic testing and system design involves coring 2 ½" suction holes in the floor and 5/16" test holes at various distances from the suction holes. A specialized sub-slab diagnostic vacuum (SSDV), capable of up to 120 CFM and an applied vacuum of up to 50" water column (w.c.) is used with a variable speed controller to apply vacuum to the sub-slab material via the suction holes. By varying the applied vacuum, the flow and vacuum characteristics of the soil beneath the slab can be defined. The SSDV has a built-in pitot tube to measure air velocity and the suction tube has a port for measuring vacuum at the suction point. During the diagnostic testing the pressure and flow values are monitored by a vacuum meter capable of measuring 60" w.c. and a micromanometer capable of reading 0.0001" w.c. The 5/16" test holes are used to monitor the pressure differential created by the SSDV with a micromanometer capable of reading down to 0.0001" w.c. The data produced by this process allow the SSD system designer to determine the area of the slab that can be depressurized to the required sub-slab pressure differential by a specific volume of air flow at a specific applied vacuum. Once the area of influence (AOI) per suction point has been determined, a design will be prepared by mapping out the building to provide the greatest amount of vacuum coverage with the least amount of suction points.

Diagnostic Test Deliverable

Following the completion of the diagnostic test, a vapor intrusion mitigation system design plan will be prepared by the SSD system designer that contains the diagnostic data collected along with an explanation of the diagnostics performed. The design will include all information including drawings and specifications required for the installation of the mitigation systems.

Appendix E Health and Safety Plan

Health and Safety Plan

Remedial Design /
Remedial Action
24 Seneca Avenue, Site
No. 828132
Rochester, New York

Prepared for:

Stanley Black & Decker

Prepared by:

EHS Support
GNARUS
ADVISORS LLC

May 2025

Table of Contents

List of Appendices

Health and Safety Plan Approval

This Health and Safety Plan (HASP) was prepared for employees performing work that poses physical and/or chemical exposure risks to EHS Support LLC ("EHS Support") employees and EHS Support subcontractors. It was prepared based on the best available information regarding the hazards known or suspected to be present on the project Site. While it is not possible to identify, evaluate, and protect against all possible hazards in advance of the Site visit, adherence to the requirements of the HASP will significantly reduce the potential for occupational injury. This HASP will be updated as necessary to include new project activities, risks, or changes in organizational structure.

By signing below, I acknowledge that I have reviewed and hereby approve this HASP. This HASP has been written for the exclusive use of EHS Support's employees and direct contractors. The plan is written for specified Site conditions, dates, and personnel, and must be amended if these conditions change. This HASP is only valid for one year after approval.

Written by:

May 1, 2025

Anton Heitger — Date
EHS Support Project Manager

Approved by:

May 1, 2025

Gregg Hicks — Date
EHS Support H&S Specialist

Approved by:

May 1, 2025

Anton Heitger — Date
EHS Support Project Manager

1 Introduction

This Health and Safety Plan (HASP) summarizes health and safety hazard information for EHS Support LLC ("EHS Support") field activities related to work conducted for the Stanley Black & Decker company at the former Sargent & Greenleaf Site located at 24 Seneca Avenue, City of Rochester, Monroe County, New York (Site). The EHS Support HASP delineates procedures that will allow personnel to identify and predict hazards, work safely, and respond quickly and appropriately to Site emergencies. All Site work will be conducted in accordance with the following:

- EHS Support standard operating procedures
- Occupational Safety and Health Administration (OSHA) regulations in the Code of Federal Regulations (CFR), Title 29 Parts 1904, 1910, and 1926 as applicable
- Any applicable state safety regulations

Organizational Structure	
EHS Support has established a chain of command with lines of authority, responsibility, and communication for this project. The Project Manager (PM) has the responsibility and authority to direct all Site operations and is ultimately responsible for the overall management of the project. The field work covered by this HASP will be overseen or managed by a Field Team Leader who is responsible for the proper implementation and execution of the comprehensive work plan. Each field project will have a Site Safety Officer (SSO) who has the responsibility and authority to implement the HASP and verify compliance with the plan. Other personnel needed to conduct the proposed work will be assigned.	
PM	Is responsible for appropriately staffing the project to safely and effectively implement the work plan. They will also ensure that company funds are available for the Field Team Leader to provide appropriate personal protective equipment (PPE) and monitoring equipment.
Field Team Leader	Is responsible for the safe and proper implementation of the work plan. They will have the authority to expend company resources to ensure that PPE and other safety equipment are available and in good working order. They will communicate with the PM regarding implementation of the work plan.
SSO	Is responsible for the implementation of this HASP. They will communicate any issues arising from changing Site conditions, upgrades in PPE, decontamination procedures, and needs for monitoring equipment with the Site PM or Field Team Leader. The SSO will ensure that other workers assigned to the project are following the HASP.
Field Team Members (EHS Support Personnel, Contractors, and Subcontractors)	The field team members are responsible for complying with the HASP, notifying the SSO of hazardous or potentially hazardous conditions, and carrying out assigned tasks during field operations.
Site Visitors and State/Federal Agency Representatives	Any visitor to the project site is responsible for complying with all aspects of this HASP.
Note: It is expected that other employees assigned to the project will follow the HASP and report all potential safety concerns to the SSO.	

1.1 Project Personnel and Emergency Contact Information

Emergency Phone Numbers		
Emergency (fire, police, ambulance)		911
Emergency Facility Specific		
Hospital: Rochester General Hospital	1425 Portland Ave Rochester, NY 14621	585-922-4000
Occupational Clinic / Urgent Care: Occupational Safety On Site, Inc	1600 Lyell Ave, Suite C Rochester, NY 14606	585-723-3891 Open Monday - Friday 8:00am-4:30pm
Site/Client Contacts		
Stanley Black & Decker Project Manager	Amanda Gonzalez	919-480-7198
Gnarus Advisors, LLC Project Manager	John Simon	202-505-1906
Site Contact / Dock Hardware Owner	Gary Rogers	585-737-7000
EHS Support Contacts		
Project Manager	Anton Heitger	603-389-7946
Task/Field Lead	Mark Smith	850-544-9219
Site Safety Officer	Michael Burge	614-354-7612
Project Health and Safety	Gregg Hicks	606-922-5585
Field Team Members	Anton Heitger	603-389-7946
	Cal Figliozzi	401-374-2566
	Kyle Shugerts	412-738-3616
	Greg Sowder	304-634-1424
H&S Service Line Lead	Monica Meyer	724-762-7951
Human Resources	Lateefah Allen	412-682-9268
Contractors		
Nothnagle Drilling	Steve DiLaura	585-538-2328
Subcontractors		
Utility Locator Company	Bloodhound	315-267-6007
State/Federal Agency		
NYSDEC	Mike Ormanoski	585-226-5480

Emergency Phone Numbers	
Incident Notification Process	
Dial 911/Facility or Site Emergency Number as applicable	
Facility contact (if applicable)	Gary Rogers – Dock Hardware
Contact EHS Support PM	Anton Heitger
Contact H&S Service Line Lead	Monica Meyer
Contact Project PM	John Simon
Contact Client PM	Amanda Gonzalez
Client incident reporting number	Amanda: 919-480-7198
Other Emergency Information	
Location of assembly areas	Dock Entrance along Seneca Ave
Location of storm shelter	Main Building Interior
Nearest First Aid Kit/AED (on-site, provided by EHS - Support personnel, or distance to nearest)	EHS Support Vehicle
Nearest Eyewash/Shower (on-site, provided by EHS - Support personnel, or distance to nearest)	EHS Support Vehicle / First Aid Kit

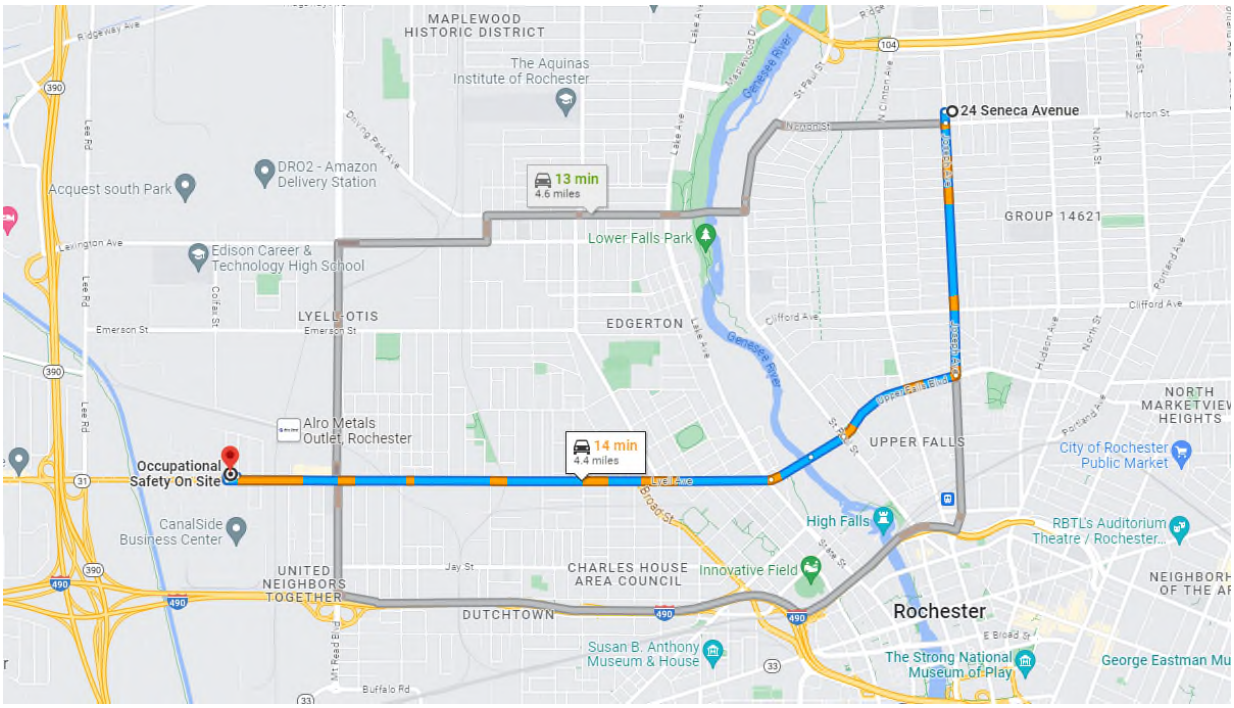

Figure 1-1 Occupational Clinic Map and Directions

Take Joseph Ave and Lyell Ave to Adirondack St

13 min (4.3 mi)

1. Head south on Seneca Ave toward Norton St

253 ft

2. Continue onto Joseph Ave

1.1 mi

3. Turn right onto Upper Falls Blvd

0.6 mi

4. Continue onto Bausch St

0.2 mi

5. Continue onto Smith St

0.2 mi

6. Continue onto Lyell Ave

Pass by Burger King (on the right in 1.2 mi)

2.3 mi

Drive to your destination

48 sec (479 ft)

7. Turn right onto Adirondack St

102 ft

8. Turn right

30 ft

9. Turn right

233 ft

10. Turn left

Destination will be on the right

115 ft

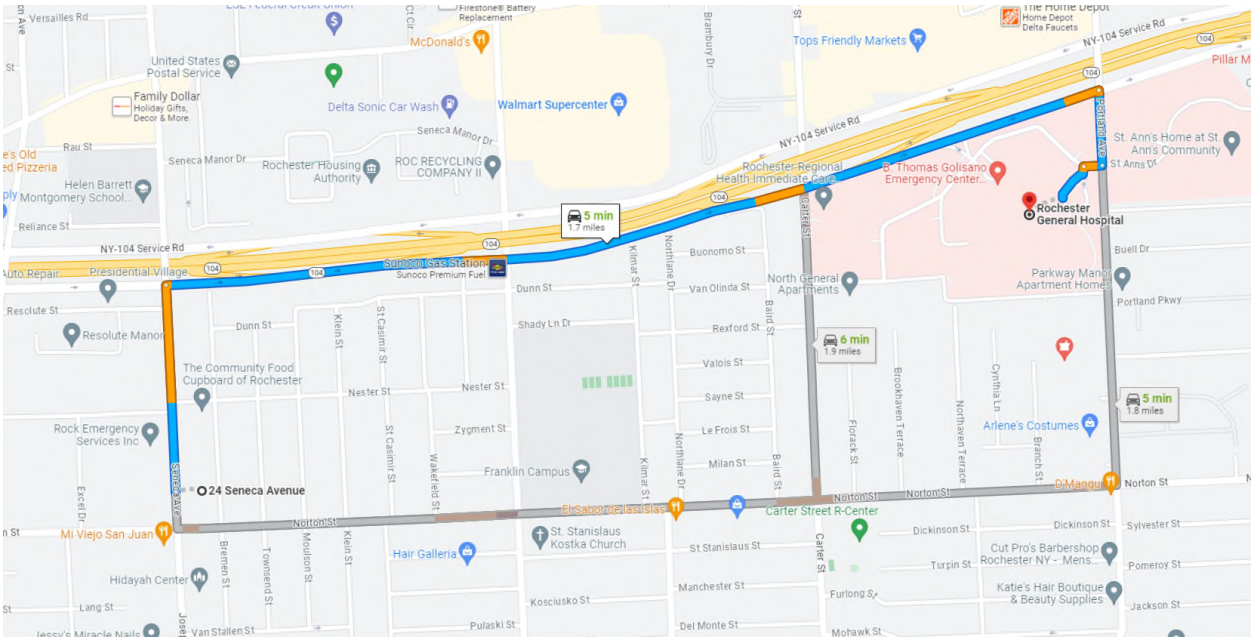

Figure 1-2 Hospital Map and Directions

1. Head north on Seneca Ave toward Bastian St
0.3 mi
2. Turn right onto NY-104 Service Rd E
1.2 mi
3. Turn right onto Portland Ave
0.1 mi
4. Turn right onto Rochester General Hospital Dr
128 ft
5. Turn left
Destination will be on the right
279 ft

Rochester General Hospital
1425 Portland Ave, Rochester, NY 14621

2 Scope of Work

Project/Task Number	LLC.04416.0000	**HASP Preparation Date**	11/02/2023 (Rev. 5/1/25)
Activity Duration (days/weeks/months)	TBD	**Anticipated Start Date of Current Work**	June 2025
State of the Site/Facility	Active / NY	**Site Access**	Road

Site Topography	Relatively flat, industrial park, some stairs in building

Normal Shift Work	Yes
Lone Working	Check in person: text. John Simon or Anton Heitger
	Check in frequency: Upon Arrival, lunch, and prior to departing Site
Traffic	Outside Facility – Med to heavy / Inside Facility - Light
Major Tasks *The Job Safety Analysis (JSA) Form must be completed for each task. This form includes the task, hazard controls, and personal protective equipment (PPE) used for each task.*	• Underground Utility Location • Monitoring Well Installation • Soil Boring/Sampling • Groundwater Sampling • Sub-slab Depressurization (SSD) System installation • Sub-slab Vapor Point Installation • Sub-slab Vapor and Indoor Air Sampling • In Situ Thermal Treatment (ISTT) System installation • Surveying • Subcontractor Oversight • Shallow excavation for sampling • Backfill of excavations • Asphalt / concrete repair
Equipment Needed	**Sampling:** Geoprobe® / Drill Rig, Low-flow groundwater sampling equipment (QED bladder pump, peristaltic pump, water level meter, flow through cell and sonde), rotary hammer drill, PID, Summa Canisters, hand tools. **Excavation and cover placement:** Excavator, bulldozer, backhoe, skid steer, drum roller, and trucks. **SSD and ISTT installation:** Geoprobe® / Drill Rig, core machine, rotary hammer drill, PID, hand tools, electrical panel and wiring.

See **Figure 2-1** for the Site location map, **Figure 2-2** for the Site plan, and **Figure 2-3** for an Aerial View of the Site.

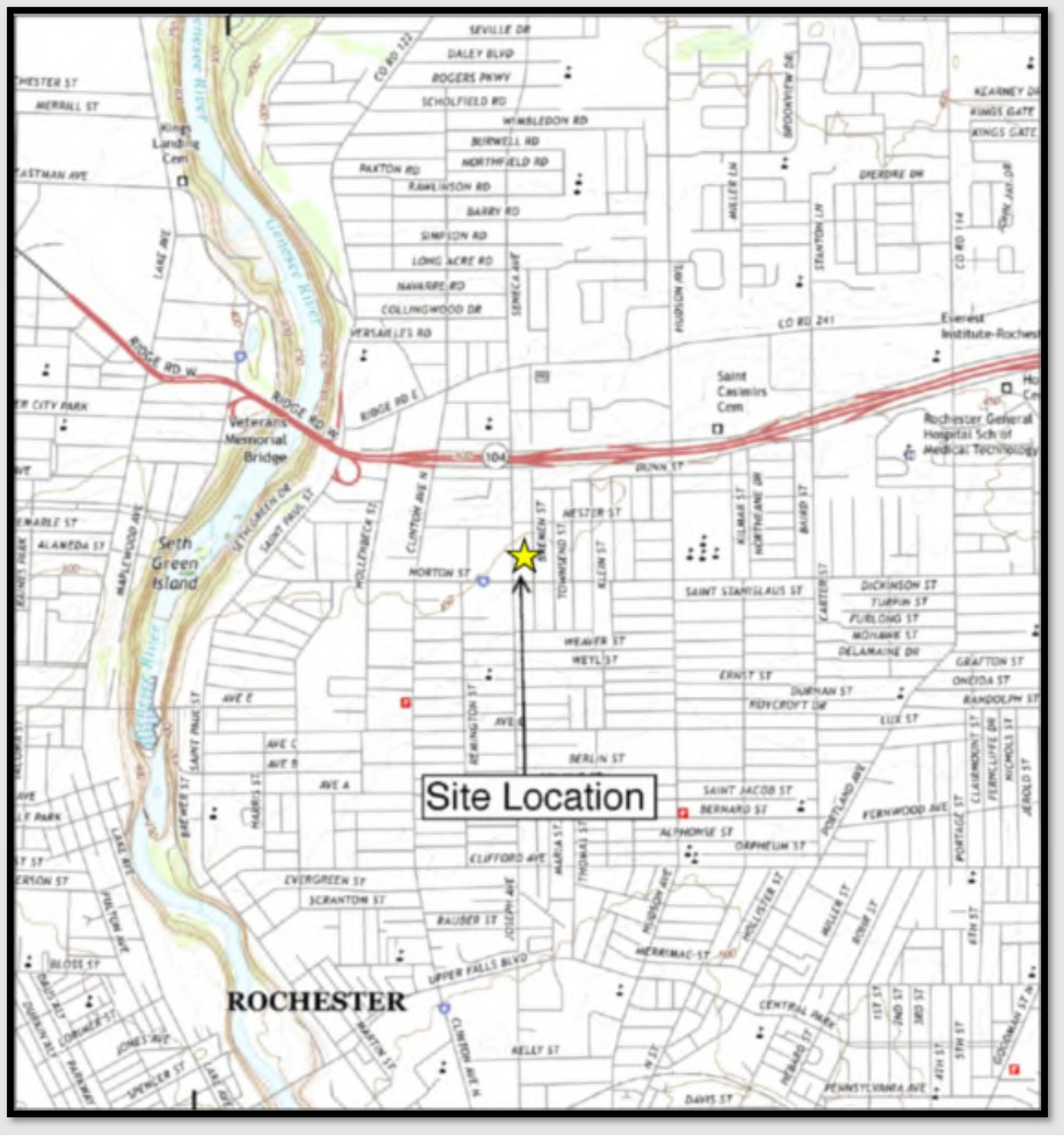

Figure 2-1 Site Location Map

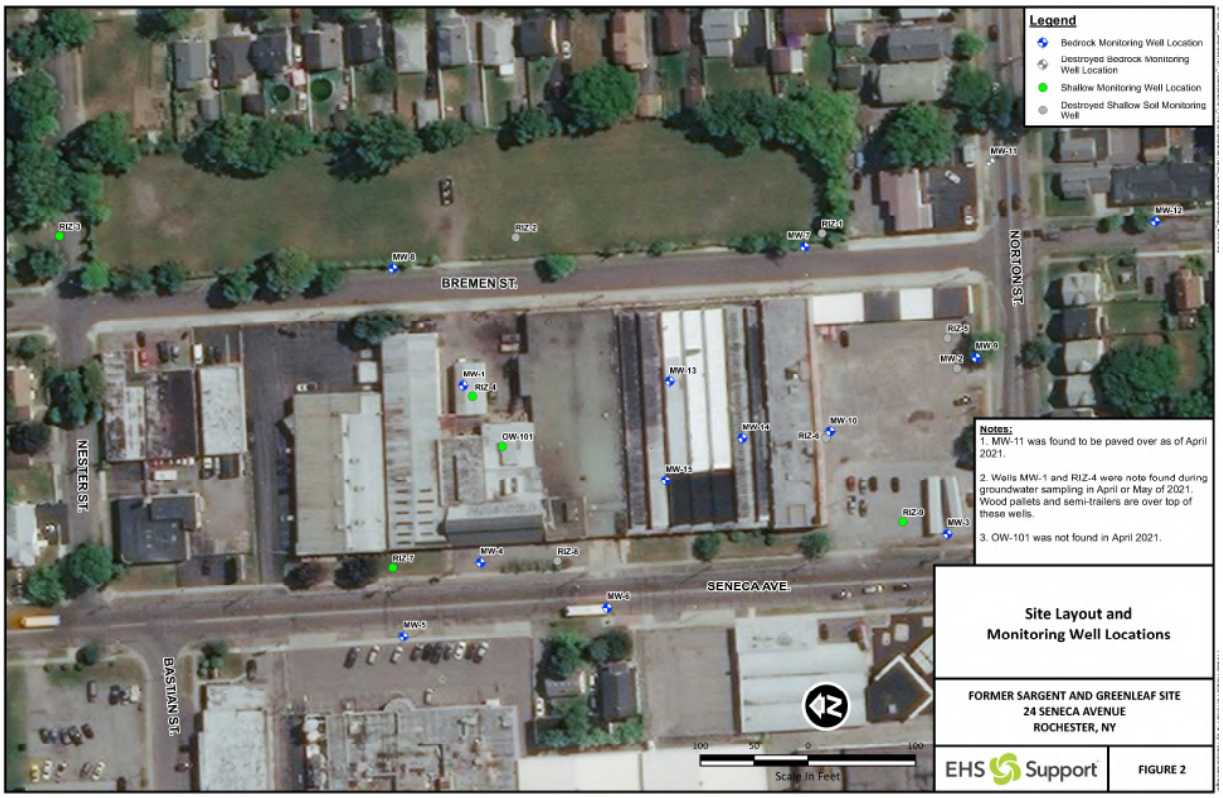

Figure 2-2 Site Plan

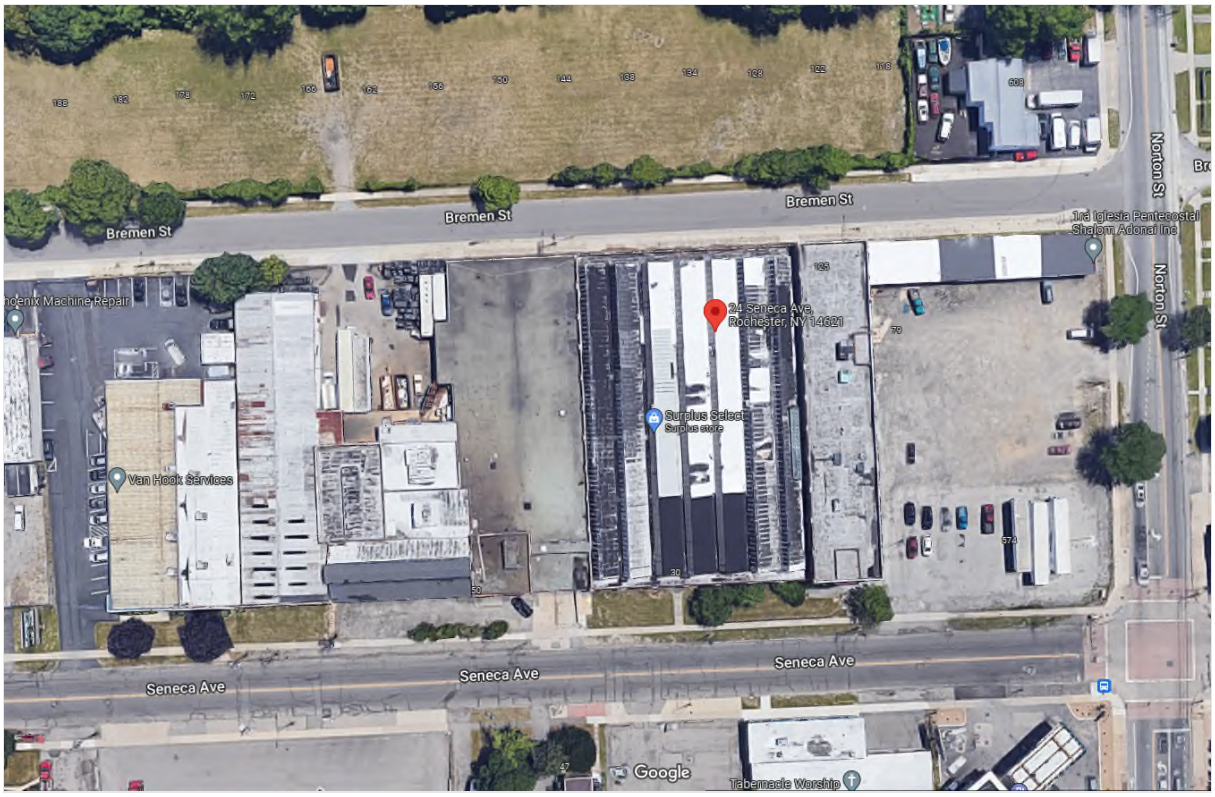

Figure 2-3 Site Ariel View Photograph

3 Task/Operation Preliminary Health and Safety Hazard Assessment

Physical Hazards	Physical hazards can include heavy equipment, drill rig/Geoprobe®, traffic, noise, slips, trips, falls, lifting hazards, hand safety/sharp objects, severe weather, fire/explosion, dust, aboveground utilities, underground utilities, aggressive individuals/animals or potentially dangerous locations, and driving/vehicle safety.
Biological Hazards	Biological Hazards include the potential for blood borne pathogens, poisonous plants, snakes, spiders, insects, mosquitoes, ticks, animal droppings, small biting animals and wildlife, and domestic pets.
Environmental Hazards and Site-Specific Conditions	Severe weather typical of the Upstate NY - Lake Ontario regional area can occur, including strong thunderstorms and snow/ice storms. Heat and cold stress are both identified as potential hazards.
Environmental Release/Spill Containment	EHS Support does not respond to major spills. Personnel will have equipment and/or absorbents on hand to clean minor spills related to the materials being handled for the work scope. For major spills, contact the appropriate agency. In the event of a spill or leak: 1. **Evacuate** (injured parties and all non-essential personnel). 2. **Stop, Coordinate and Eliminate** (stop source of incident (e.g. spill), coordinate shut down of equipment, and eliminate sources of ignition and sparks for flammables or incompatibles that could catch fire, explode, or vigorously react. Wear appropriate PPE). 3. **Notify** (call 911 for the appropriate response agency). 4. **Secure** the area. 5. **Treat** (provide immediate treatment to injured and affected personnel). 6. **Identify** material (if unknown) and identify PPE, hazard and response procedures using SDSs). 7. **Contain/Isolate** (contain released material/incident using emergency response equipment and/or set up perimeter to isolate area). 8. **Meet** the spill response crew and advise them of the spill location and the material spilled. 9. **Document** spill/environmental issue electronically via form located in the Issues section of MyMomentum. **10. Investigate and Remediate**
Chemical Hazards *Note: See* **Appendix H** *for safety data sheets and the Site-Specific Chemical Exposure Limits*	Impacts to Site soil and groundwater have been identified. Those chemicals are detailed below in **Section 3.1**

3.1 Site-Specific Chemical Exposure Limits

Site-Specific Chemical Exposure Limits										
Chemical Name	**OSHA PEL**		**ACGIH TLV**		**IDLH**	**Potential Exposure Routes**				**Exposure Symptoms**
	TWA	**STEL**	**TWA**	**STEL**		**Inhalation**	**Absorption**	**Ingestion**	**Injection**	
Diesel	NA	NA	100 mg/m^3 (vapor)	NA	NA	YES	YES	YES	YES	Irritation of eyes, skin, respiratory tract; dizziness, headache, nausea; chemical pneumonitis (from aspiration of liquid); dry, red skin; irritant contact dermatitis; eye redness, pain. Kidneys.
Trichloroethene	100	NA	10	25	NA	YES	YES	YES	YES	Irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; carcinogen.
Gasoline	NA	NA	300	500	NA	YES	YES	YES	YES	Eye & Throat Irritant, Chemical Pneumonia, Possible Liver and Kidney Damage, Central Nervous System.
1,1-Dichloroethene	100	100	NA	NA	100	YES	YES	YES	YES	Irrit skin; cns depress; liver, kidney, lung damage TO: skin, liver, kidneys, lungs, cns
Trans-1,2-Dichloroethene	200	200	NA	NA	200	YES	YES	YES	YES	Irrit eyes, resp system; cns depress TO: eyes, resp sys, cns

Site-Specific Chemical Exposure Limits										
Cis-1,2-Dichloroethene	200	200	NA	NA	200	YES	YES	YES	YES	Irrit eyes, resp system; cns depress TO: eyes, resp sys, cns
1,2-Dichloroethane	200	200	NA	NA	200	YES	YES	YES	YES	Irrit eyes, resp system; cns depress TO: eyes, resp sys, cns
Hydrochloric Acid	5	5	NA	NA	5	YES	YES	YES	YES	NA

All concentrations are in parts per million (ppm) unless otherwise noted.
ACGIH = American Conference of Governmental Industrial Hygienists
C = Ceiling Exposure Limit
Ca = Potential Occupational Carcinogen
CNS = central nervous system
GI = gastrointestinal
IDLH = Immediately Dangerous to Life and Health
mg/m^3 = milligrams per Cubic Meter
NA = Not Applicable
NIOSH = National Institute for Occupational Safety and Health
PEL = Permissible Exposure Limit
STEL = Short-Term Exposure Limit (15 minutes)
TLV = Threshold Limit Values
TWA = Time-Weighted Average

4 Employee Training Requirements

Training Type	Applies To:				
	Does Not Apply	All Personnel	EHS Support Employees	Contractor Site Personnel	Personnel Entering the Exclusion Zone
40-hour HAZWOPER training with a current 8-hour refresher certificate	☐	☒	☐	☐	☐
8-hour HAZWOPER supervisor training	☐	☐	☒	☐	☐
Contractor site-specific training	☒	☐	☐	☐	☐
Daily Tailgate Safety Meetings	☐	☒	☐	☐	☐
Fire Watch	☐	☐	☐	☒	☐
First Aid/CPR/AED training for remote Sites	☐	☐	☒	☐	☐
Initial training for Site workers and supervisors	☐	☐	☒	☐	☐
Pre-mobilization PSA and project kick off meeting	☐	☒	☐	☐	☐
Railroad Safety Training	☒	☐	☐	☐	☐
TWIC	☒	☐	☐	☐	☐
Other (specify)					
Click or tap here to enter text.		☐	☐	☐	☐
Click or tap here to enter text.		☐	☐	☐	☐
Click or tap here to enter text.		☐	☐	☐	☐

5 Employee Medical Qualifications

Type	Applies To:			
	Does Not Apply	All Personnel	EHS Support Employees	Contractor Site Personnel
Annual physical	☐	☐	☒	☐
Client/Site drug and/or alcohol testing	☒	☐	☐	☐
Respirator fit test and medical evaluation	☒	☐	☐	☐
Other (specify)				
Click or tap here to enter text.		☐	☐	☐
Click or tap here to enter text.		☐	☐	☐
Click or tap here to enter text.		☐	☐	☐

6 Hazard Controls

6.1 Engineering and Administrative Controls

EHS Support will implement engineering and administrative controls to prohibit access to hazardous areas, warn of physical hazards and/or otherwise minimize the likelihood of worker injury or exposure. Specific engineering and administrative controls for each EHS Support activity are listed in the Job Safety Analysis in **Appendix B**.

6.2 Personal Protective Equipment

Equipment	Required	Not Applicable	Comments
Steel Toe Boots/Shoes	X		
Chemical Boots		X	
Coveralls or Long Sleeve Shirt & Pants	X		
Safety Vest	X		
Hearing Protection	X		While drilling with Geoprobe or Rotary Hammer
Hard Hat	X		
Safety Glasses with Side Shields	X		
Safety Goggles	X		When pressure washing
Face Shield	X		When pressure washing
Cotton or Leather Work Gloves	X		When handling tools or drums or other equipment that may have pinch point hazards
Chemical Resistant Gloves (Nitrile)	X		While collecting soil and groundwater samples
Rain Gear	X		As needed
Half- or Full-Face Respirator (Specify Cartridges)		X	
Personal Flotation Device		X	
Chaps		X	
Other Required PPE			
All work is anticipated to be completed in Level D or modified Level D. ***NOTE: If Site conditions suggest another level than Level D or Modified Level D for EHS Support personnel, and they are not currently trained for necessary level with the appropriate equipment, stop and do not perform this work.***			

7 Air Monitoring

Periodic air monitoring will be conducted using direct-reading instruments (i.e., PID), and by collecting and analyzing personal samples. Air monitoring will be conducted with a PID with a 10.6 eV or other applicable lamp calibrated to isobutylene to evaluate concentrations of VOCs. The monitoring equipment must be calibrated in accordance with the manufacturer's instructions. In addition, the results of daily instrument calibrations must be recorded in the field notebook, or the Field Instrument Calibration Log included in **Appendix D**. Continuous monitoring of the Operator's Breathing Zone (OBZ) is required during intrusive work. Document readings in the field notes or the Air Monitoring Log included in **Appendix D**.

Monitoring – Direct-Reading Instrumentation							
Task/ Operation	**Substance(s)/ Hazard(s)**	**Monitoring Location**	**Direct Reading Instrument and Response Factor**	**Frequency of Monitoring**	**Action Level**	**Required Action**	**PPE Required**
Soft digging, Drilling, soil logging/screening /sampling, sub-slab vapor point installation and sampling	Many organic and some inorganic gases and vapors	Exclusion zone (EZ)	Ultraviolet (UV) Photoionization Detector (PID)	Continuous	Depends on chemical	Consult standard reference manuals for air concentration/ toxicity data. Action level depends on PEL/REL/TLV.	Level D: (Hardhat, steel-toed boots, eye protection, hearing protection)
Soft digging, Drilling, soil logging/screening /sampling, sub-slab vapor point installation and sampling	Tetrachloroethylene	EZ	PID and colorimetric tube	Continuous	< 50 ppm	No action required.	Level D: (Hardhat, steel-toed boots, eye protection, hearing protection)
					>50 ppm, >1 minute	Monitor OBZ; don protective clothing; establish work zones	Level C: Coveralls, nitrile outer gloves, nitrile inner (surgical) gloves, and a full-face air purifying respirators with organic vapor cartridges. Cartridges will be changed in accordance with manufacturer's recommendations, or at a minimum, on a daily basis.
					>100 ppm, >1 minute	Stop work; move upwind while vapors dissipate. If elevated levels remain, cover boring and cuttings, evacuate upwind, and notify EHS SSO	Level D: (Hardhat, steel-toed boots, eye protection, hearing protection)

Monitoring – Direct-Reading Instrumentation							
Soft digging, Drilling, soil logging/screening /sampling, sub-slab vapor point installation and sampling	Vinyl Chloride	Exclusion zone (EZ)	PID and Colorimetric Tubes	Continuous	<0.5 ppm	No action required.	Level D: (Hardhat, steel-toed boots, eye protection, hearing protection)
					>1 ppm, <5 ppm, >1 minute	Monitor OBZ; don protective clothing; establish work zones	Level C: Coveralls, nitrile outer gloves, nitrile inner (surgical) gloves, and a full-face air purifying respirators with organic vapor cartridges. Cartridges will be changed in accordance with manufacturer's recommendations, or at a minimum, on a daily basis.
					>5 ppm, >1 minute	Stop work; move upwind while vapors dissipate. If elevated levels remain, cover boring and cuttings, evacuate upwind, and notify EHS SSO	As specified by EHS SSO.
Mob'ing drill rig into indoor drilling locations. Operating combustion engine powered equipment indoors.	Oxygen	Indoors	Oxygen Meter	Depending on site conditions, prior to site entry.	< 19.5%	Monitoring, wearing self-contained breathing apparatus. Note that combustible gas readings are not valid in atmospheres with <19.5% oxygen.	Self-contained breathing apparatus plus Level D.

Monitoring – Direct-Reading Instrumentation							
Mob'ing drill rig into indoor drilling locations. Operating combustion engine powered equipment indoors.	Oxygen	Exclusion zone and vicinity of indoor exhaust discharges	Oxygen Meter	Depending on site conditions, prior to site entry.	19.5% to 25%	Normal operating conditions. Note that deviation from normal level may be due to the presence of other substances.	Level D: (Hardhat, steel-toed boots, eye protection, hearing protection)
					> 25%	Fire hazard potential. Discontinue investigation.	
Mob'ing drill rig into indoor drilling locations. Operating combustion engine powered equipment indoors.	Carbon Monoxide	Exclusion zone and vicinity of indoor exhaust discharges	CO Meter	Continuous	<17ppm	No action required.	Level D: (Hardhat, steel-toed boots, eye protection, hearing protection)
					>17ppm	Ventilate Work Area	
					>200ppm	Evacuate Work Area	

8 Site Control, Decontamination, and Emergency Contingency Plan

Is the Site securely fenced?	No	Partial fencing
If no, how will the site prevent access by unauthorized persons?	Work is indoors, lock all exterior doors	
Coordination with Owners or Operators	EHS Support must receive permission to access private property from landowners and site operators.	
Personnel and PPE Decontamination	• Deposit disposable PPE in a waste container • Wash hands and face whenever leaving the Site and before eating, drinking, smoking, or using restroom facilities	
Equipment Decontamination	Refer to the following SOPs for specific decontamination requirements and procedures: • SOP 9 – Field Decontamination • SOP 10 – Decontamination of Heavy Equipment	
Medical Emergencies	Field personnel may administer first aid on a voluntary basis if they are trained to do so. Remember to follow "universal precautions" if blood or bodily fluids are present (i.e., assume all blood and bodily fluids are contaminated and avoid contact with these fluids). Use nitrile or latex gloves when performing first aid. Contact the EHS Support H&S Program Manager if you are exposed to another individual's blood or bodily fluids. For serious injuries or illnesses, transport the victim to the hospital via ambulance by calling 911. If exposure to hazardous substances is suspected, or if any symptoms of exposure are experienced, leave the contaminated area. If a dermal or ocular exposure is suspected, wash the affected area with plenty of water for a minimum of 15 minutes. If symptoms are serious in nature, seek medical assistance immediately. In the event of any work-related injury or illness, contact the EHS Support PM and an EHS Support Safety Specialist by phone. All accidents and injuries will be reported using the electronic New Injury Report form located in the Issues section of MyMomentum.	

HASP Revisions

HASP Section	Updated By	Site Safety Officer Initials	Date	Comment(s)
Section 1.1	GWH	MB	11/02/2023	Edited contacts list
Section 2	GWH	MB	11/02/2023	Added excavation, backfill and cover system repair.
Section 1.1	AMH	MB	05/01/2025	Edited contacts list and updated for 2025

Acronyms

°F	degrees Fahrenheit
µg/m^3	micrograms per cubic meter
ACGIH	American Conference of Governmental Industrial Hygienists
AED	automatic external defibrillator
ANSI	American National Standards Institute
APR	air-purifying respirator
C	ceiling exposure limit
Ca	potential occupational carcinogen
CFR	Code of Federal Regulations
COC	constituent of concern
CPR	cardiopulmonary resuscitation
dB	decibels
eV	electron volt
FID	flame ionization detector
GI	gastrointestinal
H&S	Health and Safety
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
IDW	investigation derived waste
IDLH	immediately dangerous to life and health
IP	ionization potential
JSA	Job Safety Analysis
LEL	lower explosive limit
mg/m^3	milligrams per cubic meter
mph	miles per hour
mrem/hr	milliroentgen equivalent in man per hour
NIOSH	National Institute for Occupational Safety and Health
OBZ	Operator's Breathing Zone
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
PEL	permissible exposure limit
PID	photoionization detector
PM	Project Manager
PPE	personal protective equipment
ppm	parts per million
PSA	Project Safety Analysis
REL	recommended exposure limit
SCBA	self-contained breathing apparatus

SPCC	Spill Prevention, Control, and Countermeasure
SSO	Site Safety Officer
STEL	short-term exposure limit
TLV	threshold limit value
TWA	time-weighted average
VOC	volatile organic compound

Trademarks, trade names, company, or product names referenced herein are used for identification purposes only and are the property of their respective owners.

Appendix A PSA Checklist

Issue Date	Feb. 5, 2014
Revision No.	006
Revision Date	2/16/2023

Project Safety Analysis (PSA)

The purpose of the Project Safety Analysis (PSA) Form and the PSA call is to ensure that all predictable hazards are identified and mitigated before work begins. It should be considered the initial health and safety kickoff call for the proposed work and-at a minimum, should be held three days in advance of the field mobilization to ensure that there is sufficient time for planning and mitigation of any identified hazards. Clients and contractors may provide additional information during the PSA call regarding Site characteristics and activities that could change hazard/safety analyses. Therefore, the Health and Safety Plan (HASP) should be updated with any applicable information provided by the PSA analysis. The main objective of the PSA call is to review the information in this HASP and discuss known and predictable hazards.

The blank PSA form shall be completed by the project manager (PM), or their designated representative, reviewed with the project team during a PSA call, and kept on-site by the site safety officer (SSO). The PSA call shall be conducted at least three days prior to commencement of work. The PSA call is required for all projects involving activities with known or suspected hazards. The PSA call shall include, at a minimum, the following participants:

- EHS Support PM
- EHS Support Site Task Manager/Field Team Leader
- EHS Support SSO
- EHS Support H&S Specialist
- EHS Support contractor representative
- *Client PM
- *Client Site contact
- *Client H&S representative

*These participants are optional. However, it is customary to check on the client PM's availability to participate in the PSA call and at a minimum, include them as an optional attendee on the PSA meeting invitation.

The PSA form is designed to be populated and circulated to the project team prior to the PSA call, and the sections that are not applicable to the upcoming mobilization may be removed from the document. Personnel visiting the site for short periods of time (e.g., health and safety audits, client visits, or subcontractors preforming other duties) or during the middle of a major field mobilization, and who cannot attend the initial PSA, will be provided appropriate pre-job safety training based on the activities they may perform via the Daily Tailgate Safety Form.

PSA Process:

1. PM or their designated representative completes the PSA form.
2. PSA call is scheduled with the project team at least three days prior to commencement of work.
3. PSA form and HASP are provided to all PSA call attendees via the call invite or sent prior to the call to allow for attendee review and preparation.
4. Update PSA form with any changes or new information during the PSA call and update HASP, if necessary.

General Project Information

Project Name	S&G Rochester	**PSA Date**	Click or tap to enter a date.
Site/Project Name	S&G Rochester, NY	**Project Location**	Rochester, NY
PSA Participants (Note: If these key participants are not available, consider postponing the PSA.)			
EHS Support Project Manager	Anton Heitger	**EHS Support Task Manager/Field Team Leader**	Click or tap here to enter text.
EHS Support H&S Dept. Representative	Gregg Hicks	**EHS Support Site Safety Officer**	Click or tap here to enter text.
Client Site Contact	John Simon	**Subcontractor Representative(s)**	Click or tap here to enter text.

Scope of Work		
State of the Site/Facility	Active warehouse	
Site Access	From Seneca Avenue	
Site Topography	Relatively Flat	
Normal Shift Work	☒ Yes	
	☐ No	• Ensure workers performing shift work are properly supervised and utilize the buddy system (no lone working) • Give workers adequate notice prior to shift/working hours changes • Save high-risk work for the day shift when team members are more alert (when able to) • Provide alternative transportation to and from work to limit fatigue-related vehicular accidents (uber or ride share, where feasible) • Shorten "off-shifts" to max 8-hours (when possible)
Lone Working	☐ Yes	Ensure a buddy system been developed for the work, if possible.
		CONTACT PERSON will be contacted by the lone worker at each of the specified intervals: 1. Prior to departure (phone, text message, or email) 2. During work (by phone, text message, or email in the morning and mid-day) 3. Daily upon completion of the task (by phone, text message, or email in the morning and mid-day) 4. Upon returning home (by phone, text message, or email when arriving at home airport, office, or town/city)
	☒ No	
Traffic	Moderate, along Seneca Avenue in Rochester, NY	
Major Tasks		
Equipment Needed		
Location of assembly areas	Southern Parking lot and courtyard northeast of Site	
Location of storm shelter	Warehouse Bathrooms	

Nearest First Aid Kit/AED	Warehouse and EHS Support Vehicles (no AED)
Nearest Eyewash/Shower	Warehouse and EHS Support Vehicles (no shower)

Chemical Hazards

Item	Subject	Yes	No	N/A	Comments
A	Are contaminants present (most recent data)?	☐	☐	☐	
A1	If yes, what are the concentration levels?				
B	Are the contaminants toxic (e.g., carcinogen, mutagen, neurotoxin)?	☐	☐	☐	
C	What are the potential routes of exposure?	Dermal contact and inhalation			
C1	absorption	☐	☐	☐	
C2	inhalation	☐	☐	☐	
C3	ingestion	☐	☐	☐	
C4	injection	☐	☐	☐	
D	Are there PPE requirements?	☐	☐	☐	
D1	If “yes,” what are the levels of protection?				
E	Are there air monitoring requirements?	☐	☐	☐	
F	Are there chemicals to be used/brought on-site for the execution of the work?	☐	☐	☐	
F1	Are Safety Data Sheets available and have they been reviewed?	☐	☐	☐	
F2	Will chemical addition/treatment/injection be performed?	☐	☐	☐	
F3	Will the use of any chemicals or processes result in heat generation or off-gassing?	☐	☐	☐	
G	Will sample preservatives be prepared in the field?	☐	☐	☐	
H	Is there proximity to Site Chemical Operations?	☐	☐	☐	
H1	If “yes,” specify the hazards if exposed to these operations.				
H2	Are additional training, notification, or emergency procedures needed for working in proximity to Site Chemical Operations?	☐	☐	☐	
I	Are additional permits/notifications required for site work (e.g., underground injection control discharge)?	☐	☐	☐	
Additional Comments:					

Site Personnel Information

Item	Yes	No	N/A	PSA Discussion Topics	Comments
Do the personnel serving in the field have adequate safety expertise, training, and experience to serve in their respective project roles: • Transportation Workers Identification Credential (TWIC) • First Aid/CPR • Hot Work • Confined Spaces • Fire Watch • Other:	☐ ☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐ ☐		Click or tap here to enter text.
Are there any Short Service Employees Working on the Field Team? (EHS Support or subcontractors)	☐	☐	☐	Who is serving as the field mentor for those individuals?	
				How will the short service worker be identified? (e.g., color of hard hat, sticker etc.)	Click or tap here to enter text.
Are there subcontractors working on this project?	☐	☐	☐	A subcontractor representative must participate in the PSA call	Click or tap here to enter text.
				Proper subcontractor documents in the file and have been vetted by the H&S team	Click or tap here to enter text.
				Are the subcontractors required to be HAZWOPER trained under 29 CFR 1910.120(a)? Do we have verification of training?	Click or tap here to enter text.
Are EHS Support employees supervising subcontractors?	☐	☐	☐	Do they have the 8-hour Supervisor training in accordance with 1910.120(e)(4) and (e)(8)?	Click or tap here to enter text.

Documentation Checklist

Item	Yes	No	N/A	PSA Discussion Topics	Comments
Is the HASP current for the scope of work? Provide date and title of HASP in the Comments.	☒	☐	☐		November 2023
Has a copy of the current HASP been made available to the PSA call attendees and have the attendees reviewed?	☐	☐	☐		Click or tap here to enter text.
Is there a written scope of work for the project? Provide date and title of the document in the Comments.	☐	☐	☐		Click or tap here to enter text.

Task Specific Physical Hazards

Activity	Yes	No	N/A	PSA Discussion Topics	Yes	No	N/A	Comments
After hours/night work	☐	☐	☐	Is there adequate supplemental or task lighting?	☐	☐	☐	Click or tap here to enter text.
				How is the site secured during off-shifts?	☐	☐	☐	Click or tap here to enter text.
				Is there a buddy system in place?	☐	☐	☐	Click or tap here to enter text.
				Is there a plan for fatigue management?	☐	☐	☐	Click or tap here to enter text.
Audit Due Diligence in Operational Areas of Facility	☐	☐	☐	Will employees have an escort through the facility?	☐	☐	☐	Click or tap here to enter text.
				Will the site provide site-specific visitor/contractor training?	☐	☐	☐	Click or tap here to enter text.
				Has the PM or field team been made aware of site-specific PPE?	☐	☐	☐	Click or tap here to enter text.
				Have high hazard/off limit areas of the facility been discussed with the client?	☐	☐	☐	Click or tap here to enter text.
				Does the facility have specific emergency action protocols?	☐	☐	☐	Click or tap here to enter text.
Concrete or Asphalt Cutting or Coring	☐	☐	☐	How will dust be mitigated? (i.e. wet process)	☐	☐	☐	Click or tap here to enter text.
				High noise exposures during this process will need either distance or hearing protection	☐	☐	☐	Click or tap here to enter text.
Drilling	☐	☐	☐	How will personnel be protected from rotating equipment/moving parts?	☐	☐	☐	Click or tap here to enter text.
				Will there be any suspended loads?	☐	☐	☐	Click or tap here to enter text.
				What requirements will there be for spotters?	☐	☐	☐	Click or tap here to enter text.
				Has adequate clearing and leveling been conducted to accommodate drill rigs and supplies to provide a safe work area?	☐	☐	☐	Click or tap here to enter text.

Activity	Yes	No	N/A	PSA Discussion Topics	Yes	No	N/A	Comments
				Ground crew working in the vicinity of heavy equipment will be minimized to prevent struck by and caught between accident types.	☐	☐	☐	Click or tap here to enter text.
				The following policies will be discussed with the operators: • Keep hands on machine controls and will not engage in distractions (texting, cell phones, radios) while equipment is moving and/or movement is not locked out • Seat belts will be worn while operating equipment.	☐	☐	☐	Click or tap here to enter text.
				Crew will wear traffic vests (Type II, white or yellow) when not wearing overprotective coveralls (i.e. Tyvek).	☐	☐	☐	Click or tap here to enter text.
Driving	☐	☐	☐	Will transportation involve personal, rental, or company vehicle? If "yes," include in the Comments if the car is a personal car, rental car, or a company car.	☐	☐	☐	Click or tap here to enter text.
				Is the vehicle appropriate for the project scope?	☐	☐	☐	Click or tap here to enter text.
				Are drivers familiar with vehicle to be used (e.g., brakes, mirrors, lights, small vs large or SUV)?	☐	☐	☐	Click or tap here to enter text.
				Will work and travel exceed 12 hours?	☐	☐	☐	Click or tap here to enter text.
				Will travel to site exceed 200 miles? *If yes, is there a journey management plan?*	☐	☐	☐	Click or tap here to enter text.
				Are directions to the site available?	☐	☐	☐	24 Seneca Ave, Rochester, NY
Electrical	☐	☐	☐	Ensure all electric services are installed by a licensed electrician.	☐	☐	☐	Click or tap here to enter text.

Activity	Yes	No	N/A	PSA Discussion Topics	Yes	No	N/A	Comments
				Extension cords will be used in a manner that they are protected from damage and inspected prior to use to check for damage (i.e. cuts, breaks, splices, or missing prongs).	☐	☐	☐	Inspect prior to use. Bloodhound equipment battery operated
				If equipment needs maintenance, how will energy control and isolation be completed?	☐	☐	☐	Return to Home Depot
Excavations and Trenches	☐	☐	☐	Who is the competent person?	☐	☐	☐	Click or tap here to enter text.
				How will the excavation be sloped/shored/barricaded?	☐	☐	☐	Click or tap here to enter text.
Groundwater Sampling	☐	☐	☐	Traffic (flow and congestion)?	☐	☐	☐	Click or tap here to enter text.
				Pinch points when opening well heads	☐	☐	☐	Click or tap here to enter text.
				How will ergonomic concerns (i.e., lifting, repetitive motion, materials handling, awkward postures) be mitigated?	☐	☐	☐	Click or tap here to enter text.
				What hand protection will be used to protect against COC exposures?	☐	☐	☐	Click or tap here to enter text.
Heavy Equipment Use	☐	☐	☐	Traffic (flow and congestion)?	☐	☐	☐	Click or tap here to enter text.
				What are requirements for spotters?	☐	☐	☐	Click or tap here to enter text.
				How will daily equipment inspections be documented?	☐	☐	☐	Click or tap here to enter text.
Hot Work	☐	☐	☐	Verify with designated client representative that the planned hot work operations conform to the client's hot work procedures and permit requirements	☐	☐	☐	Click or tap here to enter text.
				How will atmospheric testing be completed?	☐	☐	☐	Click or tap here to enter text.
				Do you have a fire watch with an appropriate fire extinguisher?	☐	☐	☐	Click or tap here to enter text.

Activity	Yes	No	N/A	PSA Discussion Topics	Yes	No	N/A	Comments
				Are there any known flammable or combustible materials in the hot work areas?	☐	☐	☐	Click or tap here to enter text.
Industrial Waste Characterization	☐	☐	☐	What tools will be used to collect soil samples?	☐	☐	☐	Click or tap here to enter text.
				How will potential exposures to vapors and chemicals be mitigated?	☐	☐	☐	Click or tap here to enter text.
Land Based Ecological Surveys	☐	☐	☐	Will work be done near water or sloped ground?	☐	☐	☐	Click or tap here to enter text.
				How are task locations accessed?	☐	☐	☐	Click or tap here to enter text.
Off-site Transportation of Waste	☐	☐	☐	How are moving vehicles/traffic flow managed?	☐	☐	☐	Click or tap here to enter text.
Overwater sediment and surface water sampling	☐	☐	☐	Does the site have a float plan?	☐	☐	☐	Click or tap here to enter text.
				Be aware of the water conditions in the fieldwork area. Know where currents, rapids, and obstructions exist and the locations of shallow and deep spots.	☐	☐	☐	Click or tap here to enter text.
				How will weather conditions be monitored?	☐	☐	☐	Click or tap here to enter text.
				How will the vessel be accessed?	☐	☐	☐	Click or tap here to enter text.
				How will the vessel be secured when not in use?	☐	☐	☐	Click or tap here to enter text.
				Have the proper authorities been notified and permits been approved for work on this waterway?	☐	☐	☐	Click or tap here to enter text.
				Do passengers have appropriate training and PPE?	☐	☐	☐	Click or tap here to enter text.
Pressure washing	☐	☐	☐	Minimum wand length is 48”	☐	☐	☐	Click or tap here to enter text.
				All personnel using pressure washing equipment shall be trained in the proper use and inspection of the equipment	☐	☐	☐	Click or tap here to enter text.

Activity	Yes	No	N/A	PSA Discussion Topics	Yes	No	N/A	Comments
				Do personnel need special PPE to complete pressure washing (i.e. Tyvek suits or face shields)?	☐	☐	☐	Click or tap here to enter text.
Remedial Excavation Works	☐	☐	☐	Who is the competent person?	☐	☐	☐	Click or tap here to enter text.
				How will the excavation be sloped/shored/barricaded?	☐	☐	☐	Click or tap here to enter text.
				Will persons need to enter the excavation?	☐	☐	☐	Click or tap here to enter text.
Remedial Piping Installation	☐	☐	☐	Do any permits need to be obtained prior to starting work? (i.e. hot work)	☐	☐	☐	Click or tap here to enter text.
				Will rigging be used to suspend loads during placement?	☐	☐	☐	Click or tap here to enter text.
				How will pipes be placed? (i.e. manually or use of mechanical placement)	☐	☐	☐	Click or tap here to enter text.
Site Visit/Site Inspection	☐	☐	☐	Will employees have an escort through the facility?	☐	☐	☐	Click or tap here to enter text.
				Will the site provide site-specific visitor/contractor training?	☐	☐	☐	Click or tap here to enter text.
				Has the PM or field team been made aware of site-specific PPE?	☐	☐	☐	Click or tap here to enter text.
				Have high hazard/off limit areas of the facility been discussed with the client?	☐	☐	☐	Click or tap here to enter text.
Surface Water and Sediment Sampling (manual - maximum waist deep)	☐	☐	☐	What PPE needs to be utilized to enter the water? (i.e. waders, PFD)	☐	☐	☐	Click or tap here to enter text.
				How deep is the water expected to be and how swift the current?	☐	☐	☐	Click or tap here to enter text.
				Do field workers need a special permit to access water?	☐	☐	☐	Click or tap here to enter text.

Activity	Yes	No	N/A	PSA Discussion Topics	Yes	No	N/A	Comments
				Where/how will the task locations be accessed (i.e. kayak, riverbank, dock) and how is the terrain at the access point (i.e. sloped, rocky, swampy)?	☐	☐	☐	Click or tap here to enter text.
Waste soil/cutting management from drilling	☐	☐	☐	Determine fill capacity based on materials and weather conditions. • The maximum weight a 55-gallon drum can weight by regulation is 400 KG or 832 pounds if the drums weight more than 800lbs the waste contractor could refuse to pick up the drums. If working in cold weather conditions (i.e., temperatures below freezing), space should be left in water based IDW drums to allow for expansion.	☐	☐	☐	Click or tap here to enter text.
				Does the waste removal contractor have proper mechanical means to move full drums? (i.e. forklift with drum grappler)	☐	☐	☐	Click or tap here to enter text.
				Has a staging area been decided? • Ensure space is left in between the drums for easy removal and inspection • Segregate waste types.	☐	☐	☐	Click or tap here to enter text.
Well Installation	☐	☐	☐	Traffic (flow and congestion)?	☐	☐	☐	Click or tap here to enter text.
				What are requirements for spotters?	☐	☐	☐	Click or tap here to enter text.
				How will daily equipment inspections be documented?	☐	☐	☐	Click or tap here to enter text.
Well Surveying	☐	☐	☐	Traffic (flow and congestion)?	☐	☐	☐	Click or tap here to enter text.
				Pinch points when opening well heads	☐	☐	☐	Click or tap here to enter text.

Activity	Yes	No	N/A	PSA Discussion Topics	Yes	No	N/A	Comments
				How will ergonomic concerns (i.e., lifting, repetitive motion, materials handling, awkward postures) be mitigated?	☐	☐	☐	Click or tap here to enter text.
				What hand protection will be used to protect against COC exposures?	☐	☐	☐	Click or tap here to enter text.

Site Conditions Assessment

Site Condition	Yes	No	N/A	PSA Discussion Topics	Yes	No	N/A	Comments
Heavy Wooded Site Area/High areas of vegetation where ecology present	☐	☐	☐	Does vegetation need to be cleared? If so, what tools will be used?	☐	☐	☐	Click or tap here to enter text.
High activity site with heavy equipment	☐	☐	☐	Will spotters be used?	☐	☐	☐	Click or tap here to enter text.
				How will ground crew communicate with operators?	☐	☐	☐	Click or tap here to enter text.
				If traffic is continually flowing (i.e. trucks continually entering/exiting the site) has a traffic flow plan been developed?	☐	☐	☐	Click or tap here to enter text.
Potential for unexploded ordinance	☐	☐	☐	Are explosion hazards throughout the site, or only in exclusion zone?	☐	☐	☐	Click or tap here to enter text.
				Smoking, open flames, and spark generating equipment will only be allowed in designated areas. Have those areas been defined?	☐	☐	☐	Click or tap here to enter text.
Activity in Private Homes or Third-Party Premises	☐	☐	☐	Have access permits been obtained?	☐	☐	☐	Click or tap here to enter text.
Remote Site with limited services	☐	☐	☐	Are field members CPR/AED/First Aid trained and comfortable providing care if needed?	☐	☐	☐	Click or tap here to enter text.
				Who on the field team will provide a first aid kit and eye wash?	☐	☐	☐	Click or tap here to enter text.
Absence of Cell Phone Reception	☐	☐	☐	How will team members communicate?	☐	☐	☐	Click or tap here to enter text.
				How will emergency response be contacted in the event of an emergency?	☐	☐	☐	Click or tap here to enter text.
Poor access requiring 4WD	☐	☐	☐	Do we have the appropriate rental vehicles?	☐	☐	☐	Click or tap here to enter text.
				Are we using ATVs?	☐	☐	☐	Click or tap here to enter text.

<table>
<tr><th>Site Condition</th><th>Yes</th><th>No</th><th>N/A</th><th>PSA Discussion Topics</th><th>Yes</th><th>No</th><th>N/A</th><th>Comments</th></tr>
<tr><td rowspan="4">High crime/area subject to civil disobedience</td><td rowspan="4">☐</td><td rowspan="4">☐</td><td rowspan="4">☐</td><td>Are there any site-specific/special clearance requirements for site access (e.g., government installation, site security notification)?</td><td>☐</td><td>☐</td><td>☐</td><td>Click or tap here to enter text.</td></tr>
<tr><td>If “yes,” were arrangements made to comply with the requirements?</td><td>☐</td><td>☐</td><td>☐</td><td>Click or tap here to enter text.</td></tr>
<tr><td>Is pre-site visit drug testing required?</td><td>☐</td><td>☐</td><td>☐</td><td>Click or tap here to enter text.</td></tr>
<tr><td>Is local Area Safety Council Training required?</td><td>☐</td><td>☐</td><td>☐</td><td>Click or tap here to enter text.</td></tr>
<tr><td rowspan="5">Overhead Utilities</td><td rowspan="5">☐</td><td rowspan="5">☐</td><td rowspan="5">☐</td><td>Has an avoidance plan been prepared?</td><td>☐</td><td>☐</td><td>☐</td><td>Click or tap here to enter text.</td></tr>
<tr><td>Have project overhead utility hazards been identified?</td><td>☐</td><td>☐</td><td>☐</td><td>Click or tap here to enter text.</td></tr>
<tr><td>Will ground crew member been assigned as a spotter to any piece of heavy equipment that is working close enough to an overhead line so that a part of the machine does not infringe on the safe distance?</td><td>☐</td><td>☐</td><td>☐</td><td>Click or tap here to enter text.</td></tr>
<tr><td>On the first day, team members must designate power line crossing points and post signs stating DANGER OVERHEAD POWER LINES.</td><td>☐</td><td>☐</td><td>☐</td><td>Click or tap here to enter text.</td></tr>
<tr><td>Safe distances from overhead power lines must be maintained (see table below)
<table>
<tr><th>System Voltage (kilovolts)</th><th>Minimum Distance Required Clearance (feet)</th></tr>
<tr><td>0 -50</td><td>10</td></tr>
<tr><td>51 – 100</td><td>12</td></tr>
<tr><td>101 – 200</td><td>15</td></tr>
<tr><td>201 – 300</td><td>20</td></tr>
<tr><td>301 – 500</td><td>25</td></tr>
</table></td><td>☐</td><td>☐</td><td>☐</td><td>Click or tap here to enter text.</td></tr>
</table>

Site Condition	Yes	No	N/A	PSA Discussion Topics	Yes	No	N/A	Comments
				501 – 750: 35 751 – 1000: 45				
Underground Utilities	☐	☐	☐	How will underground utility clearance be conducted?	☐	☐	☐	Click or tap here to enter text.
				Has a public one-call been requested?	☐	☐	☐	Click or tap here to enter text.
				Private utility mark out be used?	☐	☐	☐	Click or tap here to enter text.
				Is there a minimum clearance of 5 feet from the edge of utility markings and proposed drilling locations?	☐	☐	☐	Click or tap here to enter text.
				Will the upper 4 feet of all intrusive work be manually cleared by hand augering/probing, air jet, or other similar method?	☐	☐	☐	Click or tap here to enter text.
				If intrusive work must be conducted within the required 5-foot minimum clearance, has the specific work been reviewed by an EHS Support H&S Specialist and the PM?	☐	☐	☐	Click or tap here to enter text.
Local Hunting Season	☐	☐	☐	Are there nearby woods where hunters could be?	☐	☐	☐	Click or tap here to enter text.
				What specific colors/highly visible clothing should be worn?	☐	☐	☐	Click or tap here to enter text.
				How will crew members make themselves “known” in the area? (i.e. making noise or using 4-ways on equipment)	☐	☐	☐	Click or tap here to enter text.
				Do we need to adjust working times to accommodate for typical hunting times (i.e. dawn and dusk)?	☐	☐	☐	Click or tap here to enter text.
Biological Hazards	☐	☐	☐	Alligators	☐	☐	☐	Click or tap here to enter text.
				Bears	☐	☐	☐	Click or tap here to enter text.

Site Condition	Yes	No	N/A	PSA Discussion Topics	Yes	No	N/A	Comments
				Bees	☐	☐	☐	Click or tap here to enter text.
				Fire Ants	☐	☐	☐	Click or tap here to enter text.
				Poison Ivy	☐	☐	☐	Click or tap here to enter text.
				Poison Sumac	☐	☐	☐	Click or tap here to enter text.
				Snakes	☐	☐	☐	Click or tap here to enter text.
				Spiders	☐	☐	☐	Click or tap here to enter text.
				Ticks	☐	☐	☐	Click or tap here to enter text.
				Wasps	☐	☐	☐	Click or tap here to enter text.
				Other:	☐	☐	☐	Click or tap here to enter text.
Potential for Heat or Cold Stress Activities	☐	☐	☐	Will there be significant potential for either heat or cold stress activities?	☐	☐	☐	Click or tap here to enter text.
				Heat: Plan to manage heat stress. Ensuring workers are acclimated to the conditions and means for shade / rest rotations as well as adequate hydration.	☐	☐	☐	Click or tap here to enter text.
				Cold: Plan to manage cold stress. Ensuring workers are acclimated to the conditions and means for warming rotations as well as wind management and adequate hydration.	☐	☐	☐	Click or tap here to enter text.
Potential for Thunderstorms	☐	☐	☐	Is there a designated area where will the field team can take temporary shelter when lightning is seen, or thunder is heard?	☐	☐	☐	Click or tap here to enter text.
				30 minutes must pass since the last detected lightning strike or thunderclap, how will the team keep track?	☐	☐	☐	Click or tap here to enter text.
Potential for Tornadoes	☐	☐	☐	How will the field team track severe weather alerts for tornado warnings and watches?	☐	☐	☐	Click or tap here to enter text.

Site Condition	Yes	No	N/A	PSA Discussion Topics	Yes	No	N/A	Comments
				Does the site have a site-specific evacuation and muster point? If not, the field team should define one upon arriving to the site.	☐	☐	☐	Click or tap here to enter text.
Potentials for Hurricanes	☐	☐	☐	Has the weather been checked prior to mobilization for potential hurricanes?	☐	☐	☐	Click or tap here to enter text.
Potentials for Earthquakes	☐	☐	☐	Any recent earthquake activity? Discuss and plan in the event of one happening	☐	☐	☐	Click or tap here to enter text.
Potential for snow/ice	☐	☐	☐	Is snow and ice in the forecast?	☐	☐	☐	Click or tap here to enter text.
				How will snow and ice be removed from access areas (i.e. walkways and roads) on the site?	☐	☐	☐	Click or tap here to enter text.
Other Site-Specific Hazards	☐	☐	☐	Discuss any other site-specific hazards known to the site or encountered during other mobilization efforts.	☐	☐	☐	Click or tap here to enter text.

Site Required Personal Protective Equipment (PPE)

Equipment	Required	Not Applicable	Comments
Steel Toe Boots/Shoes	X		
Chemical Boots		X	
Coveralls or Long Sleeve Shirt & Pants	X		
Safety Vest	X		
Hearing Protection	X		
Hard Hat	X		
Safety Glasses with Side Shields	X		
Safety Goggles		X	While pressure washing
Face Shield		X	While pressure washing
Cotton or Leather Work Gloves	X		
Chemical Resistant Gloves (Nitrile)	X		
Rain Gear		X	As needed
Half- or Full-Face Respirator (Specify Cartridges)		X	
Personal Flotation Device		X	
Chaps		X	
Other Required PPE	N/A		
All work is anticipated to be completed in Level D or modified Level D. ***NOTE: If Site conditions suggest another level than Level D or Modified Level D for EHS Support personnel, and they are not currently trained for necessary level with the appropriate equipment, stop and do not perform this work.***			

Appendix B Job Safety Analysis Worksheet

Issue Date	Oct. 12, 2017
Revision No.	003
Revision Date	Aug. 24, 2020

Job Safety Analysis (JSA)

Using the information accumulated regarding the potential hazards posed to EHS Support employees from your site-specific health and safety plan (HASP), an evaluation of the hazards must be conducted. The evaluation will be done as a JSA. A JSA is a method by which assigned jobs are reviewed to determine how to control hazards posed during the assigned tasks. The hierarchy of hazard control is as follows:

- Elimination – completely remove the hazard from the work environment.
- Substitution – substitute tools or chemicals to reduce the hazard.
- Engineering controls – install barriers or use mechanical means to reduce the hazard (e.g., ventilation).
- Administrative controls – change schedules, employee rotation, signage, and training to reduce exposure.
- Work practice controls – change the way tasks are conducted to reduce exposure.
- Personal Protective Equipment (PPE) – assign PPE when controls do not abate the hazard.

A JSA worksheet will be completed for each job that will be performed by EHS Support employees. The JSA is an important accident prevention tool that works by finding hazards and eliminating or controlling them before they have a chance to become accidents. The JSA can be used for job clarification and hazard awareness, as a guide in new employee training, for retraining existing employees, as a refresher on jobs which run infrequently, as an accident investigation tool, and for informing employees of specific job hazards and protective measures. JSAs should be completed by keeping in mind the potential risks of the separate tasks that comprise the job, as well as past injury/illness history of the task(s). Each job is broken into tasks that are listed on the worksheet. The hazards are then ranked using a calculation that accounts for the potential severity and the potential likelihood of the identified hazards. Before completing the JSA form, consider the following:

- The purpose of the job – what has to be done and who has to do it?
- The activities involved – how is it done, when is it done, and where is it done?

Employees assigned to perform the jobs being evaluated should be involved in the completion of the JSA form. The process for completing a JSA should include an observation and/or experience with how an EHS Support employee conducts the task/job and an operational review of the task/job.

Prior to conducting tasks that require the use of physical labor or mechanical equipment, the hazards of these tasks and mitigation measures to be used must be reviewed. If at any time tasks have not been addressed in the HASP, the Project Manager (PM) or Site Safety Officer (SSO) must review the hazards associated with that task. The time involved and level of crew involvement should be appropriate to the tasks being performed. This discussion of additional hazards should be documented in some manner (e.g., JSA, field book, Daily Tailgate Safety Meeting form). A daily Site safety briefing is required to discuss and document the tasks to be conducted that day, specific hazards associated with the tasks, and any lessons learned from the previous day. The meetings are to be held prior to the commencement of any tasks. The Daily Tailgate Safety Meeting form is in **Appendix E** of the HASP or located on MyMomentum.info.

Client: Stanley Black & Decker **Project:** Former Sargent & Greenleaf Rochester **Location:** 24 Seneca Ave., Rochester, NY	**JSA Title:**	**Page** **of**	☐ New ☐ Revised

Work Activity Description:	**Project / Field Team Members:**	**JSA Author(S):**	**Date:**
		Reviewed By:	**Date:**
		Approved By:	**Date:**

Risk Assessment Matrix		**Likelihood Ratings**					
Consequences Ratings		**A**	**B**	**C**	**D**	**E**	**F**
People	**Property**	**1** Very remote (1 in 1,000,000)	**2** Remote (1 in 100,000)	**3** Possible (1 in 10,000)	**4** Probable (1 in 1,000)	**5** Likely (1 in 100)	**6** Almost certain (1 in 10)
1 = No Injury / Illness	1 = No damage	**1 - Low**	**2- Low**	**3- Low**	**4- Low**	**5- Low**	**6- Low**
2 = Injury / Illness — first aid only	2 = Slight damage	**2- Low**	**4- Low**	**6- Low**	**8- Low**	**10- Medium**	**12- Medium**
3 = Injury / Illness — medical treatment	3 = Minor damage	**3- Low**	**6- Low**	**9- Medium**	**12- Medium**	**15- Medium**	**18- High**
4 = Disabling injury (restricted work or days away from work)	4 = Local damage	**4- Low**	**8- Low**	**12- Medium**	**16- Medium**	**20- High**	**24- High**
5 = Long-term disability or major disabling injury	5 = Major damage	**5- Low**	**10- Medium**	**15- Medium**	**20- High**	**25- High**	**30- High**
6 = Fatality	6 = Catastrophic damage	**6- Low**	**12- Medium**	**18- High**	**24- High**	**30- High**	**36- High**

Minimum Required PPE (See Critical Actions for Task-Specific Requirements)			
☐ Safety Vest	☐ Goggles	☐ Respirator (provide type)	☐ Nitrile Gloves
☐ Hard Hat	☐ Face Shield	☐ Protective Outerwear	☐ Leather or Work Gloves
☐ Lifeline / Body Harness	☐ Hearing Protection	☐ Chemical Protective Outerwear	☐ Other:
☐ Safety Glasses	☐ Safety Boots / Shoes	☐ Fire Extinguisher	

Job Steps (List Every Step in The Task)	**Potential Hazards** (List Every Hazard Associated with Every Step in The Task)	**Baseline Risk Score**	**Hazard Controls / Protection Measures**	**Post Prevention Risk Score**
Example: Access monitoring wells	• Pinch points from opening well • Metal plate covers/caps • Insects (bees, wasps etc.) • Poisonous spiders • Slips/Trips/Falls • Contaminated water / vapors	6 - Low	• Wear proper gloves to access and use tools to remove metal plate covers if necessary. • Be aware of insects and spiders in well annulus. • Watch where you are walking, avoid uneven surfaces. • Wear safety glasses, proper gloves (Nitrile). Allow well to vent long enough for vapors to dissipate.	3 - Low

Instructions for Completing the Job Safety Analysis Form

Complete a Job Safety Analysis (JSA) for all tasks being conducted on-site that may pose a hazard to EHS Support employees. Assigned jobs should be reviewed to determine how to control or minimize the hazards, as well as protect employees from these hazards. Each job is broken into tasks; the tasks are listed in order and an associated hazard ranking is calculated for each. This JSA worksheet was developed to aid in the review of jobs/tasks. The JSA is an important accident prevention tool that works by finding hazards and eliminating them before they become accidents. The JSA can be used for job clarification and hazard awareness, as a guide in new employee training, for retraining existing employees, as a refresher on jobs which run infrequently, as an accident investigation tool, and for informing employees of specific job hazards and protective measures.

Keep in mind the potential risks of the separate tasks that comprise the job, as well as the past injury/illness history of the task(s) when completing the JSA. Consider the following when completing the JSA:

- The purpose of the job — What must be done? Who will do it?
- The activities involved — How is it done? When is it done? Where is it done?

Employees assigned to perform the jobs being evaluated should be involved in the completion of the JSA form. The process for completing a JSA must include the following: a visual observation of (or experience with) how an EHS Support employee conducts the task/job and an operational review of the job/task. ALL JSAs SHOULD BE REVIEWED AT LEAST ANNUALLY OR AFTER AN INCIDENT/ACCIDENT AND REVISED AS NECESSARY. When applicable, this worksheet should be included in the site-specific health and safety plans (HASPs).

The following provides column-by-column instructions for completing the JSA form.

Column-by-Column Instructions

Job Steps

Examine a specific job/task by breaking it down into a list of steps (tasks) to discover the potential hazards employees may encounter.

Each job/task or operation will consist of a set of steps. For example, the job might be to collect a soil sample using a trowel. To determine where a step begins or ends, look for a change of activity as in a change in direction, movement, or tools. In the example, preparing the sampling equipment is one step. The next step might be to walk to the sample location (a change in activity). The following step may be clearing the area where the sample will be collected. Filling a sample container would be another step and so on.

Be sure to list all the steps needed to perform the job. It is OK if you break the job down into many small tasks rather than group too many of them together. Some steps may not be performed each time, for example, clearing a sample location. Not all sample collection areas will require clearing. However, if that step is generally part of the job, it should be listed.

Potential Hazards

A hazard is a potential physical, chemical, or environmental danger. The purpose of the JSA is to identify as many hazards as can be predicted. Consider the entire universe of the task when identifying hazards. Ask the five “Ws" and one "H" questions, who, what, when, where, why, and how. For example: who is conducting the step; what tools, equipment, and chemicals are used to complete the step; when is the task/step being conducted (e.g., time of day/year, light/dark conditions, cold/hot conditions); where is the task being conducted; why is the task being conducted (e.g., contamination); how will the step be conducted (e.g., what position will your body be in for the task — crouching, bending, standing, sitting).

To identify hazards, ask yourself these questions about each step of the task:

- Is there the chance the employee may strike against, be struck by, or otherwise making injurious contact with an object or a vehicle?
- Can an employee be caught in, by, or between objects?
- Is there potential for slipping, tripping, or falling?
- Could an employee suffer strains from pushing, pulling, lifting, bending, or twisting?
- What equipment will the employee use during the task?
- Is the environment hazardous to safety and/or health (e.g., over exposure to heat/cold, bees, snakes, ticks, spiders, fire ants, poison ivy/oak, heat, gases, mists, fumes)?
- Are there contaminants of concern present? Can the employee's activity cause a potential exposure to those contaminants?
- What is someone else doing that could negatively impact me/others or the project?

Close observation and knowledge of the job is important. Examine each step carefully to find and identify hazards: include the actions, conditions, and possibilities that could lead to an accident. Compiling an accurate and complete list of potential hazards will allow you to develop the recommended safety procedures needed to prevent accidents.

Baseline Risk Score & Post Prevention Risk Score

The Baseline Risk Score is an assessment of the risk level in the task prior to performing and acting on the findings of the JSA. The Post Prevention Risk Score provides an assessment of the risk level in the task after implementing the control and protection measures assigned by the JSA. The risk score is calculated by multiplying the Severity of the injury/illness by the Likelihood of the injury/illness occurring. Use the following matrix to determine the risk score:

Risk Assessment Matrix		Likelihood Ratings					
Consequences Ratings		A	B	C	D	E	F
People	Property	1 Very remote (1 in 1,000,000)	2 Remote (1 in 100,000)	3 Possible (1 in 10,000)	4 Probable (1 in 1000)	5 Likely (1 in 100)	6 Almost certain (1 in 10)
1 = No Injury / Illness	1 = No damage	1 - Low	2- Low	3- Low	4- Low	5- Low	6- Low
2 = Injury / Illness — first aid only	2 = Slight damage	2- Low	4- Low	6- Low	8- Low	10- Medium	12- Medium
3 = Injury / Illness — medical treatment	3 = Minor damage	3- Low	6- Low	9- Medium	12- Medium	15- Medium	18- High
4 = Disabling injury (restricted work or days away from work)	4 = Local damage	4- Low	8- Low	12- Medium	16- Medium	20- High	24- High
5 = Long-term disability or major disabling injury	5 = Major damage	5- Low	10- Medium	15- Medium	20- High	25- High	30- High
6 = Fatality	6 = Catastrophic damage	6- Low	12- Medium	18- High	24- High	30- High	36- High

To determine the risk level, complete the following:

1. Calculate the Baseline Risk score and enter it in the appropriate column on the JSA form. The baseline risk scores are used to determine the urgency of action or implementation of hazard controls (see the risk scores below).
2. Assign controls/protections for the identified hazards greater than a Baseline Prevention Risk Score of 4.
3. Re-calculate the score accounting for the changes the controls/protections will make — this new score is the Post Prevention Risk score.
4. Enter the Post Prevention Risk score in the appropriate column on the JSA form.

Using the risk scores below, determine the action to take based on the Post Prevention Risk score. (Note: If the Post Prevention Risk Score remains greater or equal to 9, the job should be suspended until controls/protections are implemented to lower the risk score.)

The risk scores are:

- 1 to 6 (Acceptable Risk) — No additional action needed.
- 5 to 8 (Low) — Review the operation/activity and take any steps necessary to reduce and control the risks.
- 9 to 16 (Medium) — Inform Site Safety Officer and seek further advice before proceeding any further with the operation/activity.
- 17 or Greater (High) — STOP the activity immediately. Review with Site Safety Officer and Project Manager and reduce the risks identified. Contact a member of the H&S Team if further guidance is needed.

Hazard Controls / Protection Measures

Using the first three columns of the JSA form as a guide, decide what actions or procedures are necessary to eliminate or minimize the hazards that could lead to an accident, injury, or occupational illness. Keep in mind the Occupational Safety and Health Administration (OSHA) requirement to control hazards before assigning personal protective equipment.

To begin minimizing/eliminating hazards, implement the following in order they are presented below:

1. Engineering controls to remove or abate the hazard
2. Administrative controls to protect from the hazard
3. Work practice controls (e.g., provide job instruction training)
4. Personal protective equipment
5. Good housekeeping
6. Good ergonomics (positioning the person in relation to the machine or other elements in such a way as to improve safety)

Once actions and/or procedures have been defined, enter them in the “Hazard Controls / Protection Measures” column on the form. Keep in mind the following:

1. List all appropriate safe operating procedures. Begin with an action word. Say exactly what needs to be done to correct the hazard, such as "lift using your leg muscles." Avoid general statements such as "be careful," "watch out," or “work safely.”
2. List the required PPE necessary to perform each step of the job if controls cannot completely abate the hazard.
3. Give a recommended action or procedure for each hazard. Serious hazards should be corrected immediately.

Appendix C Daily Tailgate Safety Meeting Form

Issue Date	Jan. 2, 2013
Revision No.	005
Revision Date	January 2021

Daily Tailgate Safety Form

General Information			
Project Name/Location: **Former Sargent & Greenleaf, Rochester, NY**		**Name(s) of Person(s) Conducting Meeting:**	
Date:	**Time:**	**Weather:**	
Lone Worker			
☐ No **If no, continue to rest of form*	☐ Yes ***If yes, complete check-in person and daily tasks/hazards section below*	**Check-In Person:**	**Check-In Frequency:** *(i.e. arrival, lunch, and de-mob; or every 2 hours)*
Subcontractor(s):			

Day 1/Project Restart topics to cover:

Who is: ☐ PM(s) ☐ SSO ☐ Client ☐ Client PM ☐Subs ☐ Contact for Emergency

Chain of command for communicating hazards, incidents, stop work, etc.?

Location of: ☐ 1st Aid Kits ☐ Fire Extinguishers ☐ SDSs ☐ JSAs ☐ Emergency Contacts ☐ Hospital/Clinic

☐ What is different on the site from what was covered during the PSA call?

☐ What are we doing today that is not captured on the JSAs?

☐ What are obvious unique risks identified?

☐ Other EHS Support, Client, Sub or Other Party activities that may pose a hazard to today's activities?

☐ Complete all pre-use inspections (i.e., heavy equipment, power/hand tools, fall protection, electrical) and turn in to Project Manager at the end of the field event

**Regroup during/after lunch to discuss morning activities and plan for afternoon activities.*

Discuss the following – review of previous day's outcomes (Check if YES):

☐ Incidents? ☐ Lessons Learned? ☐ Any Stop Work Interventions? ☐ Corrective Actions Worked?

☐ Issues with Equipment? ☐ Issues with PPE? ☐ Audits/Inspections Performed? ☐ Communication Changes?

☐ Topics from Corp H&S or Client to Cover? ☐ Any work deviate from plan? – Notify PM & client

☐ Other: Click or tap here to enter text.

Notes: Click or tap here to enter text.

**All incidents and audits shall be uploaded to MyMomentum.*

Prework authorization – check activities to be conducted that require permit issuance or completion of a checklist, or similar, before work begins:

☐ Not Applicable ☐ Access Permits ☐ Confined Space ☐ Energy Isolation (LOTO) ☐ Hot Work ☐ Steam ☐ Live Electrical

☐ Buried or Overhead Utilities ☐ Excavation/Trenching ☐ Mechanical Lifting Ops ☐ Pressure System ☐ Working at Height

☐ Float Plan ☐ Other:

Permit Name/Numbers and Notes:

Today's Task(s)	
1.	2.
3.	4.
5.	6.

Potential Hazards Associated – Review the known risks from the JSA Hazard Rating (left column) and determine if risk level has changed (check risk level of Low (L), Medium (M), High (H) - refer to Risk Assessment Matrix on JSA Form). If the risk has increased to HIGH, the JSA shall be updated and new controls implemented.

Previous Hazard Rating – Tasks with	L	M	H	Tailgate Hazard Rating	L	M	H
☐ Mechanical (i.e., augers, moving parts)	☐	☐	☐	☐ Mechanical (i.e., augers, moving parts)	☐	☐	☐
☐ Pressure (i.e., gas cylinders, wells)	☐	☐	☐	☐ Pressure (i.e., gas cylinders, wells)	☐	☐	☐
☐ Electrical (i.e., utilities, equip. repair/shut down)	☐	☐	☐	☐ Electrical (i.e., utilities, equip. repair/shut down)	☐	☐	☐
☐ Radiation (i.e., alpha, sun, laser)	☐	☐	☐	☐ Radiation (i.e., alpha, sun, laser)	☐	☐	☐
☐ Security (i.e., lighting, equipment, check-ins)	☐	☐	☐	☐ Security (i.e., lighting, equipment, check-ins)	☐	☐	☐
☐ Gravity (i.e., ladder, scaffold, trips)	☐	☐	☐	☐ Gravity (i.e., ladder, scaffold, trips)	☐	☐	☐
☐ Chemical (i.e., fuel, acid, waste)	☐	☐	☐	☐ Chemical (i.e., fuel, acid, waste)	☐	☐	☐
☐ Motion (i.e., traffic, moving water)	☐	☐	☐	☐ Motion (i.e., traffic, moving water)	☐	☐	☐
☐ Driving (i.e., boat, ATV, skid steer)	☐	☐	☐	☐ Driving (i.e., boat, ATV, skid steer)	☐	☐	☐
☐ Sound (i.e., machinery, generators)	☐	☐	☐	☐ Sound (i.e., machinery, generators)	☐	☐	☐
☐ Environment (i.e., heat, cold, rain)	☐	☐	☐	☐ Environment (i.e., heat, cold, rain)	☐	☐	☐
☐ Biological (i.e., ticks, snakes, poison ivy)	☐	☐	☐	☐ Biological (i.e., ticks, snakes, poison ivy	☐	☐	☐
☐ Personal (i.e., alone, night, not fit for duty)	☐	☐	☐	☐ Personal (i.e., alone, night, not fit for duty)	☐	☐	☐
☐ Other:	☐	☐	☐	☐ Other:	☐	☐	☐
Proposed Corrective Actions	**Yes**	**No**	**N/A**	**Proposed Corrective Actions**	**Yes**	**No**	**N/A**
Protective Clothing/Equipment Required	☐	☐	☐	Work Permit Required	☐	☐	☐
Delineate Work Areas to Protect Workers and/or Public	☐	☐	☐	Other:	☐	☐	☐
Comments:							

Attendees
Site Workers (including EHS Support Contractors and Subcontractors) by signing here, you are stating the following: • You have been involved in the Daily Tailgate Safety Meeting, the review of the JSAs, and understand the hazards and control measures associated with each task you are about to perform. • You are aware of your authority and obligation to 'Stop Work' **Fit for duty:** • You are physically and mentally fit for duty. • You are not under the influence of any type of medication, drugs, or alcohol that could negatively affect your ability to work safely. • You are aware of your responsibility to immediately report any illness, injury (regardless of where or when it occurred), or fatigue issue you may have to the EHS Support SSO. • You leave the site uninjured unless you have otherwise notified the EHS Support SSO.
EHS Support Site Safety Officer: _____ _____ Name Signature

Site Personnel Name and Affiliation	Signature	Site Personnel Name and Affiliation	Signature

Site Visitors – Not involved in work activities				
Name (print)	**Company Name**	**Arrival Time**	**Depart Time**	**Signature** *(I have been informed of today's activities and site safety parameters)*

Post Daily Activities Review – To be completed once activities for day have concluded and BEFORE leaving the Site		
Were there any incidents or near misses?	☐ Yes* ☐ No	If yes, details:
Where there any 'Stop Work' interventions?	☐ Yes ☐ No	If yes, details:
Where there any areas for improvement noted?	☐ Yes ☐ No	If yes, details:
Was the site audited by EHS Support, client, or regulatory representative?	☐ Yes* ☐ No	If yes, details:
The job site is being left in a safe condition and there were no reports of injury or first aid.	☐ Yes ☐ No	
EHS Support SSO Signature: _____		

** If response is YES, entry into MyMomentum is required.*

Please upload into SharePoint under your project in a folder titled Daily Tailgate Safety Forms.

Appendix D Air Monitoring Log

Issue Date	Aug. 16, 2013
Revision No.	002
Revision Date	Jan. 8, 2019

Air Monitoring Log

Project Information			
Company Name:	**Address:**	**Telephone:**	**Date:**
Project Name:	**Client:**	**Site Location:**	**Operation Monitored:**
Instrument:	**Model:**	**Serial No.:**	
Calibration Date:	**Probe:**	**Settings:**	
Temp/Rel. Hum:	**Wind:**	**Indoor:**	**Outdoor:**
Interference:		**Operator Name:**	

Air Monitoring Log							
Sample No.	***Time***	***LEL***	***O_2***	***H_2S***	***CO***	***Location***	***Comments***

Appendix E Corrective Action Form

EHS Support™

Issue Date	Jan. 2, 2014
Revision No.	001
Revision Date	Jan. 8, 2019

Corrective Action Form

Item No.	Corective Actions (Must match Causative Factor)	Responsible Party	Due Date	Date Completed	Details

Appendix F Incident Forms

EHS Support™

Issue Date	Nov. 6, 2012
Revision No.	001
Revision Date	Jan. 8, 2019

Employee Notification of Injury or Illness

Case No. _____

Employee Information (To be Completed by Injured Employee)		
Employee's First Name:	**Employee's Last Name**	**Date of Birth:**
Address, City, State, Zip:		**Social Security #:**
Phone Number(s): Home: **Other:**	**Job Title:**	**Time in Occupation at EHS Support:**

Accident Information			
Date of Accident:	**Start Shift Time:**	**Time of Accident:** Click here to enter a time.	**Worked Until End of Shift:** ☐Yes ☐No

Location of Accident (Be Specific – Place, Address, Customer Site, Area/Department, etc.):

Description of Injury (Be Specific – Describe how the injury occurred and what the employee was doing prior to the injury):

Part(s) of the Body Injured (List **all** that apply):

☐ Arm	☐ Elbow	☐ Neck	☐ Face	☐ Foot/Feet	☐ Groin
☐ Hand	☐ Finger(s)	☐ Back	☐ Leg	☐ Toe(s)	☐ Chest
☐ Wrist	☐ Eye	☐ Head	☐ Knee	☐ Stomach	☐ Internal Organs
☐ Other (Describe):					

Please describe the injured Body Part(s) [i.e., Right Shoulder, Left Ankle]:

Injury communicated to:	**Date Reported:**

Treatment Information

Type of medical treatment given: ☐ No Medical Treatment/Precautionary Report ☐ First Aid/In House ☐ Occupational Health Center/Clinic ☐ Hospitalized Overnight ☐ Emergency Room

Treatment rendered (forward copies of all treatment notes to the H&S Program Manager):

Name of the facility where initial medical treatment was given:

Treating physician's name: **Facility Phone Number**:

Date of Treatment:

Did employee miss any days of work? ☐Yes ☐No **If yes, date of first day missed**:

Witness name:	**Witness Phone Number**:
I hereby declare that the statements provided in this document are; to the best of my knowledge and belief, complete and true. **Fraud Notice**: Any Individual filing misleading or incomplete information knowingly and with the intent to defraud is in violation of Section1102 of the Pennsylvania Workers' Compensation Act and may also be subject to criminal and civil penalties through Pennsylvania Act165.	
Employee Signature: _____ Original Signature Required	**Date: _____**

Please submit to the Health and Safety Program Manager.

Appendix G Safety Data Sheets

SAFETY DATA SHEET

Version 5.10
Revision Date 02/26/2015
Print Date 01/22/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : 2-Propanol

Product Number : I9516
Brand : Sigma
Index-No. : 603-117-00-0

CAS-No. : 67-63-0

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 # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225
Eye irritation (Category 2A), H319
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H225 Highly flammable liquid and vapour.
H319 Causes serious eye irritation.
H336 May cause drowsiness or dizziness.

Precautionary statement(s)
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.

P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ eye protection/ face protection.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P312	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/ physician if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

May form explosive peroxides.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms : sec-Propyl alcohol
Isopropyl alcohol
Isopropanol

Formula : C_3H_8O
Molecular weight : 60.10 g/mol
CAS-No. : 67-63-0
EC-No. : 200-661-7
Index-No. : 603-117-00-0

Hazardous components

Component	Classification	Concentration
2-Propanol		
	Flam. Liq. 2; Eye Irrit. 2A; STOT SE 3; H225, H319, H336	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

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

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

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

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

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

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 water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

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

Handle and store under inert gas. Hygroscopic.
Storage class (TRGS 510): Flammable liquids

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

Component	CAS-No.	Value	Control parameters	Basis
2-Propanol	67-63-0	TWA	200.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment Upper Respiratory Tract irritation		

		Eye irritation Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		
		TWA	200 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		
		STEL	400 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		
		STEL	400.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		
		TWA	400.000000 ppm 980.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		TWA	400.000000 ppm 980.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	500.000000 ppm 1,225.000000 mg/m3	USA. NIOSH Recommended Exposure Limits

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
2-Propanol	67-63-0	Acetone	40.0000 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls

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

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

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: 0.4 mm
Break through time: 480 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.2 mm
Break through time: 60 min
Material tested:Dermatril® P (KCL 743 / Aldrich Z677388, 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.

Body Protection
impervious clothing, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

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

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Colour: colourless
b)	Odour	alcohol-like
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -89.5 °C (-129.1 °F)
f)	Initial boiling point and boiling range	82 °C (180 °F)
g)	Flash point	12.0 °C (53.6 °F) - closed cup
h)	Evaporation rate	3.0
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 12.7 %(V) Lower explosion limit: 2 %(V)
k)	Vapour pressure	43.2 hPa (32.4 mmHg) at 20.0 °C (68.0 °F) 58.7 hPa (44.0 mmHg) at 25.0 °C (77.0 °F)
l)	Vapour density	No data available

m)	Relative density	0.785 g/mL at 25 °C (77 °F)
n)	Water solubility	completely soluble
o)	Partition coefficient: n-octanol/water	log Pow: 0.05
p)	Auto-ignition temperature	425.0 °C (797.0 °F)
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

Surface tension	20.8 mN/m at 25.0 °C (77.0 °F)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Test for peroxide formation before distillation or evaporation. Test for peroxide formation or discard after 1 year.
Stable under recommended storage conditions.
Stable under recommended storage conditions.

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

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Oxidizing agents, Acid anhydrides, Aluminium, Halogenated compounds, Acids

10.6 Hazardous decomposition products
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 5,045 mg/kg
Remarks: Behavioral:Altered sleep time (including change in righting reflex). Behavioral:Somnolence (general depressed activity).

LC50 Inhalation - Rat - 8 h - 16000 ppm

LD50 Dermal - Rabbit - 12,800 mg/kg

No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Mild skin irritation

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Eye irritation - 24 h

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC: 3 - Group 3: Not classifiable as to its carcinogenicity to humans (2-Propanol)

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
Inhalation, Oral - May cause drowsiness or dizziness.

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: NT8050000

Central nervous system depression, prolonged or repeated exposure can cause:, Nausea, Headache, Vomiting, narcosis, Drowsiness, Overexposure may cause mild, reversible liver effects., Aspiration may lead to:, Lung oedema, Pneumonia
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Kidney - Irregularities - Based on Human Evidence
Kidney - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Pimephales promelas (fathead minnow) - 9,640.00 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 5,102.00 mg/l - 24 h
	Immobilization EC50 - Daphnia magna (Water flea) - 6,851 mg/l - 24 h
Toxicity to algae	EC50 - Desmodesmus subspicatus (green algae) - > 2,000.00 mg/l - 72 h
	EC50 - Algae - > 1,000.00 mg/l - 24 h

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No bioaccumulation is to be expected (log Pow <= 4).

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
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1219 Class: 3 Packing group: II
Proper shipping name: Isopropanol
Reportable Quantity (RQ):

Poison Inhalation Hazard: No

IMDG
UN number: 1219 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: ISOPROPANOL

IATA
UN number: 1219 Class: 3 Packing group: II
Proper shipping name: Isopropanol

15. REGULATORY INFORMATION

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

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
2-Propanol	67-63-0	1987-01-01

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
2-Propanol	67-63-0	1987-01-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
2-Propanol	67-63-0	1987-01-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
2-Propanol	67-63-0	1987-01-01

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Eye Irrit.	Eye irritation
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
STOT SE	Specific target organ toxicity - single exposure

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	3
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: 5.10 Revision Date: 02/26/2015 Print Date: 01/22/2016

SAFETY DATA SHEET

Version 3.11
Revision Date 12/01/2015
Print Date 05/01/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Vinyl chloride

Product Number : 387622
Brand : Aldrich
Index-No. : 602-023-00-7

CAS-No. : 75-01-4

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

Identified uses : Laboratory chemicals, Synthesis 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 # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable gases (Category 1), H220
Gases under pressure (Liquefied gas), H280
Carcinogenicity (Category 1A), H350

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H220 Extremely flammable gas.
H280 Contains gas under pressure; may explode if heated.
H350 May cause cancer.

Precautionary statement(s)
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P281 Use personal protective equipment as required.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.

P377	Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381	Eliminate all ignition sources if safe to do so.
P405	Store locked up.
P410 + P403	Protect from sunlight. Store in a well-ventilated place.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS
May form explosive peroxides.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	Chloroethylene
Formula	:	C_2H_3Cl
Molecular weight	:	62.50 g/mol
CAS-No.	:	75-01-4
EC-No.	:	200-831-0
Index-No.	:	602-023-00-7

Hazardous components

Component	Classification	Concentration
Vinyl chloride		
	Flam. Gas 1; Press. Gas Liquefied gas; Carc. 1A; SA ; H220, H280, H350,	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

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

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

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

In case of eye contact
Flush eyes with water as a precaution.

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

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 water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides, Hydrogen chloride gas

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Clean up promptly by sweeping or vacuum.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Contents under pressure. Light sensitive.

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

Component	CAS-No.	Value	Control parameters	Basis
Vinyl chloride	75-01-4	TWA	1 ppm	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		TWA	1 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Liver damage Lung cancer Confirmed human carcinogen		
		STEL	5 ppm	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		TWA	1 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		STEL	5 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		See 1910.1017		
		Potential Occupational Carcinogen See Appendix A		

8.2 Exposure controls

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

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

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.

Splash contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 120 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, 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.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

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

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: Liquefied gas
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -153.8 °C (-244.8 °F) - lit.
f)	Initial boiling point and boiling range	-13.4 °C (7.9 °F) - lit.
g)	Flash point	-61.0 °C (-77.8 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or	Upper explosion limit: 33 %(V) Lower explosion limit: 3.6 %(V)

	explosive limits	
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	0.911 g/cm3 at 25 °C (77 °F)
n)	Water solubility	No data available
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.
Contains the following stabiliser(s):
Hydroquinone (>=0 - <=0.0001 %)
Phenol (>=0 - <=0.01 %)

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
Heat, flames and sparks. Extremes of temperature and direct sunlight.

10.5 Incompatible materials
Chemically active metals, Copper

10.6 Hazardous decomposition products
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

LC50 Inhalation - Rat - 0.3 h - 180000 ppm
Remarks: Behavioral:Tremor. Behavioral:Convulsions or effect on seizure threshold. Respiratory disorder

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

This is or contains a component that has been reported to be carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Human carcinogen.

IARC:	1 - Group 1: Carcinogenic to humans (Vinyl chloride)
NTP:	Known to be human carcinogen (Vinyl chloride)
OSHA:	OSHA specifically regulated carcinogen (Vinyl chloride)

Reproductive toxicity
No data available

Overexposure may cause reproductive disorder(s) based on tests with laboratory animals.

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: KU9625000

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Central nervous system -
Stomach - Irregularities - Based on Human Evidence (Phenol)
Liver - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

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
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1086 Class: 2.1
Proper shipping name: Vinyl chloride, stabilized
Reportable Quantity (RQ): 1 lbs

Poison Inhalation Hazard: No

IMDG
UN number: 1086 Class: 2.1 EMS-No: F-D, S-U
Proper shipping name: VINYL CHLORIDE, STABILIZED

IATA
UN number: 1086 Class: 2.1
Proper shipping name: Vinyl chloride, stabilized
IATA Passenger: Not permitted for transport

15. REGULATORY INFORMATION

SARA 302 Components
The following components are subject to reporting levels established by SARA Title III, Section 302:

	CAS-No.	Revision Date
Phenol	108-95-2	2007-07-01
Hydroquinone	123-31-9	2007-07-01

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Vinyl chloride	75-01-4	2007-07-01

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Vinyl chloride	75-01-4	2007-07-01
Phenol	108-95-2	2007-07-01
Hydroquinone	123-31-9	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Vinyl chloride	75-01-4	2007-07-01
Phenol	108-95-2	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Vinyl chloride	75-01-4	2007-07-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer.	CAS-No.	Revision Date
Vinyl chloride	75-01-4	2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

	May displace oxygen and cause rapid suffocation.
Carc.	Carcinogenicity
Flam. Gas	Flammable gases
H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.
H350	May cause cancer.
Press. Gas	Gases under pressure
SA	Simple Asphyxiant

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	4
Physical Hazard	3

NFPA Rating

Health hazard:	2
Fire Hazard:	4
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: 3.11 Revision Date: 12/01/2015 Print Date: 05/01/2016

SAFETY DATA SHEET

Version 4.4
Revision Date 12/01/2015
Print Date 05/01/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : cis-Dichloroethylene

Product Number : 48597
Brand : Supelco
Index-No. : 602-026-00-3

CAS-No. : 156-59-2

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

Identified uses : Laboratory chemicals, Synthesis 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 # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225
Acute toxicity, Inhalation (Category 4), H332
Acute aquatic toxicity (Category 3), H402
Chronic aquatic toxicity (Category 3), H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H225 Highly flammable liquid and vapour.
H332 Harmful if inhaled.
H412 Harmful to aquatic life with long lasting effects.

Precautionary statement(s)
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 Use only non-sparking tools.

P243	Take precautionary measures against static discharge.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P312	Call a POISON CENTER or doctor/ physician if you feel unwell.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P403 + P235	Store in a well-ventilated place. Keep cool.
P501	Dispose of contents/ container to an approved waste disposal plant.

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

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	C2H2Cl2
Molecular weight	:	96.94 g/mol
CAS-No.	:	156-59-2
EC-No.	:	205-859-7
Index-No.	:	602-026-00-3

Hazardous components

Component	Classification	Concentration
cis-Dichloroethylene		
	Flam. Liq. 2; Acute Tox. 4; Aquatic Acute 3; Aquatic Chronic 3; H225, H332, H412	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

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

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

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

In case of eye contact
Flush eyes with water as a precaution.

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

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 water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides, Hydrogen chloride gas

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

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

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

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

Recommended storage temperature 2 - 8 °C

Handle and store under inert gas. Air and moisture sensitive. Light sensitive.

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

Component	CAS-No.	Value	Control parameters	Basis
cis-Dichloroethylene	156-59-2	TWA	200 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment Eye irritation		

8.2 Exposure controls

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

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

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.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

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

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

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Colour: light yellow
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	-80.0 °C (-112.0 °F)
f)	Initial boiling point and boiling range	60.0 - 61.0 °C (140.0 - 141.8 °F)
g)	Flash point	6.0 °C (42.8 °F) - closed cup
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	1.28 g/cm3
n)	Water solubility	No data available
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
Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks. Extremes of temperature and direct sunlight.

10.5 Incompatible materials
Oxidizing agents

10.6 Hazardous decomposition products
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LC50 Inhalation - Rat - 13700 ppm
Remarks: Behavioral:Somnolence (general depressed activity). Liver:Fatty liver degeneration.

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.
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: KV9420000

narcosis, 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
No data available

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
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1150 Class: 3 Packing group: II
Proper shipping name: 1,2-Dichloroethylene

Poison Inhalation Hazard: No

IMDG
UN number: 1150 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: 1,2-DICHLOROETHYLENE

IATA
UN number: 1150 Class: 3 Packing group: II
Proper shipping name: 1,2-Dichloroethylene

15. REGULATORY INFORMATION

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

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

SARA 311/312 Hazards
Fire Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
cis-Dichloroethylene	156-59-2	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
cis-Dichloroethylene	156-59-2	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
cis-Dichloroethylene	156-59-2	1993-04-24

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

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H332	Harmful if inhaled.
H402	Harmful to aquatic life.

HMIS Rating

Health hazard:	1
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	1

NFPA Rating

Health hazard:	2
Fire Hazard:	3
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: 4.4 Revision Date: 12/01/2015 Print Date: 05/01/2016

SAFETY DATA SHEET

Version 5.6
Revision Date 12/03/2015
Print Date 05/27/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Diesel Fuel No. 2

Product Number : UST147
Brand : Sigma-Aldrich

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

Identified uses : Laboratory chemicals, Synthesis 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 # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Skin irritation (Category 2), H315
Eye irritation (Category 2A), H319
Carcinogenicity (Category 2), H351
Specific target organ toxicity - single exposure (Category 3), Respiratory system, Central nervous system, H335, H336
Specific target organ toxicity - repeated exposure, Oral (Category 2), Liver, Blood, H373
Specific target organ toxicity - repeated exposure, Inhalation (Category 2), Central nervous system, H373

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Warning

Hazard statement(s)

H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H351	Suspected of causing cancer.
H373	May cause damage to organs (Liver, Blood) through prolonged or repeated exposure if swallowed.
H373	May cause damage to organs (Central nervous system) through prolonged or repeated exposure if inhaled.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/ physician if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

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

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Hazardous components

Component		Classification	Concentration
Methylene chloride			
CAS-No. EC-No. Index-No.	75-09-2 200-838-9 602-004-00-3	Skin Irrit. 2; Eye Irrit. 2A; Carc. 2; STOT SE 3; STOT RE 2; H315, H319, H335, H336, H351, H373, H373	>= 90 - <= 100 %
Fuels, diesel, no. 2			
CAS-No. EC-No. Index-No.	68476-34-6 270-676-1 649-227-00-2	Flam. Liq. 4; Carc. 2; STOT SE 3; Asp. Tox. 1; Aquatic Acute 2; Aquatic Chronic 2; H227, H304, H336, H351, H411	>= 0.1 - < 1 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

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

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

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

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

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

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 water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides, Hydrogen chloride gas
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
For precautions see section 2.2.

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

Store at Room Temperature.

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

Component	CAS-No.	Value	Control parameters	Basis
	Remarks	Potential Occupational Carcinogen See Appendix A		
Methylene chloride	75-09-2	TWA	50.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Carboxyhemoglobinemia		

		Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		
		TWA	50 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Carboxyhemoglobinemia Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		
		Substance listed; for more information see OSHA document 1910.1052		
		Substance listed; for more information see OSHA document 1910.1052		
		See Table Z-2		
		PEL	25.000000 ppm	OSHA Specifically Regulated Chemicals/Carcinogens
		1910.1052 This section applies to all occupational exposures to methylene chloride (MC), Chemical Abstracts Service Registry Number 75-09-2, in general industry, construction and shipyard employment. Methylene chloride (MC) means an organic compound with chemical formula, CH2Cl2. Its Chemical Abstracts Service Registry Number is 75-09-2. Its molecular weight is 84.9 g/mole OSHA specifically regulated carcinogen		
		STEL	125.000000 ppm	OSHA Specifically Regulated Chemicals/Carcinogens
		1910.1052 This section applies to all occupational exposures to methylene chloride (MC), Chemical Abstracts Service Registry Number 75-09-2, in general industry, construction and shipyard employment. Methylene chloride (MC) means an organic compound with chemical formula, CH2Cl2. Its Chemical Abstracts Service Registry Number is 75-09-2. Its molecular weight is 84.9 g/mole OSHA specifically regulated carcinogen		
Fuels, diesel, no. 2	68476-34-6	TWA	100.000000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Dermatitis Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption varies		
		TWA	100.000000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Dermatitis Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption varies		
		TWA	100 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Dermatitis Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption varies		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Methylene chloride	75-09-2	Dichloromethane	0.3000 mg/l	Urine	ACGIH - Biological Exposure Indices

					(BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			

8.2 Exposure controls

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

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

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.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

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

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	No data available
f)	Initial boiling point and boiling range	No data available
g)	Flash point	No data available
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	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition	No data available

	temperature	
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
Strong oxidizing agents

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

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:	2A - Group 2A: Probably carcinogenic to humans (Methylene chloride)
IARC:	3 - Group 3: Not classifiable as to its carcinogenicity to humans (Fuels, diesel, no. 2)
NTP:	Reasonably anticipated to be a human carcinogen (Methylene chloride)
OSHA:	OSHA specifically regulated carcinogen (Methylene chloride)

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: Not available

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

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

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
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1593 Class: 6.1 Packing group: III
Proper shipping name: Dichloromethane, solution
Reportable Quantity (RQ): 1005 lbs

Poison Inhalation Hazard: No

IMDG
UN number: 1593 Class: 6.1 Packing group: III EMS-No: F-A, S-A
Proper shipping name: DICHLOROMETHANE, SOLUTION

IATA
UN number: 1593 Class: 6.1 Packing group: III
Proper shipping name: Dichloromethane, solution

15. REGULATORY INFORMATION

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

SARA 313 Components
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
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Methylene chloride	75-09-2	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Methylene chloride	75-09-2	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Methylene chloride	75-09-2	2007-07-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer.	CAS-No.	Revision Date
Methylene chloride	75-09-2	2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Asp. Tox.	Aspiration hazard
Carc.	Carcinogenicity
Eye Irrit.	Eye irritation
Flam. Liq.	Flammable liquids
H227	Combustible liquid.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H351	Suspected of causing cancer.
H373	May cause damage to organs (/$/*_ORG_REP_INHA/$/) through prolonged or repeated exposure if inhaled.
H411	Toxic to aquatic life with long lasting effects.
Skin Irrit.	Skin irritation
STOT RE	Specific target organ toxicity - repeated exposure
STOT SE	Specific target organ toxicity - single exposure

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	1

NFPA Rating

Health hazard:	2
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: 5.6 Revision Date: 12/03/2015 Print Date: 05/27/2016

SAFETY DATA SHEET

Version 5.2
Revision Date 07/03/2014
Print Date 12/23/2014

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Gasoline, premium unleaded

Product Number : 47516-U
Brand : Supelco

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 # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225
Acute toxicity, Oral (Category 3), H301
Acute toxicity, Inhalation (Category 3), H331
Acute toxicity, Dermal (Category 3), H311
Germ cell mutagenicity (Category 1B), H340
Carcinogenicity (Category 1B), H350
Specific target organ toxicity - single exposure (Category 1), H370

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H225	Highly flammable liquid and vapour.
H301 + H311 + H331	Toxic if swallowed, in contact with skin or if inhaled
H340	May cause genetic defects.
H350	May cause cancer.
H370	Causes damage to organs.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.

P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P307 + P311	IF exposed: Call a POISON CENTER or doctor/ physician.
P322	Specific measures (see supplemental first aid instructions on this label).
P330	Rinse mouth.
P361	Remove/Take off immediately all contaminated clothing.
P363	Wash contaminated clothing before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

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

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Synonyms : Gasoline
Petrol
Petroleum benzin

Hazardous components

Component		Classification	Concentration
Methanol			
CAS-No.	67-56-1	Flam. Liq. 2; Acute Tox. 3; STOT SE 1; H225, H301 + H311 + H331, H370	90 - 100 %
EC-No.	200-659-6		
Index-No.	603-001-00-X		
Registration number	01-2119433307-44-XXXX		
Gasoline			
CAS-No.	86290-81-5	Flam. Liq. 2; Muta. 1B; Carc. 1B; Asp. Tox. 1; H225, H304, H340, H350	1 - 5 %
EC-No.	289-220-8		
Index-No.	649-378-00-4		

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

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

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

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

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

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 water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self contained breathing apparatus for fire fighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

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

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

Component	CAS-No.	Value	Control parameters	Basis
Methanol	67-56-1	TWA	200 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Headache Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		STEL	250 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Headache Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		TWA	200 ppm 260 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		ST	250 ppm 325 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		TWA	200 ppm 260 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		STEL	250 ppm 325 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		Skin notation		
		TWA	200 ppm 260 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		Skin notation		
Gasoline	86290-81-5	TWA	300 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Eye & Upper Respiratory Tract irritation Central Nervous System impairment Confirmed animal carcinogen with unknown relevance to humans		
		STEL	500 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Eye & Upper Respiratory Tract irritation Central Nervous System impairment Confirmed animal carcinogen with unknown relevance to humans		
		TWA	500 ppm 2,000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		TWA	400 ppm 1,600 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Methanol	67-56-1	Methanol	15 mg/l	Urine	ACGIH - Biological Exposure Indices

					(BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			

8.2 Exposure controls

Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

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: 0.4 mm
Break through time: 480 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.2 mm
Break through time: 30 min
Material tested:Dermatril® P (KCL 743 / Aldrich Z677388, 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.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

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

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid
b)	Odour	no data available
c)	Odour Threshold	no data available
d)	pH	no data available
e)	Melting point/freezing point	no data available
f)	Initial boiling point and boiling range	no data available

g)	Flash point	9.7 °C (49.5 °F) - closed cup
h)	Evapouration rate	no data available
i)	Flammability (solid, gas)	no data available
j)	Upper/lower flammability or explosive limits	no data available
k)	Vapour pressure	no data available
l)	Vapour density	no data available
m)	Relative density	no data available
n)	Water solubility	no data available
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
Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks. Extremes of temperature and direct sunlight.

10.5 Incompatible materials
Acids, Oxidizing agents, Alkali metals, Strong oxidizing agents, Acid chlorides, Acid anhydrides, Reducing agents

10.6 Hazardous decomposition products
Other decomposition products - no data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
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: 2B - Group 2B: Possibly carcinogenic to humans (Gasoline)

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: Not available

Methyl alcohol may be fatal or cause blindness if swallowed., Cannot be made non-poisonous., Effects due to ingestion may include:, Nausea, Dizziness, Gastrointestinal disturbance, Weakness, Confusion., Drowsiness, Unconsciousness, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence
Bladder - (Gasoline)

12. ECOLOGICAL INFORMATION

12.1 Toxicity
no data available

12.2 Persistence and degradability
no data available

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
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1230 Class: 3 Packing group: II
Proper shipping name: Methanol, solution
Reportable Quantity (RQ): 5000 lbs
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN number: 1230 Class: 3 (6.1) Packing group: II EMS-No: F-E, S-D
Proper shipping name: METHANOL, SOLUTION
Marine pollutant: No

IATA
UN number: 1230 Class: 3 (6.1) Packing group: II
Proper shipping name: Methanol, solution

15. REGULATORY INFORMATION

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
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01
Gasoline	86290-81-5	2009-07-17

New Jersey Right To Know Components

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01
Gasoline	86290-81-5	2009-07-17

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer. Gasoline	86290-81-5	2007-09-28
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Methanol	67-56-1	2012-03-16

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Asp. Tox.	Aspiration hazard
Carc.	Carcinogenicity
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H301	Toxic if swallowed.
H301 + H311 + H331	Toxic if swallowed, in contact with skin or if inhaled
H304	May be fatal if swallowed and enters airways.
H311	Toxic in contact with skin.
H331	Toxic if inhaled.
H340	May cause genetic defects.
H350	May cause cancer.
H370	Causes damage to organs.
Muta.	Germ cell mutagenicity
STOT SE	Specific target organ toxicity - single exposure

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	3
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: 07/03/2014 Print Date: 12/23/2014

Appendix H Miscellaneous Safety Forms

EHS Support

Issue Date	Jan. 2, 2014
Revision No.	001
Revision Date	Jan. 8, 2019

Daily Site Safety Record (Site Register of Everyone Entering Site)

Site (Site Name):						**Date:**	
Company Name	**Name (Print)**	**Type of Work Performed / Reason for Visit**	**Time In**	**Time Out**	**Visitor Signature (*)**	**JSA Reviewed /Checklists Completed**	**Attended Today's Toolbox Meeting**
						(Site Safety Officer Initials for Acknowledgement)	

(*) Signatory acknowledges having either attended start work discussion (operatives) or read and understood the site safety rules (delivery – visit)

Start work discussion held by:		
Works to be performed during the day – safety precautions to take – review of hazardous situations spotted during the previous day:		
Hazardous situations spotted during the day (describe briefly what? Where? What could have happened? And corrective actions taken):		
Safety tailgate discussion topics (log attendance on page 1):		
Notes and action points:		
Reviewed by:		
Site safety officer:	Signature:	Date:
Other:		
Other:		

EHS Support

Issue Date	Mar. 7, 2013
Revision No.	001
Revision Date	Jan. 8, 2019

Damage Information Reporting Tool (DIRT) Field Form

☐ Near Miss ☐ Utility Strike

Part A – Who is Submitting this Information			
☐ Electric ☐ Insurance ☐ Private Water ☐ State Regulator	☐ Engineer/Design ☐ Liquid Pipeline ☐ Public Works ☐ Telecommunications	☐ Equipment Manufacturer ☐ Locator ☐ Railroad ☐ Unknown/Other	☐ Excavator ☐ Natural Gas ☐ Road Builders
Name of the person providing the information: **Name of EHS Support Project Manager Gathering Information:**			

Part B – Date and Location of Event		
Date of Event:	**Country:**	**State:**
County:	**City:**	
Street Address:	**Nearest Intersection:**	

Right of Way where event occurred:

Public: ☐ City Street ☐ State Highway ☐ County Road ☐ Interstate Highway ☐ Public-Other

Private: ☐ Private Business ☐ Private Land Owner ☐ Private Easement ☐ Pipeline
☐ Power/Transmission Line ☐ Dedicated Public Utility Easement
☐ Federal Land ☐ Railroad ☐ Data Not Collected ☐ Unknown/Other

Part C – Affected Facility Information

What type of facility operation was affect?

☐ Cable Television ☐ Electric ☐ Natural Gas ☐ Liquid Pipeline ☐ Sewer (Sanitary Sewer)
☐ Steam ☐ Telecommunications ☐ Water ☐ Unknown/Other

What type of facility was affected?

☐ Distribution ☐ Gathering ☐ Service/Drop ☐ Transmission ☐Unknown/Other

Was the facility part of a joint trench?

☐ Unknown ☐ Yes ☐ No

Was the facility owner a member of One-Call Center?

☐ Unknown ☐ Yes ☐ No

Part D – Excavation Information

Type of Excavator

☐ Contractor ☐ County ☐ Developer ☐ Farmer ☐ Municipality ☐Occupant
☐ Railroad ☐ State ☐ Utility ☐ Date not collected ☐ Unknown/Other

Type of Excavation Equipment

☐ Auger ☐ Backhoe/Trackhoe ☐ Boring ☐ Drilling ☐ Directional Drilling
☐ Explosives ☐ Farm Equipment ☐ Hand tools ☐ Grader/Scraper ☐ Milling Equipment
☐ Trencher ☐ Vacuum Equipment ☐ Probing Device ☐ Data Not Collected ☐ Unknown/Other

Type of Work Performed

☐ Drainage ☐ Bldg Construction ☐ Electric ☐ Engineering/Survey ☐ Bldg Demolition
☐ Fencing ☐ Grading ☐ Irrigation ☐ Landscaping ☐ Liquid Pipeline
☐ Milling ☐ Natural Gas ☐ Pole ☐ Road Work ☐ Sewer (san/storm)
☐ Steam ☐ Site Development ☐ Water ☐ Telecommunication ☐ Storm Drain/Culvert
☐ Waterway Improvement ☐ Data Not Collected ☐ Unknown/Other

Part E – Notification

Was the One-Call Center notified?
☐ Yes (If YES, Part F is required) ☐ No (If NO, Skip Part F)

If Yes, which One-Call Center?

If Yes, please provide ticket number:

Part F – Locating and Marking

Type of Locator
☐ Utility Owner ☐ Contract Locator ☐ Data Not Collected ☐ Unknown/Other

Were facility marks visible in the area of excavation?
☐ Yes ☐ No ☐ Data Not Collected ☐ Unknown/Other

Were facilities marked correctly?
☐ Yes ☐ No ☐ Data Not Collected ☐ Unknown/Other

Part G – Excavator Downtime

Did Excavator Incur Downtime?
☐ Yes ☐ No

If yes, how much time?
☐ Unknown ☐ Less than 1 hour ☐ 1 hour ☐ 2 hours ☐ 3 hours or more Exact Value____

Estimated cost of down time?
☐ Unknown ☐ $0 ☐ $1 to 500 ☐ $501 to 1,000 ☐ $1,001 to 2,500 ☐ $2,501 to 5,000
☐ $5,001 to 25,000 ☐ $25,001 to 50,000 ☐ $50,001 and over Exact Value_____

Part H – Description of Damage

Was there damage to a facility?
☐ Yes ☐ No (i.e., near miss)

Did the damage cause an interruption in service?
☐ Yes ☐ No ☐ Data Not Collected ☐ Unknown/Other

If Yes, duration of interruption?
☐ Unknown ☐ <1 hour ☐ 1-2 hrs ☐ 2-4 hrs ☐ 4-8 hrs ☐ 8-12 hrs ☐ 12-24 hrs
☐ 1-2 days ☐ 2-3 days ☐ 3 or more days Exact Value _____ ☐ Data Not Collected

Approximately how many customers were affected?
☐ Unknown ☐ 0 ☐ 1 ☐ 2 to 10 ☐ 11 to 50 ☐ 51 or more Exact Value _____

Estimated cost of damage/repair/restoration?
☐ Unknown ☐ $0 ☐ $1 to 500 ☐ $501 to 1,000 ☐ $1,001 to 2,500 ☐ $2,501 to 5,000
☐ $5,001 to 25,000 ☐ $25,001 to 50,000 ☐ $50,001 and over Exact Value_____

Number of people injured?
☐ Unknown ☐ 0 ☐ 1 ☐ 2 to 9 ☐ 10-19 ☐ 20 to 49 ☐ 50 to 99
☐ 100 or more Exact Value _____

Number of fatalities?
☐ Unknown ☐ 0 ☐ 1 ☐ 2 to 9 ☐ 10-19 ☐ 20 to 49 ☐ 50 to 99
☐ 100 or more Exact Value _____

Part I – Injury Reporting	
Refer to EHS Support Incident Report form and Investigation Report Form **Attach completed investigation form to DIRT Form**	
Part J – Description of Root Cause	
One-Call Notification Practices Not Sufficient ☐ No notification made to the One-Call Center ☐ Notification to One-Call Center made, but not sufficient ☐ Wrong information provided to One-Call Center	**Locating Practices Not Sufficient** ☐ Facility could not be found or located ☐ Facility marking or location not sufficient ☐ Facility was not located or marked ☐ Incorrect facility records/map
Excavation Practices Not Sufficient ☐ Failure to maintain marks ☐ Failure to support exposed facilities ☐ Failure to use hand tools where required ☐ Failure to test-hole (pot-hole) ☐ Improper backfilling practices ☐ Failure to maintain clearance ☐ Other insufficient excavation Practices	**Miscellaneous Root Causes** ☐ One-Call Center error ☐ Abandoned facility ☐ Deteriorated facility ☐ Previous damage ☐ Lack of/Insufficient Training ☐ Lack of/Insufficient Management Control ☐ Did not follow procedure(s)/requirement(s) ☐ Data Not Collected ☐ Other
Part K – Additional Comments	
Witness Name:	**Witness Phone Number:**
Witness Name:	**Witness Phone Number:**
I hereby declare that the statements provided in this document are; to the best of my knowledge and belief, complete and true. Signature: _____	Date: _____

Please submit to the EHS Support Health and Safety Program Manager.

EHS Support

Issue Date	Jan 2, 2014
Revision No.	002
Revision Date	Jan. 8, 2019

Field Instrument Calibration Log

Project Information			
Project Name	Project Location	Name	Date

Field Instrument Calibration Log

Equipment Information								**Initial Reading(s)**			**Final Reading(s)**		
Date	**Type (FID, PID, IR)**	**Make**	**Model #**	**Lamp Ev (10.6 or 11.8)**	**Serial #**	**Calibration Gas (Type and Concentration)**	**Cylinder/ Batch #**	**Equipment Reading (PPM)**	**Time**	**Name of Person Performing Calibration**	**Equipment Reading (PPM)**	**Time**	**Name of Person Performing Calibration**

EHS Support

Issue Date	Oct. 12, 2017
Revision No.	001
Revision Date	Jan. 8, 2019

Heavy Equipment Safety Checklist

Project Name: _____ Date: _____

Project Location: _____ Inspector: _____

Operator(s): _____

Equipment Type: _____

Category	Inspection Items	Yes	No	N/A	Action(s) Needed
Records	Equipment inspection and maintenance records available				
	Operator training records available				
	Is a list of all chemicals being used on the current job kept on file and made available to all employees? (Check SDS book and verify its location is known to each employee)				

Category	Inspection Items	Pass	Fail	N/A	Action(s) Needed
Equipment	Emergency stop(s) functional (verify)				
	Leveling devices/ Outriggers/ Tracks (no damage)				
	Protective guards on moving parts (drill shaft, drive shafts, belts, chain drives and universal joints)				
	Fuel, hydraulic lines, oil reservoirs properly filled				
	No fluid leaks (pneumatic/hydraulic)				
	Operator controls, panel and gauges functional				
	Warning lights functional				
	Brakes and clutches functional				
	Steps and handholds (condition and cleanliness)				
	Tires (sidewall condition, cuts, tread condition)				
	Cracked welds/unusual wear patterns around attachment				
	Safety latches on hooks				
	Slings, chokers, and lifting devices (no damage)				
	Shackles/Clevises (no damage)				
	Fire extinguisher (10 lb. or larger; fully charged and inspected)				
PPE	Proper safety gear worn given the work environment				

Category	Inspection Items	Pass	Fail	N/A	Action(s) Needed
Fire Prevention	No smoking or open flames is observed within exclusion zone				
	Flammable liquids not stored within 50 ft (15.2m)				
Exclusion/ Work Zones	Exclusion/work zone has been established with proper controls				
Overhead Obstructions	Except where electrical distribution and transmission lines have been de-energized and visibly grounded, drill rigs will be operated proximate to under, by, or near power lines as follows: • 50 KV or less - minimum clearance of 10 feet • 50 KV to 200 KV – minimum clearance of 15 feet. • 200 KV or higher – add 5 feet for every 100KV over 200KV If voltage is unknown, maintain at least 20 feet of clearance.				
	Spotter is utilized around overhead obstructions ≤15 feet				
Housekeeping	Proper housekeeping measures implemented				
Repairs	Repairs, when possible, are conducted offsite to reduce the risk of any onsite incidents				
Support Vehicles	Vehicles are road ready (tires, seatbelts, lights, brakes, mirrors, windshield wipers)				
	Trailers are properly hitched with working brake lights				
	Vehicles meet height and weight requirements				
	Equipment is secured.				
Other	First Aid Kit available onsite				
	Proper safety measures on elevated decks				

Comments:

_____
_____
_____
_____

Signature: _____ Date: _____

EHS Support

Issue Date	Sep. 18, 2014
Revision No.	001
Revision Date	Jan. 8, 2019

Personal Air Sampling Form

PROJECT INFORMATION

Project/Company Name	**Project Number**	**Project/Company Location**

Field Technician	**Sample Date**	**Weather Conditions**

Wind Direction/Speed	**Relative Humidity**	**Shift** ☐ Day ☐ Evening ☐ Night **Shift Length** _____ hours

Sample Location ☐ Indoor ☐ Outdoor

Location Description:

POTENTIAL HAZARDOUS SOURCE(S)

☐ Non-Ionizing Radiation: Type (e.g. microwave, radiofrequency, infrared): _____

☐ Inhalation – Type: ☐ Metal: _____ ☐ Dust: _____ ☐ Mist _____ ☐ Acid: _____

☐ Base: _____ ☐ Solvent: _____ ☐ Fumes: _____ ☐ Other: _____

☐ Biological Inhalation – Type: ☐ Mold ☐ Bacteria ☐ Other: _____

☐ Blank (Air not drawn through media) Location: _____

Area Sample: ☐ Source ☐ Background (located at area not impacted by source) ☐ Other: _____

Frequency of Operation: ☐ Daily ☐ 2–3/Week ☐ Weekly ☐ 2–3/Month ☐ Monthly ☐ ___/Year ☐ Yearly ☐ Other ___

Duration of Operation: ☐ <15 min ☐ 15–30 min ☐ 30–60 min ☐ 1–4 hours ☐ 4–6 hours ☐ 6–8 hours ☐ >8 hours

Exposure Represents: ☐ Typical Work Activity ☐ Typical Area Conditions ☐ Unusual Event: _____

Comments: _____

Employee Name or ID _____ Job Title _____ Job Performed _____

Balance of Day: ☐ Balance of Shift Represented by Sampling Period ☐ Balance of Shift had No Exposure to Contaminant or Source

Type of PPE Used (respirator, open face, closed face, shield, gloves, body protections, etc.):_____

Pump Make and Model: _____

Pump SN: _____

Pump Number: _____

Sampler Type: ☐ Filter ☐ Passive Badge ☐ Tubes

Filter Type: ☐ PVC ☐ PTFE ☐ MCEF ☐

Other: _____

Filter Diameter: ____ mm Filter Pore Size ____ µm

Passive Badge or Tube Type: _____

Media Expiration Date: _____

Sample Inlet ☐ BZ (Worn on Lapel)

☐ (Fixed BZ (Location near nose/mouth)

Total Volume Pumped (mL or L): _____

Pump Operation	**Calibration by**	**Temp** **°F / °C**	**Flow** **__L/min**	**Sampling Time** **On**	**Off**
Pre Sample					
Post Sample					
Average/ Totals			Ave. Flow	Sample Time (min)	

Comments:

Sample ID	Time	Analyses	QA/QC Sample	Remarks

Metals (Pb, Be, Cu, Al, Cr, Ni, etc.)
Dusts (nuisance, silica, asbestos, fiberglass, insulation, etc.)
Mists (spray inhalation, painting, fluxes)
Fumes (welding, brazing torch cutting, glues, etc.)
Acids (hydrochloric, sulfuric)
Bases (sodium hydroxide)
PVC – Polyvinyl Chloride
PTFE – Teflon
MCE – Mixes Celluose Ester
BZ – Breathing Zone

Signature: _____ Date: _____

EHS Support

Issue Date	May 21, 2014
Revision No.	001
Revision Date	Jan. 8, 2019

Site Visitor Sign-In Log

Site Name: _____ **Date:** _____

Name (Please Print)	Organization	Email	Telephone Number	Time	Reason for Visit

SOP 3 –UTILITY CLEARANCE

Application:

The purpose of this procedure is to ensure that all aboveground and subsurface utilities (e.g., electrical lines, gas lines, telephone lines, etc.) are located and marked before initiating any intrusive activities (drilling, test pits, trenching) or using long handled tools or equipment (e.g., back hoes, drill rigs) that can impact overhead lines. Compliance with this procedure will allow the work to be conducted safely and will minimize the potential for damaging utilities.

Materials:

EHS Utility Clearance (UC) Checklist (**Attachment 1**)
Bound field log book
Black or blue ink pens
Wooden stakes
Spray paint
Camera
Flagging tape
Hand auger or post-hole digger
Facility as-built drawings
Replacement batteries or parts for instruments (if applicable)

Procedure:

Pre-site Mobilization

1. The EHS UC Checklist will be completed by a competent person prior to commencement of intrusive activities, and any variance request must be reviewed and approved by the EHS project manager prior to initiating the intrusive work or using long handled tools or equipment (e.g., back hoes, drill rigs) that can impact overhead lines. The UC Checklist includes minimum clearance requirements and is to be used in addition to consultant-specific requirements. Please ensure that the EHS Support project manager, the client project manager, and all field personnel actively participate in the planning of proposed work locations and the utility clearance procedures.

2. Gather information on the on-site and off-site areas where activities will be conducted. This information should include the following:

- Site address
- Nearest cross street or street intersection
- Map grid (if applicable)
- Site boundaries
- As-built drawings

3. Before start of subsurface activities, place a call to the federally-mandated national "Call Before You Dig" number, 811, at least 72 hours prior to field activities. State specific information can be found on the "Call Before You Dig" website: www.call811.com. Provide the utility locating service with any information they request concerning the site and work activity in order to locate utilities at the site. (In California, the proposed drilling locations must be marked with white spray paint before contacting the locating services.) The date of call, utility clearance ticket number and utilities to be located should be documented in EHS UC Checklist (see **Attachment 1**). The ticket number will be used by the various

utility companies to reference the clearance request (see note below). The public utility companies will typically mark their lines up to the property lines unless a junction box or meter is present on the site. However, request that the utility companies mark their utilities in the work areas on the site.

Note: Some utilities (e.g., sewer, water, cable TV) may not be included with the utility locating service. These utility companies will have to be contacted directly by EHS Support for clearance before the start of intrusive activities.

a. If the site is located on private property, three lines of evidence, at a minimum, shall be obtained. Lines of evidence may include:
As-built drawings
Statement from and site walk with site contact who is familiar with property
Marked utilities
Use of hand-held magnetic or magnetic-cable locating device to clear work area
Ground penetrating radar

b. If three lines of evidence cannot be obtained, or where uncertainty exists concerning the presence of underground utilities, a private utility locating company must be used to mark utilities. In this case, the private utility locating company shall provide a detailed and scaled drawing of utilities located on-site. The competent person should request a field sketch or drawing of identified utilities from the private utility locating company before the locator leaves the site.

4. Prior to working with tools and equipment that can impact overhead lines, survey the site for overhead lines. Look up! Consider all overhead lines as energized until the electric utility indicates otherwise or an electrician verifies that that the line is not energized and has been grounded.

    a. If overhead lines are present, call the utility company and find out what voltage is on the lines. Ask if the utility company can shut off the lines while you are working near them.
    b. If overhead lines cannot be shut down, ask the utility company if they can install insulation near the lines during the time you will be working near them.

Site Mobilization

1. Verify that all utility companies listed by the locating service(s) have marked all underground lines in the area and whether the lines have been marked.

2. Take photographs and detailed documentation of ground markings, flags, overhead lines, etc. in the case that the markings are washed away. Photo documentation and associated drawings must be onsite and cross-checked prior to intrusive activities.

3. Conduct a site walk prior to field activities. Review all available as-built utility diagrams and plans with the site contact to identify other potential areas where underground lines may be present. Check the drawings to ensure they are as-builts and not design plans. During the site walk, attempt to obtain a general knowledge of the types of utilities present in the work areas. Check to see whether major electrical lines are aboveground. In addition to being a potential hazard for aboveground work, the presence of aboveground lines may indicate that there are non-underground lines in that portion of the site. Underground sewer lines may be traced using the locations of manholes and storm water grates.

Note: As-built drawings are not always accurate for locating underground lines.

4. Clear each proposed work area with the performing contractor using utility markings, photographs, drawings, etc.

a. For subsurface activities, a minimum of five feet clearance should exist between utilities and proposed drilling locations; if five feet of horizontal clearance is not possible, manual clearance to a minimum of six feet below ground surface AND a minimum width of 120% of the boring diameter is required. If a utility conflict is identified, adjust the proposed location(s) using the criteria given above. If a drilling/boring location is located outside the five foot clearance zone, a manual clearance is only required four feet below ground surface.

b. If aboveground lines cannot be shut down and/or insulation applied, a minimum safe distance of 20 feet must be established. Have a brief job site meeting to discuss the planned work as it relates to power lines and identify tools and equipment that could come into contact with the lines. Consider the need for a designated person to monitor activities around the lines.

i. Only use nonconductive ladders when working near overhead power lines.

ii. Employees are not permitted to approach or carry any conductive object closer than 10 feet to an energized line.

5. Discuss the site conditions with the subcontractor (e.g., driller, excavator), and recommend that care be used at the start of the field activities. Field personnel should always consider the presence of unidentified utilities at each work area. Ensure the work is conducted safely.

6. If the scope of the field activities expands to a new on-site or off-site area(s) that have not been previously cleared, the above UC procedures must be followed beginning with public and private utility markout. (Remember, the new request will require another 72-hour period before all underground utilities can be cleared.)

Utility Strike

1. Utility strikes (unplanned contact with utilities resulting in damage to the utility or its protective coating) shall be reported in accordance with the EHS Support Incident Reporting Procedure – EHSMS 8.1, utilizing the Damage Information Reporting Tool (DIRT) form (see Attachment 2).

2. All damaged utilities shall be repaired by a qualified and/or licensed professional.

Training

1. Conduct a briefing for site employees regarding the hazards associated with working near the utilities and the means by which the operation will maintain a safe working environment. Detail the methods used to isolate the utility and the hazards presented by breaching the isolation.

Utility Clearance (UC) Checklist

GENERAL INFORMATION	
Project Name	EHS Support Project Manager
Project Address, City, State, Zip	
Competent UC Person Completing Checklist	Client Contact/Project Manager

PROJECT PLANNING		
Written Scope of Work and Figure Completed	☐ YES	☐ NO
Scope of Work and Figure Approved by PM?	☐ YES	☐ NO
Has a site walk been performed to identify potential underground and aboveground utilities and obstructions?	☐ YES	☐ NO
Have aboveground utilities or obstruction been identified within 20 feet of the location of the proposed work?	☐ YES	☐ NO
If Yes, can the work location be moved to avoid the hazard? If not, follow the appropriate federal regulations regarding safe working distances from electrical lines.	☐ YES	☒ NO
Have utility maps been requested of site personnel?	☐ YES	☐ NO
Do utility drawings exist for location?	☐ YES	☐ NO
If Yes, have they been acquired and reviewed? Check if Not Applicable ☐	☐ YES	☐ NO
Does the HASP or other relevant document specifically address the course of action following contact with a utility?	☐ YES	☐ NO
Additional Comments (Provide any relevant notes from site walk and drawing review)		

PUBLIC UTILITY MARKOUT	
Date of Public One-Call	Ticket Number(s)
One-Call Request Time	Utility Service Name
Utility Service Number	Utility Service Contact Person
Date of Public Markout Completed	Date Public Utility Markings Expire
List the Contacted Utilities	

PRIVATE UTILITY MARKOUT		
Is the boring location on private property? If YES, then private utility markout is REQUIRED **Signature of EHS Support PM waiving this requirement*	☐ YES	☐ NO
Method of underground utility clearance (UUC) utilized:		
Company providing Private UUC: Date Private UUC completed:		
Did the UUC contractor provide all existing utility figures prior to the markout?	☐ YES	☐ NO
Did the Private UUC contractor provide a detailed sketch/drawing/figure of the identified utilities?	☐ YES	☐ NO
Are any borings located within the Critical Zone (Area 5 feet vertically or horizontally of a located or suspected utility? If NO, then manual clearance (e.g. hand auger) to ~~4~~ 5 feet below ground surface is required. If YES, then manual clearance to a Minimum depth of 6 feet below ground surface and Minimum width of 120% of the boring diameter is REQUIRED. ***Signature of EHS Manager waiving this requirement** **X**_____	☐ YES	☐ NO
Please note the above clearances are the minimum. The farther the distance from the utility, the better.		

INTRUSIVE WORK		
Has a visual site inspection of all locations been completed and private and public utility markings been reviewed?	☐ YES	☐ NO
Is manual vertical clearance required?	☐ YES	☐ NO
Has the competent on-site UUC person shared any documented results of the Private UUC with the person completing the intrusive work?	☐ YES	☐ NO
Method of manual clearance utilized:		
Company providing manual clearance: Date manual clearance completed:		
EXPLANATION FOR ANY WAIVED REQUIREMENT(s) – REQUIRED:		

Signature of Person Completing Checklist: _____

Date of Completion: _____