Operable Unit 4
Field Investigation Work Plan

at

iPark 87
Former IBM Kingston Site (TechCity)
300 Enterprise Drive
Kingston, New York 12401

March 2024

Prepared for:

Mr. Daniel Bendell, P.E.
New York State Dept. of Environmental Conservation
Dept. of Environmental Remediation, Region 3
21 South Putt Corners Road
New Paltz, New York 12561-1696

WALDEN ENVIRONMENTAL ENGINEERING, PLLC
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Sent via email to daniel.bendell@dec.ny.gov

March 5, 2024
iPark2201

Mr. Daniel Bendell, P.E.
New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 3
21 South Putt Corners Road
New Paltz, New York 12561-1696

Re: iPark 87, Former IBM Kingston Site
Operable Unit 4
Field Investigation Work Plan

Dear Mr. Bendell:

Walden Environmental Engineering, PLLC ("Walden") is submitting this *Operable Unit 4 Field Investigation Work Plan* (herein referred to as "*Work Plan"*) on behalf of iPark 87 LLC ("iPark"), the owner of the iPark 87 Facility (former IBM Kingston Site) ("Facility" or "Site") located in Kingston, New York. The area of the Site designated as Operable Unit 4 ("OU-4") encompasses approximately 47.2 acres of land in the southern portion of the iPark 87 Facility's East Campus. The Site location map, existing East Campus Site plan, conceptual development plan are presented on **Figure 1.** The OU-4 Site plan is presented on **Figure 2**.

Portions of the Former IBM Kingston Site are listed as a Class 4 Site (#356002) in the New York State Registry of Inactive Hazardous Waste Disposal Sites. OU-4 is not part of the Class 4 Site. The Facility is being remediated in accordance with Order on Consent Index No. D3-10023-6-11 ("Order") issued by the New York State Department of Environmental Conservation ("NYSDEC") and executed in July 2011 by IBM and the prior Site owner ("TechCity"). iPark was added as an additional Respondent on the Order in December 2021. The Order divided the Site into ten (10) Operable Units and limited the Class 4 Site to OU-3, OU-3a, and OU-5 (refer to **Figure 1**). iPark's Site development master plan includes restricted residential use and mixed use within the OU-4 property in accordance with the Order.

The draft Interim Site Management Plan ("ISMP", July 2023) prepared on behalf of IBM sets forth procedures which govern the operation/implementation of remedial engineering and institutional controls and manage future redevelopment activities at the Facility. IBM has been

implementing a groundwater remediation and monitoring program at the Facility since the 1980's. Annual groundwater monitoring reports are prepared by IBM and submitted to NYSDEC and the New York State Department of Health ("NYSDOH") to document the findings of the long-term groundwater quality monitoring program.

The ISMP includes an Intrusive Activities Work Plan ("IAWP", Appendix C of the ISMP) which applies to intrusive activities (excavation, trenching, etc.) in areas of the Site where residual soil or groundwater contamination might be encountered during such work. In OU-4, the IAWP applies to the area that lies within 150 linear feet of the 42-inch storm sewer, which is part of the Site's groundwater remediation perimeter control system. Note that the Site Management Plan ("SMP") is pending finalization based on NYSDEC's review of the draft ISMP.

This *Work Plan* details the OU-4 field investigation to be performed in accordance with the ISMP and IAWP. Data will be collected to support iPark's development plan, which will revitalize OU-4 with a combination of restricted residential use and mixed use. The investigation will be performed prior to construction in order to characterize and evaluate existing soil conditions to allow the appropriate arrangements for handling/disposal to be made. In addition, the pre-construction data will document the nature of the soils and contaminants that will remain in place after construction is completed.

According to 6 NYCRR Part 375-1.8 (g) (2) (ii), restricted residential use shall only be considered when there is common ownership or a single owner/managing entity for a site. In addition, single-family housing is prohibited under restricted residential use requirements. Recently, the Town of Ulster Zoning Code, Section 190-12.2, was amended by Local Law #4. Enacted on December 28, 2023, the Code now allows for residential dwellings on the ground floor of a building within a Redevelopment Overlay District. Previously the Code prohibited residential dwellings on the first floor within a restricted residential use area. The Code was further amended to limit the height of the buildings to no more than 75 feet above curb level, or five stories, whichever is less. iPark will maintain ownership and management of the residential units at OU-4, and proposes to construct only multi-family housing in garden apartments and townhouses (structures to be three- to five-stories high) at OU-4. The proposed mixed use at OU-4 includes retail, hotel, and mobility hub space. Refer to **Figure 1** for the proposed Site development plan concept; note that this concept is being fine-tuned as the plans are finalized.

Once the State approves this *Work Plan,* field sampling will be completed throughout OU-4, including the area that is subject to the IAWP (within 150 feet of the 42-inch storm sewer), the former utility plant area (Parcel 6, currently owned by Ulster County), and the remainder of the operable unit. The sampling will be conducted in general accordance with the NYSDEC Division of Environmental Resources *Technical Guidance for Site Investigation and*

Remediation ("DER-10"). The OU-4 soil characterization results will be presented to the Departments in a summary report along with an analysis of long-term groundwater monitoring data for the monitoring wells located in and around OU-4 to characterize environmental conditions and to support iPark's restricted residential use and mixed-use development plan for OU-4. Based on the NYSDEC and NYSDOH report review, the Departments may request additional sampling to supplement the data.

This *Work Plan* includes the following information:

- A discussion of the ISMP and IAWP requirements that apply to OU-4;
- A summary of environmental conditions within OU-4 based on historic Site use and investigations completed by IBM;
- The scope of the proposed OU-4 field investigation; and
- A general discussion of procedures and plans to be followed during OU-4 construction activities in accordance with the ISMP/IAWP and other applicable requirements.

Interim Site Management Plan Requirements

As noted in the ISMP, previous investigations at the Site have established that surficial soil within two feet of the ground surface in OU-4 meets the 6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives (SCOs). Therefore, OU-4 has been deemed suitable for restricted residential use. Based on historic Site investigation results, NYSDEC has conservatively identified areas where groundwater has the potential to contain residual impacts. This refers to the area within 150 linear feet of the 42-inch storm water sewer which is part of the groundwater perimeter control system for the Site. NYSDEC requires that the existing two-foot-thick soil/surface cover be maintained in the portion of OU-4 within 150 linear feet of the 42-inch storm water sewer due to the potential for impacted soil and/or groundwater below the soil/surface cover system.

The Institutional Control and Engineering Control requirements that apply in specific areas and the existing components of the Site-wide remedy located within OU-4 are outlined below.

Institutional Controls

The Institutional Controls for OU-4 include:

- Compliance with the OU-4 Environmental Easement
    - Restricted to Restricted Residential Use
    - Groundwater Use Restriction

- Compliance with the ISMP

There are also specific restrictions that apply to the following activities:

- Soil disturbance
    - Soil may not be removed from OU-4 unless properly characterized and approved by NYSDEC for transport to a facility appropriately permitted to receive such material.
    - Soil may not be imported into OU-4 unless properly characterized to meet the Part 375 Restricted Residential-Use SCOs or unless the soil imported is from an NYSDEC-approved source.
    - Grossly contaminated media (GCM):
        - If GCM is encountered at any time during intrusive activities in OU-4, NYSDEC must be notified and the contingency plan identified in the IAWP must be implemented.
    - Identification of existing historical industrial infrastructure and active utilities, and protection of the structural integrity of existing buildings and utilities required.
    - Reasonable construction measures must be implemented to control dust and off-site migration of soil to roadways.
    - Dewatering procedures must be pre-approved by NYSDEC

- The IAWP (Appendix C of the ISMP) applies to intrusive activities conducted in the area of OU-4 within 150 feet of the 42-inch storm water sewer, where such activities that have the potential to encounter or disturb areas containing residual impacts. In addition to the activities listed above which are required when conducting any soil disturbance activities, elements of the IAWP include:
    - Stockpile and soil management requirements
    - Cover system restoration
    - Environmental or public health monitoring

- New building construction vapor intrusion evaluation and mitigation

- Certification and reporting of data and information as defined in the ISMP for OU-4.

Engineering Controls

The engineering controls for OU-4 include:

- 42-inch storm water sewer
    - Ongoing interception and collection of groundwater by the storm water sewer is an important component of the overall perimeter control system.

- Soil/surface cover in the vicinity of the 42-inch storm water sewer
    - If any activity performed in the portion of OU-4 within 150 linear feet of the 42-inch storm water sewer requires disturbance of the soil cover, these activities shall be managed and implemented in accordance with the IAWP. The top two feet of soil must be segregated for reuse from those soils located at depths greater than two feet below ground surface in OU-4.

- Groundwater monitoring system.
    - Long-term protection and maintenance of the groundwater monitoring well system in OU-4 is required. Any activity within the vicinity of a monitoring well must be performed in a manner that protects and maintains the integrity of the monitoring well.

Operable Unit 4 History/Existing Conditions

Site Location

The former IBM Kingston Site encompasses approximately 258 acres. The Site is bounded by John M. Clarke Drive and Route 9W to the east, Old Neighborhood Road and Route 209 to the north, Esopus Creek to the west, and Boices Lane to the south as shown in **Figure 1**. The Site was first developed by IBM from farmland during the 1950s. IBM's primary activities at the Site included the manufacturing of electric typewriters and the development, manufacture and testing of computer systems and related components and technologies. After IBM ceased operations during the early 1990s, the Site was sold to AG Properties of Kingston, LLC and Ulster Business Complex LLC during the year 1998. Multiple property transfers to other entities occurred until 2022, when iPark 87 took ownership of the majority of the parcels on the East Campus. The current Site ownership is summarized in **Appendix A**.

OU-4 is a 47.2-acre area within the Facility and is bounded to the south by Boices Lane, to the north by Operable Units 3 and 4a, to the west by Enterprise Drive, and to the east by the Facility boundary. The OU-4 property consists of paved areas, the former Building B025 slab, the former utility plant (Parcel 6, including Buildings B031 and B032 which remain at the Site), athletic fields, access roads, and other open parking areas and landscaped areas. **Figures 1 and 2** illustrate the layout of the Site and the approximate boundaries of OU-4.

OU-4 Ownership

OU-4 consists of the following Ulster County Tax Map parcels:

- Parcel 48.7-1-29.600 (Parcel 6, former utility plant) – currently owned by Ulster County; iPark 87 expects to take title of Parcel 6 in late 2024 – early 2025.

- Parcel 48.7-1-29.180 (Parcel 18, Building B051) – currently owned by BSD Realty NY LLC
- Parcel 48.7-1-29.190 (Parcel 19, Building B033) – currently owned by BSD Realty NY LLC
- Parcel 48.7-1-29.250 (Parcel 25, Building B025) – demolished
- Portions of Parcel 48.7-1-29.270 (Parcel 27)

Buildings B051 and B033 are owned not owned by iPark and are not included in the OU-4 development plans.

Historic OU-4 Use

A review of the ISMP, IBM's solid waste management unit (SWMU) summaries and other historic documentation indicates that Site activities within OU-4 included manufacturing in former B025 and former utility operations on Parcel 6. B031 was used as the facility's utility plant, B032 was used as an office, and a major oil storage facility (MOSF) was located between B031/B032 and the eastern boundary of the Site. The MOSF consisted of three aboveground No. 6 fuel oil storage tanks and a concrete delivery station. The tanks were removed in 2009 and subsequently the retention berms were leveled.

Three SMWUs are located within OU-4 as shown on **Figure 2**:

- SWMU Q: Building B031 Former Lagoon
- SWMU X: Building B031 Separator
- SWMU Z: Inactive Building B033 Septic System (coincident with SWMU C: Former Building B058)

Information on these SWMUs, as briefly summarized in the following paragraphs, was obtained from the ISMP and documents including *RCRA Facility Assessments – Newly Identified Solid Waste Management Units; IBM, Kingston, NY; March 14, 1997*; and, *Post-Closure Permit Application - Former Industrial Waste Sludge Lagoon; Former IBM Kingston, New York Facility; April 2, 2001*. No further action is required for SWMU Q and SWMU Z. SWMU X remains in place and the B031 separator needs to be removed in order to attain SMWU closure.

SWMU Q

Building B031, the site's utility plant, was constructed in 1954 and from 1954 to 1958, B031 used a lagoon for handling boiler blowdown and cooling tower water. The lagoon was drained and backfilled around 1958. The former lagoon area is designated as SWMU Q. RCRA Facility Assessments (RFA) conducted in association with this SWMU determined that the former lagoon had not been a significant impact to groundwater quality. Thus, no further actions were recommended for this unit.

SWMU X

After the Building B031 lagoon was removed, it was replaced by a subsurface oil/water separator that was used from 1958 to 1972. This oil/water separator tank is identified as SWMU X. Historic soil and groundwater sampling in the area of SWMU X identified no significant impact from the unit; therefore, no additional assessment or investigation activities were recommended. The oil/water separator was cleaned by IBM in 1994 but remains in place as part of the overall Building B031 infrastructure.

After Ulster County transfers the Parcel 6 title to iPark 87, as is expected to occur in late 2024 – early 2025, iPark will proceed with removal and closure of the B031 separator. A separate closure plan for SWMU X will be prepared and submitted to the Departments for review and approval.

SWMU Z

The Building B033 septic system, designated as SWMU Z, is located to the south of the building under the current footprint of Building B051 as shown on **Figure 2**. This septic system was installed in the mid-1950s when B033 was constructed, and is currently inactive. The former B033 septic system was coincident with the B058 septic system. Note that former Building B058 was designated as SMWU C. Investigations of subsurface soil and groundwater in the area of the inactive B058/B033 septic systems identified the presence of subsurface impacts. Groundwater plumes containing constituents associated with the inactive B058/B033 septic systems extended only a short distance downgradient from this SWMU and these plumes were intercepted by the 42-inch storm sewer line. Thus, no further action was recommended for this SWMU.

Existing OU-4 Conditions

The surface elevation at OU-4 is relatively flat at approximately 175 to 180 feet above mean sea level. There are no NYSDEC regulated wetlands within OU-4. An east-west trending groundwater divide has been identified at the Site beneath Buildings B001 and former Buildings B002, B003, B004 and B005S. OU-4 is located south of the divide; groundwater in the OU-4 area flows to the west and southwest. The typical depth to groundwater at OU-4 is approximately 6 feet below grade.

According to the 2022 Annual Groundwater Monitoring Report (March 2023), IBM began investigating and monitoring groundwater quality at the Site in 1978. Identified constituents of concern in the surficial sand aquifer include 1,1,1-trichloroethane [TCA], trichloroethene [TCE], tetrachloroethene [PCE], and related degradation products (i.e., 1,1-dichloroethene [1,1-DCE], 1,1-dichloroethane [1,1-DCA], and 1,2-cis-dichloroethene [1,2-DCE] and 1,2-dichloroethane

[1,2-DCA]). Carbon tetrachloride, Freon®, and petroleum hydrocarbons have also been detected in Site groundwater generally at lower concentrations and at a lesser extent than chlorinated VOCs.

The following groundwater plumes have been identified at the Site:

- The North Parking Lot Area (NPLA) Plume
    - This plume is located north of Building B001 and former B003 and is primarily composed of TCE and TCA, and PCE to a lesser degree. The VOCs in groundwater are likely associated with the historic manufacturing activities in Buildings B001, B002, B003, B004, and B005S.
    - The Groundwater Collection System was installed in 1985 (and extended/ upgraded in 1995) to address the NPLA plume.
- The B005 Area Plume
    - This plume is located beneath Building B001 and former Buildings B002, B003, B004, and B005S and is primarily composed of TCE and TCA.
- An Isolated PCE plume originating from a PCE tank located in the southeastern corner of former Building B005
    - A groundwater extraction well began operating in 1987 to address this release. The extraction well was shut down in February 2007.
- The B036 Area Plume on the iPark 87 West Campus (west side of Enterprise Drive)
    - This plume is believed to have migrated from the eastern campus plume prior to the utility trench barrier wall installation.

The perimeter control system intercepts and collects impacted groundwater at the Site. The 42-inch storm sewer system that runs along the northern boundary of OU-4 is an integral part of the perimeter control system, collecting and containing groundwater from the B005 Area plume and the Isolated PCE plume. Therefore, the 42-inch storm sewer prevents contaminated groundwater in these plumes from migrating onto OU-4.

Field Investigation

The scope of work proposed below details soil sampling and screening to characterize the current subsurface soil conditions in OU-4 in accordance with the ISMP and IAWP requirements. This soil sampling and screening would be conducted prior to the start of construction activities in OU-4 in order to collect data to support planning for excess soil management.

Because iPark 87 does not currently own Parcel 6 (title transfer from Ulster County is expected in late 2024 – early 2025), it will request permission from the County to perform soil sampling at locations within this parcel in accordance with this *Work Plan* in order to complete the OU-4 field investigation in a single mobilization.

A maximum sampling depth of fifteen (15) feet is proposed to document the nature of soils that would remain in place beneath any structures or backfill placed during future construction for restricted residential use in this area; the maximum depth of any future excavation is anticipated to be less than five (5) feet. Should future site development require excavation deeper than five (5) feet, additional soil sampling would be performed in step with construction if required by NYSDEC.

Soil sampling will be conducted in general accordance with the NYSDEC Division of Environmental Resources (DER) Technical Guidance for Site Investigation and Remediation (DER-10), *NYSDEC's Sampling, Analysis and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs* (April 2023), Appendix C [Intrusive Activities Work Plan (IAWP)] of the ISMP, and 29 CFR 1910.120.

Note that the soil sampling and screening locations will be modified in the field, as needed, to avoid interference with underground utilities and structures which will be marked out prior to the investigation. All locations will be cleared by ground-penetrating radar before drilling commences. Should grossly contaminated media be encountered during the investigation, all work activities will be suspended and the NYSDEC will be notified.

Soil Sampling

Soil samples will be collected for laboratory analysis at ten (10) locations (SB-1 through SB-10) throughout the Operable Unit 4 area. The approximate soil boring locations are depicted on **Figure 3** and were selected to achieve representative coverage of the area. Six (6) of the sampling locations (SB-1 through SB-6) are within 150 linear feet of the 42-inch storm sewer. SB-5 and the remaining four (4) sampling locations (SB-7 through SB-10) are located within the former utility plant area (Parcel 6).

Certain locations were chosen based on historic information. For example, SB-1 and SB-2 will be located within the footprint of former Building B025. SB-6 is located near the southwest corner of Building B051 in the area of SWMU Z, Former B058, and the end of the 42-inch storm sewer. SB-7 is located in the area of SWMU Q and SB-8 is located in the vicinity of SWMU X. The actual soil sampling locations will be adjusted as needed based on field conditions.

Soil samples will be collected utilizing a direct-push (e.g., Geoprobe®) drill rig with five (5)-foot long Macro-Cores® or similar, beginning at grade and continuing to a maximum depth of fifteen (15) feet below grade (bg). If bedrock is encountered at any of the proposed locations at depths shallower than 15 feet bg, drilling will cease and the soil

core will be retrieved from this depth. Should any core not contain enough material for sufficient screening, a second core shall be collected immediately adjacent to the first. If refusal occurs at depths shallower than five (5) feet bg due to bedrock in the unsaturated zone, the subsurface material in that location will be noted and the Geoprobe® will be moved to attempt a successful soil coring at a nearby location.

Each soil core will be visually inspected and field screened for the presence of organic vapors within the 0-15 ft bg core depth using a photoionization detector (PID) that has been properly calibrated according to manufacturer's instructions each day prior to sampling. The soil cores will be visually observed and screened using a PID at the following depth intervals: 0-1 ft bg, 1-2 ft bg, and two-foot intervals from 2 ft bg to the bottom of the core. For cores in paved areas, the sampling depths will be measured from the bottom of the pavement layer.

All observations and field screening readings will be logged in the field book by field personnel. Where groundwater is encountered in the borings, the depth to groundwater will be recorded. Excess soils removed from each sampling location shall be placed back into the respective holes before moving on to the next sampling location. If gross contamination is observed in any samples as indicated by the presence of non-aqueous phase liquids or PID screening concentrations greater than 50 ppm calibration gas equivalents, the soils from that boring will be segregated (drummed or stockpiled on plastic) for appropriate disposal based on the sampling results and NYSDEC/NYSDOH will be notified.

A total of three (3) soil samples will be collected for laboratory analysis from each of the ten (10) proposed sampling locations as follows:

- "A" Sample from the 0-1 ft bg interval
  - To be analyzed for semi-volatile organic compounds (SVOCs) [including the full list of Per- and Polyfluoroalkyl Substances (PFAS) and 1,4-dioxane], target analyte list (TAL) metals, pesticides, herbicides and polychlorinated biphenyls (PCBs)
- "B" Sample from the 1-2 ft bg interval
  - To be analyzed for volatile organic compounds (VOCs) only
- "C" Sample from the two (2)-foot soil depth interval (from 2 ft bg to the bottom of the core) exhibiting the greatest visual or olfactory evidence of contamination (odors/staining) and/or the highest PID reading. If screening and observations show no evidence of contamination from within any interval from 2 ft bg to the bottom of the core, the sample from the deepest unsaturated 2-foot soil interval will be collected.

- To be analyzed for VOCs, SVOCs (including PFAS and 1,4-dioxane), TAL metals, pesticides, herbicides and PCBs

Discrete grab samples from each boring will be collected for VOC analysis from the "B" and "C" intervals described above. Composite samples will be collected from the "A" and "C" intervals for laboratory analysis of SVOCs (including PFAS and 1,4-dioxane), TAL metals, pesticides, herbicides and PCBs.

Sample bottles, provided by the laboratory and appropriate for the analysis being performed (VOCs, SVOCs, metals, pesticides, herbicides and PCBs), will be labeled in the field, placed into a sampling cooler and kept on ice for subsequent delivery to the laboratory. Each of the samples shall be sent under chain-of-custody protocol to a laboratory certified by the New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP) for analysis. Field duplicates will be collected at a rate of five percent (5%) (one field duplicate for every 20 samples) and one (1) equipment blank will be collected per day throughout the soil sampling event.

Note that the scope of the sampling may be modified in the field as needed to collect additional site characterization information based on observations and conditions encountered during the investigation. Field adjustments may include installing additional soil cores or extending coring depths, depending on site conditions. All modifications to the sampling scope will be documented in the field book. Any additional samples shall be screened, logged and handled in the same manner as the other soil samples, as described herein.

Soil Samples for Screening

In addition to the ten (10) soil sampling locations (SB-1 through SB-10) discussed above, soil samples for screening will be collected at an additional six locations (SC-1 through SC-6) as shown on **Figure 3**. These samples will be collected in the same manner as the SB-1 through SB-10 samples utilizing a direct-push (e.g., Geoprobe®) drill rig with five (5)-foot long Macro-Cores® or similar, beginning at grade and continuing to a maximum depth of fifteen (15) feet bg.

Each soil core will be visually inspected and field screened for the presence of organic vapors within the 0-15 ft bg core depth using a calibrated PID. The soil cores will be visually observed and screened using a PID at the following depth intervals: 0-1 ft bg, 1-2 ft bg, and two-foot intervals from 2 ft bg to the bottom of the core. All observations and screening readings will be logged in the field book.

If any core is found during screening to exhibit evidence of contamination, samples will be collected from the core for laboratory analysis in accordance with the soil sampling procedure outlined above.

Investigation Implementation Plans

Field personnel will don the appropriate health and safety equipment, as outlined in the Health and Safety Plan (HASP) prepared for the intrusive OU-4 sampling activities, provided as **Attachment A**.

The sampling and recordkeeping procedures are detailed in the attached Quality Assurance Project Plan (QAPP) for the OU-4 field investigation presented in **Attachment B**. A project logbook/field notebook will be maintained to record all field activities and observations during the sampling, and soil boring logs will be prepared as described in the QAPP. PFAS sampling will be conducted in accordance with the procedures detailed in NYSDEC's *Sampling, Analysis and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs* (April 2023).

The Community Air Monitoring Plan (CAMP) presented in **Attachment C** will be implemented during all ground intrusive activities as part of the OU-4 investigation. Note that the CAMP stations may be adjusted in the field based on the work area locations and wind direction. The CAMP reports will be submitted to NYSDEC and NYSDOH weekly during the investigation. NYSDEC and NYSDOH will be notified of any exceedances that stop work as soon as possible (prior to the weekly report).

Decontamination Procedures

Non-disposable sampling equipment will be decontaminated between sampling intervals and locations using the following procedures:

- Remove any large debris, such as clumps of soil, from the equipment by hand;
- Wash and scrub the equipment with a detergent solution, such as Alconox or equivalent, and potable water; and
- Rinse the equipment with potable water.

Waste Handling

Disposable sampling supplies will be bagged/containerized and properly disposed of as solid waste. Decontamination fluids will be containerized and discharged to the on-site stormwater drainage system.

Laboratory Analysis

Information on the soil samples laboratory analysis and data quality review is presented below.

Soil Samples

Soil samples will be sent under chain-of-custody protocol and on ice via overnight courier or hand delivery to Phoenix Environmental Laboratories, Inc., an ELAP certified laboratory (NYSDOH ELAP #11301) located in Manchester, CT. All analyses will be conducted on a standard turn-around time basis unless iPark calls for expedited analysis. The laboratory results will be provided with NYSDEC Analytical Services Protocol (ASP) Category B deliverable packages.

All soil samples will be analyzed for New York Code of Rules and Regulations (NYCRR) Part 375-6.8 VOCs, SVOCs, pesticides, herbicides, PCBs and TAL metals, via USEPA Methods 8260, 8270, 8081B, 8151A, 8082A and 6010, respectively. In addition, the soil samples will be analyzed for the full list of PFAS and 1,4-dioxane in accordance with *NYSDEC's Sampling, Analysis and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs (April 2023)*. Note that the PFAS analysis will be performed by an outside laboratory (with the required PFAS certification) contracted by Phoenix Laboratories.

Data Review

The data will be reviewed in order to define and document analytical data quality in accordance with NYSDEC requirements that project data must be of known and acceptable quality and as discussed in the QAPP, provided as **Attachment B**. The laboratory data reports will be evaluated and a Data Usability Summary Report (DUSR) will be prepared in accordance with the NYSDEC DER-10 Appendix 2B Guidance for the Development of Data Usability Summary Reports.

Investigation Reporting

Upon completion of the OU-4 soil characterization activities and acceptance of final analytical results, a report of findings will be prepared to document all of the fieldwork described herein, including tables of analytical results, field screening observations, photographs, field logs, figures, and recommendations. The laboratory analytical data for the soil samples will be compared to the NYCRR Part 375-6.8(b) restricted use Soil Cleanup Objectives (SCOs) for various categories ranging from unrestricted residential to restricted residential use. In addition, the summary report will discuss the IBM groundwater data for the monitoring wells located in and around the OU-4 area to characterize groundwater conditions in this area and evaluate groundwater trends over the last five (5) years for the monitoring wells located in the OU-4 area.

The analytical results from the OU-4 area sampling will be submitted to NYSDEC in the Electronic Data deliverable (EDD) format pursuant to 6 NYCRR 375-1.11(a).

Construction Activities

In the coming months, iPark's preliminary development concepts for OU-4 will be advanced and construction details will be finalized for approval by the Town of Ulster and other stakeholders. Construction plans will address the environmental requirements that apply to OU-4 as set forth in the ISMP, IAWP, Consent Order, and other deed restrictions and environmental easements (existing or to be developed). This section provides a general discussion of actions to be taken during excavation and construction activities in accordance with these requirements.

Soil Excavation, Soil Handling and Backfilling

The HASP and CAMP will be implemented during excavation and earth moving activities at OU-4. Soils excavated during the OU-4 construction work will be stockpiled on plastic and covered with anchored tarps. The stockpiles will be surrounded with hay bales, silt fencing or other erosion and sedimentation control measures. Soil sample(s) will be collected from the stockpiles and submitted to an ELAP-certified laboratory for analysis. Stockpiled soil sampling will be performed in accordance with NYSDEC's "DER-10 Technical Guidance for Site Investigation and Remediation" and the sampling frequencies listed in DER-10 Table 5.4(e)10. The soil samples will be analyzed for 6 NYCRR Part 375-6.8 VOCs, SVOCs, metals, PCBs and pesticides. The soil analytical results will be compared to the 6 NYCRR Part 375-6.8(b) Restricted Residential Use SCOs to determine if it is suitable for use as backfill at OU-4 or other areas of the Site. The lab results will be submitted to NYSDEC and NYSDOH for review and approval of the appropriate soil management based on the data. If the stockpiled soil sampling results confirm that the soils excavated during construction can be used as fill at OU-4, a geotextile fabric liner will be placed in the excavations as a demarcation layer prior to backfilling to provide a visual reference to the top of the remaining contamination zone in accordance with Section 11.0 of the Intrusive Activities Work Plan (Soil/Surface Cover System Restoration).

Any soils that do not meet the Restricted Residential Use SCOs will be removed from OU-4 for proper disposal in accordance with Sections 7.0 and 8.0 of the Intrusive Activities Work Plan (Materials Transport Off-site and Materials Disposal Off-site). If additional fill is needed for OU-4 construction, any material imported from an off-site source must meet the Part 375 Restricted Residential Use SCOs or come from an NYSDEC-approved source in accordance with DER-10 Section 5.4(e) requirements.

Concrete and demolition material will be reused on-site if approved by the Departments, or disposed of appropriately off-site. Any concrete demolition material proposed for reuse on-site

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will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval.

The two-foot clean soil cover will be restored in the OU-4 area within 150 linear feet of the 42-inch storm sewer prior to completing construction.

Dewatering

If dewatering is required during excavation and installation of foundations during OU-4 construction, a dewatering system will be designed to effectively draw down the water table based on the construction requirements. The dewatering design will describe the wellpoint specifications and groundwater management plan (including treatment, if necessary). The design will be presented to the Departments for approval prior to installing and operating the system.

Soil Vapor Intrusion and Indoor Air Quality

A vapor barrier and a passive sub-slab venting system will be installed directly beneath all buildings constructed at OU-4 to prevent soil vapors from entering the interior spaces. The sub-slab passive venting systems will be able to be converted to active sub-slab depressurization systems by adding vacuum fans or blowers if necessary to retrofit the systems to prevent potential soil vapor intrusion (SVI) impacts.

As construction of restricted residential housing units and mixed-use buildings is completed at OU-4, a soil vapor intrusion investigation will be performed in each building to evaluate the potential for SVI and associated indoor air quality (IAQ) impacts, and to confirm that IAQ is acceptable prior to occupancy. A work plan for the SVI investigation will be submitted to the Departments for review and approval before the sampling is performed. The IAQ data will be evaluated to determine if the passive venting installed beneath the building slabs is adequate to address any indoor air concerns or if the passive system must be converted to an active sub-slab depressurization system prior to occupancy.

If you have any questions or require any additional information, please call (516) 624-7200.

Very truly yours,
Walden Environmental Engineering, PLLC

Nora M. Brew, P.E.
VP/Senior Project Manager

Gwen Burke, P.E.
Project Engineer

cc: J. Kenney, NYSDOH
D. Lanners, NYSDEC
S. Brown, IBM
C. Monheit, iPark 87 LLC
D. Pennessi, iPark 87 LLC
D. Vitija, iPark 87 LLC

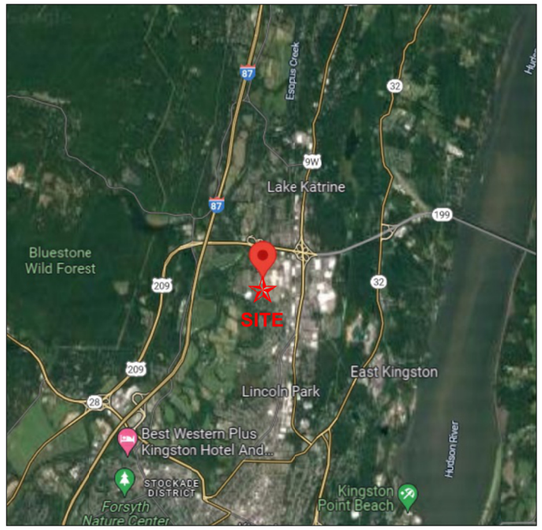
Figure 1 – Site Maps & Proposed East Campus Development
Figure 2 – Site Plan Operable Unit 4
Figure 3 – Operable Unit 4 Proposed Soil Sampling Locations

Appendix A – Current Site Ownership

Attachment A – Health and Safety Plan
Attachment B – Quality Assurance Project Plan
Attachment C – Community Air Monitoring Plan

Z:\iPark2201 - Kingston\Operable Unit 4 Restricted Residential Sampling Plan\Final Document\Revisions\iPark OU-4 Restricted Residential Sampling Work Plan REVISED DRAFT 3.5.2024.doc

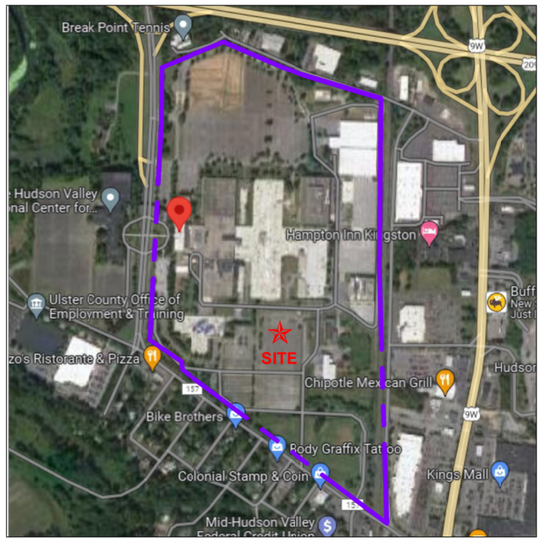
FIGURE 1
SITE MAPS & PROPOSED EAST CAMPUS DEVELOPMENT



SOURCE: GOOGLE MAPS

SITE LOCATION MAP

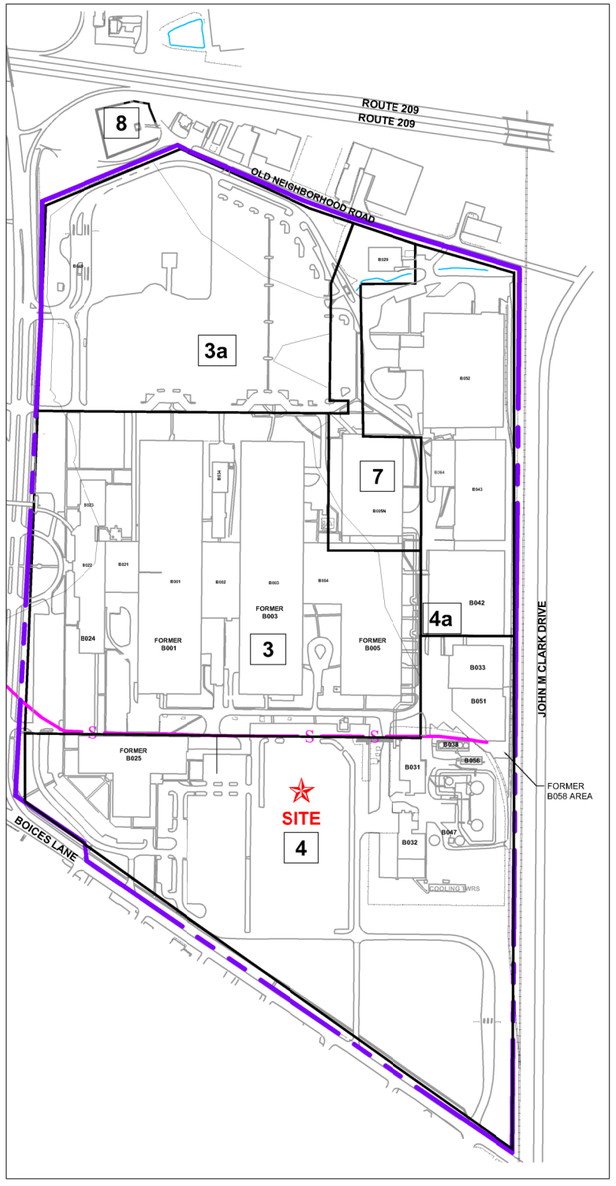
N.T.S.



SOURCE: GOOGLE Maps

SITE MAP

N .T.S.

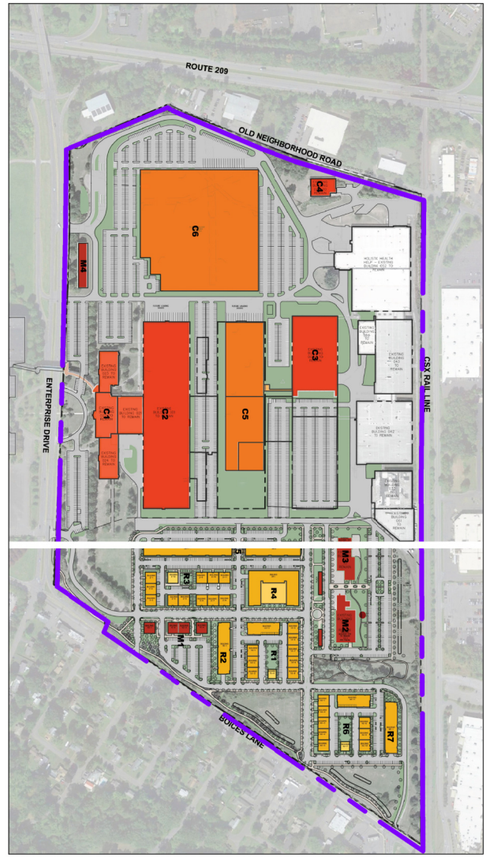


EXISTING EAST CAMPUS SITE PLAN

SCALE:1" = 600'-0"

0 300 600 1200 1800

SCALE: 1"=600'



iPARK87 | EAST CAMPUS PROPOSED COMPREHENSIVE DEVELOPMENT PLAN

CATEGORY	TAG	PRIMARY USE	PHASE	STORIES	TOTAL AREA (S.F.)	COMMERCIAL AREA (S.F.)			RESIDENTIAL AREA (S.F.)				# UNITS
					TOTAL	COMMERCIAL	RETAIL	HOTEL	RESIDENTIAL	AMENITY	UTILITY	GARAGE	
TOTAL					2,412,198								880
COMMERCIAL					1,303,000								
	C1	OFFICE	PHASE 1	2	180,000	180,000							
	C2	INDUSTRIAL	PHASE 1	1	250,000	250,000							
	C3	OFFICE	PHASE 1	3	300,000	300,000							
	C4	INDUSTRIAL	PHASE 1	1	13,000	13,000							
	C5	FILM STUDIOS	PHASE 2	1	160,000	160,000							
	C6	INDUSTRIAL	PHASE 2	1	400,000	400,000							
RESIDENTIAL					1,036,003								880
	R1	RESIDENTIAL	PHASE 2A	3-4	141,040				110,900	7,485	9,530	13,125	125
	R2	RESIDENTIAL	PHASE 2A	5	87,260				69,115	3,000	2,920	12,225	80
	R3	RESIDENTIAL	PHASE 2B	3	119,636				96,030	6,740	1,466	15,400	110
	R4	RESIDENTIAL	PHASE 2C	5	187,030		7,560		132,100	7,410	2,415	37,545	144
	R5	RESIDENTIAL	PHASE 2D	5	272,737		1,215		198,920	10,340	27,532	34,730	216
	R6	RESIDENTIAL	PHASE 2E	3-4	141,040				110,900	7,485	9,530	13,125	125
	R7	RESIDENTIAL	PHASE 2E	5	87,260				69,115	3,000	2,920	12,225	80
MIXED-USE					73,195								
	M1	RETAIL ENTRY PLAZA	PHASE 2A	1	14,400		14,400						
	M2	RETAIL/AMENITY	PHASE 2A	1	24,440		22,940				1,500		
	M3	HOTEL/ARTS CENTER	PHASE 2C	2	19,355			19,355					
	M4	MOBILITY HUB	PHASE 3	1	15,000	15,000							

LEGEND

PROPERTY BOUNDARY

OPERABLE UNIT BOUNDARY

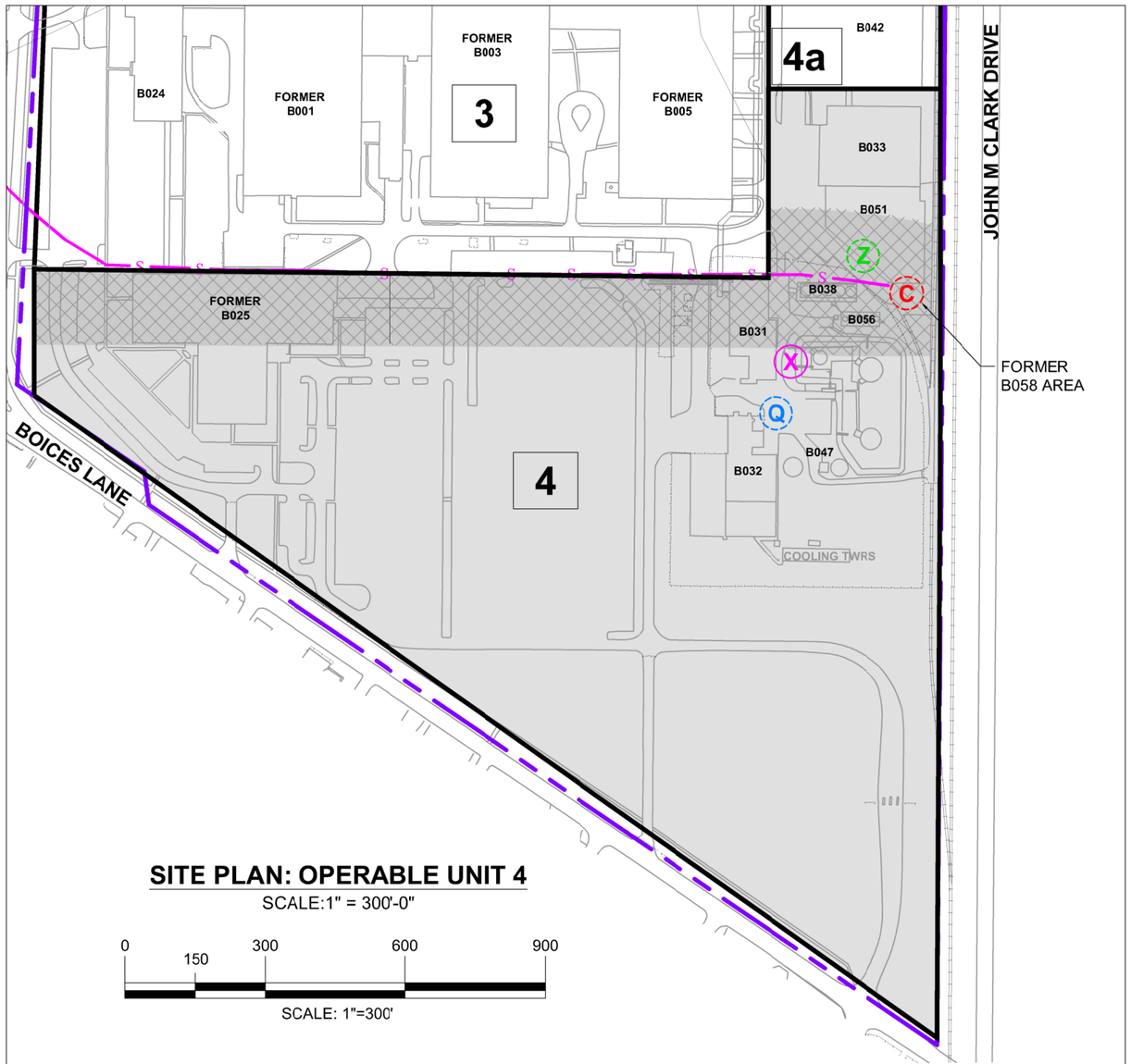
B202 BUILDING NUMBER

WALDEN

HEADQUARTERS: 16 SPRING STREET OYSTER BAY, NY 11771
P: (516) 624-7200 F: (516) 624-3219
ADDITIONAL OFFICES: HOPEWELL JUNCTION, NY; HARTFORD, CT; LATHAM, NY; FORT WAYNE, IN
WWW.WALDENENVIRONMENTALENGINEERING.COM

FOR: iPARK87, 300 Enterprise Drive, Kingston, N.Y. 12401	DRAWING TITLE: SITE MAPS & PROPOSED DEVELOPMENT EAST CAMPUS			DRAWING NO: 1	ISSUED
DESIGNED BY: NMB	DRAWN BY: LS	CHECKED BY: GHB	JOB NC: iPark2201_Kingston 87	DATE: 3/5/24	11x17	SHEET NO: 1 of 4	REVISION NO: 0
APPROVED BY: NMB	SCALE: AS NOTED	CAD FILE LOCATION: Z:\iPark2201 - Kingston\ACAD\iPARK 87_Kingston\iPark2201_Kingston 87_OU 4_Sampling Plan (11x17) (3-5-24) LS.dwg					

FIGURE 2
SITE PLAN OPERABLE UNIT 4



SITE PLAN: OPERABLE UNIT 4

SCALE:1" = 300'-0"

LEGEND

- PROPERTY BOUNDARY LINE
- OPERABLE UNIT BOUNDARY
- S — 42" Ø STORM SEWER SYSTEM (SITE PERIMETER CONTROL SYSTEM)
- B025 — BUILDING NUMBER
- 4 — OPERABLE UNIT DESIGNATION
- C — SWMU C - FORMER B058
- Q — SWMU Q - FORMER B031 LAGOON
- X — SWMU X - FORMER B031 SEPARATOR
- Z — SWMU Z - INACTIVE B033 SEPTIC SYSTEM
- AREA OF OU-4 WHERE INTRUSIVE ACTIVITIES WORK PLAN IS APPLICABLE

NOTE:

2014 STATEMENT OF BASIS INDICATES NO FURTHER ACTION REQUIRED FOR SWMUs C, Q, AND Z, AND ADDITIONAL ACTION REQUIRED FOR SWMU X CLOSURE.

REFERENCES

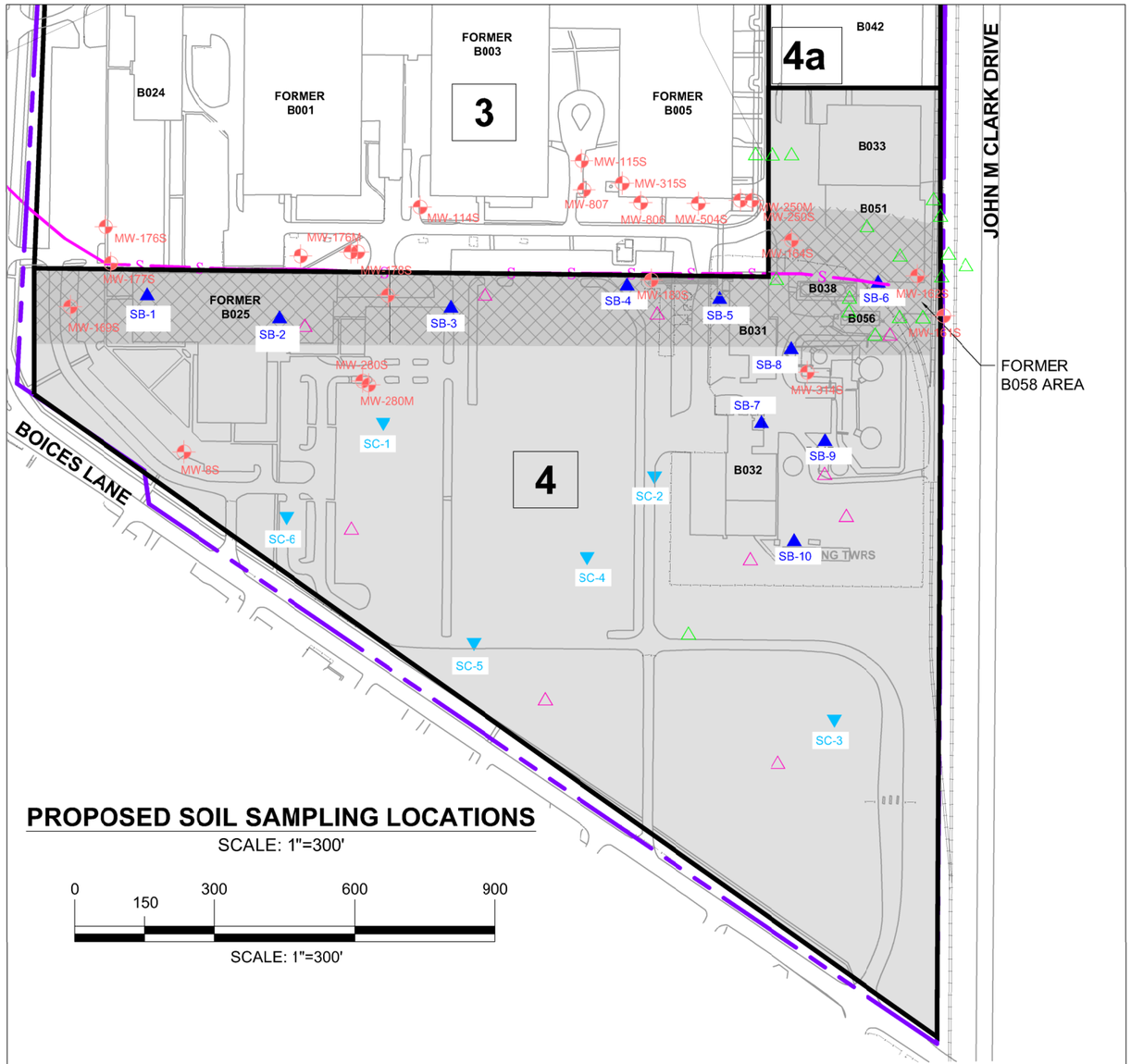
1. BASE MAP TAKEN FROM DIGITAL CAD FILE 3002-108-13.DWG, DRAWING NUMBER 93002-108-13 ENTITLED "LOCATION MAP" DATED MARCH 5, 2009, PROVIDED BY GROUNDWATER SCIENCES CORPORATION.
2. OPERABLE UNIT BOUNDARIES DIGITIZED FROM A HARDCOPY FILE ENTITLED "OPERABLE UNIT COMPOSITE MAP_2011-0830.PDF", PREPARED BY BRINNIER & LARIOS, P.C.

WALDEN
HEADQUARTERS: 16 SPRING STREET OYSTER BAY, NY 11771
P: (516) 624-7200 F: (516) 624-3219
ADDITIONAL OFFICES: HOPEWELL JUNCTION, NY; HARTFORD, CT; LATHAM, NY, FORT WAYNE, IN
WWW.WALDENENVIRONMENTALENGINEERING.COM

FOR:	DRAWING TITLE:	DRAWING NO:	ISSUED
iPARK87 300 Enterprise Drive Kingston, N.Y. 12401	SITE PLAN iPARK 87 OPERABLE UNIT 4	2	REVISION NO: 0

DESIGNED BY: NMB	DRAWN BY: LS	CHECKED BY: GHB	JOB NO: iPark2201_Kingston 87	DATE: 3/5/24	11x17	SHEET NO: 2 of 4
APPROVED BY: NMB	SCALE: AS NOTED	CAD FILE LOCATION: Z:\iPark2201 - Kingston\ACAD\iPARK 87_Kingston\iPark2201_Kingston 87_OU 4_Sampling Plan (11x17) (3-5-24) LS.dwg				

FIGURE 3
OPERABLE UNIT 4 PROPOSED SOIL SAMPLING LOCATIONS



PROPOSED SOIL SAMPLING LOCATIONS

SCALE: 1"=300'

0 150 300 600 900

SCALE: 1"=300'

N

LEGEND

- OPERABLE UNIT BOUNDARY
- PROPERTY BOUNDARY LINE
- S — 42" Ø STORM SEWER SYSTEM (SITE PERIMETER CONTROL SYSTEM)
- B031/B032 — FOOTPRINT CF EXISTING BUILDING TO REMAIN.
- 4 — OPERABLE UNIT DESIGNATION
- AREA OF OU-4 WHERE INTRUSIVE ACTIVITIES WORK PLAN IS APPLICABLE
- IBM MONITORING WELL LOCATION
- PROPOSED SOIL BORING LOCATION
- IBM SOIL BORING LOCATION (1984-1996)
- IBM SURFICIAL SOIL SAMPLING LOCATION (2011)
- PROPOSED LOCATIONS FOR SOIL VOC SCREENING ONLY

NOTE:

PROPOSED SOIL SAMPLING LOCATIONS SHOWN ON OVERLAY OF CCNCEPTUAL 0U4 DEVELOPMENT PLAN.

REFERENCES

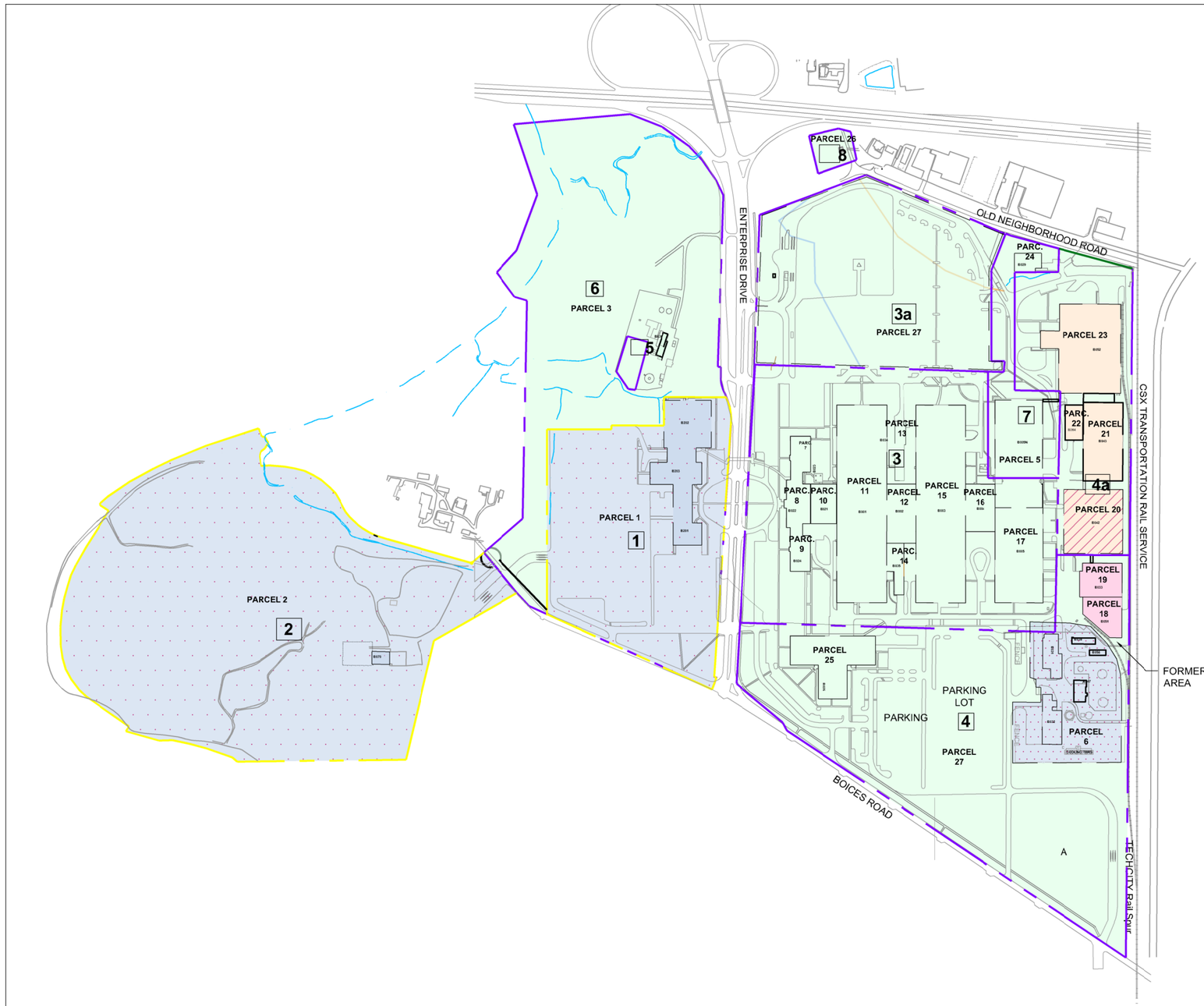
1. BASE MAP TAKEN FROM DIGITAL CAD FILE 01_C130_2222588-01.DWG, DRAWING NUMBER C130 ENTITLED "SITE PLAN" DATED AUGUST 29, 2023, PROVIDED BY LABELLA P.C.
2. OPERABLE UNIT BOUNDARIES DIGITIZED FROM A HARDCOPY FILE ENTITLED "OPERABLE UNIT COMPOSITE MAP_2011-0830.PDF", PREPARED BY BRINNIER & LARIOS, P.C.

WALDEN

HEADQUARTERS: 16 SPRING STREET OYSTER BAY, NY 11771
P: (516) 624-7200 F: (516) 624-3219
ADDITIONAL OFFICES: HOPEWELL JUNCTION, NY; HARTFORD, CT; LATHAM, NY, FORT WAYNE, IN
WWW.WALDENENVIRONMENTALENGINEERING.COM

FOR: iPARK87, 300 Enterprise Drive, Kingston, N.Y. 12401			DRAWING TITLE: OPERABLE UNIT 4 PROPOSED SOIL SAMPLING LOCATIONS			DRAWING NO: 3	ISSUED / REVISION NO: 0
DESIGNED BY: NMB	DRAWN BY: LS	CHECKED BY: GHB	JOB NC: iPark2201_Kingston 87	DATE: 3/5/24	11x17	SHEET NO: 3 of 4	
APPROVED BY: NMB	SCALE: AS NOTED	CAD FILE LOCATION: Z:\iPark2201 - Kingston\ACAD\iPARK 87_Kingston\iPark2201_Kingston 87_OU 4_Sampling Plan (11x17) (3-5-24) LS.dwg					

APPENDIX A
CURRENT SITE OWNERSHIP



N

LEGEND

- PROPERTY BOUNDARY
- PARCEL LINE
- B202 — BUILDING NUMBER
- PARCEL OWNED BY iPARK 87 LLC
- PARCEL OWNED BY iPARK 87 WEST, LLC
- PARCEL CURRENTLY OWNED BY ULSTER COUNTY AND OWNERSHIP TO BE TRANSFERRED TO IPARK 87, LLC
- PARCEL OWNED BY KINGSTON REALTY TEAM LLC
- PARCEL OWNED BY BSD REALTY NY LLC
- PARCEL OWNED BY ABE'S NY REALTY, LLC

EXISTING SITE PLAN & OWNERSHIP

SCALE: 1"=600'

0 300 600 1200 1800

SCALE: 1"=600'

WALDEN

HEADQUARTERS: 16 SPRING STREET OYSTER BAY, NY 11771
P: (516) 624-7200 F: (516) 624-3219
ADDITIONAL OFFICES: HOPEWELL JUNCTION, NY;
HARTFORD, CT; LATHAM, NY, FORT WAYNE, IN
WWW.WALDENENVIRONMENTALENGINEERING.COM

FOR: iPARK87, 300 Enterprise Drive, Kingston, N.Y. 12401			DRAWING TITLE: EXISTING SITE PLAN & OWNERSHIP		DRAWING NO: A-1	ISSUED / REVISION NO: 0
DESIGNED BY: NMB	DRAWN BY: LS	CHECKED BY: GHB	JOB NO: iPark2201_Kingston 87	DATE: 3/5/24	11x17	SHEET NO: 4 of 4
APPROVED BY: NMB	SCALE: AS NOTED	CAD FILE LOCATION: Z:\iPark2201 - Kingston\ACAD\iPARK 87_Kingston\iPark2201_Kingston 87_OU 4_Sampling Plan (11x17) (3-5-24) LS.dwg				

Current Ownership Summary*

UC SBL #	IBM Parcel Number	Buildings / Areas	Parcel Size (Acres)	Owner	Date of Transfer	Deed Document Number	Recorded Date
48.7-1-29.100	1**	B201 B202 B203	24.7	*Ulster Business Complex LLC*	1998-02-06	1998-27610194	1998-02-18
				County of Ulster	2019-11-01	2019-14519	2019-11-01
				Ulster County Economic Development Alliance, Inc	2021-05-20	2021-10714	2021-05-27
				iPark 87 West LLC**	2023-04-06	2023-8594	2023-08-01
48.7-1-29.110	11	B001	5.84	*AG Properties of Kingston LLC*	1998-02-06	1998-27610203	1998-02-18
				County of Ulster	2017-03-09	2017-3853	2017-03-13
				Ulster County Economic Development Alliance, Inc	2021-12-28	2022-2610	2022-02-10
				iPark 87 LLC	2022-06-08	2022-14757	2022-08-26
48.7-1-29.120	12	B002	1.0	*AG Properties of Kingston LLC*	1998-02-06	1998-27610203	1998-02-18
				County of Ulster	2017-03-09	2017-3853	2017-03-13
				Ulster County Economic Development Alliance, Inc	2021-12-28	2022-2610	2022-02-10
				iPark 87 LLC	2022-06-08	2022-14757	2022-08-26
48.7-1-29.130	13	B034	0.38	*AG Properties of Kingston LLC*	1998-02-06	1998-27610203	1998-02-18
				County of Ulster	2017-03-09	2017-3853	2017-03-13
				Ulster County Economic Development Alliance, Inc	2021-12-28	2022-2610	2022-02-10
				iPark 87 LLC	2022-06-08	2022-14757	2022-08-26
48.7-1-29.140	14	B035	0.43	*AG Properties of Kingston LLC*	1998-02-06	1998-27610203	1998-02-18
				Ulster County	2021-12-30	2021-25131	2021-12-30
				Ulster County Economic Development Alliance, Inc	2021-12-28	2022-2614	2022-02-10
				iPark 87 LLC	2022-06-08	2022-14755	2022-08-26
48.7-1-29.150	15	B003	5.8	*AG Properties of Kingston LLC*	1998-02-06	1998-27610203	1998-02-18
				Ulster County	2021-12-30	2021-25131	2021-12-30
				Ulster County Economic Development Alliance, Inc	2021-12-28	2022-2614	2022-02-10
				iPark 87 LLC	2022-06-08	2022-14755	2022-08-26
48.7-1-29.160	16	B004	0.84	*AG Properties of Kingston LLC*	1998-02-06	1998-27610203	1998-02-18
				Ulster County	2021-12-30	2021-25131	2021-12-30
				Ulster County Economic Development Alliance, Inc	2021-12-28	2022-2614	2022-02-10
				iPark 87 LLC	2022-06-08	2022-14755	2022-08-26
48.7-1-29.170	17	B005S	2.7	*AG Properties of Kingston LLC*	1998-02-06	1998-27610203	1998-02-18
				Ulster County	2021-12-30	2021-25131	2021-12-30
				Ulster County Economic Development Alliance, Inc	2021-12-28	2022-2614	2022-02-10
				iPark 87 LLC	2022-06-08	2022-14755	2022-08-26
48.7-1-29.180	18	B051	0.67	*AG Properties of Kingston LLC*	1998-02-06	1998-27610203	1998-02-18
				TechCity 33 51 64 LLC	2017-11-16	2018-00001945	2018-02-06
				BSD Realty NY LLC	2021-08-17	2021-16500	2021-08-20
48.7-1-29.190	19	B033	1.0	*AG Properties of Kingston LLC*	1998-02-06	1998-27610203	1998-02-18
				TechCity 33 51 64 LLC	2017-11-16	2018-00001945	2018-02-06
				BSD Realty NY LLC	2021-08-17	2021-16500	2021-08-20
48.7-1-29.200	2**	58 acres (B070)	57.5	*AG Properties of Kingston LLC*	1998-02-06	1998-27610203	1998-02-18
				County of Ulster	2019-11-01	2019-14519	2019-11-01
				Ulster County Economic Development Alliance, Inc	2021-05-20	2021-10715	2021-05-27
				iPark 87 West LLC**	2023-04-06	2023-8594	2023-08-01
48.7-1-29.210	21	B043	1.8	*Ulster Business Complex LLC*	1998-02-06	1998-27610194	1998-02-18
				TechCity 42 43 LLC	2010-05-26	2010-00007508	2010-06-02
				Kingston Realty Team LLC	2021-08-17	2021-16540	2021-08-23

Current Ownership Summary (continued)

UC SBL #	IBM Parcel Number	Buildings / Areas	Parcel Size (Acres)	Owner	Date of Transfer	Deed Document Number	Recorded Date
48.7-1-29.220	22	B064	0.39	*AG Properties of Kingston LLC*	1998-02-06	1998-27610203	1998-02-18
				TechCity 33 51 64 LLC	2017-11-16	2018-00001945	2018-02-06
				Kingston Realty Team LLC	2021-08-17	2021-16541	2021-08-23
48.7-1-29.230	23	B052	3.5	*AG Properties of Kingston LLC*	1998-02-06	1998-27610203	1998-02-18
				TechCity 52 LLC	2000-03-31	2000-30360279	2000-05-02
				Kingston Realty Team LLC	2021-08-17	2021-16542	2021-08-23
48.7-1-29.240	24	B029	0.28	*AG Properties of Kingston LLC*	1998-02-06	1998-27610203	1998-02-18
				Ulster County	2021-12-30	2021-25131	2021-12-30
				Ulster County Economic Development Alliance, Inc	2021-12-28	2022-2614	2022-02-10
				iPark 87 LLC	2022-06-08	2022-14755	2022-08-26
48.7-1-29.250	25	B025	2.1	*AG Properties of Kingston LLC*	1998-02-06	1998-27610203	1998-02-18
				Ulster County	2021-12-30	2021-25131	2021-12-30
				Ulster County Economic Development Alliance, Inc	2021-12-28	2022-2614	2022-02-10
				iPark 87 LLC	2022-06-08	2022-14755	2022-08-26
48.7-1-29.260	26	60-in storm outfall	0.87	*AG Properties of Kingston LLC*	1998-02-06	1998-27610203	1998-02-18
				Ulster County	2021-12-30	2021-25131	2021-12-30
				Ulster County Economic Development Alliance, Inc	2021-12-28	2022-2614	2022-02-10
				iPark 87 LLC	2022-06-08	2022-14755	2022-08-26
48.7-1-29.270	27	Common Areas	95.5	*AG Properties of Kingston LLC*	1998-02-06	1998-27610203	1998-02-18
				County of Ulster	2021-12-30	2021-25129	2021-12-30
				Ulster County Economic Development Alliance, Inc	2021-12-28	2022-2607	2022-02-10
				iPark 87 LLC	2022-06-08	2022-14756	2022-08-26
48.7-1-29.290	20***	B042	2.3	*Ulster Business Complex LLC*	1998-02-06	1998-27610194	1998-02-18
				TechCity 42 43 LLC	2010-05-26	2010-00007508	2010-06-02
				Kingston Realty Team LLC	2021-08-17	2021-16540	2021-08-23
				Abe's NY Realty LLC	2023-02-28	2023-5227	2023-05-10
48.7-1-29.300	3	B036	36.1	*AG Properties of Kingston LLC*	1998-02-06	1998-27610203	1998-02-18
				Ulster County	2021-12-30	2021-25131	2021-12-30
				Ulster County Economic Development Alliance, Inc	2021-12-28	2022-2614	2022-02-10
				iPark 87 LLC	2022-06-08	2022-14755	2022-08-26
48.7-1-29.400	10	B021	0.65	*AG Properties of Kingston LLC*	1998-02-06	1998-27610203	1998-02-18
				TechCity 22 23 24 LLC	2011-10-12	2011-00013981	2011-10-18
				Ulster County	2021-12-30	2021-25131	2021-12-30
				Ulster County Economic Development Alliance, Inc	2021-12-28	2022-2614	2022-02-10
				iPark 87 LLC	2022-06-08	2022-14755	2022-08-26
48.7-1-29.500	5	B005N	3.0	*AG Properties of Kingston LLC*	1998-02-06	1998-27610203	1998-02-18
				Ulster County	2021-12-30	2021-25131	2021-12-30
				Ulster County Economic Development Alliance, Inc	2021-12-28	2022-2614	2022-02-10
				iPark 87 LLC	2022-06-08	2022-14755	2022-08-26
48.7-1-29.600	6****	B031, B032, B067, B038, B056	7.4	*AG Properties of Kingston LLC*	1998-02-06	1998-27610203	1998-02-18
				Ulster County	2022-03-29	2022-5664	2022-03-30

Current Ownership Summary (continued)

UC SBL #	IBM Parcel Number	Buildings / Areas	Parcel Size (Acres)	Owner	Date of Transfer	Deed Document Number	Recorded Date
48.7-1-29.700	7	B022	0.49	*AG Properties of Kingston LLC*	1998-02-06	1998-27610203	1998-02-18
				TechCity 22 23 24 LLC	1999-10-01	1999-29880039	1999-11-22
				Ulster County	2021-12-30	2021-25131	2021-12-30
				Ulster County Economic Development Alliance, Inc	2021-12-28	2022-2614	2022-02-10
				iPark 87 LLC	2022-06-08	2022-14755	2022-08-26
48.7-1-29.800	8	B023	0.64	*AG Properties of Kingston LLC*	1998-02-06	1998-27610203	1998-02-18
				TechCity 22 23 24 LLC	1999-10-01	1999-29880039	1999-11-22
				Ulter County	2021-12-30	2021-25131	2021-12-30
				Ulster County Economic Development Alliance, Inc	2021-12-28	2022-2614	2022-02-10
				iPark 87 LLC	2022-06-08	2022-14755	2022-08-26
48.7-1-29.900	9	B024	0.55	*AG Properties of Kingston LLC*	1998-02-06	1998-27610203	1998-02-18
				TechCity 22 23 24 LLC	1999-10-01	1999-29880039	1999-11-22
				Ulster County	2021-12-30	2021-25131	2021-12-30
				Ulster County Economic Development Alliance, Inc	2021-12-28	2022-2614	2022-02-10
				iPark 87 LLC	2022-06-08	2022-14755	2022-08-26

Note: Italicized names indicate previous owner(s)

*Source: IBM's Supplemental Site Characterization Emerging Contaminants PFAS and 1,4-Dioxane SPDES Outfalls Sampling Work Plan (November 14, 2022)

**Modification to reflect the April 6, 2023 transfer of ownership to iPark 87 West LLC.

***Modification to reflect the Feb. 28, 2023 transfer of ownership to Abe's NY Realty LLC.

****Transfer of ownership to iPark 87 is pending.

ATTACHMENT A
HEALTH AND SAFETY PLAN

Health and Safety Plan

At

iPark 87
Former IBM Kingston Site

March 2024

Prepared for:

iPark 87, LLC
300 Enterprise Drive
Kingston, New York 12401

Prepared by:

Walden Environmental Engineering
16 Spring Street
Oyster Bay, New York 11771

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Attachments

1.0 INTRODUCTION

Walden Environmental Engineering, PLLC (Walden) employees may be exposed to risks from site-related hazardous conditions while performing field activities at the iPark 87 Site owned by iPark 87, LLC (iPark) (the Former IBM Kingston Site, the "Site" or "Facility") located in Kingston, New York (refer to **Attachment A**). The Site is owned by iPark 87, LLC (iPark). Walden's policy is to minimize the possibility of work-related injury through aware and qualified supervision, health and safety training, medical monitoring and the use of appropriate personal protective equipment (PPE). Walden has established a guidance program to implement this corporate policy in a manner that protects personnel to the maximum reasonable extent.

This Health and Safety Plan (HASP) applies to all Walden personnel, iPark representatives, subcontractors, the New York State Department of Environmental Conservation (NYSDEC), the New York State Department of Health (NYSDOH), and any other individuals on the jobsite where operations involve actual or potential physical and chemical hazards that have been identified by Walden or others during activities including but not limited to the following:

- Shallow soil sampling;
- Sediment sampling;
- Groundwater sampling;
- Construction or demolition work that disturbs surface or subsurface soils, groundwater, sediment, etc. at the Facility; and
- Construction or demolition work involving equipment, piping, etc. currently or formerly containing hazardous materials or wastes at the Facility.

This HASP is also intended to inform and guide all personnel (Walden employees and/or owner representatives, subcontractors or State/local regulatory agency representatives) entering the exclusion zone, ensuring that each person sign and acknowledge the Site hazards on the Acknowledgement Form provided in Section 9.0. Walden and/or the owner's subcontractors are retained as independent contractors and, as such, are responsible for ensuring the safety of their employees.

Walden may require that its personnel take certain precautions in accordance with this HASP, and Walden requests that others protect their personnel in a manner that they deem necessary or sufficient.

This HASP is based on the best available information to date. Should a conflict occur between this document and any other related Health and Safety Plans, Operating Procedures, regulations,

etc., workers shall follow the most stringent/protective requirements. HASP Supplements will be generated, as necessary, to address any new information, change in conditions, or activities. While it is not possible to discover, evaluate, and protect in advance against all possible hazards which may be encountered throughout the course of this project, adherence to the requirements of this HASP will significantly reduce the potential for occupational injury.

2.0 SCOPE

2.1 Generic Scope

This HASP is intended to be utilized during intrusive work performed at the Facility, including but not limited to the following:

- Collection of soil samples via hand auger or similar methods;
- Installation of soil borings;
- Collection of groundwater samples;
- Collection of soil gas and sub-slab vapor samples;
- Collection of air samples;
- Non-hazardous and hazardous soil/solids management;
- Non-hazardous and hazardous liquid management;
- Real-time air monitoring using instrumentation;
- Cutting and handling of concrete slabs;
- Construction, installation and maintenance of engineering controls to reduce chemical exposure;
- Excavation;
- Stockpiling;
- Grading;
- Trenching;
- Removal/installation/modification of piping and drainage structures;
- Interior building renovations;
- Installation of pavement and concrete; and
- General site construction and building activities.

Previous site investigations have identified soil, soil vapor and groundwater contamination at various locations at the Facility associated with historic site activities. Contaminants associated with the site are volatile organic compounds (VOCs). Therefore, precautions shall be taken to prevent exposure to contaminants and ensure that appropriate and safe procedures are followed when potentially contaminated media and hazardous materials and wastes may be encountered and handled during the work. Work at the Facility shall be performed by employees who are properly trained and experienced in dealing with the hazards which may arise from these types of tasks, which are defined as toxic effects, including threshold limit values (TLVs), immediately dangerous to life and health (IDLH), reactivity, stability, flammability, and operational hazards with sampling, decontaminating, etc.

2.2 Project-Specific Scope of Work

This HASP is intended to be utilized during intrusive soil investigation work in the Operable Unit 4 area at the Facility, including collection of soil samples via Geoprobe®. Specific details of the investigation work to be performed at the site are provided in the *Operable Unit 4 Field Investigation Work Plan* (Walden, March 2024).

2.3 Equipment

The following equipment may be utilized for this task:

1. Geoprobe®
2. Hand auger;
3. Scrub brush;
4. Photoionization detector (PID);
5. MultiRAE multi-gas meter;
6. 55-gallon drums, both metal and plastic;
7. Excavation machinery (e.g. mini-excavator);
8. Hand shovels;
9. Plastic sheeting;
10. Soil/solids sampling containers;
11. Chemical-resistant, leather, and/or cut-resistant gloves; and
12. Miscellaneous hand tools (screwdriver, socket driver).

2.4 Site Access

The topography in the Operable Unit 4 area is relatively flat and mostly covered by asphalt parking areas. In the event of an emergency, personnel and subcontractors should assemble at a predetermined assembly area, designated by the Site Safety Officer (SSO) for the task.

Access to work areas will be denied to the general public via the SSO or designated personnel, thus establishing the perimeter of controlled work areas, minimizing potential exposure to unauthorized individuals, protecting the public from hazards and preventing vandalism. All equipment and materials will be secured during non-work hours. Continuous communication (via portable radios, hand signals, telephones, etc.) shall be maintained between the SSO and key personnel associated with this project at all times during field operations.

2.5 Controlled Work Areas

Controlled work areas will be established prior to and for each work area, depending on the task, and shall float (move around) depending on the tasks being performed on any given day. Each controlled work area will consist of three (3) zones: the exclusion zone, the contaminant reduction zone and the support zone, based on the degree of danger present. To the extent possible, the support and contaminant reduction zones will be established outside of the exclusion zone.

2.5.1 Exclusion Zone

The exclusion zone consists of the primary activity area, as defined by the SSO. Only personnel directly involved with performance of a job task within that area and meeting the required qualifications (40 Hour HAZWOPER trained) may be allowed entry. Before entering the exclusion zone, all personnel must be familiar with emergency response procedures, Site safety locations, first aid and communication equipment, and the locations of the map to the hospital and the list of emergency telephone numbers. Attempts will be made so that equipment and Site activities taking place in the exclusion zone are situated so that personnel are upwind of potential contaminant sources.

2.5.2 Contaminant Reduction Zone

The contaminant reduction zone shall be located between the exclusion zone and the support zone. In this area authorized personnel (those with 40 Hour HAZWOPER training) will don protective equipment, as needed in the exclusion zone. When exiting the restricted area, personnel will remove contaminated PPE.

2.5.3 Support Zone

The support zone shall extend beyond the exclusion and contaminant reduction zones, where other support activities shall occur, such as first aid, equipment supply, etc., and where vendors, subcontractors and inspectors, and the like, shall be allowed. The support zone shall be established prior to commencement of activities and shall serve as the entry point for controlling access.

Trespassers shall be immediately escorted outside of these established areas and all work within these areas shall halt until the trespasser has been removed.

3.0 ORGANIZATIONAL STRUCTURE

The following Walden personnel are the main parties involved with the project at hand.

POSITION/TITLE	NAME/AFFILIATION	PHONE NUMBER/PAGER
Project Manager	Nora M. Brew, P.E.	516-624-7200 (Office)
Site Safety Officer(s)	Erica Johnston	631-521-1266 (Mobile)
	Louis Goldstein	845-406-8242 (Mobile)
	Nikita Oarcera	845-399-3038 (Mobile)
	Shreyak Karkera	516-491-8579 (Mobile)

3.1 Project Manager

The Project Manager has the responsibility and authority to direct all operations related to this project. The Project Manager is responsible to observe and provide guidance to employees, subcontractors and visitors with regard to safe work behavior and safety training, discuss deviations from the work plan and any safety issues that arise, assist the SSO with the development and implementation of corrective actions for Site safety deficiencies, the implementation of this HASP, and ensuring compliance.

3.2 Site Safety Officer

A qualified SSO will be continuously on the jobsite during the period of work and will have the authority to receive and execute any directions given by the owner representative in the absence of the Project Manager. The SSO will establish the necessary controlled work areas. The SSO will ensure that task areas are kept in a clean condition, free of rubbish and all undue accumulations and surplus materials while the work progresses. The SSO and/or Project Manager shall guarantee that all employees are fit for duty and that material and equipment is protected to prevent damage to employees and visitors, as well as, at the end of each work day, all rubbish and unused materials are removed and any damage done is repaired. These individuals will enforce this HASP, ensuring required safety equipment is on-site, clean and operable.

The SSO will coordinate all relevant health and safety issues, and may conduct specialized training and compliance inspections, as required. It will be the duty of the SSO to provide emergency training to associated personnel and, in the event of an emergency situation, to inform the local authorities as to the nature of the incident. In case of an emergency incident, the SSO

will be contacted immediately. The SSO is to work with the Project Manager to develop and implement any corrective actions that may be necessary.

The Project Manager and the SSO are responsible for periodically reviewing the HASP and its Attachments and any Supplements and, as necessary, amending them to keep current with new or changing conditions.

3.3 Employees

Employees are responsible for understanding and abiding by the policies and procedures specified in this HASP and other applicable safety policies, and clarifying those areas where understanding is incomplete; providing feedback to health and safety management relating to omissions and modifications in the HASP or other safety policies; and, notifying the SSO, in writing, of unsafe conditions and acts. Each employee shall sign this HASP (Section 9.0) in acknowledgement of such.

The health and safety authority of each employee assigned to the Facility includes the right to refuse to work and/or stop work authority when the employee feels that the work is unsafe (including subcontractors), or where specified safety precautions are not adequate or fully understood; the right to refuse to work on any task where the safety procedures specified in this HASP or other safety policies are not being followed; the right to contact the SSO at any time to discuss potential concerns; the right and duty to stop work when conditions are unsafe, and to assist in correcting these conditions.

3.4 Subcontractors

Subcontractors shall submit to the SSO a copy of their own health and safety plan or shall review and sign this document acknowledging acceptance and understanding of the information contained herein. Subcontractors are responsible for assigning specific work tasks to their employees. Subcontractors shall provide qualified employees equipped with the necessary PPE and training required for the task. Each subcontractor is responsible for compliance with the regulatory requirements that pertain to those services. Each subcontractor is expected to perform operations in accordance with their own unique safety policies and procedures, or those documented herein, in order to ensure that hazards associated with the performance of the work activities are properly controlled. Copies of any required safety documentation/certification for a subcontractor's work activities will be provided to Walden for review prior to the start of on-site activities, if required. Hazards not listed herein but known to any subcontractor must be identified to Walden prior to commencing any on-site activity. The Project Manager and SSO have the authority to halt any subcontractor operations, and to remove any subcontractor or

subcontractor employee for failure to comply with established health and safety procedures or for operating in an unsafe manner.

3.5 Visitors

Authorized visitors requiring entry to any work location on-site shall be briefed by the SSO on the hazards present prior to entry and acknowledge receipt of this briefing by signing this HASP. Visitors shall be escorted at all times within the controlled zones and shall be responsible for compliance with all health and safety policies. All visitors shall hold the appropriate qualifications, training and PPE which are required for entry to any controlled work area. Should a visitor requiring entry to an exclusion zone fail to meet the qualifications for that zone, all work activities within the exclusion zone shall halt while the visitor is within the controlled zone.

4.0 EMERGENCY RESPONSE

Site personnel must be prepared in the event of an emergency. Emergencies can take many forms including: illnesses, injuries, chemical exposure, fires, spills, leaks, releases of harmful contaminants, or sudden changes in the weather. Walden employees shall not participate in any emergency response where there are potential safety or health hazards (i.e., fire, explosion or chemical exposure); their actions will thus be limited to evacuation. Predetermined safe areas shall be determined and relayed by the SSO to all on-site personnel at the start of each shift and will be based on prevailing wind direction. Evacuation routes established by work area locations will be highlighted on a Site map and periodically reviewed. As the work areas change, the evacuation route and map will be altered accordingly, and the new route will be reviewed.

Emergency telephone numbers and a map to the nearest hospital shall be on-hand at the Facility. The hospital with an emergency room closest to the Facility is Health Alliance Hospital (Mary's Avenue Campus) at 105 St. Mary's Avenue, Kingston, New York 12401. A map of the route to Health Alliance Hospital is provided herein as **Attachment B**. Personnel shall be familiar with the emergency procedures, and the locations of safety, first aid and communication equipment.

4.1 Emergency Facilities and Telephone Numbers

COMPANY	NAME	PHONE #
Walden Project Manager	Nora M. Brew, P.E.	516-624-7200 (Office)
Walden Site Safety Officer(s)	Erica Johnston	631-521-1266 (Mobile)
	Louis Goldstein	845-406-8242 (Mobile)
	Nikita Oarcera	845-399-3038 (Mobile)
	Shreyak Karkera	516-491-8579 (Mobile)
iPark 87	Robert Newhard	845-905-6129 (Mobile)
Emergency Response	Police/Fire/Medical	911
Health Alliance Hospital (Mary's Avenue Campus)		845-338-2500
NYSDEC Spill Hotline		518-457-7362
American Association of Poison Control Centers		800-222-1222

First Aid Kit Locations: Within work vehicles on-site; Walden office on Facility grounds.

Fire Extinguishers: Walden office on Facility grounds and various locations throughout the Facility; the fire extinguisher location nearest to the work area will be identified before work commences.

4.2 Response Procedures

A communication network shall be established prior to commencement of any on-site tasks. At least one (1) on-site person shall have a phone accessible and in good working order at all times. Hand signals shall be used in instances when verbal communication is not feasible. The Project Manager, followed by the SSO, will immediately coordinate any and all emergency situations with the proper local medical/emergency organizations and personnel at the Facility. In the event of a fire, use of fire-fighting equipment available on-site may be administered, if appropriate; removing or isolating flammable or other hazardous materials that may contribute to the fire will be performed. The personnel on-site will coordinate evacuation procedures (if necessary) and remain a safe distance away from the area of health and safety concern. Personnel on-site may need to perform basic first aid as warranted by the emergency situation. Personnel with suspected neck or back injuries must not be moved. A detailed written report of the emergency situation will be provided within 24 hours to Walden by the Project Manager or SSO. Site security and control will be enforced by the SSO with consent for undertaken measures from the Project Manager. The SSO is responsible for pre-emergency planning, as well as emergency recognition and prevention.

4.3 First Aid Kit and Medical Emergencies

A basic first aid kit will be maintained and readily available (never locked up) at the Facility and within easy access to work areas (in personnel vehicles on-site). At a minimum, the first aid kit will include the following, as per ANSI Z308.1-1978: aspirin, bandage compresses, adhesive/triangular bandages (to keep wounds clean), medical tape, gauze, scissors, tweezers, sterilization lotion/cream, eye dressing, and antibacterial lotion/soap or pads. Items are to be replaced as they are used. Sterile items must be wrapped, sealed and used only once. Reusable items, such as scissors and tape, shall be kept clean. Should plentiful amounts of clean water not be available, eye flush shall be utilized. The number of first aid kits on-site shall be:

Number of Persons Assigned to the Facility	Minimum First Aid Supplies
1-5	10 Package Kit
6-15	16 Package Kit
16-30+	24 Package Kit

Professional medical assistance is to be called in the event of a medical emergency. In the event of a medical emergency:

- Stay calm and seek help, do not delay in calling for more assistance;
- Do not provide medical assistance unless you are trained to do so;
- Do not move the injured party unnecessarily;
- Do not attempt to remove any object that may have impaled the victim;
- Check to ensure the victim has an open airway, is breathing and has a heartbeat (if not, immediate action is required prior to taking care of any additional injuries);
- Promptly control any bleeding;
- Treat the injured party gently and keep them calm and quiet, reassuring them that additional help is on the way;
- Do not administer any food or drink and never provide the injured party with alcohol;
- Gather as much information as you can about the accident/injury and the victim's condition and be prepared to report that to first responders, as well as any medical actions already taken; and
- Let emergency responders do their job and aid them in keeping others out of their way.

4.3.1 Burns

For minor burns (redness or blisters over a small area), flush the wound with cold water and apply a sterile dressing; do not use butter or similar substance on any burn and do not break open blisters.

For major burns (white or charred skin; redness or blisters over a large area; burns on face, hands or genital area), cover the wound with sterile dressing and seek immediate emergency medical attention.

In the event of a chemical burn (spilled liquid or dry chemical on skin), promptly seek medical attention. For a liquid chemical burn, flush the wound with large amounts of water immediately and keep the water at a gentle flow. For dry chemical burns, brush off as much as possible before flushing with water. In both instances, flush the wound for at least five (5) minutes before covering with sterile dressing. Never use anything but water on a burned area and do not break open blisters.

4.3.2 Eye Wounds

Should an individual find/feel they have a foreign object in their eye, do not rub the eye; have them pull their upper eyelid over their lower eyelid or run plain water over the eye. If the object

persists, cover both eyes with a gauze dressing and aid them in seeking immediate emergency medical attention.

If the eye is wounded (eyelid or eyeball; pain; history of blow to eye area; discoloration), seek immediate emergency medical attention and apply loose sterile dressing over both eyes. For bruising, a cold compress or ice pack should be used to relieve pain and reduce swelling. Do not try to remove any imbedded object or apply any pressure to an injured eye.

If the eye has sustained a chemical burn, seek immediate emergency medical attention. Flush the open eye (it may be necessary to hold the patient's eyelid open) immediately with water for at least ten (10) minutes, twenty (20) minutes if the substance was alkali. Cover both eyes with sterile dressing. Never put anything but water in the eye.

4.4 Fire: Hazards, Prevention, Protection and Extinguishers

Many potential ignition hazards may exist on-site, including internal combustion engines, combustible materials and smoking. Combustible materials shall be kept well away from the exhaust of any internal combustion engine powered equipment. Smoking is prohibited except in designated areas, as determined by the SSO. Operations which constitute a fire hazard shall be identified as such, with signs conspicuously posted, stating: "No Smoking or Open Flame". Flammable gases and liquids shall be stored and handled in approved containers, places and as per the requirements described on the applicable Safety Data Sheet (SDS).

All employees who will use a fire extinguisher shall be trained on the use and hazards involved with firefighting initially and annually thereafter. All fire extinguishers shall be visually inspected monthly for general condition and adequate charge and serviced, tested, and certified by qualified personnel at least annually. Fire extinguisher inspection and maintenance are the responsibility of the Facility owner. Records of the annual maintenance check must be maintained. Only those employees designated as capable of using fire extinguishers shall be allowed to do so. Extinguishers shall be located and identified for easy accessibility.

It is imperative to use the proper extinguisher for a fire, as using the wrong one can spread the fire. Portable extinguishers shall be suitable for ABC class fires. The following table provides further information on types of fire extinguishers and their use:

Class	Distribution	Notes
A ("A" on a green triangle)	75’ or less travel distance between the employee and the extinguisher	Use on wood, paper, trash
B ("B" on a red square)	50’ or less travel distance between hazard area and the employee	Use on flammable liquid, gas
C ("C" on a blue circle)	Based on the appropriate pattern for the existing Class A or Class B hazards	Use on electrical fires
D ("D" on a yellow star)	75’ or less travel distance between the combustible metal working area and the extinguisher or other containers of Class D extinguishing agent	Use on combustible metals

4.4.1 Fire Prevention

The best method of protection against fire is prevention. The following rules are to be adhered to in an effort to prevent fire:

- Smoking is prohibited except in designated areas, as determined by the SSO. All smoking materials are to be totally extinguished and placed in appropriate receptacles;
- SDS’s shall be referred and adhered to prior to the moving, handling and storage of any chemical product;
- In order to prevent accidental ignition of combustible materials, heat producing equipment is to be properly maintained and operated as per the manufacturer’s instructions;
- All chemicals and combustibles must be stored in approved containers;
- Materials that severely react or combust when mixed must not be stored near each other;
- Chemical spills must immediately be cleaned, particularly in the case of spilled combustible or reactive materials. Damaged containers and cleaning materials must be properly disposed;
- Combustible materials and refuse must be segregated and kept from sources of ignition;
- All employees shall be made aware of the locations of fire extinguishers and hydrants and access to those resources shall be kept clear;
- The SSO shall notify all employees of any unusual fire hazard condition; and
- Good housekeeping practices are to be followed.

4.4.2 Fire Protection

All personnel shall be notified if a fire occurs; the local fire department shall also be notified. When notifying the local fire department: remain calm and speak clearly and slowly; give the exact location of the fire and describe the situation; give a phone number for the location you are calling from; and, do not hang up until you are told to do so.

4.5 Evacuation Procedures

In the event of an emergency which necessitates evacuation of the work area, personnel will notify other personnel verbally or otherwise. All personnel will immediately evacuate the work area, keeping upwind of smoke, vapors or spill location, to a predetermined safe area, without regard for equipment. The predetermined safe area will be specified to all personnel by the SSO prior to the start of field work. Personnel will not re-enter the area until all health and safety issues return to a satisfactory level. The SSO is responsible for selecting the most effective evacuation route, as well as designating safe distances and places of refuge. The SSO shall conduct a roll call to ensure that all personnel have been evacuated safely.

Evacuation procedures in case of personal injury of personnel will be conducted as follows:

- Another team member (buddy) should signal the SSO that the injury has occurred;
- A field team member trained in first aid can administer treatment to an injured worker;
- The victim should then be transported to the nearest emergency room (see **Attachment B**). If necessary, an ambulance should be called to transport the victim; and
- The SSO is responsible for making certain that an Accident Report Form is completed. This form is to be submitted to the Project Manager. Follow-up action should be taken to correct the situation that caused the accident.

If a member of the field crew demonstrates symptoms of chemical exposure, the procedures outlined below shall be followed:

- Another team member (buddy) is to remove the individual from the immediate area of contamination if it is safe for them to do so. The buddy shall communicate to the SSO (via voice/hand signals) about the chemical exposure. The SSO will then contact the appropriate emergency response agency;
- Precautions must be taken to avoid exposure of other individuals to the chemical;
- If the chemical is on the individual's clothing, the chemical shall be neutralized or removed if it is safe to do so;

- If the chemical has contacted the skin, the skin shall be washed with copious amounts of water; and
- In case of eye contact, an emergency eye wash is to be used. Eyes should be washed for at least fifteen (15) minutes.

All chemical exposure incidents must be reported in writing to the Project Manager. The SSO is responsible for completing the accident report.

4.6 Spill Containment

In an effort to prevent spills, all hazardous material will be stored in appropriate containers and the tops/lids will be placed back on the containers after use. Hazardous materials brought on-site shall come with the appropriate SDS, will be stored appropriately, with labels, and away from moving equipment. Containers will be lifted/moved utilizing equipment appropriate for the task and secured and handled in a manner which minimizes spillage and reduces the risk of personal injury. At least one (1) spill response kit shall be available at the Facility.

All environmental spills or releases of hazardous materials are to be immediately reported to the SSO and dealt with according to the chemical manufacturers recommended procedures, which can be found on the SDS. The SDS for chemicals/contaminants identified during historic Site investigations and known to be associated with the Facility are provided in **Attachment C**. If any materials brought on-site during the work come with an SDS, that SDS will be added to **Attachment C**.

4.7 Incident Reporting

If an accident, fire, or release of toxic materials occurs during the course of work, the Project Manager shall be telephoned immediately and receive written notification within 24 hours. That notification shall include the following information:

- Name, organization, telephone number, and location of the Contractor;
- Name and title of the person(s) reporting;
- Date and time of the accident/incident;
- Location of the accident/incident (i.e. site location, facility name);
- Brief summary of the accident/incident giving pertinent details including type of operation ongoing at the time of the accident/incident;
- Cause of the accident/incident, if known;
- Casualties (fatalities, disabling injuries);
- Details of any existing chemical hazard or contamination;

- Estimated property damage and effect on contract schedule;
- Action taken by Contractor to ensure safety and security; and
- Other damage or injuries sustained, public, or private.

If any employee of a subcontractor is injured, documentation of the incident will be recorded in accordance with the subcontractor's procedures; however, copies of all documentation (which at a minimum must include the OSHA Form 301 or equivalent) must be provided to the SSO within 24 hours after the accident has occurred. All accidents/incidents will be investigated. Copies of all subcontractor accident investigations will be provided to the SSO within five (5) days of the accident/incident.

5.0 GENERAL HEALTH AND SAFETY REQUIREMENTS

All Site personnel shall conduct themselves in a safe manner and maintain a working environment that is free of additional hazards.

5.1 Qualifications and Training

All personnel performing work at the Facility must be qualified for their assigned project task, as determined by the Project Manager. They must meet the training and medical monitoring requirements necessary for the task and as described herein. If possible, exposure above an OSHA permissible exposure limit (PEL) has or is expected to occur, employees must be required to receive supplemental medical testing to document any symptoms that may be specific to the particular materials present.

Training programs instruct employees on the intent of the OSHA standards, health and safety principles and procedures, proper operation of monitoring instruments, use of personal protective equipment, decontamination, and specific emergency plans. All personnel are required to remain current in all of their required training and evaluate their need for additional training when there is a change in work. In addition to the general health and safety training programs, personnel will be required to complete any supplemental task specific training (e.g. OSHA 40 Hour HAZWOPER training) developed for the tasks to be performed. Administration and compliance with the requirements for additional task-specific training will be the responsibility of the Project Manager. Any additional required training that is completed will be documented and tracked in the project files. Additional training will be provided to any employees responsible for responding to emergencies.

A copy of this HASP will also be made available to all personnel for review. All employees on-site will sign the Record of HASP Acknowledgement form (refer to Section 9.0) to verify they have reviewed this Plan. Any subcontractors involved in implementing the work plan will be required to acknowledge that their employees have received adequate training.

All on-site personnel involved with the project will attend a pre-entry briefing on the contents of this HASP, including chemical and physical hazards associated with the Facility. The initial health and safety briefing will consist of the following information:

- Names of personnel and alternates responsible for worker safety and health;
- Injury, illness, and other potential project hazards;
- Safe use of engineering controls and equipment on-site;

- Work practices by which the employee can minimize risks from hazards;
- Selection, use, care, and maintenance of PPE; and
- Standard operation safety procedures.

Documentation of all training, testing and medical monitoring certificates (if applicable) will be maintained by Walden.

5.1.1 Hazardous Communication Training (29 CFR 1910.1200)

Hazardous materials that may be encountered as existing on-site environmental or physical/health contaminants during the work activities are addressed in this HASP and their properties, hazards and associated required controls will be communicated to all affected employees and subcontractors, as per OSHA's Hazard Communication Standard. All personnel shall be briefed on the hazards of any chemical product they use and shall be aware of and have access to all SDS; these employees must be 40 Hour HAZWOPER trained.

All containers on-site shall be properly labeled in compliance with the Globally Harmonized System to indicate their contents. Labeling on any containers not intended for single day, individual use shall contain additional information indicating potential health and safety hazards (flammability, reactivity, etc.). SDS for chemicals/contaminants known to be associated with the Facility are provided in **Attachment C**. If any materials brought on-site during the work come with an SDS, that SDS will be added to **Attachment C**.

5.1.2 Visitor Training

All visitors to work areas will be informed of the hazards and necessary personal protective equipment associated with those areas, should they require entry to controlled work areas. Visitors shall also be briefed on emergency procedures.

5.2 General Safety

The SSO shall inspect work areas prior to commencement of daily activities. The SSO will take all corrective measures necessary to perform safe work at the Facility. All inspections and corrective measures will be documented and communicated to Site workers at the initial safety meeting and subsequent safety meetings.

Employees will practice contamination avoidance to include not walking through puddles or mud unnecessarily, avoiding kneeling on the ground or leaning on equipment whenever possible, or setting equipment on the ground. Weather conditions that may escalate potential hazards such as lightning, rain or extreme temperatures, will be recorded in the project files.

Employees will use extreme caution in inclined areas. Ground surfaces may be wet and slippery and may have hazardous objects protruding from the surface.

Dependent on the season in which the work will be performed, employees should exercise caution when encountering animals (e.g. snakes, spiders, bees, wasps, ticks, mosquitoes, ants, etc.) at the Facility. Employees who are known to be highly sensitive to insect stings should carry a "sting kit" and notify the SSO. All employees are encouraged to use permethrin (0.5%) clothing repellent and DEET (30%) skin repellent for protection against ticks and mosquitoes.

Hearing protection devices will be available to be worn by all field personnel in work areas where noise levels are at or above 85 decibels (dBA). The use of hearing protection devices when the noise levels exceed 85 dBA on an 8-hour average is a condition of employment.

5.2.1 Tailgate Safety Meetings

The SSO will conduct an informational safety meeting at the start of each workday to ensure that all on-site personnel (those entering the exclusion, contaminant reduction and support zones) understand changing conditions and daily operating procedures, and to address safety questions and concerns; these topics shall typically require ten (10) minutes to discuss and shall be recorded in the field notebook. Additional meetings may be conducted, as required. Attendance is mandatory and an attendance record shall be kept by the SSO. Any person who observes safety concerns or potential hazards that have not been addressed in the daily safety meeting should immediately report observations/concerns to the SSO. Meetings will include pertinent information regarding the day's work and include, but will not be limited to, the following:

- The whereabouts of any hazardous chemicals near specific work areas;
- Methods used to detect the presence or release of hazardous chemicals;
- The physical and chemical health hazards of the Facility;
- Protective measures such as safe work practices, emergency procedures, and PPE;
- Details regarding the proper use of protective measures and SDS's;
- Target activities for the day's work;
- Changes in observed exposure levels; and
- Staff changes (e.g., due to vacations, reassignments, etc.) and responsibilities.

5.2.2 Housekeeping

During project activities, work areas will be continuously policed for identification of excess trash and unnecessary debris. Excess trash and debris will be collected and stored in an

appropriate container (e.g., plastic trash bags, garbage can, roll-off bin) prior to disposal. All electrical equipment must be grounded.

5.2.3 Hazardous, Solid or Municipal Waste

If hazardous, solid, and/or municipal wastes are generated, the waste shall be accumulated, labeled, and disposed of in accordance with all applicable Federal, State and/or local regulations. If equipment or materials that will be used (i.e., calibration gases, lithium batteries, etc.) need to be shipped but fall under criteria that define them as hazardous materials under Department of Transportation (DOT) regulations 49 Code of Federal Regulations (CFR) Parts 171-177, then they must be shipped in accordance with those regulations by an individual who is certified as having been "function-specific" trained, as required under the DOT regulations.

5.2.4 Smoking, Eating and Drinking

Eating, drinking, or smoking is permitted only in designated areas in the support zone. An exception is made for the replacement of fluids as a preventive measure for heat stress. Workers will first wash hands and face immediately after leaving controlled work areas (and always prior to eating or drinking).

5.2.5 Personal Hygiene

The following personal hygiene requirements will be observed:

- No contact lenses shall be worn in the exclusion zone without the use of additional eye protection;
- If work is to be performed outdoors on a building perimeter, protective clothing that is loose fitting and covers arms and legs to protect against sunlight during times of high levels of ultraviolet exposure (May through September) shall be worn; hats, sunscreen that provides UVA and UVB protection and sunglasses shall also be donned, as appropriate;
- A water supply meeting the following requirements will be utilized:
    - *Potable Water* - An adequate supply of potable water will be available for personnel consumption. Potable water can be provided in the form of water bottles, canteens, water coolers, or drinking fountains. Where drinking fountains are not available, individual-use cups will be provided as well as adequate disposal containers. Potable water containers will be properly identified in order to distinguish them from non-potable water sources; and
    - *Non-Potable Water* - Non-potable water may be used for job tasks and cleaning activities only. Non-potable water will not be used for drinking purposes or for

hand washing. All containers of non-potable water will be marked with a label stating: "***Non-Potable Water - Not Intended for Drinking Water Consumption"***.

- Access to nearby toilet facilities shall be maintained; and
- Employees will be provided washing facilities (e.g., buckets with water and soap). The use of water and hand soap (or similar substance) will be required by all employees following exit from the exclusion zone, prior to breaks, and at the end of daily work activities.

5.2.6 Stop Work Authority

All employees have the right and duty to stop work when conditions are unsafe and to assist in correcting these conditions. Whenever the SSO determines that workplace conditions present an uncontrolled risk of injury or illness to employees, immediate resolution shall be sought. Stop work shall be immediately binding on all affected employees and subcontractors. Upon issuing the stop work order, the SSO shall implement corrective actions so that operations may be safely resumed. Resumption of safe operations is the primary objective; however, operations shall not resume until the SSO and Project Manager concur that workplace conditions meet acceptable safety standards.

5.2.7 Severe Weather

Severe weather can occur with little warning. Employees will be vigilant for the potentials for storms, lightning, high winds, and flash flood events. The SSO will be attentive to daily weather forecasts for the project area each morning. For activities occurring outdoors, the following conditions will be observed:

- Condition #1 – Storm threat within 24 hours: stow non-essential gear indoors and maintain a six (6) hour weather watch; and
- Condition #2 – Storm threat within 12 hours: securely lash down all moveable gear, drums, pipes, tools, etc. and maintain a three (3) hour weather watch.

5.3 Communication Procedures

Personnel will be informed of all known Facility hazards during an initial safety meeting and will be kept informed of hazards discovered during work activities.

- Personnel within the exclusion zone will remain in constant communication or within sight of other personnel. Failure of communication requires evacuation of the exclusion zone until communication is reestablished;

- The emergency signal will be one of the following:
    - Any blast from a pressurized air horn or vehicle horn; and
    - Verbal notification.
- The following standard hand signals will be used:
    - Hand gripping throat -- Out of air and cannot breathe;
    - Grip buddy's wrist -- Leave area immediately;
    - Both hands on buddy's waist -- Leave area immediately;
    - Hands on top of head -- Need assistance;
    - Thumb down -- No/negative; and
    - Thumb up -- Yes/I am OK/I am alright.

5.4 Hazard Communication

SDSs, along with a list of those materials covered by the SDSs, will be available to all personnel (including subcontractors) for all hazardous substances brought on-site. SDS for chemicals/ contaminants known to be associated with the Facility are provided in **Attachment C**. SDS's for materials later brought on-site shall come with an SDS, which is to be included in **Attachment C**. Any employee or subcontractor intending to bring a hazardous material onto the jobsite must first provide a copy of the SDS to the SSO for review and filing. Should an SDS be necessary but not available for the material in question, the material may not be brought onto the Facility.

All containers on-site shall be properly labeled to indicate their contents. Labeling on any containers not intended for single-day, individual use shall contain additional information indicating potential health and safety hazards (flammability, reactivity, etc.). Prior to starting work, personnel, including any subcontractors, will be briefed by the SSO regarding hazardous chemicals and their properties, hazards and associated required controls present at the work-site that personnel could use or be exposed to.

5.5 Medical Monitoring

OSHA has established requirements for a medical surveillance program designed to monitor and reduce health risks for employees who may potentially be exposed to hazardous materials. The medical surveillance program has been designed to provide baseline medical data for each employee involved in hazardous material operations. Each employee must undergo testing and training, and a determination of his/her ability to wear PPE and carry out certain tasks. Medical examinations must be administered during pre-employment, on an annual basis, upon employment termination, and as warranted for potential chemical exposure. These examinations shall be provided by employers without cost or loss of pay to the employee. In accordance with 29 CFR 1910.1020, medical surveillance records should be maintained for thirty (30) years past employment and shall be available to the employee, owner, or regulatory agencies, as required.

Due to potential exposure to hazardous materials, all contractors, employees, subcontractors and other prime contractors involved in Facility activities within the exclusion zone will be informed about the medical monitoring program meeting specifications of 29 CFR Part 1926.1153. Each contractor shall assume the responsibility of maintaining a medical surveillance program (if needed) as well as maintaining personnel medical records, as regulated by 29 CFR 1910.1020, for all personnel, including subcontractors, who will be on-site. Subcontractors working on the job must provide the SSO with documentation on their medical monitoring programs.

5.6 Logs, Reports and Record Keeping

Walden shall keep a permanently bound logbook containing as a minimum the following information:

- Agency property number, facility name, address, location and project duration;
- Contractor name, address, phone number;
- A list of Contractor personnel assigned to the project; and
- A day-to-day record of personnel entering the work area, short description of the day's work, and a record of any significant or unusual events occurring during the course of work, including but not limited to inspections, observations, unusual incidents, (e.g. damage, unexpected visitors, etc.). The project narrative is to be kept by the Project Manager.

The SSO and Project Manager will ensure that all records are kept up to date and maintained in accordance with applicable regulations. The following items will be recorded in the daily field log in waterproof, permanent ink:

- Daily list of field personnel;
- Record of all visitors;
- Training logs;
- Levels of PPE worn by workers and, as appropriate, visitors;
- Exposure work-hours and a log of occupational injuries and illnesses;
- Accident investigations;
- Daily record of all first aid treatments not otherwise reportable; and
- Daily health and safety inspection report.

6.0 HAZARD ASSESSMENT

This section identifies the general and activity-specific hazards associated with Facility operations and what should be implemented to reduce the hazards; identifies general physical hazards that can be expected; and presents a summary of documented or potential chemical hazards that may be encountered during the soil investigation work, as well as biological hazards. Every effort must be made to reduce or eliminate these hazards. Those which cannot be eliminated must be guarded against by using engineering controls and/or personal protective equipment.

6.1 Physical Hazards

The following physical hazards may be associated with the project at hand:

6.1.1 Site Mobilization/Demobilization

Mobilization and demobilization activities may cause health injuries during traffic accidents. Manual materials handling and manual site preparation may cause blisters, sore muscles and joints, and skeletal injuries. It may also present the potential for eye hazards, contusions and lacerations. Slippery work surfaces can increase the likelihood of back injuries, overexertion injuries, slips and falls.

Underground utilities must be identified before commencing any subsurface work.

6.1.2 General Work Activities

Tasks required for this project may involve exposure to slipping/tripping/falling, manual lifting, noise, heat/cold stress, electrical, hand and power tools, operation of motorized vehicles, and other physical hazards associated with soil investigation activities. All work at this Facility will be conducted during daylight hours.

Slipping/Falling: Slips, trips and falls are the most common workplace incidents and can result in serious injuries, even death. General housekeeping of the Site, PPE, attention to your surroundings, minimizing distractions and warding off fatigue can all help to minimize risk of slips, trips and falls. Work areas shall be kept free of any materials, obstructions and substances that could cause a hazardous situation. Workers shall ensure clear footing and avoid obstructions, holes, protruding objects or other tripping hazards and look out for uneven, unstable and slippery terrain. Designated routes shall be taken, not shortcuts, and makeshift substitutes of equipment must not be used. Workers are prohibited from horse-play and shall ensure a clear path prior to carrying/moving equipment.

Manual Lifting: Lifting/carrying of equipment and materials may cause strains, particularly back injuries, fatigue and over-exertion. Proper lifting techniques should be exercised; bend at the knees, let your legs do the lifting, do not twist while lifting, bring the load as close to you as possible prior to lifting, be sure there is a clear walking path, use mechanical devices for heavier objects, team lift.

Noise: The operation of certain equipment (e.g., generator, nearby construction work, etc.) may result in momentary high noise levels which could result in temporary to permanent hearing loss and interference in communication. Hearing protection (e.g. ear plugs, ear muffs) will be used as necessary; as a rule of thumb, if it becomes necessary to shout at someone three (3) feet away, hearing protection should be worn.

Eye Protection: All Facility-related operations involving possible eye injury (chemical splash, etc.), must have approved eye wash units readily available. Protective eyewear shall be donned in Level D, when directed by the SSO.

Heat Stress: Monitoring of personnel wearing personal protective clothing should commence when the ambient temperature is 72°F or above. Monitoring frequency should increase as ambient temperature increases or as slow recovery rates are observed. Heat stress monitoring should be performed by the SSO, who shall be able to recognize symptoms of heat stress; refer to **Attachment D**.

Proper training and preventive measures will aid in averting loss of worker productivity and serious illness. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat-related illness. To avoid heat stress, the following steps should be taken:

- Adjust work schedules;
- Mandate work slowdowns as needed;
- Perform work during cooler hours of the day if possible or at night if adequate lighting can be provided;
- Provide shelter (air conditioned, if possible) or shaded areas to protect personnel during rest periods; and
- Maintain workers' body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat, i.e. eight (8) fluid ounces (0.23 liters) of water must be ingested for approximately every eight (8) ounces (0.23 kg) of weight lost. When heavy

sweating occurs, encourage workers to drink more. The following strategies may be useful:

- Maintain water temperature between 50° and 60°F (10° to 16.6°C);
- Provide small disposal cups that hold about four ounces (0.1 liter);
- Have workers drink sixteen (16) ounces (0.5 liter) of fluid (preferably water or dilute drinks) before beginning work;
- Urge workers to drink one (1) or two (2) cups every 15 to 20 minutes, or at each monitoring break. A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per day are recommended, but more may be necessary to maintain body weight; and
- Train workers to recognize the symptoms of heat-related illness.

Should an employee display signs of heat exhaustion (fatigue, weakness, profuse sweating, normal temperature, pale clammy skin, headache, cramps, vomiting, fainting), they are to be immediately removed from the hot area and lay down with their feet raised. Their clothing should be loosened or removed and cool, wet clothes applied. If the victim is not vomiting, they should be encouraged to take small sips of water.

Should an employee display signs of heat stroke (dizziness, nausea, severe headache, hot and dry skin, confusion, collapse, delirium, coma and death), seek immediate emergency medical attention. Remove the victim from the hot area and remove clothing, lay them down and cool their body (shower, cool wet clothes); do not give stimulants to the victim. Refer to **Attachment D** for further instruction.

Cold Stress: Cold stress is a result of cold, wetness, and wind. A worker's susceptibility to cold stress can vary according to their physical fitness, degree of acclimatization to cold weather, age, and diet. If work on this project occurs during winter months, thermal injury due to cold exposure can become a problem for on-site personnel. A cold-stress monitoring program shall be implemented, as appropriate. Workers should be aware of the local cold exposure hazard (frostbite) and the overall cold exposure hazard (hypothermia). Refer to **Attachment E** for further information on Cold Stress.

To prevent cold-related illness:

- Educate workers to recognize the symptoms of frostbite and hypothermia;
- Identify and limit known risk factors;
- Assure the availability of enclosed, heated environments on or adjacent to the Site;
- Assure the availability of dry changes of clothing;
- Assure the availability of warm drinks; and

- Start oral temperature recording at the Site:
  - At the SSO or Project Manager's discretion when changes in a worker's performance or mental status are suspected;
  - At a worker's request;
  - As a screening measure, two (2) times per shift, under unusually hazardous conditions (e.g. wind chill less than 20°F or wind chill less than 30°F with precipitation); and
  - As a screening measure whenever any worker at the Facility develops hypothermia.

Electrical: Hazards associated with electricity include shock, electrocution, burns, fires and explosions, as well as trip and fall hazards from power cords, and including electrical hazards and exposure to carbon monoxide from the use of portable generators. No work is to be performed on electrical equipment or near any part of an electrical circuit unless the worker is protected against shock by guarding or de-energizing and grounding the circuit. Ground Fault Circuit Interrupters (GFCIs) are required for portable tools. Extension cords shall be rated for hard or extra hard use and must be capable of grounding. All cords shall be inspected prior to use for wear and exposed wiring, strain, rips, tears, cuts or burns; defective cords shall be taken out of commission. Generators shall be fueled only after being shut down and allowed to cool, in addition, portable generators shall not be utilized indoors; the exhaust is to pointed downwind from workers.

Hand and Power Tools: The use of hand and power tools can present a variety of hazards, including physical harm from being struck by flying objects, being cut or struck by the tool, sparks, fire, abrasions, contusions and electrocution, or being exposed to harmful dusts, fumes, mists, vapors or gases. Ground Fault Circuit Interrupters are required for portable tools. Workers shall confirm that all tools are in proper operating condition and that they are used in accordance with applicable manufacturers' recommendations. All appropriate PPE must be provided and utilized throughout the duration of applicable tasks.

Operation of Motorized Vehicles: Moving vehicles can be a danger whether one is within or outside of a vehicle. Distracted drivers, drivers under the influence of drugs/alcohol, tired drivers can all lead to injury, damage or death. Only authorized workers may operate motorized vehicles. Site conditions may include off-road surfaces and operation should be performed according to ground conditions. Authorized drivers must comply with all applicable state laws while operating the vehicle and possess the appropriate qualifications. Loads shall be secured and within the appropriate weight limit for the vehicle (including the number of passengers). Vehicles shall be inspected prior to use and taken out of commission if deemed unsafe. The vehicles shall be properly maintained. Operators are not to be distracted, should wear seatbelts anytime a vehicle is in motion and headlights shall be used during operation. Operation by an

employee who has recently partaken in consumption of alcoholic beverages and/or illegal drugs is prohibited.

6.2 Chemical Hazards

Previously identified chemicals used at various locations throughout the Facility, thus potentially contained in soil and groundwater, include:

Chemical	OSHA Permissible Exposure Limit (PEL), 8-Hour Time-Weighted Average (TWA)	OSHA Short-term Exposure Limit (STEL)
Tetrachloroethylene	25 ppm*	100 ppm
Trichloroethylene	25 ppm	100 ppm
1,2-Dichloroethene	200 ppm	n/a
Vinyl Chloride	1 ppm	n/a

*ppm = parts per million

The major route of exposure to these contaminants will be respiratory in nature, however dermal exposure is also possible. Inhalation of vapors and contaminated dusts would provide the mechanism for respiratory exposure. Skin contact with soils and groundwater would result in dermal exposure. Facility-related work will use engineering controls, work practices, air monitoring and personnel protective equipment to reduce the amount of potential exposure. Restricting access to controlled work areas, staying upwind of potential sources, adhering to personal hygiene practices and wearing proper safety equipment will reduce risk of injuries.

During construction, excavation, sampling and soil management activities, air monitoring shall be performed with a PID and/or multi-gas meter to determine if workers are at risk for chemical exposure. Air monitoring equipment shall be calibrated daily and noted in a log book. Air monitoring shall be performed by trained Walden individuals, only. If concentrations exceed time-weighted average (TWA), the SSO shall immediately instruct the workers to stop work. Once everyone is removed from the work area, the SSO shall consider the following measures, listed in order from most desirable to least desirable:

- Installation of engineering controls (e.g. ventilation, containment of source);
- Administrative controls; and
- Donning of PPE; upgrading PPE.

The SSO shall decide which of the above options are feasible and make a rational decision based on available resources. Workers shall not be allowed back into the work zone until the chemical hazard is properly mitigated, with no exceptions. Refer to Section 7.2 below for further information.

6.3 Biological Hazards

Potential biological hazards include illnesses and/or injuries transmitted by plants, insects, animals, and pathogenic agents.

6.3.1 Plants

Contact with poisonous plants, such as ivy, oak and sumac, can cause skin irritation referred to as contact dermatitis, which may appear as a red, itchy rash consisting of small bumps, blisters or swelling, caused by the urushiol on the leaves, stems, roots and vines. These vines/shrubs/ground cover grow in woods and fields alike, as well as in both wet and dry areas. Workers will avoid contact with these plants. If work is to take place in a field or wooded area where poisonous plants may exist, precautions shall be implemented to avoid contact including wearing protective clothing, using Tyvek™ coveralls and nitrile gloves, or using a barrier cream. If contact is suspected, workers will immediately wash all exposed skin/materials with a strong soap and water to remove the oil. Personnel that believe they may have been in contact with such plants during work at the Facility should notify the SSO or Project Manager of such an incident immediately.

6.3.2 Animals

During operations at the Facility, animals such as dogs, pigeons, sea gulls, mice, and rats may be encountered. Contact with such animals can cause rabies (dog's or squirrel's bite); Hantavirus (rat and mice droppings); psittacosis, crytococcosis, and histoplasmosis (dried bird droppings). Workers will use discretion and avoid all contact with animals.

6.3.3 Insects

Bees, wasps, hornets, mosquitoes, ticks and spiders may be present at the Facility. Some individuals may have severe allergic reactions to an insect bite or sting that can result in a life-threatening condition. In addition, mosquito bites may lead to St. Louis encephalitis or West Nile encephalitis. Personnel that have been bitten or stung by an insect during work at the Facility should notify the SSO or Project Manager of such an incident immediately. Workers will wear protective clothing and footwear, apply insect repellent prior to work, and avoid contact with bushes, tall grass, or brush to the extent possible. Field personnel who may have

insect allergies should provide this information to the SSO or Project Manager in advance and will have allergy medication on-hand.

6.3.4 Blood-borne Pathogens

Blood-borne pathogens (BBPs) include diseases that can be transmitted by contact with blood or other bodily fluids as well as contaminated items which may be encountered (e.g., used syringes, medical pads, etc.). Universal precautions shall be used when administering first aid. Good hygiene practices and proper decontamination of non-disposable PPE will minimize potential for transmission of BBPs.

7.0 EXPOSURE MONITORING

The following is a discussion of the hazards presented to worker personnel during work at this Facility from on-site physical and chemical hazards known, suspected or anticipated to be present on-site at the time this HASP was prepared.

7.1 Noise

Noise levels are measured in units of dBA, which matches the response of the human ear, and are measured on the A-scale of a standard sound level meter at slow response. Normal conversation produces a noise level of 60 dBA, while power tools often produce levels between 90-110 dBA. If two people standing an arm's length apart must raise their voices to talk, the noise level is over 85 dBA. Noise levels above 140 dBA cause pain immediately and produce hearing damage. Decibels are a logarithmic scale, meaning that 100 dBA is ten (10) times as loud as 90 dBA, 100 times as loud as 80 dBA, and 1,000 times as loud as 70 dBA.

Hearing protection (disposable or reusable type) will be utilized by any on-site personnel potentially exposed to either continuous or impact noise levels exceeding 90 dBA (slow response) for an 8-hour work shift. Should employees be exposed to such sound levels, all feasible administrative and engineering controls shall be utilized. If such controls fail to reduce sound levels within the specified sound levels provided in the table below, PPE shall be provided and used to reduce sound levels within the levels provided in the table. A sound is considered if the variations in noise level involve maxima intervals of one (1) second or less. Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

Permissible Noise Exposure Table

Duration Per Day (Hours)	Sound Level (dBA)
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25	115

7.1.1 Hearing Conservation Program

In all cases where the sound levels exceed the values shown in the table above, a continuing, effective hearing conservation program shall be administered. The program shall equip employees with the knowledge and hearing protection devices necessary to safeguard themselves from occupational hearing loss. The program shall consist of the following elements:

- Monitoring of employee noise exposures;
- The institution of engineering, work practice, and administrative controls for excessive noise;
- The provision of each overexposed employee with an individually fitted hearing protector with an adequate noise reduction rating;
- Employee training and education regarding noise hazards and protection measures;
- Baseline and annual audiometry;
- Procedures for preventing further occupational hearing loss by an employee whenever such an event has been identified; and
- Record keeping.

7.2 Chemical Contaminants

OSHA Permissible Exposure Limits (PEL) and American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV) may be exceeded during soil and groundwater investigative activities or when contaminated media are exposed or disturbed during construction or other activities. These activities will be closely monitored and evaluated to determine potential for exceeding standards and the need to implement control measures to protect personnel and the environment.

7.2.1 Air Monitoring

Direct reading instruments will be used in active work areas in order to enable rapid field decisions regarding levels of respiratory protection, as well as indicate the need for increased monitoring frequency at the edge of the exclusion zone. Walden staff will conduct air monitoring during all intrusive activities.

A MiniRAE or equivalent PID, which is calibrated daily and adjusted to give maximum sensitivity to the contaminants of concern will be used to monitor the air on a continuous basis while intrusive activities are performed. Should the meter read 0.5 parts per million (ppm) or greater above background in the breathing zone for more than one (1) minute and the source of the reading is unknown, work will be stopped until PPE is upgraded; the same holds true if the

meter reads greater than five (5) ppm above background levels in the breathing zone for more than thirty (30) continuous seconds.

PPE requirements and upgrade thresholds are summarized in the tables presented below:

Personal Protective Equipment Requirements Table

Location	Level of Protection/Tasks	Description
Support Zone	D	Steel toe boots and work clothes
Exclusion Zone and Contaminant Reduction Zone	To be determined by the site safety officer based on contamination present	
	D (modified)	Steel toe boots, nitrile or latex gloves, hard hat, safety glasses
	C	Full face respirator fitted with organic vapor cartridge and Level D PPE.
	B	Positive pressure, pressure demand self-contained breathing apparatus or positive pressure, pressure demand supplied air and Level C PPE.

Air Monitoring Action Levels Table

Instrument	Hazard Monitored	Instrument Reading	Action Required
PID	Organic Vapors	0.5 ppm or greater above background in the breathing zone for 1 minute and the source of the reading is unknown. 5 ppm or greater above background in the breathing zone for 30 continuous seconds	PPE will be upgraded to Level C. Stop work. Evaluate the source and upgrade Level C to Level B.
Combustible Gas Indicator	Explosive Vapors	>10% LEL	Explosion hazard! Withdraw from the area immediately until LEL <10%.
Oxygen Meter	Oxygen	<19.5% O_2	Stop work and withdraw from area until oxygen levels increase.

The following are examples of actions that can be implemented in addition to PPE upgrades to reduce the potential for contaminant release and exposure:

- Cover areas of exposed soils;
- Increase ventilation; and
- Install measures to contain areas of contaminant release.

7.3 Calibration

Any exposure monitoring instruments used will be calibrated at the beginning of each work shift, in accordance with the manufacturer's recommendations. If the owner's manual is not available, the personnel operating the equipment will contact the applicable office representative, rental agency or manufacturer for technical guidance for proper calibration. If equipment cannot be pre-calibrated to specifications, operations requiring monitoring for worker exposure will be postponed or temporarily ceased until this requirement is completed.

8.0 PERSONAL PROTECTIVE EQUIPMENT

The purpose of PPE is to provide a barrier, which will shield or isolate individuals from the chemical and/or physical hazards that may be encountered during work activities. The level of worker protection can be increased or reduced if determined by an employee exposure assessment. Until an employee exposure assessment is complete, the following procedures and PPE shall be made available:

- Head protection;
- Foot protection;
- Hand protection;
- Eye protection;
- Hearing protection; and
- Respiratory protection.

By signing this HASP (Section 9.0) the employee agrees to having been trained in the use, limitations, care and maintenance of the PPE to be used by the employee at this project. If training has not been provided, request same of the SSO for the proper training before signing.

8.1 Head Protection

Workers and individuals within work areas where overhead work is being performed must wear protective helmets. The protective helmets will reduce the potential for permanent injury to the head from falling and/or sharp edged objects. The head protection shall comply with the ANSI and the International Safety Equipment Association (ISEA) latest standard ANSI/ISEA Z89.1-2014, “Industrial Head Protection”.

8.2 Foot Protection

All personnel and individuals in the work areas will wear steel-toed or equivalent protective footwear to help prevent foot injuries from falling or rolling objects, objects piercing the footwear sole, and/or exposure to electrical hazards. The footwear will be properly secured to the feet at all times. Protective footwear will comply with the American National Standard for Safety-Toe Footwear, Z41.1-1967.

8.3 Hand Protection

All workers entering the work areas will use hand protection to prevent injuries caused from exposure, abrasions, lacerations, and burns of any type. The performance characteristics of the

hand protection will reflect the task(s) of the individual worker. If worn, protective disposable clothing will cover the hand protection as much as possible.

8.4 Eye Protection

All workers and individuals within the work areas will use appropriate eye protection to reduce the potential of damage caused by splashing, falling or flying objects/materials. The eye protection should fit securely on the face so the objects/materials will not enter from any side of the protection (goggles that seal to the face using an elastic headband are recommended). Eye protection will comply with ANSI/ISEA Z87.1-2015 Standards.

8.5 Hearing Protection

All workers and individuals within the work areas will use appropriate hearing protection if operations produce noise levels that exceed levels given in the permissible noise exposure table provided in Section 7.1. Exposure to impulsive or impact noise should not exceed 140 dBA peak sound pressure level. Hearing protection will be recommended if either continuous or impact noise levels exceed 90 dBA (slow response) for an 8-hour work shift. If unable to carry out conversation at an arm length or at three (3) feet distance, hearing protection such as ear plugs or muffs will be used. Hearing protection selected must control employee exposures to comply with OSHA permissible noise standards if noise levels exceed OSHA permissible noise levels. Where disposable earplugs are selected, sufficient supplies will be maintained on-site to allow for multiple changeovers per day, per worker. A non-"roll-down" type earplug, such as the E-A-R Pod Plug, should be considered to reduce the potential for ear canal contamination.

8.6 Respiratory Protection

All personnel and individuals in the work areas will wear respiratory protective equipment when needed, to help prevent exposure to any fumes, vapors, dust, and other respiratory hazards that may be encountered during on-site activities. The respirators (if needed) will be properly fitted and employees who wear or may wear respiratory protection will undergo fit-testing. Respiratory protection will comply with applicable National Institute for Occupational Safety and Health (NIOSH) and American Society for Testing and Materials (ASTM) International Standards depending on the type of PPE to be worn.

During work activities including, but not limited to, saw-cutting of concrete and the operation of power tools such as jackhammers, grinders or drills on concrete or cement (none presently anticipated for the work covered under this HASP), personnel will wear protective equipment to prevent the inhalation of dust and silica particles.

8.7 PPE Program

PPE will be required when work activities generate and/or involve known or suspected atmospheric vapors, gases, liquids, or particulates at or above satisfactory health and safety levels or regulatory action limits. Protective equipment shall be ANSI/ISEA/NIOSH-approved.

For the work covered under this HASP, PPE should typically comprise Level D protection. Should air monitoring indicate that Level D fails to meet protection requirements, work shall be stopped and PPE shall be upgraded to Level C. Level D PPE consists of:

- Standard work uniform with coveralls or tyvek, as needed;
- Steel-toe and steel shank work boots;
- Hard hat;
- Gloves, as needed;
- Safety glasses; and
- Hearing protection, as needed.

Level C PPE consists of:

- Full face respirator fitted with appropriate organic vapor cartridge and Level D PPE.

8.7.1 Inspections

Before use of protective clothing, all personnel shall determine that the clothing material is correct for the specified task at hand. The clothing is to be visually inspected for imperfect seams, non-uniform coatings, tears and malfunctioning closures.

Before using gloves, they are to be checked for pinhole leaks. It is imperative that any equipment found to be defective be replaced immediately.

8.7.2 Donning/Doffing of Personal Protective Equipment

The following information is to provide on-site personnel with helpful hints that, when applied, make donning and doffing of PPE a safer and more manageable task:

- Have a “buddy” check your ensemble to ensure proper donning before entering controlled work areas. Without mirrors, the most obvious discrepancies can go unnoticed and may result in a potential exposure situation;
- Never perform personal decontamination with a pressure washer;
- Decontamination of equipment with water and a detergent shall be performed while PPE is still worn; and

- PPE will be removed and personnel will thoroughly wash their hands prior to leaving the Facility.

All PPE is to be bagged and contained in the proper receptacle prior to proper off-site disposal.

9.0 RECORD OF HASP ACKNOWLEDGEMENT

I certify that I have thoroughly read and fully understand the information in this HASP for intrusive activities performed at the iPark 87 Facility. I understand the associated potential health and safety hazards and issues.

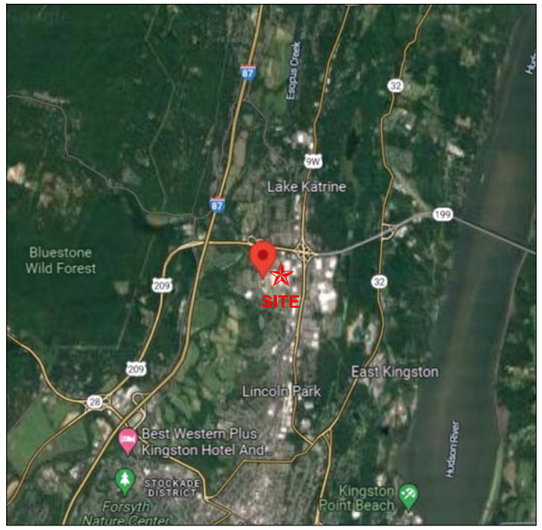
I certify that I have been trained in the use, care, and limitations of the PPE that could be used.

My signature below is official record that I comply with provisions of the HASP and federal, state, and local health and safety regulations and guidelines.

Printed Name	Signature	Representing	Date

ATTACHMENT A

iPARK 87 FACILITY SITE MAP



SOURCE: GOOGLE MAPS

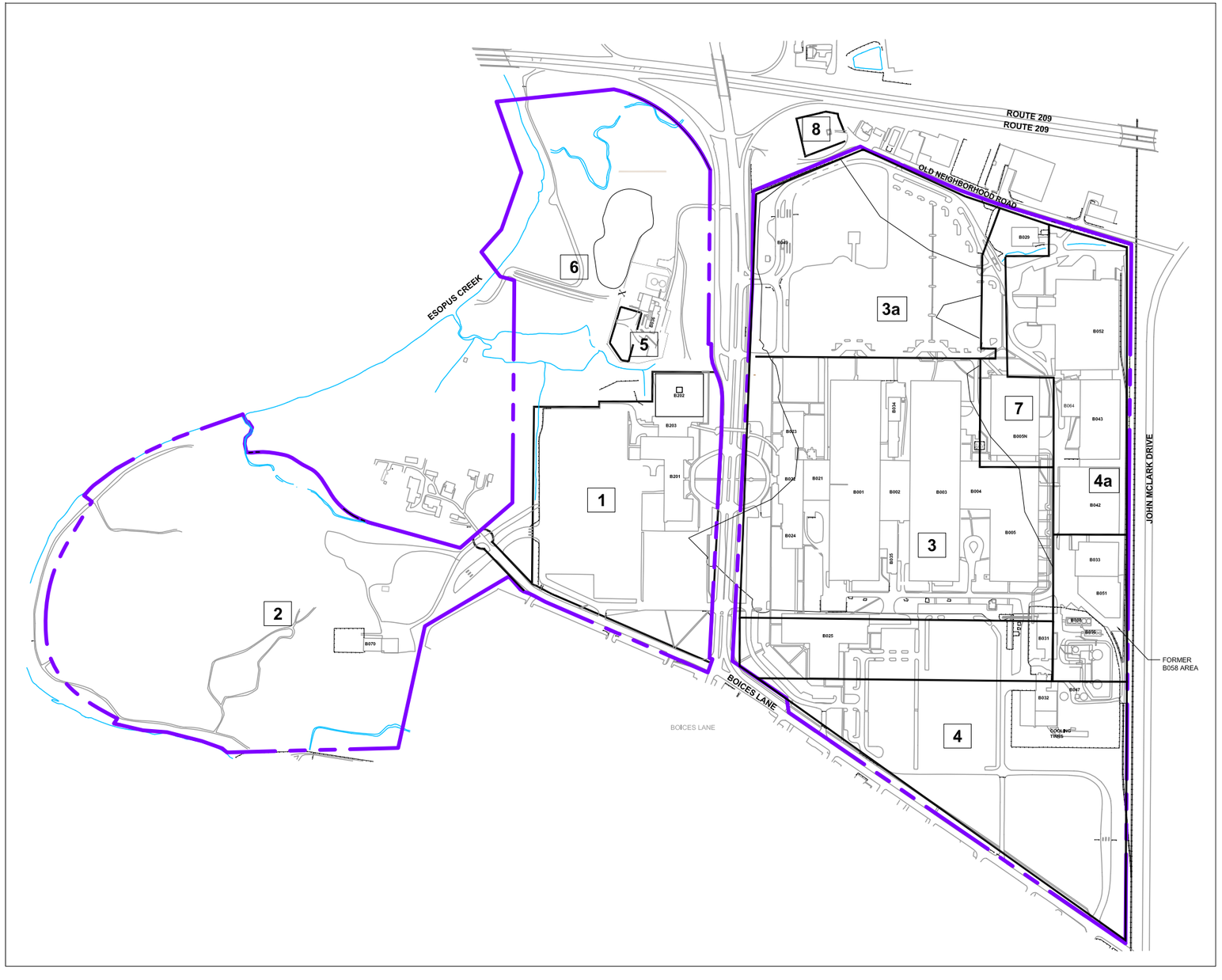
SITE LOCATION MAP

N.T.S.

SOURCE: GOOGLE Maps

SITE MAP

N .T.S.



0 300 600 1200 1800

SCALE: 1"=600'

PROPERTY SITE PLAN

SCALE: 1" = 600'-0"

LEGEND

- PROPERTY BOUNDARY
- PARCEL LINE
- B202 BUILDING NUMBER

HEADQUARTERS: 16 SPRING STREET OYSTER BAY, NY 11771
P: (516) 624-7200 F: (516) 624-3219
ADDITIONAL OFFICES: HOPEWELL JUNCTION, NY;
HARTFORD, CT; LATHAM, NY, FORT WAYNE, IN
WALDEN www.WaldenEnvironmentalEngineering.com

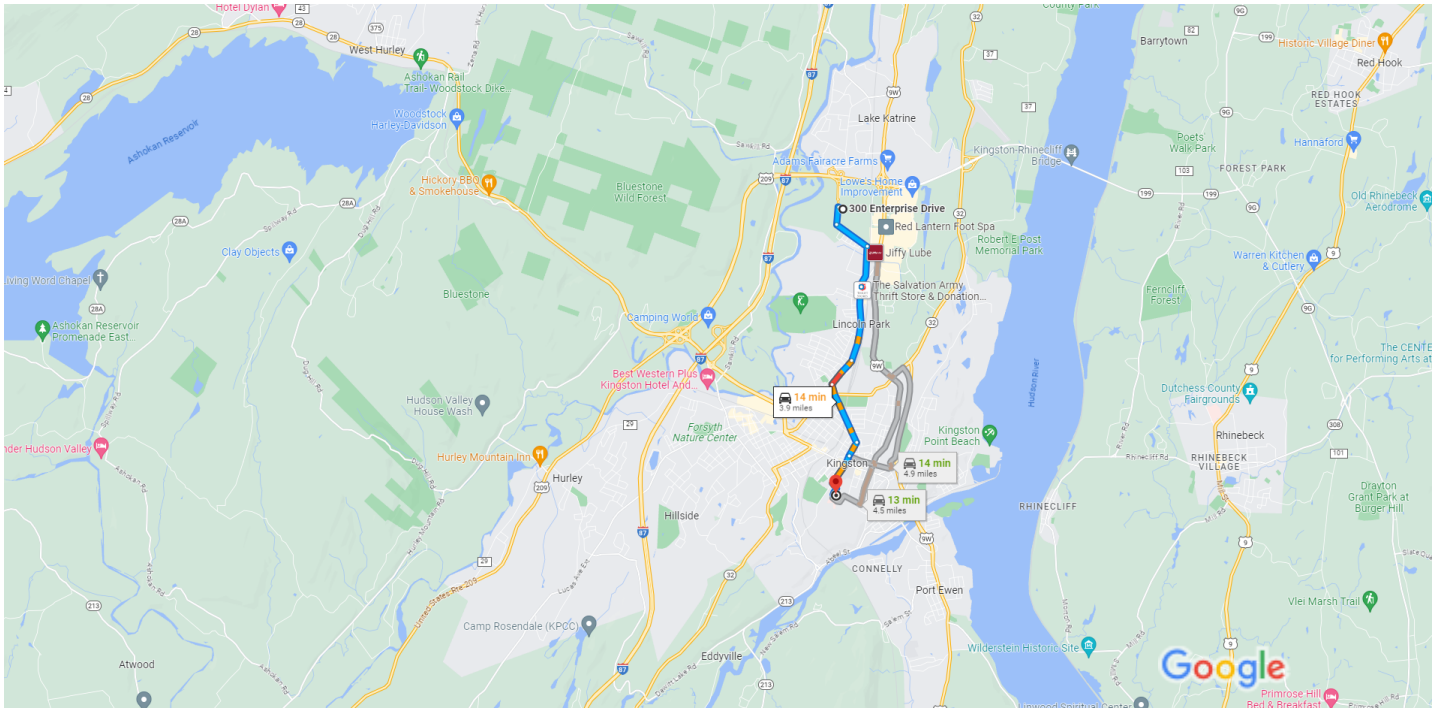
FOR: iPARK 87, 300 Enterprise Drive, Kingston, N.Y. 12401			DRAWING TITLE: PROPERTY SITE PLAN & SITE MAPS		DRAWING NO: 1	ISSUED: XXXX
DESIGNED BY: NMB	DRAWN BY: LS	CHECKED BY: NMB	JOB NO: iPARK2101	DATE: 6/8/23	11x17	SHEET NO: 1 of 1
APPROVED BY:	SCALE: AS NOTED	CAD FILE LOCATION: Z:\iPark2201 - Kingston\Debris Piles BUD Petition Application\ACAD\iPark2201_iPARK 87_BASE SITE PLAN				REVISION NO: 0

ATTACHMENT B
EMERGENCY ROOM DIRECTIONS

Google Maps

300 Enterprise Dr, Kingston, NY 12401 to HealthAlliance Hospital Mary's Avenue, 105 Marys Ave, Kingston, NY 12401

Drive 3.9 miles, 14 min



Map data ©2023 Google 1 mi

300 Enterprise Dr
Kingston, NY 12401

Take Boices Ln and Morton Blvd to Ulster Ave in Lincoln Park

3 min (1.2 mi)

1. Head north toward Enterprise Dr

236 ft

2. Turn left at the 1st cross street onto Enterprise Dr

0.2 mi

3. Turn left onto Boices Ln

0.4 mi

4. Turn right onto Morton Blvd

0.5 mi

Continue on Ulster Ave to Kingston

3 min (1.3 mi)

5. Turn right onto Ulster Ave
   Pass by the gas station (on the right in 0.2 mi)

0.9 mi

6. Continue onto Albany Ave
   Pass by QuickChek (on the right)

0.4 mi

Continue on Foxhall Ave to your destination

6 min (1.5 mi)

7. Turn left onto Foxhall Ave

0.7 mi

8. Turn right onto Garden St

0.2 mi

9. Continue onto E O'Reilly St

0.4 mi

10. Turn left onto Marys Ave

417 ft

11. Turn right

308 ft

12. Keep left

135 ft

13. Turn left

Destination will be on the left

75 ft

HealthAlliance Hospital Mary's Avenue
105 Marys Ave, Kingston, NY 12401

ATTACHMENT C
SAFETY DATA SHEETS

SAFETY DATA SHEET

Creation Date 22-Sep-2009 **Revision Date** 23-Jan-2018 **Revision Number** 3

1. Identification

Product Name **cis-1,2-Dichloroethylene**

Cat No. : **AC113380000; AC113380025; AC113380100; AC113380500**

Synonyms cis-Acetylene dichloride.

Recommended Use Laboratory chemicals.
Uses advised against Not for food, drug, pesticide or biocidal product use

Details of the supplier of the safety data sheet

Company
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

Emergency Telephone Number
For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11
Emergency Number **US:**001-201-796-7100 / **Europe:** +32 14 57 52 99
CHEMTREC Tel. No.**US:**001-800-424-9300 / **Europe:**001-703-527-3887

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids	Category 2
Acute oral toxicity	Category 4
Acute Inhalation Toxicity - Vapors	Category 4
Skin Corrosion/irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Respiratory system.	

Label Elements

Signal Word
Danger

Hazard Statements
Highly flammable liquid and vapor
Harmful if swallowed
Harmful if inhaled
Causes serious eye irritation
Causes skin irritation
May cause respiratory irritation

Precautionary Statements
Prevention
Wear protective gloves/protective clothing/eye protection/face protection
Use only outdoors or in a well-ventilated area
Avoid breathing dust/fume/gas/mist/vapors/spray
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Keep container tightly closed
Ground/bond container and receiving equipment
Take precautionary measures against static discharge
Do not eat, drink or smoke when using this product
Response
Call a POISON CENTER or doctor/physician if you feel unwell
Inhalation
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
Skin
IF ON SKIN: Wash with plenty of soap and water
Take off contaminated clothing and wash before reuse
If skin irritation occurs: Get medical advice/attention
Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
Ingestion
Rinse mouth
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
Fire
Explosion risk in case of fire
Fight fire with normal precautions from a reasonable distance
Evacuate area
Storage
Store in a well-ventilated place. Keep cool
Store in a closed container
Store locked up
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
None identified

3. Composition/Information on Ingredients

Component	CAS-No	Weight %
cis-1,2-Dichloroethylene	156-59-2	97

4. First-aid measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Obtain medical attention.

Inhalation Move to fresh air. Obtain medical attention. If not breathing, give artificial respiration.

Ingestion Do not induce vomiting. Obtain medical attention.

Most important symptoms and effects Breathing difficulties. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media Water spray. Carbon dioxide (CO_2). Dry chemical. Use water spray to cool unopened containers. Chemical foam. Cool closed containers exposed to fire with water spray.

Unsuitable Extinguishing Media No information available

Flash Point 6 °C / 42.8 °F

Method - No information available

Autoignition Temperature 440 °C / 824 °F

Explosion Limits

Upper 12.80%

Lower 9.70%

Sensitivity to Mechanical Impact No information available

Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical

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

Hazardous Combustion Products

Hydrogen chloride gas Carbon monoxide (CO) Carbon dioxide (CO_2)

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
2	3	0	N/A

6. Accidental release measures

Personal Precautions Ensure adequate ventilation. Use personal protective equipment. Remove all sources of ignition. Take precautionary measures against static discharges. Avoid contact with skin, eyes and clothing.

Environmental Precautions See Section 12 for additional ecological information. Do not flush into surface water or sanitary sewer system.

Methods for Containment and Clean Up Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.

7. Handling and storage

Handling Ensure adequate ventilation. Wear personal protective equipment. Use explosion-proof equipment. Use only non-sparking tools. Avoid contact with skin, eyes and clothing. Avoid breathing dust/fume/gas/mist/vapors/spray. Avoid ingestion and inhalation. Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharges. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded.

Storage Keep in a dry, cool and well-ventilated place. Keep container tightly closed. Keep away from heat and sources of ignition. Flammables area. Keep container tightly closed in a dry and well-ventilated place.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
cis-1,2-Dichloroethylene	TWA: 200 ppm			

Legend

ACGIH - American Conference of Governmental Industrial Hygienists

Engineering Measures Ensure adequate ventilation, especially in confined areas. Use explosion-proof electrical/ventilating/lighting/equipment. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection No protective equipment is needed under normal use conditions.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	aromatic
Odor Threshold	No information available
pH	No information available
Melting Point/Range	-80 °C / -112 °F
Boiling Point/Range	60 °C / 140 °F @ 760 mmHg
Flash Point	6 °C / 42.8 °F
Evaporation Rate	No information available
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	12.80%
Lower	9.70%
Vapor Pressure	201 mmHg @ 25 °C
Vapor Density	3.34 (Air = 1.0)
Specific Gravity	1.280
Solubility	No information available
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	440 °C / 824 °F
Decomposition Temperature	No information available
Viscosity	No information available
Molecular Formula	C2 H2 Cl2
Molecular Weight	96.94

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Stable under normal conditions.

Conditions to Avoid Keep away from open flames, hot surfaces and sources of ignition. Exposure to air. Exposure to light. Incompatible products. Exposure to moist air or water.

Incompatible Materials Bases

Hazardous Decomposition Products Hydrogen chloride gas, Carbon monoxide (CO), Carbon dioxide (CO_2)

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information
Component Information
Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation Irritating to eyes, respiratory system and skin

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
cis-1,2-Dichloroethylene	156-59-2	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure Respiratory system
STOT - repeated exposure None known

Aspiration hazard No information available

Symptoms / effects,both acute and delayed Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Do not empty into drains. Do not flush into surface water or sanitary sewer system. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The product contains following substances which are hazardous for the environment.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea

cis-1,2-Dichloroethylene	Not listed	Not listed	EC50 = 721 mg/L 5 min EC50 = 905 mg/L 30 min	Not listed

Persistence and Degradability Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility Will likely be mobile in the environment due to its volatility.

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT

UN-No UN1150
Proper Shipping Name 1,2-DICHLOROETHYLENE
Hazard Class 3
Packing Group II

TDG

UN-No UN1150
Proper Shipping Name 1,2-DICHLOROETHYLENE
Hazard Class 3
Packing Group II

IATA

UN-No 1150
Proper Shipping Name 1,2-DICHLOROETHYLENE
Hazard Class 3
Packing Group II

IMDG/IMO

UN-No 1150
Proper Shipping Name 1,2-DICHLOROETHYLENE
Hazard Class 3
Packing Group II

15. Regulatory information

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
cis-1,2-Dichloroethylene	X	-	X	205-859-7	-		-	X	X	X	X

Legend:
X - Listed
E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
P - Indicates a commenced PMN substance
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
S - Indicates a substance that is identified in a proposed or final Significant New Use Rule
T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).
Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313 Not applicable

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act) Not applicable

Clean Air Act Not applicable

OSHA Occupational Safety and Health Administration
Not applicable

CERCLA

California Proposition 65 This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
cis-1,2-Dichloroethylene	X	-	X	-	-

U.S. Department of Transportation

Reportable Quantity (RQ): N
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security
This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

16. Other information

Prepared By Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 22-Sep-2009
Revision Date 23-Jan-2018
Print Date 23-Jan-2018
Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

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

End of SDS

SAFETY DATA SHEET

Creation Date 10-Dec-2009 **Revision Date** 23-Jan-2018 **Revision Number** 5

1. Identification

Product Name **Tetrachloroethylene**

Cat No. : **AC445690000; ACR445690010; AC445690025; AC445691000**

CAS-No 127-18-4
Synonyms Perchloroethylene

Recommended Use Laboratory chemicals.
Uses advised against Not for food, drug, pesticide or biocidal product use

Details of the supplier of the safety data sheet

Company
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

Emergency Telephone Number
For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11
Emergency Number **US:**001-201-796-7100 / **Europe:** +32 14 57 52 99
CHEMTREC Tel. No.**US:**001-800-424-9300 / **Europe:**001-703-527-3887

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin Corrosion/irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2
Skin Sensitization	Category 1
Carcinogenicity	Category 1B
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Central nervous system (CNS).	
Specific target organ toxicity - (repeated exposure)	Category 2
Target Organs - Kidney, Liver, Blood.	

Label Elements

Signal Word
Danger

Hazard Statements
Causes skin irritation
Causes serious eye irritation
May cause an allergic skin reaction
May cause drowsiness or dizziness
May cause cancer
May cause damage to organs through prolonged or repeated exposure

Precautionary Statements
Prevention
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Wash face, hands and any exposed skin thoroughly after handling
Contaminated work clothing should not be allowed out of the workplace
Do not breathe dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Wear protective gloves/protective clothing/eye protection/face protection
Response
IF exposed or concerned: Get medical attention/advice
Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Skin
IF ON SKIN: Wash with plenty of soap and water
Take off contaminated clothing and wash before reuse
If skin irritation or rash occurs: Get medical advice/attention
Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
Toxic to aquatic life with long lasting effects
WARNING. Cancer - https://www.p65warnings.ca.gov/.

3. Composition/Information on Ingredients

Component	CAS-No	Weight %
Tetrachloroethylene	127-18-4	>95

4. First-aid measures

General Advice If symptoms persist, call a physician.

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician.

Inhalation Move to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms occur.

Ingestion Clean mouth with water and drink afterwards plenty of water.

Most important symptoms and effects	None reasonably foreseeable. May cause allergic skin reaction. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting: Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing
Notes to Physician	Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Unsuitable Extinguishing Media	No information available
Flash Point	No information available
Method -	No information available
Autoignition Temperature	No information available
Explosion Limits	
Upper	No data available
Lower	No data available
Sensitivity to Mechanical Impact	No information available
Sensitivity to Static Discharge	No information available

Specific Hazards Arising from the Chemical
Thermal decomposition can lead to release of irritating gases and vapors. Containers may explode when heated.

Hazardous Combustion Products
Chlorine Hydrogen chloride gas Phosgene
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
2	0	0	N/A

6. Accidental release measures

Personal Precautions	Use personal protective equipment. Ensure adequate ventilation.
Environmental Precautions	Do not flush into surface water or sanitary sewer system.
Methods for Containment and Clean Up	Soak up with inert absorbent material. Keep in suitable, closed containers for disposal.

7. Handling and storage

Handling	Wear personal protective equipment. Do not get in eyes, on skin, or on clothing. Ensure adequate ventilation. Avoid ingestion and inhalation.
Storage	Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from sunlight.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
Tetrachloroethylene	TWA: 25 ppm STEL: 100 ppm	(Vacated) TWA: 25 ppm (Vacated) TWA: 170 mg/m^3 Ceiling: 200 ppm TWA: 100 ppm	IDLH: 150 ppm	TWA: 100 ppm TWA: 670 mg/m^3 TWA: 200 ppm TWA: 1250 mg/m^3 STEL: 200 ppm STEL: 1340 mg/m^3

Legend

ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Engineering Measures Use only under a chemical fume hood. Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection Long sleeved clothing.

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	Characteristic, sweet
Odor Threshold	No information available
pH	No information available
Melting Point/Range	-22 °C / -7.6 °F
Boiling Point/Range	120 - 122 °C / 248 - 251.6 °F @ 760 mmHg
Flash Point	No information available
Evaporation Rate	6.0 (Ether = 1.0)
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	18 mbar @ 20 °C
Vapor Density	No information available
Density	1.619
Specific Gravity	1.625
Solubility	0.15 g/L water (20°C)
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	No information available
Decomposition Temperature	> 150°C
Viscosity	0.89 mPa s at 20 °C
Molecular Formula	C2 Cl4
Molecular Weight	165.83

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Stable under normal conditions.

Conditions to Avoid Incompatible products. Excess heat. Exposure to moist air or water.

Incompatible Materials Strong acids, Strong oxidizing agents, Strong bases, Metals, Zinc, Amines, Aluminium

Hazardous Decomposition Products Chlorine, Hydrogen chloride gas, Phosgene

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Tetrachloroethylene	LD50 = 2629 mg/kg (Rat)	LD50 > 10000 mg/kg (Rat)	LC50 = 27.8 mg/L (Rat) 4 h

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation Irritating to eyes and skin

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Tetrachloroethylene	127-18-4	Group 2A	Reasonably Anticipated	A3	X	A3

IARC: (International Agency for Research on Cancer)

NTP: (National Toxicity Program)

ACGIH: (American Conference of Governmental Industrial Hygienists)

Mexico - Occupational Exposure Limits - Carcinogens

IARC: (International Agency for Research on Cancer)
Group 1 - Carcinogenic to Humans
Group 2A - Probably Carcinogenic to Humans
Group 2B - Possibly Carcinogenic to Humans
NTP: (National Toxicity Program)
Known - Known Carcinogen
Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen
ACGIH: (American Conference of Governmental Industrial Hygienists)
A1 - Known Human Carcinogen
A2 - Suspected Human Carcinogen
A3 - Animal Carcinogen
Mexico - Occupational Exposure Limits - Carcinogens
A1 - Confirmed Human Carcinogen
A2 - Suspected Human Carcinogen
A3 - Confirmed Animal Carcinogen
A4 - Not Classifiable as a Human Carcinogen
A5 - Not Suspected as a Human Carcinogen

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure Central nervous system (CNS)

STOT - repeated exposure Kidney Liver Blood

Aspiration hazard No information available

Symptoms / effects,both acute and delayed Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting: Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing

Endocrine Disruptor Information

Component	EU - Endocrine Disrupters Candidate List	EU - Endocrine Disruptors - Evaluated Substances	Japan - Endocrine Disruptor Information
Tetrachloroethylene	Group II Chemical	Not applicable	Not applicable

Other Adverse Effects Tumorigenic effects have been reported in experimental animals.

12. Ecological information

Ecotoxicity

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The product contains following substances which are hazardous for the environment.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Tetrachloroethylene	EC50: > 500 mg/L, 96h (Pseudokirchneriella subcapitata)	LC50: 4.73 - 5.27 mg/L, 96h flow-through (Oncorhynchus mykiss) LC50: 11.0 - 15.0 mg/L, 96h static (Lepomis macrochirus) LC50: 8.6 - 13.5 mg/L, 96h static (Pimephales promelas) LC50: 12.4 - 14.4 mg/L, 96h flow-through (Pimephales promelas)	EC50 = 100 mg/L 24 h EC50 = 112 mg/L 24 h EC50 = 120.0 mg/L 30 min	EC50: 6.1 - 9.0 mg/L, 48h Static (Daphnia magna)

Persistence and Degradability Insoluble in water Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility . Is not likely mobile in the environment due its low water solubility. Will likely be mobile in the environment due to its volatility.

Component	log Pow
Tetrachloroethylene	2.53 - 2.88

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

Component	RCRA - U Series Wastes	RCRA - P Series Wastes
Tetrachloroethylene - 127-18-4	U210	-

14. Transport information

DOT

UN-No UN1897
Proper Shipping Name TETRACHLOROETHYLENE
Hazard Class 6.1
Packing Group III

TDG

UN-No UN1897

Proper Shipping Name TETRACHLOROETHYLENE
Hazard Class 6.1
Packing Group III

IATA
UN-No UN1897
Proper Shipping Name TETRACHLOROETHYLENE
Hazard Class 6.1
Packing Group III

IMDG/IMO
UN-No UN1897
Proper Shipping Name TETRACHLOROETHYLENE
Hazard Class 6.1
Subsidiary Hazard Class P
Packing Group III

15. Regulatory information

All of the components in the product are on the following Inventory lists: X = listed

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Tetrachloroethylene	X	X	-	204-825-9	-		X	X	X	X	X

Legend:
X - Listed
E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
P - Indicates a commenced PMN substance
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
S - Indicates a substance that is identified in a proposed or final Significant New Use Rule
T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).
Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313

Component	CAS-No	Weight %	SARA 313 - Threshold Values %
Tetrachloroethylene	127-18-4	>95	0.1

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act)

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Tetrachloroethylene	-	-	X	X

Clean Air Act

Component	HAPS Data	Class 1 Ozone Depletors	Class 2 Ozone Depletors
Tetrachloroethylene	X		-

OSHA Occupational Safety and Health Administration
Not applicable

CERCLA This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Tetrachloroethylene	100 lb 1 lb	-

California Proposition 65 This product contains the following proposition 65 chemicals

Component	CAS-No	California Prop. 65	Prop 65 NSRL	Category
Tetrachloroethylene	127-18-4	Carcinogen	14 µg/day	Carcinogen

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Tetrachloroethylene	X	X	X	X	X

U.S. Department of Transportation

Reportable Quantity (RQ): Y
DOT Marine Pollutant Y
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security
This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

16. Other information

Prepared By
Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 10-Dec-2009
Revision Date 23-Jan-2018
Print Date 23-Jan-2018
Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

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

End of SDS

SAFETY DATA SHEET

Creation Date 03-Feb-2010 **Revision Date** 14-Jul-2016 **Revision Number** 2

1. Identification

Product Name **Trichloroethylene**

Cat No. : **T340-4; T341-4; T341-20; T341-500; T403-4**

Synonyms Trichloroethene (Stabilized/Technical/Electronic/Certified ACS)

Recommended Use Laboratory chemicals.
Uses advised against

Details of the supplier of the safety data sheet

Company
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Emergency Telephone Number
CHEMTREC®, Inside the USA: 800-424-9300
CHEMTREC®, Outside the USA: 001-703-527-3887

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin Corrosion/irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2
Skin Sensitization	Category 1
Germ Cell Mutagenicity	Category 2
Carcinogenicity	Category 1A
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Central nervous system (CNS).	
Specific target organ toxicity - (repeated exposure)	Category 2
Target Organs - Kidney, Liver, Heart, spleen, Blood.	

Label Elements

Signal Word
Danger

Hazard Statements
Causes skin irritation
Causes serious eye irritation
May cause an allergic skin reaction
May cause drowsiness or dizziness
Suspected of causing genetic defects
May cause cancer
May cause damage to organs through prolonged or repeated exposure

Precautionary Statements
Prevention
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Wash face, hands and any exposed skin thoroughly after handling
Contaminated work clothing should not be allowed out of the workplace
Do not breathe dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Wear protective gloves/protective clothing/eye protection/face protection
Response
IF exposed or concerned: Get medical attention/advice
Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Skin
IF ON SKIN: Wash with plenty of soap and water
Take off contaminated clothing and wash before reuse
If skin irritation or rash occurs: Get medical advice/attention
Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
Harmful to aquatic life with long lasting effects
WARNING! This product contains a chemical known in the State of California to cause cancer, birth defects or other reproductive harm.

3. Composition / information on ingredients

Component	CAS-No	Weight %
Trichloroethylene	79-01-6	100

4. First-aid measures

General Advice Show this safety data sheet to the doctor in attendance. Immediate medical attention is required.

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Immediate medical attention is required.

Inhalation Move to fresh air. If not breathing, give artificial respiration. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a

	pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediate medical attention is required.
Ingestion	Do not induce vomiting. Call a physician or Poison Control Center immediately.
Most important symptoms/effects	None reasonably foreseeable. May cause allergic skin reaction. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting: Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing
Notes to Physician	Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Unsuitable Extinguishing Media	No information available
Flash Point	No information available
Method -	No information available
Autoignition Temperature	410 °C / 770 °F
Explosion Limits	
Upper	10.5 vol %
Lower	8 vol %
Oxidizing Properties	Not oxidising
Sensitivity to Mechanical Impact	No information available
Sensitivity to Static Discharge	No information available

Specific Hazards Arising from the Chemical
Thermal decomposition can lead to release of irritating gases and vapors. Containers may explode when heated. Keep product and empty container away from heat and sources of ignition.

Hazardous Combustion Products
Hydrogen chloride gas Chlorine Phosgene Carbon monoxide (CO) Carbon dioxide (CO_2)
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

NFPA

Health	Flammability	Instability	Physical hazards
2	1	0	N/A

6. Accidental release measures

Personal Precautions	Ensure adequate ventilation. Use personal protective equipment. Keep people away from and upwind of spill/leak. Evacuate personnel to safe areas.
Environmental Precautions	Should not be released into the environment. Do not flush into surface water or sanitary sewer system.
Methods for Containment and Clean Up	Soak up with inert absorbent material. Keep in suitable, closed containers for disposal.

7. Handling and storage

Handling	Wear personal protective equipment. Do not get in eyes, on skin, or on clothing. Use only under a chemical fume hood. Do not breathe vapors or spray mist. Do not ingest.
Storage	Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from light. Do not store in aluminum containers.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
Trichloroethylene	TWA: 10 ppm STEL: 25 ppm	(Vacated) TWA: 50 ppm (Vacated) TWA: 270 mg/m³ Ceiling: 200 ppm (Vacated) STEL: 200 ppm (Vacated) STEL: 1080 mg/m³ TWA: 100 ppm	IDLH: 1000 ppm	TWA: 100 ppm TWA: 535 mg/m³ STEL: 200 ppm STEL: 1080 mg/m³

Legend

ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Engineering Measures Use only under a chemical fume hood. Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection Long sleeved clothing.

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	Characteristic
Odor Threshold	No information available
pH	No information available
Melting Point/Range	-85 °C / -121 °F
Boiling Point/Range	87 °C / 188.6 °F
Flash Point	No information available
Evaporation Rate	0.69 (Carbon Tetrachloride = 1.0)
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	10.5 vol %
Lower	8 vol %
Vapor Pressure	77.3 mbar @ 20 °C
Vapor Density	4.5 (Air = 1.0)
Specific Gravity	1.460
Solubility	Slightly soluble in water
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	410 °C / 770 °F
Decomposition Temperature	> 120°C
Viscosity	0.55 mPa.s (25°C)

Molecular Formula C2 H Cl3
Molecular Weight 131.39

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Light sensitive.

Conditions to Avoid Incompatible products. Excess heat. Exposure to light. Exposure to moist air or water.

Incompatible Materials Strong oxidizing agents, Strong bases, Amines, Alkali metals, Metals,

Hazardous Decomposition Products Hydrogen chloride gas, Chlorine, Phosgene, Carbon monoxide (CO), Carbon dioxide (CO_2)

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information
Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Trichloroethylene	LD50 = 4290 mg/kg (Rat) LD50 = 4920 mg/kg (Rat)	LD50 > 20 g/kg (Rabbit) LD50 = 29000 mg/kg (Rabbit)	LC50 = 26 mg/L (Rat) 4 h

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation Irritating to eyes and skin

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Trichloroethylene	79-01-6	Group 1	Reasonably Anticipated	A2	X	Not listed

IARC: (International Agency for Research on Cancer)

IARC: (International Agency for Research on Cancer)
Group 1 - Carcinogenic to Humans
Group 2A - Probably Carcinogenic to Humans
Group 2B - Possibly Carcinogenic to Humans

NTP: (National Toxicity Program)

NTP: (National Toxicity Program)
Known - Known Carcinogen
Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen

ACGIH: (American Conference of Governmental Industrial Hygienists)

A1 - Known Human Carcinogen
A2 - Suspected Human Carcinogen
A3 - Animal Carcinogen
ACGIH: (American Conference of Governmental Industrial Hygienists)

Mutagenic Effects Mutagenic effects have occurred in humans.

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure Central nervous system (CNS)
STOT - repeated exposure Kidney Liver Heart spleen Blood

Aspiration hazard No information available

Symptoms / effects,both acute and delayed Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting: Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Do not empty into drains. The product contains following substances which are hazardous for the environment. Contains a substance which is:. Harmful to aquatic organisms. Toxic to aquatic organisms.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Trichloroethylene	EC50: = 175 mg/L, 96h (Pseudokirchneriella subcapitata) EC50: = 450 mg/L, 96h (Desmodesmus subspicatus)	LC50: 39 - 54 mg/L, 96h static (Lepomis macrochirus) LC50: 31.4 - 71.8 mg/L, 96h flow-through (Pimephales promelas)	EC50 = 0.81 mg/L 24 h EC50 = 115 mg/L 10 min EC50 = 190 mg/L 15 min EC50 = 235 mg/L 24 h EC50 = 410 mg/L 24 h EC50 = 975 mg/L 5 min	EC50: = 2.2 mg/L, 48h (Daphnia magna)

Persistence and Degradability Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility Will likely be mobile in the environment due to its volatility.

Component	log Pow
Trichloroethylene	2.4

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

Component	RCRA - U Series Wastes	RCRA - P Series Wastes
Trichloroethylene - 79-01-6	U228	-

14. Transport information

DOT

UN-No UN1710
Proper Shipping Name TRICHLOROETHYLENE
Hazard Class 6.1
Packing Group III

TDG

UN-No UN1710
Proper Shipping Name TRICHLOROETHYLENE
Hazard Class 6.1
Packing Group III

IATA

UN-No UN1710
Proper Shipping Name TRICHLOROETHYLENE

Hazard Class 6.1
Packing Group III

IMDG/IMO

UN-No UN1710
Proper Shipping Name TRICHLOROETHYLENE
Hazard Class 6.1
Packing Group III

15. Regulatory information

All of the components in the product are on the following Inventory lists: X = listed

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Trichloroethylene	X	X	-	201-167-4	-		X	X	X	X	X

Legend:
X - Listed
E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
P - Indicates a commenced PMN substance
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
S - Indicates a substance that is identified in a proposed or final Significant New Use Rule
T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).
Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

Component	TSCA 12(b)
Trichloroethylene	Section 5

SARA 313

Component	CAS-No	Weight %	SARA 313 - Threshold Values %
Trichloroethylene	79-01-6	100	0.1

SARA 311/312 Hazard Categories

Acute Health Hazard Yes
Chronic Health Hazard Yes
Fire Hazard No
Sudden Release of Pressure Hazard No
Reactive Hazard No

CWA (Clean Water Act)

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Trichloroethylene	X	100 lb	X	X

Clean Air Act

Component	HAPS Data	Class 1 Ozone Depletors	Class 2 Ozone Depletors
Trichloroethylene	X		-

OSHA Occupational Safety and Health Administration
Not applicable

CERCLA
This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Trichloroethylene	100 lb 1 lb	-

California Proposition 65 This product contains the following proposition 65 chemicals

Component	CAS-No	California Prop. 65	Prop 65 NSRL	Category
Trichloroethylene	79-01-6	Carcinogen Developmental Male Reproductive	14 µg/day 50 µg/day	Developmental Carcinogen

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Trichloroethylene	X	X	X	X	X

U.S. Department of Transportation

Reportable Quantity (RQ): Y
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security
This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

16. Other information

Prepared By Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 03-Feb-2010
Revision Date 14-Jul-2016
Print Date 14-Jul-2016
Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

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

End of SDS

SAFETY DATA SHEET

Revision Date 19-Jan-2018 **Revision Number** 3

1. Identification

Product Name **Poly(vinyl chloride), high molecular weight**

Cat No. : **AC183320000; AC183320010; AC183325000**

Synonyms Chlorethene homopolymer; Ethylene, chloro-, polymer; PVC

Recommended Use Laboratory chemicals.
Uses advised against Not for food, drug, pesticide or biocidal product use

Details of the supplier of the safety data sheet

Company
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

Emergency Telephone Number
For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11
Emergency Number **US:**001-201-796-7100 / **Europe:** +32 14 57 52 99
CHEMTREC Tel. No.**US:**001-800-424-9300 / **Europe:**001-703-527-3887

2. Hazard(s) identification

Classification
Classification under 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Based on available data, the classification criteria are not met

Label Elements
None required

Hazards not otherwise classified (HNOC)
None identified

3. Composition/Information on Ingredients

Component	CAS-No	Weight %
PVC (Chloroethylene, polymer)	9002-86-2	100

4. First-aid measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes.

Inhalation Move to fresh air.

Ingestion Do not induce vomiting.

Most important symptoms and effects No information available.

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Unsuitable Extinguishing Media No information available

Flash Point
Method - No information available

Autoignition Temperature 435 °C

Explosion Limits
Upper No data available
Lower No data available
Sensitivity to Mechanical Impact No information available
Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical
Keep product and empty container away from heat and sources of ignition.

Hazardous Combustion Products
None known
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
1	1	0	N/A

6. Accidental release measures

Personal Precautions Ensure adequate ventilation. Use personal protective equipment.
Environmental Precautions See Section 12 for additional ecological information.

Methods for Containment and Clean Up No information available.

7. Handling and storage

Handling Ensure adequate ventilation.

Storage Keep containers tightly closed in a dry, cool and well-ventilated place.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
PVC (Chloroethylene, polymer)	TWA: 1 mg/m³			

Legend

ACGIH - American Conference of Governmental Industrial Hygienists

Engineering Measures Ensure adequate ventilation, especially in confined areas.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Powder Solid
Appearance	Off-white
Odor	Odorless
Odor Threshold	No information available
pH	
Melting Point/Range	No data available
Boiling Point/Range	
Flash Point	
Evaporation Rate	No information available
Flammability (solid,gas)	No information available
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	No information available
Vapor Density	No information available
Specific Gravity	1.4000
Solubility	No information available
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	435 °C
Decomposition Temperature	No information available
Viscosity	No information available

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Stable under normal conditions.

Conditions to Avoid Incompatible products.

Incompatible Materials Strong oxidizing agents

Hazardous Decomposition Products None under normal use conditions

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Component Information

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation No information available

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
PVC (Chloroethylene, polymer)	9002-86-2	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure None known

STOT - repeated exposure None known

Aspiration hazard No information available

Symptoms / effects,both acute and delayed No information available

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Do not empty into drains.

Persistence and Degradability No information available

Bioaccumulation/ Accumulation No information available.

Mobility No information available.

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT Not regulated

TDG Not regulated

IATA Not regulated

IMDG/IMO Not regulated

15. Regulatory information

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
PVC (Chloroethylene, polymer)	X	X	-	-	420-490-3		X	X	X	X	X

Legend:
X - Listed
E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
P - Indicates a commenced PMN substance
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
S - Indicates a substance that is identified in a proposed or final Significant New Use Rule
T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).
Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313 Not applicable

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act) Not applicable

Clean Air Act Not applicable

OSHA Occupational Safety and Health Administration
Not applicable

CERCLA Not applicable

California Proposition 65 This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations Not applicable

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
PVC (Chloroethylene, polymer)	-	X	-	-	-

U.S. Department of Transportation

Reportable Quantity (RQ): N
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security
This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

16. Other information

Prepared By
Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Revision Date	19-Jan-2018
Print Date	19-Jan-2018
Revision Summary	This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer

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

End of SDS

Vinyl chloride

Safety Data Sheet 1300505

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 10/02/2015 Version: 1.0

SECTION 1: Identification

1.1. Identification

Product form	:	Substance
Substance name	:	Vinyl chloride
CAS No	:	75-01-4
Product code	:	1300-5-05
Formula	:	C2H3Cl
Synonyms	:	1-Chloroethene; 1-Chloroethylene; Chloroethene; Chloroethylene
Other means of identification	:	MFCD00040415

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

Use of the substance/mixture	:	Laboratory chemicals Manufacture of substances Scientific research and development

1.3. Details of the supplier of the safety data sheet

SynQuest Laboratories, Inc.
P.O. Box 309
Alachua, FL 32615 - United States of America
T (386) 462-0788 - F (386) 462-7097
info@synquestlabs.com - www.synquestlabs.com

1.4. Emergency telephone number

Emergency number	:	(844) 523-4086 (3E Company - Account 10069)

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

Classification (GHS-US)

Simple Asphy	H380 -	May displace oxygen and cause rapid suffocation
Flam. Gas 1	H220 -	Extremely flammable gas
Compressed gas	H280 -	Contains gas under pressure; may explode if heated
Carc. 1A	H350 -	May cause cancer

Full text of H-phrases: see section 16

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :

GHS02 GHS04 GHS08

Signal word (GHS-US) : Danger

Hazard statements (GHS-US) :
H220 - Extremely flammable gas
H280 - Contains gas under pressure; may explode if heated
H350 - May cause cancer
H380 - May displace oxygen and cause rapid suffocation

Precautionary statements (GHS-US) :
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
P280 - Wear protective gloves/protective clothing/eye protection/face protection
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
P403 - Store in a well-ventilated place
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. Other hazards

Other hazards not contributing to the classification : May cause frostbite.

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substance

Substance type : Mono-constituent

Name	Product identifier	%	Classification (GHS-US)
Vinyl chloride (Main constituent)	(CAS No) 75-01-4	<= 100	Simple Asphy, H380 Flam. Gas 1, H220 Compressed gas, H280 Carc. 1A, H350

Full text of H-phrases: see section 16

3.2. Mixture

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Move the affected personnel away from the contaminated area.

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. If not breathing, give artificial respiration. Get immediate medical advice/attention.

First-aid measures after skin contact : Thaw frosted parts with lukewarm water. Do no rub affected area. Get immediate medical advice/attention.

First-aid measures after eye contact : Remove contact lenses, if present and easy to do. Continue rinsing. Get medical advice/attention. Immediately flush eyes thoroughly with water for at least 15 minutes.

First-aid measures after ingestion : Due to its physical form, exposure to this chemical is not likely. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth out with water. Get medical advice/attention.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11.

Symptoms/injuries after skin contact : Contact with the liquid the may cause cold burns/frostbite.

Symptoms/injuries after eye contact : Direct contact with the liquefied gas may cause severe and possibly permanent eye injury due to frostbite from rapid liquid evaporation.

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

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Alcohol resistant foam. Carbon dioxide. Dry powder. Water spray. Use extinguishing media appropriate for surrounding fire.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Thermal decomposition generates: Carbon oxides. Hydrogen chloride.

Explosion hazard : Contains gas under pressure; may explode if heated. Use water spray or fog for cooling exposed containers.

5.3. Advice for firefighters

Protection during firefighting : Wear gas tight chemically protective clothing in combination with self contained breathing apparatus. For further information refer to section 8: "Exposure controls/personal protection".

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Evacuate unnecessary personnel. Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground level. Ensure adequate air ventilation. Do not breathe gas, fumes, vapor or spray. May cause suffocation by reducing oxygen available for breathing. Gas/vapor explosive with air within explosion limits. Eliminate every possible source of ignition.

6.1.1. For non-emergency personnel

Emergency procedures : Only qualified personnel equipped with suitable protective equipment may intervene.

6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Avoid release to the environment. Notify authorities if product enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

For containment : Stop leak if safe to do so.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Ensure good ventilation of the work station. Do not breathe fumes, gas, mist, spray, vapors. Wear personal protective equipment. Avoid contact with skin and eyes. Keep away from ignition sources (including static discharges).

Safe handling of the gas receptacle : Contents under pressure. Ensure cylinder valve is closed and not leaking after each use.

Hygiene measures : Handle in accordance with good industrial hygiene and safety procedures. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Securely chain cylinders when in use and protect against physical damage. Ground/bond container and receiving equipment.

Storage conditions : Protect from sunlight. Do not expose to temperatures exceeding 50 °C.

Incompatible materials : Refer to Section 10 on Incompatible Materials.

Storage area : Store in dry, cool, well-ventilated area.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Vinyl chloride (75-01-4)		
ACGIH	ACGIH TWA (ppm)	1 ppm
OSHA	OSHA PEL (TWA) (ppm)	1 ppm
OSHA	OSHA PEL (STEL) (ppm)	5 ppm (see 29 CFR 1910.1017)

8.2. Exposure controls

Appropriate engineering controls : Ensure good ventilation of the work station. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

Hand protection : Protective gloves.

Eye protection : Chemical goggles or safety glasses. Face shield.

Skin and body protection : Wear suitable protective clothing.

Respiratory protection : In case of inadequate ventilation wear respiratory protection.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Gas

Appearance : Colorless gas at ordinary temperature. Colorless liquid below -14 °C (7 °F).

Color : Colorless

Odor : mild Sweet

Odor threshold : No data available

pH : No data available

Melting point : -153.7 °C

Freezing point : No data available

Boiling point : -13.8 °C

Flash point : -78 °C (open cup)

Relative evaporation rate (butyl acetate=1)	:	No data available
Flammability (solid, gas)	:	No data available
Explosion limits	:	No data available
Explosive properties	:	No data available
Oxidizing properties	:	No data available
Vapor pressure	:	3330 hPa (at 20 °C)
Relative density	:	No data available
Relative vapor density at 20 °C	:	No data available
Specific gravity / density	:	0.911 g/cm³ (at 20 °C)
Solubility	:	Water: 1.1 g/l (at 20 °C)
Log Pow	:	1.58 (at 22 °C)
Auto-ignition temperature	:	472.22 °C
Decomposition temperature	:	No data available
Viscosity	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

The product is stable at normal handling and storage conditions. Stabilized product: Hydroquinone.

10.3. Possibility of hazardous reactions

No additional information available

10.4. Conditions to avoid

Exclude sources of heat, sparks and open flame. Protect from sunlight. Do not expose to temperatures exceeding 50 °C.

10.5. Incompatible materials

Oxidizing agents. Copper.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced. Hazardous decomposition products in case of fire, see Section 5.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Vinyl chloride (75-01-4)	
LD50 oral rat	500 mg/kg
LC50 inhalation rat (mg/l)	18 lb/h (Exposure time: 15 min)
ATE US (oral)	500.000 mg/kg body weight

Skin corrosion/irritation	:	Not classified
Serious eye damage/irritation	:	Not classified
Respiratory or skin sensitization	:	Not classified
Germ cell mutagenicity	:	Not classified
Carcinogenicity	:	May cause cancer.

Vinyl chloride (75-01-4)	
IARC group	1 - Carcinogenic to humans
National Toxicology Program (NTP) Status	2 - Known Human Carcinogens
In OSHA Hazard Communication Carcinogen list	Yes
In OSHA Specifically Regulated Carcinogen list	Yes

Reproductive toxicity	:	Not classified
Specific target organ toxicity (single exposure)	:	Not classified
Specific target organ toxicity (repeated exposure)	:	Not classified
Aspiration hazard	:	Not classified
Symptoms/injuries after skin contact	:	Contact with the liquid the may cause cold burns/frostbite.
Symptoms/injuries after eye contact	:	Direct contact with the liquefied gas may cause severe and possibly permanent eye injury due to frostbite from rapid liquid evaporation.

SECTION 12: Ecological information

12.1. Toxicity

Vinyl chloride (75-01-4)	
LC50 fish 1	210 mg/l (Exposure time: 96 h - Species: Brachydanio rerio)

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

Vinyl chloride (75-01-4)	
BCF fish 1	(no significant bioaccumulation)
Log Pow	1.58 (at 22 °C)

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Regional legislation (waste)	:	U.S. - RCRA (Resource Conservation & Recovery Act) - Basis for Listing - Appendix VII. U.S. - RCRA (Resource Conservation & Recovery Act) - Constituents for Detection Monitoring. U.S. - RCRA (Resource Conservation & Recovery Act) - D Series Wastes - Max Conc of Contaminants for the Tox Characteristic. U.S. - RCRA (Resource Conservation & Recovery Act) - Hazardous Constituents - Appendix VIII to 40 CFR 261. U.S. - RCRA (Resource Conservation & Recovery Act) - List for Hazardous Constituents. U.S. - RCRA (Resource Conservation & Recovery Act) - Part 268 Appendix III - Halogenated Organic Compounds (HOCs). U.S. - RCRA (Resource Conservation & Recovery Act) - Phase 4 LDR Rule - Universal Treatment Standards. U.S. - RCRA (Resource Conservation & Recovery Act) - TSD Facilities Ground Water Monitoring. U.S. - RCRA (Resource Conservation & Recovery Act) - U Series Wastes - Acutely Toxic Wastes & Other Hazardous Characteristics.
Waste treatment methods	:	Remove to an authorized incinerator equipped with an afterburner and a flue gas scrubber.
Waste disposal recommendations	:	Dispose of contents/container in accordance with licensed collector's sorting instructions.

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

Transport document description	:	UN1086 Vinyl chloride, stabilized, 2.1
UN-No.(DOT)	:	UN1086
Proper Shipping Name (DOT)	:	Vinyl chloride, stabilized
Transport hazard class(es) (DOT)	:	2.1 - Class 2.1 - Flammable gas 49 CFR 173.115
Hazard labels (DOT)	:	2.1 - Flammable gas

DOT Packaging Non Bulk (49 CFR 173.xxx)	:	304

DOT Packaging Bulk (49 CFR 173.xxx)	:	314;315
DOT Special Provisions (49 CFR 172.102)	:	21 - This material must be stabilized by appropriate means (e.g., addition of chemical inhibitor, purging to remove oxygen) to prevent dangerous polymerization (see 173.21(f) of this subchapter). B44 - All parts of valves and safety relief devices in contact with lading must be of a material which will not cause formation of acetylides. N86 - UN pressure receptacles made of aluminum alloy are not authorized. T50 - When portable tank instruction T50 is referenced in Column (7) of the 172.101 Table, the applicable liquefied compressed gases are authorized to be transported in portable tanks in accordance with the requirements of 173.313 of this subchapter.
DOT Packaging Exceptions (49 CFR 173.xxx)	:	306
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	:	Forbidden
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	:	150 kg
DOT Vessel Stowage Location	:	B - (i) The material may be stowed ‘‘on deck’’ or ‘‘under deck’’ on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length; and (ii) ‘‘On deck only’’ on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this section is exceeded.
DOT Vessel Stowage Other	:	40 - Stow ‘‘clear of living quarters’’
Emergency Response Guide (ERG) Number	:	116P
Other information	:	No supplementary information available.

TDG

No additional information available

Transport by sea

UN-No. (IMDG)	:	1086
Proper Shipping Name (IMDG)	:	VINYL CHLORIDE, STABILIZED
Class (IMDG)	:	2 - Gases

Air transport

UN-No. (IATA)	:	1086
Proper Shipping Name (IATA)	:	Vinyl chloride, stabilized
Class (IATA)	:	2

SECTION 15: Regulatory information

15.1. US Federal regulations

Vinyl chloride (75-01-4)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Subject to reporting requirements of United States SARA Section 313	
SARA Section 313 - Emission Reporting	0.1 %

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

Chemical(s) subject to the reporting requirements of Section 313 or Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372.

Vinyl chloride	CAS No 75-01-4	100%

15.2. International regulations

CANADA

Vinyl chloride (75-01-4)	
Listed on the Canadian DSL (Domestic Sustances List)	
WHMIS Classification	Class A - Compressed Gas Class B Division 1 - Flammable Gas Class D Division 2 Subdivision A - Very toxic material causing other toxic effects Class D Division 2 Subdivision B - Toxic material causing other toxic effects Class F - Dangerously Reactive Material

EU-Regulations
No additional information available

National regulations

Vinyl chloride (75-01-4)
Listed on IARC (International Agency for Research on Cancer) Listed on the AICS (Australian Inventory of Chemical Substances) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory Listed on the Korean ECL (Existing Chemicals List) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Japanese Pollutant Release and Transfer Register Law (PRTR Law) Listed as carcinogen on NTP (National Toxicology Program) Listed on the Canadian IDL (Ingredient Disclosure List) Listed on INSQ (Mexican national Inventory of Chemical Substances) Listed on Turkish inventory of chemical

15.3. US State regulations

Vinyl chloride (75-01-4)	
U.S. - California - Proposition 65 - Carcinogens List	Yes
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
No significant risk level (NSRL)	3 µg/day
State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances U.S. - Pennsylvania - RTK (Right to Know) List

California Proposition 65 - This product contains, or may contain, trace quantities of a substance(s) known to the state of California to cause cancer and/or reproductive toxicity

SECTION 16: Other information

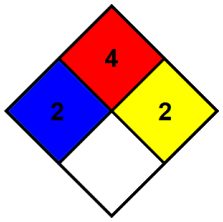
Full text of H-phrases:

Carc. 1A	Carcinogenicity Category 1A
Compressed gas	Gases under pressure Compressed gas
Flam. Gas 1	Flammable gases Category 1
Simple Asphy	Simple Asphyxiant
H220	Extremely flammable gas
H280	Contains gas under pressure; may explode if heated
H350	May cause cancer
H380	May displace oxygen and cause rapid suffocation

NFPA health hazard : 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.

NFPA fire hazard : 4 - Will rapidly or completely vaporize at normal pressure and temperature, or is readily dispersed in air and will burn readily.

NFPA reactivity : 2 - Normally unstable and readily undergo violent decomposition but do not detonate. Also: may react violently with water or may form potentially explosive mixtures with water.



HMIS III Rating

Health	:	2 Moderate Hazard - Temporary or minor injury may occur * - Chronic (long-term) health effects may result from repeated overexposure
Flammability	:	4 Severe Hazard - Flammable gases, or very volatile flammable liquids with flash points below 73 F, and boiling points below 100 F. Materials may ignite spontaneously with air. (Class IA)
Physical	:	2 Moderate Hazard - Materials that are unstable and may undergo violent chemical changes at normal temperature and pressure with low risk for explosion. Materials may react violently with water or form peroxides upon exposure to air.

SDS US (GHS HazCom 2012)

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 offered solely for your consideration, investigation, and verification. It does not represent any guarantee of the properties of the product nor that the hazard precautions or procedures described are the only ones which exist. SynQuest shall not be held liable or any damage resulting from handling or from contact with the above product.

ALCONOX MSDS

Section 1 : MANUFACTURER INFORMATION

Product name: Alconox

Supplier: Same as manufacturer.

Manufacturer: Alconox, Inc.
30 Glenn St.
Suite 309
White Plains, NY 10603.

Manufacturer emergency phone number: 800-255-3924.
813-248-0585 (outside of the United States).

Manufacturer: Alconox, Inc.
30 Glenn St.
Suite 309
White Plains, NY 10603.

Supplier MSDS date: 2009/04/20

D.O.T. Classification: Not regulated.

Section 2 : HAZARDOUS INGREDIENTS

C.A.S.	CONCENTRATION %	Ingredient Name	T.L.V.	LD/50	LC/50
25155-30-0	10-30	SODIUM DODECYLBENZENESULFONATE	NOT AVAILABLE	438 MG/KG RAT ORAL 1330 MG/KG MOUSE ORAL	NOT AVAILABLE
497-19-8	7-13	SODIUM CARBONATE	NOT AVAILABLE	4090 MG/KG RAT ORAL 6600 MG/KG MOUSE ORAL	2300 MG/M3/2H RAT INHALATION 1200 MG/M3/2H MOUSE INHALATION
7722 88-5	10-30	TETRASODIUM PYROPHOSPHATE	5 MG/M3	4000 MG/KG RAT ORAL 2980 MG/KG MOUSE ORAL	NOT AVAILABLE
7758-29-4	10-30	SODIUM PHOSPHATE	NOT AVAILABLE	3120 MG/KG RAT ORAL 3100 MG/KG MOUSE ORAL >4640 MG/KG RABBIT DERMAL	NOT AVAILABLE

Section 2A : ADDITIONAL INGREDIENT INFORMATION

Note: (supplier).
CAS# 497-19-8: LD50 4020 mg/kg - rat oral.
CAS# 7758-29-4: LD50 3100 mg/kg - rat oral.

Section 3 : PHYSICAL / CHEMICAL CHARACTERISTICS

Physical state: Solid

Appearance & odor: Almost odourless.
White granular powder.

Odor threshold (ppm): Not available.

Vapour pressure (mmHg): Not applicable.

Vapour density (air=1): Not applicable.

By weight: Not available.

Evaporation rate (butyl acetate = 1): Not applicable.

Boiling point (°C): Not applicable.

Freezing point (°C): Not applicable.

pH: (1% aqueous solution).
9.5

Specific gravity @ 20 °C: (water = 1).
0.85 - 1.10

Solubility in water (%): 100 - > 10% w/w

Coefficient of water\oil dist.: Not available.

VOC: None

Section 4 : FIRE AND EXPLOSION HAZARD DATA

Flammability: Not flammable.

Conditions of flammability: Surrounding fire.

Extinguishing media: Carbon dioxide, dry chemical, foam.
Water
Water fog.

Special procedures: Self-contained breathing apparatus required.
Firefighters should wear the usual protective gear.

Auto-ignition temperature: Not available.

Flash point (°C), method: None

Lower flammability limit (% vol): Not applicable.

Upper flammability limit (% vol): Not applicable.

Not available.

Sensitivity to mechanical impact: Not applicable.

Hazardous combustion products: Oxides of carbon (COx).
Hydrocarbons.

Rate of burning: Not available.

Explosive power: None

Section 5 : REACTIVITY DATA

Chemical stability: Stable under normal conditions.

Conditions of instability: None known.

Hazardous polymerization: Will not occur.

Incompatible substances: Strong acids.
Strong oxidizers.

Hazardous decomposition products: See hazardous combustion products.

Section 6 : HEALTH HAZARD DATA

Route of entry: Skin contact, eye contact, inhalation and ingestion.

Effects of Acute Exposure

Eye contact: May cause irritation.

Skin contact: Prolonged contact may cause irritation.

Inhalation: Airborne particles may cause irritation.

Ingestion: May cause vomiting and diarrhea.
May cause abdominal pain.
May cause gastric distress.

Effects of chronic exposure: Contains an ingredient which may be corrosive.

LD50 of product, species & route: > 5000 mg/kg rat oral.

LC50 of product, species & route: Not available for mixture, see the ingredients section.

Exposure limit of material: Not available for mixture, see the ingredients section.

Sensitization to product: Not available.

Carcinogenic effects: Not listed as a carcinogen.

Reproductive effects: Not available.

Teratogenicity: Not available.

Mutagenicity: Not available.

Synergistic materials: Not available.

Medical conditions aggravated by exposure: Not available.

First Aid

Skin contact: Remove contaminated clothing.
Wash thoroughly with soap and water.
Seek medical attention if irritation persists.

Eye contact: Check for and remove contact lenses.
Flush eyes with clear, running water for 15 minutes while holding eyelids open: if irritation persists, consult a physician.

Inhalation: Remove victim to fresh air.
Seek medical attention if symptoms persist.

Ingestion: Dilute with two glasses of water.
Never give anything by mouth to an unconscious person.
Do not induce vomiting, seek immediate medical attention.

Section 7 : PRECAUTIONS FOR SAFE HANDLING AND USE

Leak/Spill: Contain the spill.
Recover uncontaminated material for re-use.
Wear appropriate protective equipment.
Contaminated material should be swept or shoveled into appropriate waste container for disposal.

Waste disposal: In accordance with municipal, provincial and federal regulations.

Handling procedures and equipment: Protect against physical damage.
Avoid breathing dust.
Wash thoroughly after handling.
Keep out of reach of children.
Avoid contact with skin, eyes and clothing.
Launder contaminated clothing prior to reuse.

Storage requirements: Keep containers closed when not in use.
Store away from strong acids or oxidizers.
Store in a cool, dry and well ventilated area.

Section 8 : CONTROL MEASURES

Precautionary Measures

Gloves/Type:

Neoprene or rubber gloves.

Respiratory/Type:

If exposure limit is exceeded, wear a NIOSH approved respirator.

Eye/Type:

Safety glasses with side-shields.

Footwear/Type: Safety shoes per local regulations.

Clothing/Type: As required to prevent skin contact.

Other/Type: Eye wash capability should be in close proximity.

Ventilation requirements: Local exhaust at points of emission.

ATTACHMENT D
HEAT STRESS

HEAT STRESS

1. Heart rate (HR) should be monitored by the radial pulse for 30 seconds as soon as possible in the resting period.

   If at the beginning of the rest period a worker's radial pulse is measure and his heart rate exceeds 100 beats per minute, the worker's next work period should be reduced by 33%. Therefore, if the original work period was one hour, the following work cycle should be reduced to 40 minutes.

2. Heat Stroke is a true medical emergency. First aid should be directed toward immediate measures to cool the body quickly, as well as seeing that the victim receives medical attention as soon as possible.

   Prior to medical treatment, remove as much clothing as possible and proceed to cool the victim's body, taking care not to over chill the victim once his temperature falls below 102^0F. One of the following cooling measures should be taken: (a) sponge the bare skin with cool water; (b) apply cold packs continuously; (c) wrap the victim in a sheet soaked with water; or (d) immerse the victim in a tub of cold water, while closely monitoring the victim's level of consciousness.

3. Prior to site activity, the Site Safety Officer may make arrangements for heat stress monitoring (i.e., monitoring heart rate, body temperature and body water loss) during actual site work if conditions warrant these measures. In addition, the Site Safety Officer would want to ensure that the team members have been acclimatized to the particular environmental conditions and that personnel are aware of the signs and symptoms of heat sickness and have been adequately trained in first aid procedures. As Site Safety Officer, one could also make sure there is sufficient personnel on-site, so as to rotate work assignments, schedule work during hours of reduced temperatures and ensure personnel do not consume alcoholic or caffeinated beverages but rather drink moderate levels of an electrolyte solution and eat well prior to commencing site work.

4. The worker could be experiencing a condition of heat rash. Allow workers to rest and relieve the itching associated with heat rash rather than return to work too soon. Itching

workers may not follow stringent decontamination procedures or scratch where it itches on-site and risk cross contamination.

Keeping the skin clean and dry will reduce the incidence of heat rash. This can be accomplished by wearing cotton garments (or other materials that absorb perspiration) underneath protective clothing. Upon removal of the protective clothing, the worker should wash and dry his skin thoroughly.

5. The sense of thirst is not an adequate regulator of water replacement during heat exposure. Therefore, as a general rule, the amount of water administered should replace the amount of water lost, and it should be administered at regular intervals throughout the day. For every 1/2 pound of water loss, 8 ounces of water should be ingested. Water should be replaced by drinking 2-4 ounce servings during every rest period. A recommended alternative to water is an electrolyte drink spilt 50/50 with water.

6. Although there is no specific test given during a baseline physical that would identify a person's intolerance to heat, there are physical factors and personal habits which may indicate possible intolerance to heat, such as, whether or not an individual smokes, one's dietary habit, body weight, as well as predisposed physical conditions such as high blood pressure, heavier conditions, diabetes or one's medication, that may influence an individual's ability to tolerate excessive heat.

7. Heat cramps are caused by profuse perspiration with inadequate fluid intake and salt replacement. Heat cramps most often afflict people in good physical condition who overwork in conditions of high temperature and humidity. Heat cramps usually come on suddenly during vigorous activity. Untreated, heat cramps may progress directly to heat exhaustion or heat stroke. First aid treatment: remove victim to a cool place and give sips of salted water (1 teaspoon of salt to 1 quart of water) - 4 ounces every 15 minutes over a period of one hour. A commercial preparation, e.g., Gatorade, may be used if split 50/50 with water.

   The salted water or solution should mitigate the cramps. Manual pressure should not be applied to the cramped muscles.

TABLE D-1

REQUIRED FREQUENCY OF HEAT STRESS MONITORING
FOR WORKERS IN IMPERMEABLE CLOTHING

Adjusted (2) Temperature (^{0}F)	**Work Time Allowed Before Monitoring Break (min.)**
90 or above	15
87.5-90	30
82.5-87.5	60
77.5-82.5	90
72.5-77.5	120

(1) Adapted from Eastern Research Group and National Institute for Occupational Safety and Health, Occupational Safety and Health Guidance Manual for Super Activities. September 26, 1984, pp. 8-75.

(2) Calculate the adjusted air temperature (Ta adj) by using this equation:

$$\text{Ta adj } {}^0\text{F} = \text{Ta } {}^0\text{F} + (13 \times \% \text{ sunshine})$$

Measure air temperature (Ta) with a standard thermometer, with the bulb shielded from radiant heat. Then estimate percent sunshine (100 percent sunshine = no cloud cover an a sharp, distinct shadow; 0 percent sunshine = no shadows).

TABLE D-2

HEAT STRESS SIGNS AND SYMPTOMS

Heat Stress Indicator	**When to Measure**	**If Exceeds**	**Action**
heart rate (pulse)	beginning of rest period	110 beats per minute	shorten next work period by 33%
oral temperature	beginning of rest period	99 ^{0}F (after thermometer is under tongue for 3 minutes) 100.6 ^{0}F or greater	shorten next work period by 33% prohibit work in impermeable clothing and shorten next work period by 33%
body weight	1. before workday begins (a.m.) 2. after workday ends (p.m.)	Decreases more than 5%	increase fluid intake

ATTACHMENT E
COLD STRESS

COLD STRESS (Hypothermia)

Cold stress is a function of cold, wetness and wind. A worker's susceptibility to cold stress can vary according to his/her physical fitness, degree of acclimatization to cold weather, age and diet.

Prevention

Institute the following steps to prevent or overexposure of workers to cold:

1. Maintain body core temperature at 96.8^0 F or above by encouraging workers to drink warm liquids during breaks (preferably not coffee) and wear several layers of clothing. Wool is recommended since it can keep the body warm even when the wood is wet.
2. Avoid frostbite by adequately covering hands, feet and other extremities. Clothing such as insulated gloves or mittens, earmuffs and hat liners should be worn. To prevent contact frostbite (from touching metal and cold surfaces below 20^0 F) workers should wear anti-contact gloves. Tool handles and control bars should be covered with insulating material.
3. Adjust work schedules if necessary, providing adequate rest periods. When feasible, rotate personnel and perform work during the warmer hours of the day.
4. Provide a heated enclosure for workers close to their work area. Workers should remove their outer layer(s) of clothing while in the shelter to allow for sweat evaporation.
5. In the event that wind barriers are constructed around an intrusive operation (such as drilling), the enclosure must be properly vented to prevent the build-up of toxic or explosive gases or vapors. Care must be taken to keep any heat source away from flammable substances.
6. Using a wind chill chart such as the one in Table D-1, obtain the equivalent chill temperature (ECT) based on actual wind speed and temperature. Refer to the ECT when setting up work warm-up schedules, planning appropriate clothing, etc. Workers should use warming shelters at regular intervals at or below an ECT or 20^0 F For exposure skin, continuous exposure should not be permitted at or below an ECT of -35^0 F.
7. Workers who become immersed in water or whose clothing becomes wet (from perspiration, rain, etc) must immediately be provided a change of dry clothing whenever the air temperature is 25.6^0 F or below.

8. Maintain an optimal level of worker fitness by encouraging regular exercise, proper diet, etc. If possible, acclimatize workers to site conditions for several days before work begins.

Monitoring

Personnel should be aware of the symptoms of cold stress. If the following symptoms of systemic hypothermia are noticed in any worker, he/she should immediately go the warm shelter:

Heavy, uncontrollable shivering;
Excessive fatigue or drowsiness;
Loss of coordination;
Difficulty in speaking; and,
Frostbite (see below).

Frostbite is the generic term for local injury resulting from cold. The stages of frostbite and their symptoms are as follows:

1. Frostbite or incipient frostbite: sudden blanching or whitening of the skin.
2. Superficial frostbite: waxy or white skin, which is firm to the touch (tissue underneath is still resilient).
3. Deep frostbite: tissues are cold, pale and solid.

TABLE E-1

WINDCHILL CHART

Wind Speed (mph)	Actual thermometer Reading (^{0}F)									
	50	40	30	20	10	0	-10	-20	-30	-40
	Equivalent Temperature (^{0}F)									
Calm	50	40	30	20	10	0	-10	-20	-30	-40
5	48	37	27	16	6	-5	-15	-26	-36	-47
10	40	28	16	4	-9	-21	-33	-46	-58	-70
15	36	22	9	-5	-18	-36	-45	-58	-72	-85
20	32	18	4	-10	-25	-39	-53	-67	-82	-96
25	30	16	0	-15	-29	-44	-59	-74	-88	-104
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109
35	27	11	-4	-20	-35	-49	-67	-82	-98	-113
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116
>40 (Little added effect)	Little Danger (For properly clothed person)				Increasing Danger (Danger from freezing of exposed flesh)			Great Danger		

ATTACHMENT B

QUALITY ASSURANCE PROJECT PLAN

iPARK 87
(FORMER IBM KINGSTON SITE)

OPERABLE UNIT 4 FIELD INVESTIGATION QUALITY ASSURANCE PROJECT PLAN (QAPP)

1.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

Walden maintains company policies and procedures to ensure that samples collected and any analytical analyses performed are completed with a high degree of quality. These policies and procedures ensure confidence that the resulting data represent the matrix being sampled. Quality Assurance/Quality Control (QA/QC) starts with the design of the sampling program and ends with the summarized analytical data submitted in the final report. This Quality Assurance Project Plan (QAPP) describes these policies and procedures for soil sampling. Specific details of the work to be performed at the site are provided in the *Operable Unit 4 Field Investigation Work Plan* (Walden, March 2024).

The project Quality Assurance Officer (QAO) shall be Mr. Lawrence Zeman. The QAO is responsible for ongoing surveillance of project activities, ensuring conformance to this QAPP, and evaluating the effectiveness of the QAPP requirements. The QAO will have access to all personnel and subcontractors, as necessary, to resolve technical problems and take corrective action, as appropriate. The QAO has the authority to recommend that work be stopped when the quality of the work appears to be in jeopardy. The QAO will be available to respond to immediate QA/QC problems. The primary QAO responsibilities are as follows:

- Monitor the correction of QC problems and alert task leaders to situations where similar problems might occur;
- Develop and maintain project QA files for sampling, monitoring, and field QA records;
- Participate in QA audits;
- Recommend changes to the project manager to improve the effectiveness of the project in attaining its QA objectives for field sampling and monitoring activities; and
- Review proposed additions and changes to this QAPP.

Project QA will be maintained under the direction of Mr. Zeman, in accordance with this QAPP.

QC for specific tasks will be the responsibility of Walden and its subcontractors, which shall be selected at the time the work is required under the direction of Mr. Zeman.

2.0 QUALITY ASSURANCE PROJECT PLAN OBJECTIVES

2.1 OVERVIEW

Overall project goals are defined by developing Data Quality Objectives (DQOs), which are qualitative and quantitative statements that specify the quality of the data required to support decision-making. Data quality is measured by how well the data meet the project QA/QC goals. In this QAPP, "Quality Assurance" and "Quality Control" are defined as follows:

- Quality Assurance - The total integrated program to assure the reliability of monitoring and measurement data; and
- Quality Control - The routine application of procedures to obtain prescribed standards of performance in the monitoring and measurement process.

2.2 QA/QC REQUIREMENTS

QA elements to be evaluated include accuracy, precision, sensitivity, representativeness, and completeness. Data reporting must be clear, concise and comprehensive. The data generated by the analytical laboratory for this project are required to be sensitive enough to achieve detection levels low enough to meet Contract Required Quantitation Limits (CRQLs) as specified in NYSDEC Analytical Services Protocol (NYSDEC ASP) for Superfund CLP and EPA SW-846 methods performed in accordance with NYSDEC ASP protocol. The analytical results meeting the CRQLs will provide data sensitive enough to meet the objectives of this investigation as described in the work plan. The QC elements that are important to this project are blank contamination, instrument calibration, field data completeness, sample holding times, sample preservation, and sample custody.

2.2.1 Initial Instrument Calibration

Calibration curves will be developed for each of the compounds to be analyzed. Standard concentrations and a blank will be used to produce the initial curves. The development of calibration curves and initial calibration response factors must be consistent with method requirements presented in the most recent version of NYSDEC ASP.

2.2.2 Continuing Instrument Calibration

The initial calibration curve will be verified every twelve (12) hours by analyzing one (1) calibration standard. The standard concentration will be the midpoint concentration of the initial calibration curve. The calibration check compound must come within 25% relative percent difference (RPD) of the average response factor obtained during initial calibration. If the RPD is greater than 25%, then corrective action must be taken, as provided in the specific methodology.

2.2.3 Method Blanks

The method blank or preparation blank is prepared from an analyte-free matrix, which includes the same reagents, internal standards and surrogate standards as the related samples. It is carried through the entire sample preparation and analytical procedure. A method blank analysis will be performed once for each 12-hour period during the analysis of samples for volatile organic compounds (VOCs) and once for each batch of samples for semi-volatile organic compounds (SVOCs) and metals. An acceptable method blank will contain less than five (5) times the CRQL of methylene chloride, acetone, 2-butanone, and phthalate esters. For all other target compounds, the method blank must contain less than or equal to the CRQL of any single target compound. For non-target peaks in the method blank, the peak area must be less than 10% of the nearest internal standard. The method blank will be used to demonstrate the level of laboratory background and reagent contamination that might result from the analytical process itself.

2.2.4 Equipment Blanks

An equipment blank consists of two sets of identical, laboratory-cleaned sample containers. The first set is filled at the laboratory with deionized laboratory-grade water. The water used is from the same source as that used for the laboratory method blank. In the field, this water will be passed through the field sampling equipment into an additional second set of containers that will then be taken back to the laboratory to be analyzed for the compounds of interest. Equipment blanks shall be collected at a rate of one (1) per day of sampling. The purpose of an equipment blank is to determine whether the field sampling equipment is cross-contaminating samples.

2.2.5 Field Duplicates

Duplicate samples are two (2) or more samples considered to be representative sub-samples of the same source. The samples are identically processed throughout the measurement system. A field duplicate (blind duplicate) will be analyzed for the appropriate parameters. Laboratory duplicate analyses will be performed on solid matrices at a rate of five percent (5%). Duplicate samples will be analyzed for Target Analyte List (TAL) constituents. Duplicate analyses for Target Compound List (TCL) compounds will be associated with matrix spike and matrix spike duplicate analyses. The results of the duplicate analyses will be used to assess the precision of the measurement systems.

2.2.6 Surrogate Spike Analysis

Surrogate standard determinations will be performed on all samples and blanks analyzed by the analytical laboratory. All samples and blanks will be spiked with the appropriate surrogate compounds (as indicated by the methodology) before purging or extraction in order to monitor sample preparation and analyses. Surrogate spike recoveries shall fall within the advisory limits in accordance with the NYSDEC ASP protocols for samples falling within the quantitation limits without dilution.

2.2.7 Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank (MS/MSD/MSB) Analysis

MS, MSD and MSB analyses will be performed to evaluate the matrix effect of the sample upon the analytical methodology along with the precision of the instrument by measuring recoveries. The MS/MSD/MSB samples will be analyzed for each group of samples of a similar matrix, at a rate of one (1) for every batch of field samples. The RPD will be calculated from the difference between the MS and MSD.

Matrix spike blank analysis will be performed to indicate the appropriateness of the spiking solution(s) used for the MS/MSD.

2.3 ACCURACY

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

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

where:

SSR	=	measurement from spiked sample
SR	=	measurement from un-spiked sample
SA	=	actual data of spike added

2.4 PRECISION

Precision is defined as the measurement of agreement of a set of replicate results among themselves without assumption of any prior information as to the true result. Precision is assessed by means of duplicate/replicate sample analyses.

Analytical precision is expressed in terms of RPD. The RPD is calculated using the following formula:

$$RPD = \frac{D_1 - D_2}{(D_1 + D_2)/2}$$

where:

RPD = relative percent difference

D_1 = larger sample value

D_2 = smaller sample value (duplicate)

2.5 SENSITIVITY

The sensitivity objectives for this QAPP require that data generated by the analytical laboratory achieve detection levels low enough to meet the CRQLs specified by NYSDEC ASP. The method detection limits (MDL) for target compounds and target analyses will be established by the analytical laboratory to be well below the project objectives. The laboratory will submit appropriate documentation to Walden as required by the QAO.

2.6 REPRESENTATIVENESS

Representativeness is a measure of the relationship of an individual sample taken from a particular site to the remainder of that site and the relationship of a small aliquot of the sample (i.e., the one used in the actual analysis) to the sample remaining on-site. A blind duplicate is used to accomplish this task, as well as to assess the precision of the data. Two (2) identical groundwater samples will be collected from one (1) monitoring well and submitted as different samples. The RPD between the two (2) samples should be between 25% and 50%. The use of standardized techniques and statistical sampling methods influences the representativeness of an aliquot of sample to the sample at the site. The representativeness of samples is assured by adherence to proposed sampling procedures.

2.7 COMPLETENESS

Completeness is a measure of the quantity of data obtained from a measurement system as compared to the amount of data expected from the measurement system. Completeness is defined as the percentage of all results that are not affected by failing QC qualifiers, and should be between 70% and 100% of all analyses performed. The objective of completeness in laboratory reporting is to provide a thorough data support package. The laboratory data package provides documentation of sample analysis and results in the form of summaries, QC data, and raw analytical data. The laboratory will be required to submit data packages that follow NYSDEC ASP reporting format, which, at a minimum, will include the following components:

1. All sample chain-of custody forms;
2. The case narrative(s) presenting a discussion of any problems and/or procedural changes required during analyses. Also presented in the case narrative are sample summary forms;
3. Documentation demonstrating the laboratory's ability to attain the contract specified detection limits for all target analyses in all required matrices;
4. Tabulated target compound results and tentatively identified compounds;

5. Surrogate spike analysis results (organics);
6. Matrix spike/matrix spike duplicate/matrix spike blank results;
7. QC checks sample and standard recovery results;
8. Spike sample results (inorganics);
9. Blank results (field and method); and
10. Internal standard area and real-time (RT) summary.

2.8 COMPARABILITY

Comparability is the degree to which analytical data generated from an individual laboratory can be compared with those from another laboratory, in terms of use of standardized industry methods and equivalent instrumentation techniques. No laboratory split samples are expected to be taken for this project.

3.0 CALIBRATION AND MAINTENANCE PROCEDURES FOR FIELD EQUIPMENT

Walden follows manufacturer's recommendations and guidelines with regard to field instrument calibration procedures. The calibration of each instrument will be checked prior to each day's use. The date and time of the calibration check, instrument serial and model number, and signature of the calibrating technician will be entered into the field logbook. If the instrument readings are incorrect, the instrument will be either recalibrated by the technician or returned to Walden's office where it will be further evaluated and/or repaired. If field instruments require major overhauls, the instruments will be returned to the manufacturer.

Preventive maintenance of field equipment is performed routinely before each sampling event. More extensive maintenance is performed based on hours of use. The Walden equipment coordinator has overall responsibility for the preventive maintenance program. However, certain maintenance programs are also overseen by the project manager. Manually operated sampling equipment is routinely checked to ensure that it operates properly and that excessive wear has not occurred. If necessary, equipment is taken out of service for repair or replacement.

4.0 SAMPLE CUSTODY

4.1 OVERVIEW

Sample handling in the field and in the laboratory will conform to the sample custody procedures presented in this section. Field custody procedures involve proper sample identification, chain-of-

custody forms, and packaging and shipping procedures. Laboratory custody begins with the receipt of samples at the laboratory and continues through sample storage, analysis, data reporting, and data archiving. This section provides the procedures that will be followed during the course of the project to ensure proper sample custody.

4.2 FIELD CUSTODY PROCEDURES FOR OFF-SITE LABORATORY

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

- Sample identification;
- Sample labels;
- Custody records;
- Shipping records; and
- Packaging procedures.

Sample labels will be attached to all sampling bottles before field activities begin. The sample labels will contain the site name, Walden job number, sample location and identification, date, time, sampler's initials, and the parameter(s) for analysis. Sampling locations will be marked on a map with a description of the sample location. The number, type of sample, and sample identification will be entered into the field logbook.

A chain-of-custody form, initiated at the analytical laboratory, will accompany the sample bottles from the laboratory into the field. Upon receipt of the bottles and cooler, the sampler will sign and date the first "Received" blank space. After each sample is collected and appropriately identified, entries will be made on the chain-of-custody form that includes:

- Site name and address;
- Samplers' names and signatures;
- Names and signatures of persons involved in chain of possession;
- Sample number;
- Number of containers;
- Sampling station identification;
- Date and time of collection;
- Type of sample and the analyses requested;
- Preservatives used (if any); and
- Pertinent field data (pH, temperature, turbidity, etc.).

After sampling has been completed, the samplers will return/ship the samples to the laboratory. The sampler will sign and date the next "Relinquished" blank space. One copy of the custody form will remain in the field and the remaining copies will accompany the samples to the laboratory. The laboratory will receive all samples within 24 hours of collection. Samples will be received by laboratory personnel, who will assume custody of the samples and sign and date the next "Received" blank.

4.3 LABORATORY CUSTODY PROCEDURES

Upon receipt by the analytical laboratory, samples will proceed through an orderly processing sequence specifically designed to ensure continuous integrity of both the sample and its documentation.

All samples will be received by the laboratory's sample control group and will be carefully checked for label identification and completed accurate chain-of-custody records. The sample will be tracked from storage through the laboratory system until the analytical process is completed and the sample is returned to the custody of the sample control group for disposal. Generally, access to New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified laboratories is restricted to prevent any unauthorized contact with samples, extracts, or documentation.

5.0 SAMPLE PREPARATION/ANALYTICAL PROCEDURES

Containers, preservation and holding times of environmental samples will be applied as detailed in the NYSDEC ASP. The holding time of samples of all matrices for all analysis will be seven (7) days from the verified time of sample receipt (VTSR).

If any modifications or additions to the standard procedures are anticipated, and if any nonstandard sample preparation or analytical protocols are to be used, the modifications and the nonstandard protocol will be explicitly defined and documented.

Prior approval by Walden’s QAO is required for any nonstandard analytical or sample preparation protocol used by the laboratory.

6.0 DATA REDUCTION, REVIEW, AND REPORTING

The process of data reduction, review, and reporting ensures that assessments or conclusions based on the final data accurately reflect actual site conditions. This plan presents the specific procedures,

methods, and format that will be employed for data reduction, review, and reporting of each measurement parameter determined in the laboratory and field. Also described in this section is the process by which all data, reports, and work plans are proofed and checked for technical and numerical errors prior to final submission.

6.1 DATA REDUCTION

Data reduction is the process by which raw analytical data generated from the laboratory instrument systems are converted into usable mass concentrations. The raw data, which may take the form of summation of areas under the instrument curve responses, or observations, is processed by the laboratory and converted into concentrations expressed in micrograms per kilogram (µg/kg) for soil samples. The analytical laboratory will be required to follow ASP data reduction procedures.

Data reduction also includes the process by which raw field data are summarized in tables and graphs, from which quantitative or qualitative assessments can be derived by filter integration and evaluation.

Field data obtained during sampling is summarized on appropriate field forms. This information will be used to assess field conditions at the time of sampling and is summarized and analyzed along with the chemistry data in the final report. Occasionally, the reduction of actual field data requires correcting measurement data for the measurement system's baseline value. The data will be adjusted only after the raw data has been submitted to Walden's QAO and prior to final report preparation.

6.2 DATA REVIEW

6.2.1 Laboratory Data

The purpose of laboratory data review is to define and document analytical data quality and determine whether the laboratory data quality is sufficient for the intended use(s) of the data. The QAO or a designee under the project manager's supervision will review each analytical data package for completeness (i.e., *have all the analyses requested been performed?*) and general protocol compliance, such as holding times, detection limits, spike recoveries, and surrogate recoveries. If information is found to be missing from the data package the analytical laboratory will be contacted and requested to submit any missing information.

6.2.2 Usability Report

Walden's QAO will perform a data usability analysis on all analytical laboratory data. The laboratory data reports will be evaluated and a Data Usability Summary Report (DUSR) will be prepared in accordance with the NYSDEC Draft Division of Environmental Resources (DER)-10 Appendix 2B: Guidance for the Development of Data Usability Summary Reports. Taking into account protocols for

sampling, transport, analysis, reduction, reporting, and the data validation report, the QAO will use this information and his/her own experience to establish whether the results of each analysis can be used for the purpose intended. The QAO will determine whether the final results can be used as reported, qualified to indicate limitations, or rejected outright.

6.3 REPORTING

6.3.1 Field Data Reporting

All field real-time measurements and observations will be recorded legibly in project logbooks or field data records, with all entries signed and dated. Field measurements may include photoionization detector (PID) results. If entries are changed, the change will not obscure the original entry. The reason for the change will be stated, and the correction and explanation will be signed and dated at the time the correction is made. Field data records will be organized into standard formats whenever possible, and retained in permanent files. Soil boring logs will be prepared based on the field observations recorded in the project logbook/field notebook.

6.3.2 Laboratory Data Reporting

All sample data packages submitted by the analytical laboratory will be required to be reported in conformance to the NYSDEC ASP Superfund-CLP, Category B deliverable requirements.

6.4 DATA USAGE

The data will be used to evaluate and determine whether soils meet project objectives.

7.0 INTERNAL QUALITY CONTROL

7.1 OVERVIEW

QC checks will be performed to ensure the collection of representative and valid data. Internal QC refers to all data compilation and contaminant measurements. QC checks will be used to monitor project activities to determine whether QA objectives are being met. All specific internal QC checks to be used are identified in this section.

7.2 LABORATORY QUALITY CONTROL

The analytical laboratory is required to exercise internal control in a manner consistent with the requirements of this plan. Control checks and internal QC audits are required by the NYSDEC ASP methods. These include reference material analysis, blank analysis, MS/MSD analysis, cleanups, instrument adjustments and calibrations, standards, and internal audits.

A laboratory qualified professional will proof and check all final reports for transcription and/or calculation errors. Twenty percent (20%) of all final reports will be subsequently checked again by a qualified professional. All data tables will be checked to ensure that no transcription errors have occurred. Data tables will also be checked to ensure that any criteria cited for comparison purposes is appropriate and correctly referenced. All calculations will be checked to ensure that they will be properly presented and that resulting values are achievable. If any results cannot be duplicated the calculations will be independently checked for accuracy.

8.0 PERFORMANCE AND SYSTEMS AUDITS

Performance audits may be used to monitor project activities to assure compliance with project DQOs. The following text summarizes the field audits that may be conducted periodically.

8.1 FIELD AUDITS

Walden periodically conducts internal audits of field activities. The Walden on-site project manager will routinely monitor all field activities to ensure that work is done correctly. All sampling and analytical work will be reviewed routinely by the project manager.

A field audit will include monitoring and evaluation of sample collection, sample holding times, preservation techniques, field QC, and equipment calibration. These audit forms will be kept on file with the Walden project manager for one (1) year after completion of the project, then will be transferred to storage and held for an additional five (5) years.

9.0 ANALYTICAL CORRECTIVE ACTION

9.1 LABORATORY CORRECTIVE ACTION

Corrective actions will be implemented if unsatisfactory performance and/or system audit results indicate that problems exist. Corrective action may also be implemented if the result of a data assessment or internal QC check warrants such action.

ATTACHMENT C
COMMUNITY AIR MONITORING PLAN

iPARK 87
(FORMER IBM KINGSTON SITE)

OPERABLE UNIT 4 FIELD INVESTIGATION
COMMUNITY AIR MONITORING PLAN (CAMP)

The following Community Air Monitoring Plan (CAMP) is based on the New York State Department of Environmental Conservation's (NYSDEC's) Division of Environmental Remediation Technical Guidance for Site Investigation and Remediation (DER-10) (May 2010) Appendix 1A: New York State Department of Health Generic Community Air Monitoring Plan, with modifications as appropriate for the scope of work to be performed at the iPark 87 Former IBM Kingston Site.

Overview

A 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.

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

Qualified Environmental Monitor Responsibilities

The qualified environmental monitor (QEM) shall be Walden Environmental Engineering, PLLC (Walden), whose designated employees will be responsible for implementing the CAMP and performing the on-site air monitoring specified below. The QEM has the authority to stop work and shall be responsible for the air monitoring and daily calibration and maintenance of the equipment in accordance with the manufacturer's specifications. All instrumentation and equipment shall be maintained at all times in proper operating condition. Copies of manufacturers' monitoring equipment specifications shall be maintained on-site at all times during the work and shall be attached to the on-site copy of the CAMP.

The QEM or designated representative shall document in the dedicated CAMP project log book each calibration event, any equipment and instrument malfunctions, unusual conditions, air monitoring station locations, any exceedances of action levels and countermeasures implemented. Dates and times must be well documented.

Ambient air monitoring shall be conducted upwind and downwind of the work area at the property perimeters for fugitive dust emissions and organic vapors during periods of soil boring, excavation, other ground intrusive activities, placement of excavated materials in storage piles, and loading of transporting vehicles. If readings above established threshold levels are detected, the Contractor shall institute measures to control dust and/or organic vapors at no additional cost to the Owner. The measures utilized shall be subject to the approval of the Owner and Owner's designated representatives.

Any exceedance of a CAMP threshold or action level shall be recorded on the project summary report which shall be submitted to NYSDEC and NYSDOH. The summary report shall include the instrument readings at the monitoring stations, location of the monitoring station where any exceedance was recorded, readings at upwind locations, duration of any elevated readings (i.e., number of 15-minute time-weighted exceedances), activities being performed at the time of any exceedances, and descriptions of countermeasures implemented to control the exceedance and prevent future occurrences.

The Contractor shall respond to exceedances of the CAMP action levels immediately.

Odor or dust complaints from any owner of an adjacent or nearby property shall be managed by the Contractor in a manner equivalent to an exceedance of an action level in the CAMP.

Community Air Monitoring Plan

Based upon the nature of known or potential contaminants at the Site, real-time air monitoring for volatile organic compounds (VOCs) and particulate levels at the perimeter of the exclusion zone/work area will be necessary.

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

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil samples. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while overturning soil, 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) shall be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind

concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work should be performed using equipment such as a MiniRAE 2000 photoionization detector (PID) Portable VOC Monitor or other appropriate instrument to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds five (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 five (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 five (5) ppm over background but less than 25 ppm, work activities must be halted. The source of vapors must be identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can only 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 five (5) ppm over background for the 15-minute average; and
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown. Work methods and controls will be re-evaluated.

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.

Particulate Monitoring, Response Levels, and Actions

Particulate (dust) 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 (such as a portable particulate monitor EPAM 5000 or equal) capable of measuring particulate matter less than ten (10) micrometers in size (PM-10) and capable of integrating over a period of fifteen (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.

All readings must be recorded and be available for State (NYSDEC and NYSDOH) personnel to review.

Particulate concentrations shall be monitored at the upwind perimeter of an active work zone for background concentrations at the beginning and the end of the work day and at the downwind perimeter

of an active work zone on a continuous basis during all ground intrusive activities. At any time, the Contractor will carry out dust and particulate control measures, such as water misting to prevent generation of dust and particulate matter during the work activities.

If the elevated levels of particulate matter are detected during the monitoring, corrective action is determined by the following levels:

- If the downwind PM-10 at a site perimeter location is 100 micrograms per cubic meter ($\mu g/m^3$) greater than background (upwind perimeter) for the 15-minute period of if airborne dust is observed leaving the perimeter of the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques if the downwind PM-10 particulate level does not exceed 150 $\mu g/m^3$ above the upwind level and if no visible dust is migrating from the work area; and
- If, after implementing dust suppression techniques, downwind PM-10 particulate levels are greater than 150 $\mu g/m^3$ above the upwind level, work must be stopped and re-evaluation of work activities initiated. Work can resume if dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 $\mu g/m^3$ of the upwind level and in preventing visible dust migration.

Summary

As noted above, air monitoring activities for the iPark 87 Operable Unit 4 field investigation work described in the *Operable Unit 4 Field Investigation Work Plan* (Walden, March 2024) will be appropriate for the soil sampling activities to be conducted in the investigation area. Therefore, the CAMP will encompass VOC and particulate monitoring during the ground intrusive activities. A CAMP report will be submitted to NYSDEC and NYSDOH upon completion of the project.