# **BUILDING 330D CREPINI SPACE**

# TRENCHING AND DRAINAGE INSTALLATION WORK PLAN

AT

IPARK 84
FORMER IBM EAST FISHKILL FACILITY

**MARCH 2019** 

PREPARED FOR:

JESSICA LACLAIR
NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION
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# WALDEN ENVIRONMENTAL ENGINEERING, PLLC

**Industry Leader in Environmental Engineering Consulting** 

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Sent via email to jess.laclair@dec.ny.gov

March 11, 2019 iPARK0118.26

Jessica LaClair
Environmental Engineer
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233-7013

Re: iPark 84

Former IBM East Fishkill Facility Building 330D Crepini Space

Trenching and Pipe Installation Work Plan

Dear Ms. LaClair:

Walden Environmental Engineering, PLLC (Walden) is submitting this Investigation Work Plan on behalf of National Resources (NR/Owner), the owner of Building 330D at the iPark 84 Former IBM East Fishkill Facility located in Hopewell Junction, New York. NR is leasing space within Building 330D at the iPark 84 site to Crepini, a food manufacturer. Crepini requires the installation of new floor drainage lines to supplement the existing floor drainage structures and trenches within the space. This retrofitting activity involves the removal of sections of the concrete building slab, and disturbance of subsurface soil beneath the slab in order to install the trenches. This Work Plan outlines the steps that will be taken by NR to ensure compliance with the Interim Site Management Plan (ISMP) and Intrusive Activities Work Plan (IAWP) while the intrusive activities associated with this indoor construction project take place.

#### **Notification**

NR notified NYSDEC of the intended work by email on February 8, 2019. The notification and supplemental information provided with this Work Plan provide:

• A detailed description of the project including the location and extent of the work, applicable plans, estimated volumes of soil to be excavated, and any potential impacts to existing engineering controls;



- A summary of environmental conditions within the work area including the nature and concentration levels of contaminants of concern;
- Plans for pre-construction sampling and post-excavation waste characterization sampling;
- A statement that the work will be performed in compliance with the IAWP, which is included as Appendix C of the ISMP;
- The Health and Safety Plan (HASP) and special requirements Community Air Monitoring Plan (CAMP) to be implemented during the work;
- Handling and disposal details for potential waste streams; and
- Potential sources for backfill (if applicable) to be verified as suitable for use based on chemical testing results as applicable.

## **Project Description**

Crepini occupies approximately 30,000 ft<sup>2</sup> within the 80K space in the northwestern portion of the first floor of Building 330D on the iPark 84 campus. See Figure 1 for the location map and Figure 2 for details on the proposed layout of the Crepini space, which will be used for food manufacturing. The remainder of the first-floor areas in Building 330D are unoccupied. Global Foundries leases the second-floor area above the Crepini space while eMagin and Greystone Care Design occupy space on the second floor at the opposite end of Building 330D (on the southeast side). IBM currently operates an existing sub-slab vapor extraction and treatment system (SVE system) in the 80K space. The vapor extraction ports and piping are located outside the proposed Crepini work area as shown on Figure 2.

In order to properly retrofit the space for Crepini's needs, approximately 300 ln. ft. of trench floor drains will be installed as shown on Figure 2. The trenches will be approximately one (1) foot deep and one (1) foot wide. The proposed trench work will not disturb the integrity of the existing 80K SVE system. IBM will perform indoor air and SVE system testing after the trenching/drainage system installation and interior modifications are completed prior to tenant occupancy to confirm acceptable indoor air quality and effective SVE system performance.

All work will be performed in accordance with the attached HASP (Attachment A) and special requirements CAMP (Attachment B) as discussed below.



## **Pre-Construction Soil Sampling**

Prior to cutting the slab and conducting trenching activities, soil samples will be collected from beneath the slab. The sampling will be performed to evaluate contaminant levels in the soil and to characterize exposure risks. One (1) sample set shall be collected for every 100 ln. ft. of trench length. A concrete core drill (with an integral wet system) will be used to drill through the slab using water for dust control. Immediately after the concrete core is removed at each location, a small diameter hand auger will be used to collect a soil sample from one (1) to two (2) feet below the bottom of the slab. The top layer of soil directly beneath will not be sampled in order to avoid the potential for inaccurate results associated with soil wetting due to the coring equipment and release of VOCs due to soil disturbance in the 0'-1' interval. Real-time air monitoring shall be performed during the drilling and sampling activities in accordance with the HASP and CAMP.

The soil samples will be submitted to an ELAP-certified laboratory for VOCs via EPA Method 8260, Semi Volatile Organic Compounds (SVOCs) via EPA Method 8270, and Metals via EPA Method 6010C. The soil analytical results will be compared to the NYCRR Part 375-6.8(b) Soil Cleanup Objectives (SCOs). If the soil meets the Industrial Use SCOs, it will be used as backfill or transferred to Lot 3 where it will be stockpiled for future re-use on-site upon approval from NYSDEC and NYSDOH. Any soils that do not meet the SCOs for industrial use will be properly disposed of off-site.

### Floor Trenching and Drainage Pipe Installation

While cutting the building slab, power tools with integral dust management features shall be utilized. Approximately eleven (11) cubic yards of soil will be generated as a result of this installation. All soil will be appropriately handled and disposed of. During this work, the contractor will implement actions to protect workers and adjacent tenant spaces from contaminant releases in accordance with the HASP and special requirements CAMP, which are further discussed below. All exposed trenches will be covered with plastic sheeting to the extent possible, as site work allows. All trenches will be covered overnight with plastic. Excess soil generated by all excavation work shall be either stockpiled on top of plastic and covered with weighted tarps, or placed into drums and covered.

Any concrete demolition material proposed for reuse on-Site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-Site will not be performed without prior NYSDEC approval.

Concrete and demolition material will be reused on site, as allowable, or disposed of appropriately off-site. If a soil sample is found to contain hazardous material, NYSDEC shall be notified and the soil shall be disposed of at an appropriate facility in accordance with federal, state, and local laws.



## **Health and Safety Plan**

NR and its subcontractors shall adhere to the HASP that is provided in Attachment A for all intrusive work that will be conducted under this Work Plan. Health and Safety air monitoring will take place during work to monitor workers' exposure. Only on-Site personnel who have received 40-hour OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) training and annual 8-hour refresher training (and have proof of certified HAZWOPER training) will be allowed in the exclusion zone and contaminant reduction zone per the HASP. The air monitoring described below will provide data to monitor worker exposure and support measures to ensure worker safety in accordance with the HASP.

### **Special Requirements CAMP Air Monitoring**

The Community Air Monitoring Program (CAMP) provided in Attachment B shall be implemented during construction work involving intrusive activities. Because the construction will be performed inside the building, the CAMP includes special requirements for monitoring to ensure that tenants occupying other spaces in Building 330D are not exposed from VOC and particulates released during the Crepini work.

Prior to the beginning of any planned construction work within the Crepini space, background VOC and dust concentrations will be measured in the work area and other tenant-occupied spaces in Building 330D adjacent to Crepini (including eMagin and Greystone Programs). In addition, the location of all exhaust vents in the Crepini space and their discharge points, as well as potential vapor pathways (openings, conduits, etc.) relative to adjoining rooms, will be evaluated and background concentrations will be measured in spaces that share the same ventilation/exhaust system as Crepini. Exhaust intake vents within the workspace may be sealed if appropriate. Any unusual background readings will be discussed with NYSDEC and NYSDOH prior to commencement of the work. The CAMP air monitoring stations will be established based on the findings of the pre-construction evaluation and input from NYSDEC and NYSDOH to reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures.

Air monitoring for VOCs and particulates shall take place during intrusive work activities that take place within the building. The VOC and particulate concentrations shall be collected prior to the start of work each day to obtain a baseline condition of the space for that workday.

VOC concentrations will be monitored using Mini Rae 3000 Photo-ionization detectors (PID) (or equivalent) and Dusttraks (or equivalent) will be used to monitor particulate concentrations. The PIDs and Dusttraks will be calibrated daily in accordance with the instrument manufacturers' instructions; all calibrations will be recorded in Walden's field book. Two (2) air monitoring stations will be set up at the locations determined during the pre-construction evaluation as



detailed above. Each air monitoring station will have a PID and a dust meter connected to a data logger to continuously record the breathing zone VOC and dust concentrations during the work day, from before the work starts until after the last workers leave the area each day.

Walden will record the VOC and dust concentrations at each monitoring station every fifteen minutes (at a minimum) during the work day to ensure that appropriate actions are implemented when needed based on the action levels presented below. In addition, Walden will use a third PID during the work to monitor breathing zone VOC concentrations in the immediate vicinity of the work activities to ensure the workers are protected in accordance with the HASP. Similarly, a multi-gas meter will be used to continually measure the concentrations of hydrogen sulfide, oxygen, lower explosive limit, carbon monoxide and chlorine in the indoor air within the work area.

The air monitoring action levels as stated in the CAMP, including the special requirements are as follows:

- 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 twenty-five (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 twenty (20) feet, is below five (5) ppm over background for the 15-minute average.
- If the organic vapor level is above twenty-five (25) ppm at the perimeter of the work area, activities must be shutdown. Work methods and controls will be re-evaluated.
- If total VOC concentrations opposite the walls of occupied tenant spaces or next to intake vents exceed 1 ppm, monitoring will be performed within the occupied spaces.

  Depending upon the nature of contamination, chemical-specific colorimetric tubes of



sufficient sensitivity may be utilized to compare the exposure point concentrations with appropriate pre-determined response levels (response actions will be predetermined).

• If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m³, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m³ or less at the monitoring point. If VOC readings exceed 5 parts per million (ppm) in these same locations, work activities shall be suspended. Any exceedances will be documented, and the NYSDEC and NYSDOH will be notified by the end of the same day.

If the action levels for VOCs or dust are exceeded, exhaust fans or other engineering controls may be used on an as-needed basis to create negative air pressure within the work area during the intrusive construction activities. Dust and particulate control measures, such as water misting, may also be implemented to prevent generation of dust and particulate matter during the work activities as needed. Vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices will be considered in order to prevent exposures related to the work activities. If necessary, the work may be scheduled to take place when potentially exposed populations are at a minimum, such as during weekends or evening hours.

If the VOC or dust concentrations exceed the action criteria at the end of a work day, Walden's oversight staff will remain on-Site to oversee the engineering controls and continue air monitoring until the elevated concentrations dissipate to concentrations below the action levels. VOC and dust concentrations will be documented just before Walden leaves the work area each day. Fans may be left running overnight to ventilate the space as needed.

If Walden's air monitoring staff observes elevated VOC concentrations which occur as a direct result of the on-Site contractor's work (such as the use of certain plumbing compounds), the work will be paused and Walden will review the Safety Data Sheets (SDS) for the commercial products as applicable to determine the chemical components and the respective OSHA permissible exposure levels (PELs, 8-hour time weighted averages), consistent with 29 CFR 1910.1000. If it is confirmed that the VOC concentrations do not exceed the applicable PELs, the on-site personnel may continue to work while engineering controls are utilized to increase ventilation in the work area and reduce VOC concentrations. In this case, the VOC concentrations will be closely monitored outside the work area to confirm that the elevated VOC concentrations are localized/limited to the immediate work zone and do not migrate from the work space to occupied areas of Building 330D.



## Reporting

Following the completion of the construction project, a letter summary report shall be prepared and supplied to NYSDEC. The letter report shall include an overview of the activities that took place; a description of the air monitoring activities, results, exceedances (if any) and engineering controls utilized to control VOC and dust concentrations during the work; photo documentation of the work activities; a description of the soil sampling performed before construction began and the results of the sampling; and the final use/disposal of the soil.

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

Very truly yours,

Walden Environmental Engineering, PLLC

Joseph M. Heanes III, P.E.

Principal

cc:

Nora M. Brew, P.E.

Project Manager

C. Monheit, National Resources

M. Buckley, National Resources

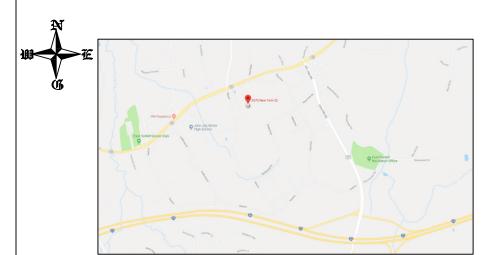
Figure 1 – Site Plan

Figure 2 – Building 330D Trenching/Drainage Work Layout

Attachment A – Health and Safety Plan

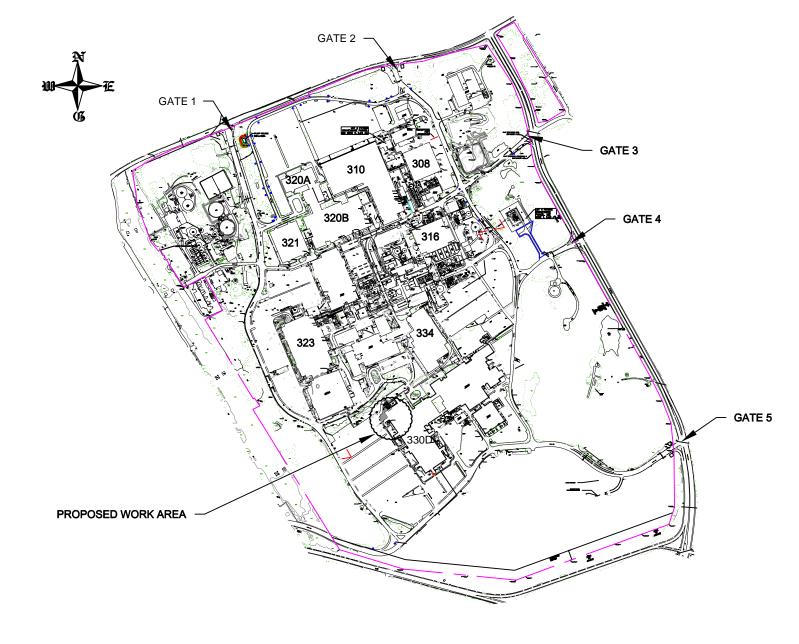
Attachment B – Community Air Monitoring Plan (Including Special Requirements)

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# SITE LOCATION

NOT TO SCALE SOURCE: GOOGLEMAPS.COM



# **LEGEND**



PROPOSED WORK AREA

CHAZAN ENGINEERING, LAND SURVEYING & LANDSCAPE ARCHITECTURE CO. D.P.C. POUGHKEEPSIE, NY (XBASE-SVY\_51421-00.DWG 8/10/15); PARCELS: XSUBD\_51539-00.DWG.

"GROUNDWATER MONITORING BASEMAP", IBM EAST FISHKILL FACILITY (9718NEW.DWG, ORIGINAL DATE 12/21/98).

PHOTOGRAMMERTR BY GOLDEN AERIAL SURVEYS, INC., NEWTON, CT (3/3/1997).

CONTOUR INTERVAL: 1 FOOT (HORIZONTAL DATUM BASED UPON IBM EAST FISHKILL COORDINATE SYSTEM; VERTICAL DATUM

BASED UPON NATIONAL GEODETIC VERTICAL DATUM OF 1929).

HORIZONTAL ACCURACY: 90% OF ALL DETAIL, IFELD CHECKED, WILL BE WITHIN +/- 1.0 FOOT, THE REMAINING 10% OF DETAIL, WILL BE WITHIN +/- 2.0 FEET OF ITS TRUE POSITION.

VERTICAL ACCURACY: 90% OF ALL CONTOURS, FIELD CHECKED, WILL BE WITHIN +/- 1.5 FOOT. THE REMAINING 10% OF CONTOURS, FIELD CHECKED, WILL BE WITHIN +/- 1.0 FEET.

Walden Environmental

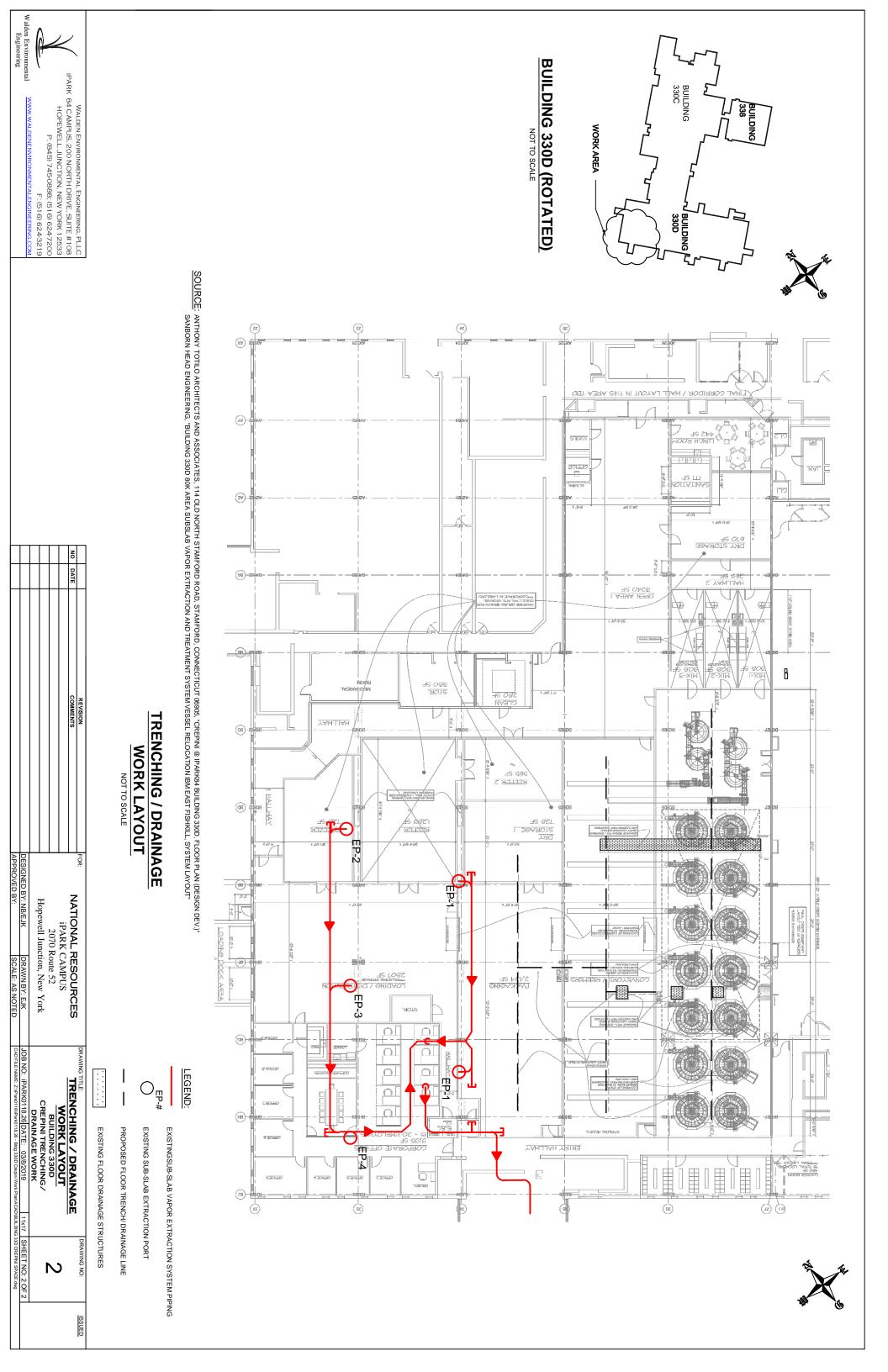
WALDEN ENVIRONMENTAL ENGINEERING, PLLC IPARK 84 CAMPUS, 200 NORTH DRIVE, SUITE #108 HOPEWELL JUNCTION, NEW YORK 12533 P: (845) 745-0888; (516) 624-7200 F: (516) 624-3219

WWW.WALDENENVIRONMENTALENGINEERING.COM

# SITE PLAN

NOT TO SCALE SOURCE: GOOGLEMAPS.COM

NO	DATE	REVISION COMMENTS	iPARK ( 2070 F	RESOURCES CAMPUS Route 52 ction, New York	Build Crepini	E PLAN ING 330D TRENCHING/ IAGE DORK	DRAWING NO:	ISSUED
			DESIGNED BY: NB/EJK	DRAWN BY: EJK	JOB NO: iPARK0118.26	DATE: 3/8/2019 11x1	7 SHEET NO: 1 OF 2	
			APPROVED RV: SCALE: AS NOTED CAD FILE NAME: 7-UParkot 18/IParkot 1		en .	•		



# ATTACHMENT A HEALTH AND SAFETY PLAN

# **HEALTH AND SAFETY PLAN**

ΑT

IPARK 84
FORMER IBM EAST FISHKILL FACILITY

**MARCH 2019** 

PREPARED FOR:
National Resources
200 North Drive
Hopewell Junction, New York 12533

PREPARED BY:
WALDEN ENVIRONMENTAL ENGINEERING, PLLC
2070 ROUTE 52
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WALDEN ENVIRONMENTAL ENGINEERING, PLLC

**Industry Leader in Environmental Engineering Consulting** 

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# **Attachments**

Attachment A: iPark 84 Facility Site Map Attachment B: Emergency Room Directions

Attachment C: Safety Data Sheets

Attachment D: Heat Stress Attachment E: Cold Stress

#### 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 84 Site owned by National Resources (the Former IBM East Fishkill Facility, the "Site" or "Facility") located in Hopewell Junction, New York (refer to **Attachment A**). 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, National Resources 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 job-site 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.

1

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 include volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and inorganics. 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

National Resources is modifying the floor drainage system in a new tenant space located in the northwestern portion of Building 330D for Crepini, a food manufacturer. The work involves cutting the concrete floor slab, trenching into soil underlying the slab, and installing new a floor drainage system. The trenches will be backfilled and the concrete floor will be restored.

## 2.3 Equipment

The following equipment may be utilized during work at the Facility:

- Hand auger;
- Portable generator;
- Battery;
- Peristaltic pump;
- Bailer;
- Water quality meter;
- Water level indicator;
- Scrub brush:
- Photoionization detector (PID);
- MultiRAE multi-gas meter;
- Ventilation devices (fans);
- Concrete saw;
- 55-gallon drums, both metal and plastic;
- Plastic chemical totes:
- Excavation machinery (e.g. mini-excavator);
- Hand shovels;
- Plastic sheeting;
- Air sampling canisters;
- Water sampling containers;
- Soil/Solids sampling containers;
- Chemical-resistant, leather, and/or cut-resistant gloves; and
- Miscellaneous hand tools (screwdriver, socket driver).

## 2.4 Site Access

The Facility includes occupied and unoccupied building spaces and undeveloped areas. Authorized Facility owner personnel, tenants and subcontractors have access to buildings at the Facility depending on security clearance designations. 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.

ONE NUMBER/PAGER
6-624-7200 (Office)
6-732-5378 (Mobile)
5-745-0888 (Mobile)
46-824-1123 (Mobile)
1-521-1266 (Mobile)
-5-406-8242 (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 onsite 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 St. Luke's Cornwall Hospital at 70 Dubois Street, Newburgh, New York 12550. A map of the route to St. Luke's Cornwall 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(s)	Joseph M. Heaney III, P.E.	516-624-7200 (Office)
	Nora Brew, P.E.	516-732-5378 (Mobile)
	Larry LePere, P.E.	845-745-0888 (Mobile)
Walden Site Safety Officer(s)	Madeleine Tierney	646-824-1123 (Mobile)
	Erica Johnston	631-521-1266 (Mobile)
	Louis Goldstein	845-406-8242 (Mobile)
National Resources	Mike Buckley	203-430-9211 (Mobile)
Emergency Response	Police/Fire/Medical	911
St. Luke's Cornwall Hospital		845-568-2305
NYSDEC Spill Hotline		518-457-7362
American Association of Poison	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 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 <u>both</u> 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 <u>both</u> 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 <u>both</u> 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
	75' or less travel distance	
A ("A" on a green triangle)	between the employee and the	Use on wood, paper, trash
	extinguisher	
	50' or less travel distance	
B ("B" on a red square)	between hazard area and the	Use on flammable liquid, gas
	employee	
	Based on the appropriate	
C ("C" on a blue circle)	pattern for the existing Class A	Use on electrical fires
	or Class B hazards	
	75' or less travel distance	
	between the combustible metal	
D ("D" on a yellow star)	working area and the	Use on combustible metals
	extinguisher or other containers	
	of Class D extinguishing agent	

#### 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 (the SDS sheets for chemicals that are most likely to be encountered on-site are attached to this HASP in **Attachment C**), 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 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 onsite will sign the Record of HASP Acknowledgement form 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 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:
  - O 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
  - o *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:
  - o Any blast from a pressurized air horn or vehicle horn; and
  - Verbal notification.
- The following standard hand signals will be used:
  - o Hand gripping throat -- Out of air and cannot breathe;
  - o Grip buddy's wrist -- Leave area immediately;
  - o Both hands on buddy's waist -- Leave area immediately;
  - o Hands on top of head -- Need assistance;
  - o Thumb down -- No/negative; and
  - o 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**. 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 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 activities including soil and groundwater investigation, construction, building renovations, etc. All work at this Facility will be conducted during daylight hours, or with adequate lighting provided for indoor work.

<u>Slipping/Falling</u>: 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.

<u>Manual Lifting</u>: 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.

<u>Noise</u>: 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.

<u>Eye Protection</u>: 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.

<u>Heat Stress</u>: 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 fluid ounces (0.23 liters) of water must be ingested for approximately every eight ounces (0.23 kg) of weight lost. When heavy

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

- o Maintain water temperature between 50° and 60°F (10° to 16.6°C);
- o Provide small disposal cups that hold about four ounces (0.1 liter);
- Have workers drink 16 ounces (0.5 liter) of fluid (preferably water or dilute drinks) before beginning work;
- O Urge workers to drink a cup or two 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
- o 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.

<u>Cold Stress</u>: 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;
  - o At a worker's request;
  - As a screening measure, two 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
  - o As a screening measure whenever any worker at the Facility develops hypothermia.

<u>Electrical</u>: 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.

<u>Hand and Power Tools</u>: 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
Freon-113	500 ppm	n/a

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 the TWA values listed in the table above, 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. Please see 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 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.

#### 6.3.2 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.

#### 6.3.3 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

<u>Duration Per Day</u> (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.
	В	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	Action Required
		Reading	
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.	PPE will be upgraded to Level C.
		5 ppm or greater above background in the breathing zone for 30 continuous seconds	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 <sub>2</sub>	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 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, 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 or Level C 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 more safe and 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 84 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	<u>Date</u>

# <u>ATTACHMENT A</u> iPARK 84 FACILITY SITE MAP



# SITE LOCATION

NOT TO SCALE SOURCE: GOOGLEMAPS.COM





SITE BASEMAP: CHAZAN ENGINEERING, LAND SURVEYING & LANDSCAPE ARCHITECTURE CO. D.P.C. POUGHKEEPSIE, NY (XBASE-SVY\_51421-00.DWG 8/10/15); PARCELS: XSUBD\_51539-00.DWG.

SITE PLAN

0 800 1600 2400

1" = 800'-0"

PROPERTY LINE

SCALE: 1"=800'

DESIGNED BY: LL APPROVED BY: JMH

WALDEN ENVIRONMENTAL ENGINEERING, PLLC
16 SPRING STREET
OYSTER BAY, NEW YORK 11771
P; (516) 624-7200 F: (516) 624-3219
Walden Environmental

WWW.WALDENENVIRONMENTALENGINEERING.COM

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0	1/22/19	HEALTH & SAFETY PLAN

REVISION

IPARK CAMPUS
2070 ROUTE 52
Hopewell Junction, New York

HEALTH A
iPA

DRAWN BY: LTG SCALE: AS NOTED DRAWING TITLE:

HEALTH AND SAFETY PLAN

iPARK CAMPUS

PRAWING NO:

| REVISION NO: | O | | O | | O | | O | | O | | O | | O | | O | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O | | O |

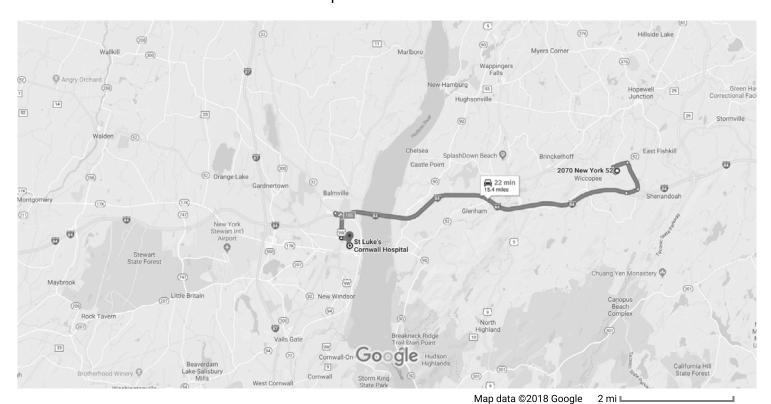
ISSUED

# ATTACHMENT B EMERGENCY ROOM DIRECTIONS

# Google Maps

# 2070 NY-52, Hopewell Junction, NY 12533 to St Luke's Cornwall Hospital

Drive 15.4 miles, 22 min



# 2070 NY-52

Hopewell Junction, NY 12533

# Get on I-84 from NY-52 E and Lime Kiln Rd

	1.	Head southeast toward North Dr	
		▲ Restricted usage road	
l	2.	Slight left onto North Dr	44
		A Restricted usage road	
	3.	Turn right onto West Dr	5
		▲ Restricted usage road	
	4.	Turn right onto NY-52 E	0.2
	5.	Turn right onto Lime Kiln Rd	0.
	6.	Use the right 2 lanes to take the I-84 W ramp	1. <sup>-</sup>
			0.5

11 min (11.3 mi)

*	7.	Merge onto I-84	
۳	8.	Take exit 10S for NY-32 toward US-9W S/Newburgh	11.1 m
Tala	D.L	in an Annual Dubaia Olda con dadination in Naudonal	0.2 m
таке	KOD	inson Ave and Dubois St to your destination in Newburgh	— 6 min (1.7 mi
Ļ	9.	Turn right onto NY-32 S/N Plank Rd (signs for Route 9w S)	
<b>L</b>	10.	. Use the right 2 lanes to turn right onto Robinson Ave	0.2 m
•			0.9 m
4	11.	. Turn left onto South St	
_	10	Time vielet ente Dubeie Ct	———— 0.3 m
Γ*	12.	. Turn right onto Dubois St	0.3 m
4	13.	. Turn left	0.0111
			246 f
4	14.	Turn left  Destination will be on the left	
		Destination will be on the left	125 f

# St Luke's Cornwall Hospital

70 Dubois St, Newburgh, NY 12550

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

# 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 Acros Organics
One Reagent Lane One Reagent Lane
Fair Lawn, NJ 07410 Fair Lawn, NJ 07410

Tel: (201) 796-7100

**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

Acute oral toxicity

Acute Inhalation Toxicity - Vapors

Skin Corrosion/irritation

Serious Eye Damage/Eye Irritation

Specific target organ toxicity (single exposure)

Category 2

Category 2

Category 2

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

#### **Eves**

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.

Do not induce vomiting. Obtain medical attention. Ingestion

Most important symptoms and

effects

Notes to Physician

Breathing difficulties. Inhalation of high vapor concentrations may cause symptoms like

headache, dizziness, tiredness, nausea and vomiting

Treat symptomatically

#### Fire-fighting measures

Water spray. Carbon dioxide (CO<sub>2</sub>). Dry chemical. Use water spray to cool unopened **Suitable Extinguishing Media** 

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

No information available Method -

**Autoignition Temperature** 440 °C / 824 °F

**Explosion Limits** 

12.80% Upper 9.70% Lower

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 (CO2)

#### **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.

Up

Methods for Containment and Clean 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** 

Wear appropriate protective eyeglasses or chemical safety goggles as described by **Eye/face Protection** 

OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard

EN166.

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

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

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

# 9. Physical and chemical properties

Liquid **Physical State Appearance** Colorless Odor aromatic

**Odor Threshold** No information available No information available

Melting Point/Range -80 °C / -112 °F

Boiling Point/Range

60 °C / 140 °F @ 760 mmHg 6 °C / 42.8 °F **Flash Point** 

**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

440 °C / 824 °F **Autoignition Temperature** No information available **Decomposition Temperature Viscosity** No information available

**Molecular Formula** C2 H2 Cl2

**Molecular Weight** 96.94

# 10. Stability and reactivity

#### cis-1,2-Dichloroethylene

**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<sub>2</sub>), Carbon dioxide (CO<sub>2</sub>)

Hazardous Polymerization Hazardous polymerization does not occur.

**Hazardous Reactions**None under normal processing.

# Toxicological information

**Acute Toxicity** 

Product Information Component Information

Toxicologically Synergistic No information available

**Products** 

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-Dichloroethylen	156-59-2	Not listed				
е						

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

delayed

Symptoms / effects,both acute and 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

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

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 ||

IMDG/IMO

**UN-No** 1150

Proper Shipping Name 1,2-DICHLOROETHYLENE

Hazard Class 3
Packing Group ||

# 15. Regulatory information

#### International Inventories

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

#### 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	Χ	-	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

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**

Revision Date 17-Jan-2018 Revision Number 3

# 1. Identification

Product Name 1,1,2-Trichloro-1,2,2-trifluoroethane

Cat No.: T178-1; T178-4

Synonyms Fluorocarbon 113; Freon 113; 1,1,2-Trichlorotrifluoroethane

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

#### **Emergency Telephone Number**

CHEMTREC®, Inside the USA: 800-424-9300 CHEMTREC®, Outside the USA: 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 %
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	99

# 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.

Revision Date 17-Jan-2018

Inhalation Move to fresh air.

Do not induce vomiting. Ingestion

Most important symptoms and

effects

No information available.

**Notes to Physician** Treat symptomatically

#### Fire-fighting measures

No information available **Unsuitable Extinguishing Media** 

**Flash Point** No information available Method -No information available

**Autoignition Temperature** 

**Explosion Limits** 

770 °C

No data available Upper 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**

No information available

#### **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	0	0	N/A

#### 6. Accidental release measures

Ensure adequate ventilation. Use personal protective equipment. **Personal Precautions** 

**Environmental Precautions** See Section 12 for additional ecological information.

Methods for Containment and Clean No information available.

Up

# 7. Handling and storage

Ensure adequate ventilation. Handling

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

# Exposure controls / personal protection

This product does not contain any hazardous materials with occupational exposure **Exposure Guidelines** 

limitsestablished by the region specific regulatory bodies.

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
1,1,2-Trichloro-1,2,2-trifluoro	TWA: 1000 ppm	(Vacated) TWA: 1000 ppm	IDLH: 2000 ppm	TWA: 1000 ppm
ethane	STEL: 1250 ppm	(Vacated) TWA: 7600 mg/m <sup>3</sup>	TWA: 1000 ppm	TWA: 1600 mg/m <sup>3</sup>
		(Vacated) STEL: 1250 ppm	TWA: 7600 mg/m <sup>3</sup>	STEL: 1250 ppm
		(Vacated) STEL: 9500	STEL: 1250 ppm	STEL: 9500 mg/m <sup>3</sup>
		mg/m³	STEL: 9500 mg/m <sup>3</sup>	
		TWA: 1000 ppm		
		TWA: 7600 mg/m <sup>3</sup>		

#### 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 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 StateLiquidAppearanceClearOdoraromatic

Odor Threshold

pH

No information available
No information available

Melting Point/Range No information -36 °C

Boiling Point/Range 48 °C

Flash Point

Evaporation Rate

Flammability (solid,qas)

No information available

> 1.0 (Ether = 1.0)

No information available

Flammability or explosive limits

Upper
Lower
No data available
16.5 (Air = 1.0)
Specific Gravity
1.47 @ 21°C
Solubility
Insoluble in water
Partition coefficient: n-octanol/water
No data available

Partition coefficient; n-octanol/water

No data available
Autoignition Temperature

770 °C

Decomposition TemperatureNo information availableViscosityNo information available

Molecular FormulaC2Cl3F3Molecular Weight187.38

# 10. Stability and reactivity

Reactive Hazard None known, based on information available

Revision Date 17-Jan-2018

Stability Stable under normal conditions.

**Conditions to Avoid** Incompatible products.

**Incompatible Materials** Strong acids, Powdered metals

Hazardous Decomposition Products No information available

**Hazardous Polymerization** Hazardous polymerization does not occur.

**Hazardous Reactions** None under normal processing.

# 11. Toxicological information

#### **Acute Toxicity**

**Component Information** 

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
1,1,2-Trichloro-1,2,2-trifluoroethane	LD50 = 43 g/kg (Rat)	Not listed	LC50 = 38000 ppm (Rat) 4 h LC50 = 38500 mg/kg (Rat) 4 h

**Toxicologically Synergistic** 

**Products** 

No information available

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

No information available Irritation

No information available Sensitization

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

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
1,1,2-Trichloro-1,2,2-tri	76-13-1	Not listed				
fluoroethane						

**Mutagenic Effects** No information available

No information available. **Reproductive Effects** 

**Developmental Effects** No information available.

No information available. **Teratogenicity** 

STOT - single exposure None known STOT - repeated exposure None known

**Aspiration hazard** No information available

Symptoms / effects,both acute and No information available

delayed

**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. Chlorotrifluoromethane (CFC-13) is a Class I ozone-depleting chlorofluorocarbon. It is stable in the atmosphere. The half-life for degradation by reaction with photochemically-produced hydroxyl radicals is about 62 years. Following gradual diffusion into the stratosphere above the ozone layer, it slowly degrades (est. half-life of 180-450 years) due to direct photolysis and contributes to the catalytic removal of atmosphere ozone.

1,1,2-Trichloro-1,2,2-trifluoro ethane  Not listed  LC50: 7 - 14 mg/L, 96h static (Brachydanio rerio) LC50: = 1250 mg/L, 96h (Pimephales promelas)  LC50: 96h (Pimephales promelas)	Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
CC50: = 6240 mg/L, 96n (Oryzias latipes)		Not listed	static (Brachydanio rerio) LC50: = 1250 mg/L, 96h (Pimephales promelas) LC50: = 6240 mg/L, 96h	Not listed	

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.

	44 T 11 C 11			
14. Transport information				
DOT	Not regulated			
DOT TDG IATA	Not regulated			
<u>IATA</u>	Not regulated			
IMDG/IMO	Not regulated			
15 Regulatory information				

#### International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
1,1,2-Trichloro-1,2,2-trifluoro	Х	Х	-	200-936-1	-		Χ	Χ	Χ	Х	Χ
ethane										1	

# 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

Component	CAS-No	Weight %	SARA 313 - Threshold Values %
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	99	1.0

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

CWA (Clean Water Act) Not applicable

#### 1,1,2-Trichloro-1,2,2-trifluoroethane

Clean Air Act Not applicable

Component	HAPS Data	Class 1 Ozone Depletors	Class 2 Ozone Depletors
1,1,2-Trichloro-1,2,2-trifluoroethane	-	X	-

# **OSHA** Occupational Safety and Health Administration

Not applicable

CERCLA Not applicable

Component	Hazardous Substances RQs	CERCLA EHS RQs
1,1,2-Trichloro-1,2,2-trifluoroethane	5000 lb	-

**California Proposition 65** 

This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know

Component 1,1,2-Trichloro-1,2,2-triflu

oroethane

Regulations

Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Χ	X	Х	-	Х

#### **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

Not applicable

Email: EMSDS.RA@thermofisher.com

Revision Date 17-Jan-2018 Print Date 17-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 Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410 Fair Lawn, NJ 07410

Tel: (201) 796-7100

**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

Serious Eye Damage/Eye Irritation

Skin Sensitization

Category 2

Category 2

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

#### Lyes

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

L	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** 

**Explosion Limits** 

No information available

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** Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. **Up** 

	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	(Vacated) TWA: 25 ppm	IDLH: 150 ppm	TWA: 100 ppm
	STEL: 100 ppm	(Vacated) TWA: 170 mg/m <sup>3</sup>		TWA: 670 mg/m <sup>3</sup>
		Ceiling: 200 ppm		TWA: 200 ppm
		TWA: 100 ppm		TWA: 1250 mg/m <sup>3</sup>
				STEL: 200 ppm
				STEL: 1340 mg/m <sup>3</sup>

#### 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

OdorCharacteristic, sweetOdor ThresholdNo information available

Odor ThresholdNo information availablepHNo information availableMelting 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 No information available 6.0 (Ether = 1.0)

Flammability (solid,gas) Not applicable

Flammability or explosive limits

Upper<br/>LowerNo data available<br/>No data availableVapor Pressure18 mbar @ 20 °CVapor DensityNo information available

Density1.619Specific Gravity1.625

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.

No information available

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** 

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	A3	Х	A3
			Anticinated			

IARC: (International Agency for Research on Cancer)

NTP: (National Toxicity Program)

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

Mexico - Occupational Exposure Limits - Carcinogens

Hygienists)

A1 - Known Human Carcinogen A2 - Suspected Human Carcinogen

A3 - Animal Carcinogen

ACGIH: (American Conference of Governmental Industrial Hygienists)

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)

Revision Date 23-Jan-2018 **Tetrachloroethylene** 

STOT - repeated exposure Kidney Liver Blood

**Aspiration hazard** No information available

delayed

Symptoms / effects,both acute and 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	EU - Endocrine Disruptors -	Japan - Endocrine Disruptor
	Candidate List	Evaluated Substances	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
Ī	Tetrachloroethylene	EC50: > 500 mg/L, 96h	LC50: 4.73 - 5.27 mg/L, 96h	EC50 = 100 mg/L 24 h	EC50: 6.1 - 9.0 mg/L, 48h
	-	(Pseudokirchneriella	flow-through (Oncorhynchus	EC50 = 112  mg/L  24  h	Static (Daphnia magna)
		subcapitata)	mykiss)	EC50 = 120.0 mg/L 30 min	
			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)		
- 1					

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

UN1897 **UN-No** 

**Proper Shipping Name TETRACHLOROETHYLENE** 

**Hazard Class** 6.1 **Packing Group** 

**TDG** 

UN-No UN1897

Proper Shipping Name TETRACHLOROETHYLENE

Hazard Class 6.
Packing Group

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	<b>EINECS</b>	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Tetrachloroethylene	Х	Χ	-	204-825-9	-		Χ	Χ	Χ	Х	Χ

#### 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	Component CWA - Hazardous Substances		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

Serious Eye Damage/Eye Irritation

Skin Sensitization

Germ Cell Mutagenicity

Category 2

Category 1

Category 2

Category 1

Category 2

Category 1

Category 2

Category 2

Category 1

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

Trichloroethylene Revision Date 14-Jul-2016

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# **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

Trichloroethylene Revision Date 14-Jul-2016

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 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 (CO2)

## **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.

## <u>NFPA</u>

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** Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. **Up** 

	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.

Revision Date 14-Jul-2016 **Trichloroethylene** 

# 8. Exposure controls / personal protection

#### **Exposure Guidelines**

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
Trichloroethylene	TWA: 10 ppm	(Vacated) TWA: 50 ppm	IDLH: 1000 ppm	TWA: 100 ppm
	STEL: 25 ppm	(Vacated) TWA: 270 mg/m <sup>3</sup>		TWA: 535 mg/m <sup>3</sup>
		Ceiling: 200 ppm		STEL: 200 ppm
		(Vacated) STEL: 200 ppm		STEL: 1080 mg/m <sup>3</sup>
		(Vacated) STEL: 1080		_
		mg/m³		
		TWA: 100 ppm		

#### 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

Use only under a chemical fume hood. Ensure adequate ventilation, especially in confined **Engineering Measures** 

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.

Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard **Respiratory Protection** 

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.

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

# 9. Physical and chemical properties

**Physical State** Liquid **Appearance** Colorless Characteristic Odor

**Odor Threshold** No information available

No information available -85 °C / -121 °F **Melting Point/Range** 

**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)

1.460 **Specific Gravity** 

Slightly soluble in water Solubility Partition coefficient; n-octanol/water No data available **Autoignition Temperature** 410 °C / 770 °F

**Decomposition Temperature** > 120°C

0.55 mPa.s (25°C) **Viscosity** 

Trichloroethylene Revision Date 14-Jul-2016

Molecular FormulaC2 H Cl3Molecular Weight131.39

# 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<sub>2</sub>), Carbon dioxide (CO<sub>2</sub>)

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** 

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

No information available

 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	A2	Х	Not listed
1		·	Anticipated			

IARC: (International Agency for Research on Cancer)

IARC: (International

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.

Revision Date 14-Jul-2016 **Trichloroethylene** 

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

No information available **Aspiration hazard** 

delayed

Symptoms / effects,both acute and 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

No information available **Endocrine Disruptor Information** 

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

**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

UN1710 **UN-No** 

**Proper Shipping Name TRICHLOROETHYLENE** 

**Hazard Class** 6.1 **Packing Group** Ш

**TDG** 

**UN-No** UN1710

**Proper Shipping Name** TRICHLOROETHYLENE

**Hazard Class** 6.1 **Packing Group** Ш

IATA

**UN-No** UN1710

**Proper Shipping Name** TRICHLOROETHYLENE

Trichloroethylene Revision Date 14-Jul-2016

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	Χ	Χ	-	201-167-4	-		Χ	Χ	Χ	Χ	Χ

#### 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.
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- P Indicates a commenced PMN substance
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- 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** 

OAKA 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

Trichloroethylene Revision Date 14-Jul-2016

#### **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	14 μg/day	Developmental
		Developmental	50 μg/day	Carcinogen
		Male Reproductive		_

# U.S. State Right-to-Know

Regulations

	Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
ſ	Trichloroethylene	Χ	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
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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 Acros Organics
One Reagent Lane One Reagent Lane
Fair Lawn, NJ 07410 Fair Lawn, NJ 07410

Tel: (201) 796-7100

**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.

Poly(vinyl chloride), high molecular weight

Revision Date 19-Jan-2018

**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

# Fire-fighting measures

**Unsuitable Extinguishing Media** No information available

**Flash Point** 

No information available Method -

**Autoignition Temperature** 

**Explosion Limits** Upper

No data available

435 °C

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.

See Section 12 for additional ecological information. **Environmental Precautions** 

Methods for Containment and Clean No information available.

Up

# 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,	TWA: 1 mg/m <sup>3</sup>			
polymer)				

## 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 StatePowder SolidAppearanceOff-whiteOdorOdorless

Odor Threshold No information available

рΗ

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 TemperatureNo information availableViscosityNo 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** 

Revision Date 19-Jan-2018

**Component Information** 

**Toxicologically Synergistic** No information available

**Products** 

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

No information available Irritation Sensitization No information available

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

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

**Mutagenic Effects** No information available

**Reproductive Effects** No information available. **Developmental Effects** No information available.

**Teratogenicity** No information available.

None known STOT - single exposure STOT - repeated exposure None known

**Aspiration hazard** No information available

Symptoms / effects,both acute and No information available

delayed

**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 class

sified 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				
DOTNot regulatedTDGNot regulatedIATANot regulated					
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,	Х	Χ	-	-	420-490		Χ	Χ	Χ	Х	Χ
polymer)					-3						

#### Legend:

- X Listed
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#### 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 Not applicable

Regulations

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

## **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

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**End of SDS** 

# 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°F. 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 C-1

# REQUIRED FREQUENCY OF HEAT STRESS MONITORING FOR WORKERS IN IMPERMEABLE CLOTHING

Adjusted (2)	Work Time Allowed Before Monitoring
Temperature (°F)	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:

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

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 C-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 °F (after thermometer is under tongue for 3 minutes) 100.6 °F or greater	shorten next work period by 33%  prohibit work in impermeable clothing and shorten next work period by 33%
body weight	<ol> <li>before workday begins (a.m.)</li> <li>after workday ends (p.m.)</li> </ol>	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° 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° 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° F For exposure skin, continuous exposure should not be permitted at or below an ECT of -35° 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° 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 D-1
WINDCHILL CHART

				Actual	thermor	neter Re	eading (°	F)		
	50	40	30	20	10	0	-10	-20	-30	-40
Wind Speed (mph)	Equivalent Temperature ( <sup>0</sup> 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 Danger			Increasing Danger Great Danger				ger		
(Little added effect)	(For properly clothed person) (Danger from freezing of exposed flesh)				sh)					

ATTACHMENT B
<u>ATTACHMENT B</u> COMMUNITY AIR MONITORING PLAN (INCLUDING SPECIAL REQUIREMENTS)

# <u>iPARK 84</u> (FORMER IBM EAST FISHKILL FACILITY)

# <u>BUILDING 330D CREPINI SPACE INTERIOR MODIFICATIONS</u> COMMUNITY AIR MONITORING PLAN (CAMP) WITH SPECIAL REQUIREMENTS

The following Community Air Monitoring Plan (CAMP) is based on NYSDEC's DER-10 Technical Guidance for Site Investigation and Remediation (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 84 Former IBM East Fishkill facility. Special requirements are included in this CAMP as the work will conducted indoors and tenants occupy other parts of the building.

# Overview

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

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

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

# **Qualified Environmental Monitor Responsibilities**

The qualified environmental monitor (QEM) shall be Walden Environmental Engineering, PLLC, 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 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 weekly reports which shall be submitted to NYSDEC and NYSDOH. The weekly reports 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**

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

**Continuous monitoring** will be required for all <u>ground intrusive</u> activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not

limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

**Periodic monitoring** for VOCs will be required during <u>non-intrusive</u> activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

# **VOC Monitoring, Response Levels, and Actions**

Volatile organic compounds (VOCs) 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 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 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring. □
- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted. The source of vapors 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 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown. Work methods and controls will be re-evaluated.

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

# 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 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

All readings must be recorded and be available for State (DEC and DOH) 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.
- If, after implementing dust suppression techniques, downwind PM-10 particulate levels are greater than 150 μg/m³ 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 μg/m³ of the upwind level and in preventing visible dust migration.

# **Additional CAMP Special Requirements**

When work areas are within occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary

negative-pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of sufficient sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels (response actions should also be predetermined). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.
- If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m3, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m3 or less at the monitoring point.

Additionally, the location of all exhaust vents in the room and their discharge points, as well as potential vapor pathways (openings, conduits, etc.) relative to adjoining rooms, should be understood and the monitoring locations established accordingly. In these situations, it is strongly recommended that exhaust fans or other engineering controls be used to create negative air pressure within the work area during remedial activities.

# **Summary**

As noted above, air monitoring activities for the iPark 84 work described in the *Building 330D Crepini Space Trenching and Drainage Installation Work Plan* (Walden, March 11, 2019) will be appropriate for the intrusive activities to be conducted in the Building 330D Crepini space. Therefore, the CAMP and associated special requirements will encompass VOC and particulate monitoring during the indoor work beneath the concrete floor slab. CAMP reports will be submitted to NYSDEC and NYSDOH on a weekly basis during the Building 330D Crepini space intrusive activities work.