LIGHTHOUSE POINTE INLAND EAST

MONROE COUNTY

TOWN OF IRONDEQUOIT, NEW YORK

INTERIM SITE MANAGEMENT PLAN

NYSDEC Site Number: C828212

Prepared for:

Lighthouse Pointe Property Associates LLC

100 S. Clinton Ave., Ste. 2600

Rochester, New York 14604

Prepared by:

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Pittsford, New York

Revisions to Final Approved Site Management Plan:

Revision No.	Date Submitted	Summary of Revision	NYSDEC Approval Date

JANUARY 19, 2026

CERTIFICATION STATEMENT

I, Steven J. Turybury certify that I am currently a NYS Registered Professional Engineer as in defined in 6 NYCRR Part 375 and that this Interim Site Management Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and Green Remediation (DER-31).

Steven J Turybury P.E.

16 January 2026 DATE

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List of Acronyms

BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
bgs	Below ground surface
CAMP	Community Air Monitoring Plan
COC	Certificate of Completion
EC	Engineering Control
EWP	Excavation Work Plan
GWQS	Groundwater Quality Standard
HASP	Health and Safety Plan
IC	Institutional Control
ISMP	Interim Site Management Plan
Marsh	Marsh Engineering DPC
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYCRR	New York Codes, Rules and Regulations
PCBs	Polychlorinated Biphenyls
PCE	Tetrachloroethylene
P.E. or PE	Professional Engineer
PFAS	Per- and Polyfluoroalkyl Substances
PID	Photoionization Detector
PRR	Periodic Review Report
QEP	Qualified Environmental Professional
RAAR	Remedial Alternatives Analysis Report
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
RRSCO	Restricted Residential Soil Cleanup Objective
SCG	Standards, Criteria, and Guidelines
SCO	Soil Cleanup Objective
SMP	Site Management Plan
SVOC	Semivolatile Organic Compounds
TAL	Target Analyte List
TCE	Trichloroethylene
TCL	Target Compound List
USCO	Unrestricted Soil Cleanup Objective
USEPA	United States Environmental Protection Agency
VCA	Voluntary Cleanup Agreement
VOCs	Volatile Organic Compounds

ES EXECUTIVE SUMMARY

The following provides a brief summary of the controls implemented for the Site, as well as the inspections, monitoring, maintenance and reporting activities required by this Interim Site Management Plan (ISMP).

Site Identification: C828212, Lighthouse Pointe Inland East Site

Institutional Controls:	1. The property may be used for restricted residential use
	2. Imposition of an Institutional Control (IC) in the form of an environmental easement that will: • The property may be used for restricted residential use. • All ICs must be inspected at a frequency and in a manner defined in the ISMP • The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Monroe Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department. • Data and information pertinent to site management must be reported at the frequency and in a manner as defined in this ISMP. • All future activities that will disturb contaminated material must be conducted in accordance with this ISMP. • Maintenance, inspection, and reporting of any component of the IC shall be performed as defined in this ISMP. • Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the ISMP. • The potential for vapor intrusion must be evaluated for any buildings developed in the area within the IC boundaries noted on **Figure 2**, and any potential impacts that are identified must be monitored or mitigated. • Vegetable gardens and farming on the site are prohibited; and • An evaluation shall be performed to determine the need for further investigation and remediation should large-scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible.

Site Identification: C828212, Lighthouse Pointe Inland East Site

Institutional Controls (continued):	3. All ICs must be inspected at a frequency and in a manner defined in the ISMP.	
	4. Evaluation of the need for a Vapor Mitigation System if occupied buildings are constructed on the site.	
Engineering Controls:	1. No Engineering Controls (ECs) currently exist	
Inspections:		Frequency
1. Inspection of the existing Site cover (existing conditions; remedy not implemented as of this ISMP). A majority of the Site consists of undeveloped land. The undeveloped portion of the Site consists of grassed/field areas and mature canopy trees. A building occupied by Monroe County Pure Waters is located at 100 Marina Drive, which is located at the southwestern corner of the Site. Inspections of vegetated ground surfaces for disturbances, any paved/hard cover surfaces for damages, or any dumping activities will be included in the Site-wide inspections.		Annually
Monitoring:		
1. Soil Vapor Intrusion Evaluation for New Buildings		As needed, if occupied buildings are constructed
Maintenance:		
1. Maintenance of existing site cover		As needed
Reporting:		
1. Interim Site Inspection Report		Annually

Further descriptions of the above requirements are provided in detail in the latter sections of this ISMP.

1.0 INTRODUCTION

1.1 General

This Interim Site Management Plan (ISMP) for the Lighthouse Point Inland East site located in Irondequoit, New York (hereinafter referred to as the "Site") has been prepared at the request of the New York State Department of Environmental Conservation (NYSDEC) as forwarded in their July 11, 2023 letter correspondence. A Site Location Map is included as **Figure 1**. The Site is currently in the New York State (NYS) Brownfield Cleanup Program (BCP), Site No. C828212, which is administered by NYSDEC.

Lighthouse Pointe Property Associates, LLC entered into a Brownfield Cleanup Agreement (BCA) as a Volunteer on June 11, 2010 with the NYSDEC to remediate the Lighthouse Pointe Site. In June 2015 an Application to Amend the BCA was approved that modified the description of the site. The approved Application to Amend (Index #C828140-04-10) reduced the BCA property by 3.71 acres. In May 2018 an Application to Amend was submitted to amend the June 11, 2010 BCA to exclude certain parcels from the original BCP site (site No. C828141) and create separate BCP sites. The NYSDEC determined that the requested amendment was a major modification to the existing BCA and created two additional BCP sites (Site No. C828211 - Lighthouse Pointe Riverfront North, containing 8.570 acres, and Site #C828212 - Lighthouse Pointe Inland East, containing 5.80 acres) to address the amendment to application. The Lighthouse Pointe Inland East site (Inland East site) location and boundaries of this site is provided in **Figure 2**. The boundaries of the Lighthouse Pointe Inland East site will be more fully described in the metes and bounds site description that is part of the Environmental Easement that will be provided in the final Site Management Plan (SMP), when completed.

A Remedial Alternative Analysis Report (RAAR) has not been completed for the Inland East Site; accordingly, a Decision Document describing the selected remedy for the Site has not been issued. However, in the interim, to protect public health, the NYSDEC has requested that an ISMP be prepared. For the purposes of this ISMP, it is anticipated that the site remedy will include restricted residential use and institutional controls. This assumed remedy is subject to change based on completion of the RAAR and finalization of a Decision Document.

After completion of remedial work, it is anticipated that some contamination will remain at this Site, which is hereafter referred to as "remaining contamination". Engineering Controls (ECs) in the form of a site cover, and Institutional Controls may be incorporated into the site remedy to control exposure to remaining contamination to ensure protection of public health and the environment. An Environmental Easement will be granted to the NYSDEC, and recorded with the Monroe County Clerk, that will require compliance with this ISMP and all ECs and ICs that will be placed on the site at the completion of the remedy.

This ISMP was prepared to manage existing contamination at the Inland East site until a remedy is implemented. At that time a final Site Management Plan (SMP) will be prepared. The SMP will be enforced until the Environmental Easement is extinguished in accordance with ECL Article 71, Title 36. This plan has been approved by the NYSDEC, and

compliance with this plan is required by the grantor of the Environmental Easement and the grantor's successors and assigns. This ISMP may only be revised with the approval of the NYSDEC.

It is important to note that:

- This ISMP details the site-specific implementation procedures that are anticipated to be required by the Environmental Easement. Failure to properly implement the ISMP is a violation of the Environmental Easement, which is grounds for revocation of the Certificate of Completion (COC); and
- Failure to comply with this ISMP is also a violation of Environmental Conservation Law, 6 NYCRR Part 375 and the BCA (Index #C828212-08-20; Site #C828212) for the site, and thereby subject to applicable penalties.

All reports associated with the site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State. A list of contacts for persons involved with the site is provided in **Appendix A** of this ISMP.

This ISMP was prepared by Marsh Engineering, D.P.C (Marsh), on behalf of Lighthouse Pointe Property Associates LLC, in accordance with the requirements of the NYSDEC's DER-10 ("Technical Guidance for Site Investigation and Remediation"), dated May 3, 2010, with latest revised Errata Sheet dated April 9, 2019, and the guidelines provided by the NYSDEC. This ISMP addresses the means for implementing the ICs and/or ECs that are required by the Environmental Easement for the site.

1.2 Revisions and Alterations

Revisions and alterations to this plan will be proposed in writing to the NYSDEC's project manager. The NYSDEC can also make changes to the ISMP or request revisions from the remedial party. Revisions will be necessary upon, but not limited to, the following occurring: a change in media monitoring requirements, upgrades to or shutdown of a remedial system, post-remedial removal of contaminated sediment or soil, or other significant change to the site conditions. All approved alterations must conform with Article 145 Section 7209 of the Education Law regarding the application of professional seals and alterations. For example, any changes to as-built drawings must be stamped by a New York State Professional Engineer. In accordance with the Environmental Easement for the site, the NYSDEC project manager will provide a notice of any approved changes to the ISMP, and append these notices to the ISMP that is retained in its files.

1.3 Notifications

Notifications will be submitted by the property owner, or by their appointed representative, to the NYSDEC, as needed, in accordance with NYSDEC's DER – 10 for the following reasons:

1. 60-day advance notice of any proposed changes in site use that are required under the terms of the BCA, 6 NYCRR Part 375, and/or Environmental Conservation Law.

2. 7-day advance notice of any field activity associated with the remedial program.
3. 15-day advance notice of any proposed ground-intrusive activity pursuant to the Excavation Work Plan (**Appendix B**). If the ground-intrusive activity qualifies as a change of use as defined in 6 NYCRR Part 375, the above mentioned 60-day advance notice is also required.
4. Notice within 48 hours of any damage or defect to the foundation, structures or EC that reduces or has the potential to reduce the effectiveness of an EC, and likewise, any action to be taken to mitigate the damage or defect.
5. Notice within 48 hours of any non-routine maintenance activities.
6. Verbal notice by noon of the following day of any emergency, such as a fire; flood; or earthquake that reduces or has the potential to reduce the effectiveness of ICs in place at the site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
7. Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action submitted to the NYSDEC within 45 days describing and documenting actions taken to restore the effectiveness of the ICs.

Any change in the ownership of the site or the responsibility for implementing this ISMP will include the following notifications:

8. At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser/Remedial Party has been provided with a copy of the BCA, and all approved work plans and reports, including this ISMP.
9. Within 15 days after the transfer of all or part of the site, the new owner's name, contact representative, and contact information will be confirmed in writing to the NYSDEC.

Table 1 presented below includes contact information for the above notifications. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in **Appendix C.**

Table 1: Notifications*

Name	Contact Information	Required Notification**
Mackenzie Rees, P.E.	585-226-5409 Mackenzie.Rees@dec.ny.gov	All Notifications
David Pratt, P.E.	585-226-5449 David.Pratt@dec.ny.gov	All Notifications
Chief, NYSDEC Site Control	518-402-9553 DERSiteControl@dec.ny.gov	Notifications 1 and 8
Ben Caligiuri	518-402-7860 Benjamin.Caligiuri@health.ny.gov	Notifications 3, 4, 6, and 7

* Note: Notifications are subject to change and will be updated as necessary.
** Note: Numbers in this column reference the numbered bullets in the notification list in this section.

2.0 SUMMARY OF PREVIOUS INVESTIGATIONS

2.1 Site Location and Description

The Inland East site is located in Town of Irondequoit, Monroe County, New York and is identified as parcels 47.18-1-7.111 (100 Marina Drive) and 47.18-1-9 (180 Pattonwood Drive) on the Monroe County Tax Map. The Inland East site was formerly a part of a larger site identified as the Inland site. The Inland site was an approximately 25.4-acre area and is generally bounded by an unnamed access road to the Rochester Yacht Club to the north, Pattonwood Drive to the south, a Town of Irondequoit parcel and Timrod Drive to the east, and a boat marina to the west. In May 2018, Lighthouse Pointe Property Associates LLC submitted an application to amend the June 2010 BCA to exclude certain parcels from the original BCP site (site No. C828141) and create separate BCP sites. In December 2020 the application was approved, and the Inland East site (site No. C828212) was created. The Inland East site is approximately 5.80 acres in area. The Inland East site is bounded to the south by Pattonwood Drive, to the west by Marina Drive and the Inland site, and to the north and east by residential properties. The area comprising the Inland East site is shown on **Figure 2**. The boundaries of the site will be more fully described in the Environmental Easement that will be prepared and included in the final SMP. The owner of the site parcel at the time of issuance of this ISMP is included in **Appendix A**.

2.2 Physical Setting

2.2.1 Land Use

The majority of the Inland East site is undeveloped land. The undeveloped portion of the Site consists of grassed/field areas and mature canopy trees. A building occupied by Monroe County Pure Waters is located at 100 Marina Drive, which is located at the southwestern corner of the Site. A figure showing the surface cover materials and location of the Monroe County Pure Water's building is included as **Figure 4**. The following provides a description of both the Inland and Inland East sites, as they were formerly part of the same site.

A railroad roundhouse (a building used by railroads for servicing locomotives) and spurs leading to piers along the east side of the Genesee River were constructed on the Inland Site prior to 1908. The roundhouse and railroad spurs remained on the Inland Site until sometime between 1931 and 1951. Commercial development of the Inland Site took place in the late 1950s and 1960s. The majority of the Inland Site and the Riverfront North Site were used by the City of Rochester as a municipal landfill beginning in the late 1940s. The landfill operations consisted of disposal of residential refuse, ash, slag, sewage sludge, and construction debris. Landfill operations reportedly ceased around 1962 but may have continued as late as 1978. The Inland East site is zoned River Harbor and is currently unoccupied with trees and grass cover.

The properties adjoining the Site and in the neighborhood surrounding the Inland East Site primarily include commercial and residential properties. The properties immediately north, south, and west of the Site include commercial properties; the properties east of the site include residential properties.

2.2.2 Geology

Previous investigations in the Lighthouse Pointe area reported fill material, consisting of municipal solid waste, construction and demolition debris, and dredging spoils ranging in depth from 4 to 26 feet below ground surface (bgs). Native soil encountered below the fill material include, in order of increasing depth: black peat, brown sand and silt, and gray clay, silt, and sand. A Fill Soil Isopach Plan is provided as **Figure 3.** Mapping of the elevation of the bedrock surface in the area shows the bedrock slopes to the west toward the Genesee River at a rate of 0.6 percent, before plunging rapidly to a depth of more than 130 feet bgs in the vicinity of the Colonel O'Rorke Bridge. On the east side of the Inland Site, bedrock is approximately 27.5 feet bgs. Beneath the site, the Queenston Shale is the first to be encountered, but because of the erosion from the Genesee River, the depth to bedrock ranges from approximately 30 to 111.4 feet bgs.

2.2.3 Hydrogeology

The Inland East site has had limited groundwater investigation, only MW-4-05 exists on the site. MW-4-05 was gauged and sampled in 2005 and again in 2009. During both events, there were no detections of volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, or polychlorinated biphenyls (PCBs). Iron was the only metal that exceeded its groundwater standard during the 2009 (i.e., most recent) sampling event.

A groundwater elevation contour map for the entire Lighthouse Pointe site, including the Inland East site, is provided on **Figure 5**.

2.3 Investigation History

A complete history of investigations completed at the Lighthouse Pointe project site was provided in the Phase II Environmental Site Assessment Report ("Phase II") prepared by CDM Smith in June 2013. The Inland East site was formerly part of the entire Lighthouse Pointe Inland site, and as described above, in 2020 was removed to form a separate brownfield site. No subsequent environmental investigations have been completed at the Inland East site; therefore, the investigation history of the Lighthouse Pointe Inland site (which includes the Inland East site) is presented below. Full titles for each of the reports referenced below are provided in Section 8.0 - References.

The following environmental investigations were previously conducted at the Site:

- Between 1990 and 1992, Engineering-Science, Inc. was retained by the NYSDEC to conduct an investigation at the Old Rochester City Landfill to determine whether hazardous wastes or contamination was present within the groundwater and soil at a level posing a potential threat to human health and the environment. This investigation included the following activities and associated results:
    - An electromagnetic survey was conducted to determine the extent of landfilling, possible contaminant plumes, and buried metal objects.

- Seven soil borings were advanced, and 11 composite subsurface samples collected and analyzed for Target Compound List (TCL) VOCs, TCL SVOCs, TCL pesticides, TCL PCBs, Target Analyte List (TAL) metals (including cyanide), and regulated hazardous metals using the Extraction Procedure Toxicity Test analytical methods. The following compounds exceeded NYSDEC TAGM #4046 SCOs: benzene, ethylbenzene, toluene, xylene (total), total VOCs, benzo(a)anthracene, benzo(a)pyrene, bis(2-ethylhexyl)phthalate, dibenzo(a,h)anthracene, di-n-butylphthalate, dieldrin, arsenic, barium, beryllium, cadmium, chromium (total), copper, iron, lead, mercury, nickel, selenium, and zinc.
- Four groundwater monitoring wells were installed and sampled for TCL VOCs, TCL SVOCs, TCL pesticides, TCL PCBs, TAL metals and cyanide. The following compounds exceeded NYSDEC Ambient Water Quality Standards (GWQS) and guidance values (for parameters that do not have standards): benzene, methylene chloride, tetrachloroethene (PCE), trichloroethene (TCE), endrin, total PCBs, barium, iron, lead, magnesium, manganese, mercury, nickel, sodium, and zinc.

- In 1999, the Town retained Passero Associates, P.C. to conduct environmental sampling concurrently with a geotechnical investigation implemented for the construction of Marina Drive. This investigation included advancing nine boreholes and collecting soil samples for toxic characteristic leaching procedure (TCLP) analysis. No exceedances of EPA TCLP criteria were observed.
- In 2005, CRA was retained by Lighthouse Pointe Property Associates to complete a Phase I ESA. The assessment identified several RECs including the following:
  - Historic Landfilling: Historic landfilling occurred onsite from the 1930s to at least 1962, and possibly as late as 1978. Several previous investigations identified the presence of VOCs, SVOCs, pesticides, PCBs, metals, and cyanide in the subsurface soil and VOCs, SVOCs, and metals in the groundwater onsite. Historically, the Site was listed on the New York State Registry of IHWDS; it was eventually delisted due to a lack of evidence pertaining to onsite hazardous waste disposal practices. The Site was later listed on the Hazardous Substance Waste Disposal Site Inventory in 2003, due to an amendment enacting the BCP to include Comprehensive Environmental Response, Compensation, and Liability Act hazardous substances under the definition of hazardous waste. The full nature and extent of the soil and groundwater impacts to the Site associated with the historic landfilling activities have not been defined.
- 2006 Remedial Investigation. The results of the previous investigations resulted in a remedial investigation conducted by CRA in 2005. The objective of the RI was to identify conditions at the Site so that restricted residential or commercial redevelopment could occur under the New York State BCP. The results from the remedial investigation are summarized below.
  - Thirty-one trenches were excavated to investigate the nature and lateral extent of buried landfill waste. All waste material encountered during subsurface

activities was surveyed for gamma radiation using a Victoreen 190 Radiation Monitor. No gamma radiation levels above background were observed.

- Six samples were collected of landfill waste material; the results indicated levels of VOCs, SVOCs, and metals exceeding the NYSDEC TAGM #4046 SCOs.
- Twelve surface soil samples were collected; results indicated levels of SVOCs, metals, and total PCBs exceeding the TAGM #4046 SCOs.
- Six subsurface samples were collected of fill materials; results indicated SVOCs, metals, and total PCBs exceeding the TAGM #4046 SCOs.
- Nine onsite monitoring wells were installed and sampled; results indicated levels of metals exceeding New York State GWQS. One monitoring well sample contained SVOCs above GWQS.
- Soil vapor probes were installed and sampled. Results indicated that several VOCs exceeded EPA generic soil vapor screening criteria for 10^{-5} and 10^{-6} target cancer risk, including TCE, vinyl chloride, and benzene.
- Two surface water samples were collected on the Site. Bis(2-ethylhexyl)phthalate, iron, and thallium exceeded GWQS for drinking water; aluminum and iron exceeded GWQS for Fish Propagation.
- Two sediment samples were collected on the Site. Results indicated exceedances of the TAGM #4046 SCOs for SVOCs and metals.
- Exceedances of SCOs were predominantly in the northern portion of the subject property, north of Pattonwood Drive.
- The results of the remedial investigation identified waste material and fill soil as the primary contaminant sources onsite.

- In 2009, CRA conducted additional characterization at the Site, consisting of hydraulic monitoring, groundwater sampling, soil vapor monitoring and sampling, indoor air sampling at selected residences and buildings near the properties, and additional soil sampling at the Inland Site to determine the potential presence of lead contamination related to historical refinishing of the Stutson Street Bridge. The scope of work and associated results and findings of the additional site characterization included:
  - Groundwater samples collected from the nine existing monitoring wells indicated SVOCs and metals exceeded GWQS. Dieldrin exceeded GWQS in one well (MW-09).
  - Soil vapor sampling results indicated VOCs exceeding EPA generic soil vapor screening criteria for 10^{-5} and 10^{-6} target cancer risk.
  - Lead exceeded SCOs in soil samples.
- In 2012 CDM Smith conducted a Phase II ESA that consisted of a surface geophysical survey to determine the presence of underground anomalies, and advanced 14 soil borings (SB-01, SB-02, SB-03, SB-04, SB-05/SB-06, SB-07, SB-

08, SB-09, SB-10, SB-11, SB-13, SB-15, and SB-16) to obtain lithologic information, characterize soil contamination, and screen for potential impacts. Twenty (20) subsurface soil samples were collected using direct push technology drilling methods. Nine soil vapor sampling points were installed and monitored for methane, carbon monoxide, and oxygen, and sampled for VOCs. A Final Phase II Environmental Assessment Report dated June 10, 2013 was prepared that presented the results from the field activities. Based on the data generated during the Phase II ESA, CDM Smith concluded that SVOCs and metals existed in the subsurface along the East and North sides of the Site along the Genesee River at concentrations above NYSDEC Restricted Residential Use SCOs. Concentrations are generally similar or lower than those detected during the 2006 RI and previous ESAs. Soil vapors are present in the subsurface soils; VOCs are most prevalent and at the highest concentrations located offsite along Timrod Road and at SB-05/SB-06 located in a mounded area of a former landfill. The TCE concentration detected in one soil vapor sample also exceeded the NYSDEC screening level.

2.4 Remedial Action Objectives

The following activities have not been completed for the Inland East site:

- An RAAR specific to the Inland East site has not been completed; a draft RAAR for the Inland site (that formerly included the area now defined as the Inland East site) exists but was not submitted to NYSDEC.
- A Decision Document has not been prepared by the NYSDEC.

Based on the request by the NYSDEC to prepare an ISMP for the Inland East site, draft/interim Remedial Action Objectives (RAOs) are presented for the purposes of this ISMP. These RAOs are subject to change during preparation of the RAAR and the Decision Document.

The proposed draft/interim RAOs are as follows:

2.4.1 Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.

RAOs for Environmental Protection

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

2.4.2 Soil

RAOs for Public Health Protection

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

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.
- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

2.4.3 Soil Vapor

RAOs for Public Health Protection

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

2.5 Remaining Contamination

This section presents a summary of the contamination that exists at the Inland East site. As mentioned above, only a limited number of soil and groundwater samples have been collected from the Inland East site. These samples include the following:

Groundwater: MW-4-05 (2005 and 2009)

Surface Soil: SV-11 (2005)

Subsurface Soil: MW-4-05 (2009) and SB-10 (2013)

Soil Vapor: SG-04 (2012)

Figures that show the sampling locations and locations of exceedances of Unrestricted Soil Cleanup Objectives ("USCOs") and Restricted Residential Soil Cleanup Objectives ("RRSCOs") are provided in **Appendix C**. Tables summarizing the analytical data that also compare the data to USCOs and RRSCOs are presented in **Appendix D**. Samples collected from the Inland East Site are highlighted in the tables. For completeness, figures and tables showing the sampling locations and results also include data collected from Inland Site (Site #C828141). A final summary of the remaining contamination at the Inland East Site will be included in the Site Management Plan after completion of the remedial action.

2.5.1 Soil

No surface soil samples have been collected from the Inland East Site; however, one surface soil sample (SV-11) located adjacent to the Site was collected for laboratory analysis in October 2005. No VOCs, SVOCs, pesticides, or PCBs were reported above TAGM 4046 Recommended Soil Cleanup Objectives or TAGM 4046 Recommended Soil Cleanup Objectives for the Protection of Groundwater. Five metals (Beryllium, Total Chromium, Iron, Mercury, and Zinc) were reported at concentrations exceeding their respective TAGM 4046 Recommended Soil Cleanup Objectives.

No exceedances of the USCOs or RRSCOs in subsurface soil samples were reported for VOCs, SVOCs, or Metals on the Inland East Site or from SB-11 and SB-13 located adjacent to the Inland East Site. One soil boring (SB-10) was installed within the Inland East Site in 2012; however, no samples were collected for laboratory analysis.

2.5.2 Groundwater

The Inland East Site has had limited groundwater investigation, only MW-4-05 exists on the Site. MW-4-05 was sampled in 2005 and again in 2009. During both events, there were no detections of VOCs, SVOCs, pesticides, or PCBs. Iron was the only metal that exceeded its groundwater standard during the 2009 (i.e., most recent) sampling event. **Figure 2** shows the location of MW-4-05; tables that summarize the results of the groundwater sampling are included in **Appendix D**.

2.5.3 Soil Vapor

No soil vapor samples were collected for laboratory analyses from the Inland East Site.

3.0 INSTITUTIONAL CONTROL PLAN

3.1 General

Since remaining contamination exists at the Site, Institutional Controls (ICs) are required prior to implementing a Site remedy to protect human health and the environment. No ECs currently exist at the Site. This IC Plan describes the procedures for the implementation and management of all ICs at the Site. The IC Plan is one component of the ISMP and is subject to revision by the NYSDEC project manager.

This plan provides:

- A description of all ICs on the Site;
- The basic implementation and intended role of each IC;
- A description of the key components of the ICs anticipated to be set forth in the Environmental Easement (when completed);
- A description of the controls to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of ICs, such as the implementation of the Excavation Work Plan ("EWP") (as provided in **Appendix B**) for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment on the Site.
- Any other provisions necessary to identify or establish methods for implementing the IC, as determined by the NYSDEC project manager.

3.2 Institutional Controls

A series of ICs is anticipated to be required by the Decision Document to: (1) implement, maintain and monitor Engineering Control systems; (2) prevent future exposure to remaining contamination; and (3) limit the use and development of the Site to restricted residential uses only. Adherence to these ICs on the Site will be required by the Environmental Easement (when completed) and in the interim will be implemented under this ISMP. ICs identified in the Environmental Easement may not be discontinued without

an amendment to or extinguishment of the Environmental Easement. The anticipated IC boundaries are shown on **Figure 2**. These ICs are anticipated to include:

- The property may be used for restricted residential use;
- All ICs must be inspected at a frequency and in a manner defined in the ISMP;
- The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Monroe Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department;
- Data and information pertinent to Site management must be reported at the frequency and in a manner as defined in this ISMP;
- All future activities that will disturb contaminated material must be conducted in accordance with this ISMP;
- Maintenance, inspection, and reporting of any component of the IC shall be performed as defined in this ISMP;
- Access to the Site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the ISMP;
- The potential for vapor intrusion must be evaluated for any buildings developed in the area within the IC boundaries noted on **Figure 2**, and any potential impacts that are identified must be monitored or mitigated.
- Vegetable gardens and farming on the Site are prohibited; and
- An evaluation shall be performed to determine the need for further investigation and remediation should large scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible.

Access to the Site will be restricted under this ISMP by installing signage restricting trespassing and requiring proper PPE for those approved to enter the Site.

3.3 Engineering Controls

No engineering controls currently exist at the Site. An engineering control in the form of a Site cover is anticipated to be required when the RAAR and Decision Document are finalized for the Inland East Site.

In the event that intrusive activities occur prior to the finalization of a Decision Document for the Site, an EWP is included as **Appendix B.** Any work pursuant to the EWP, will follow the procedures listed in the Community Air Monitoring Plan ("CAMP") included in **Appendix E**, and the Health and Safety Plan ("HASP") prepared for the Site included as **Appendix F.**

4.0 MONITORING PLAN

4.1 General

This Monitoring Plan describes the measures for evaluating the condition of the Site prior to implementing the Site remedy. This Monitoring Plan may only be revised with the approval of the NYSDEC project manager.

This Monitoring Plan describes the methods to be used for:

- Evaluating Site information periodically to confirm that the current Site conditions have not changed and are effective in protecting public health and the environment;

To adequately address these issues, this Monitoring Plan provides information on:

- Inspection and maintenance requirements for the existing Site cover;
- Annual inspection and periodic certification.

Reporting requirements are provided in Section 7.0 of this ISMP.

4.2 Site–Wide Inspection

Site-wide inspections will be performed annually or at a minimum of once per year. These periodic inspections must be conducted when the ground surface is visible (i.e. no snow cover). Site-wide inspections will be performed by an environmental professional reporting directly to a Qualified Environmental Professional. Modification to the frequency or duration of the inspections will require prior approval from the NYSDEC project manager. Site-wide inspections will also be performed after all severe weather conditions that may affect ECs and ICs. During these inspections, observations will be documented on the inspection forms located in **Appendix G**. The information included in the inspection forms will compile sufficient information to assess the following:

- Compliance with all ICs, including Site usage;
- An evaluation of the condition and continued effectiveness of ICs;
- The Site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection;
- General Site conditions at the time of the inspection (e.g. documenting that the Site cover is in good condition, any changes in the condition of the Site, any pooling of water, etc.);

A comprehensive Site-wide inspection will be conducted and documented according to the ISMP schedule. The inspections will determine and document the following:

- If the IC controls continue to be protective of human health and the environment;
- Compliance with requirements of this ISMP and the Environmental Easement (when completed).

Reporting requirements are outlined in **Section 7.0** of this plan.

Inspections will also be performed in the event of an emergency. If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs that reduces or has the potential to reduce the effectiveness of ECs in place at the Site, verbal notice to the NYSDEC project manager must be given by noon of the following day. In addition, an inspection of the Site will be conducted within 5 days of the event to verify the effectiveness of the IC/ECs implemented at the Site by a qualified environmental professional, as defined in 6 NYCCR Part 375. Written confirmation must be provided to the NYSDEC project manager within 7 days of the event that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public. The remedial party will submit follow-up status reports to the NYSDEC within 45 days of the event on actions taken to respond to any emergency event requiring ongoing responsive action, describing and documenting actions taken to restore the effectiveness of the ECs.

4.2.1 Monitoring Protocol

All monitoring activities will be recorded in a field book.

5.0 OPERATION AND MAINTENANCE PLAN

5.1 General

The Site remedy does not rely on any mechanical systems, such as groundwater treatment systems, sub-slab depressurization systems or air sparge/soil vapor extraction systems to protect public health and the environment. Therefore, the operation and maintenance of such components is not included in this ISMP. However, maintaining Site access controls and department notification and providing the department access to the Site and O&M records is required to ensure proper Site cover maintenance.

6.0 PERIODIC ASSESSMENTS/EVALUATIONS

6.1 Climate Change Vulnerability Assessment

Increases in both the severity and frequency of storms/weather events, an increase in sea level elevations along with accompanying flooding impacts, shifting precipitation patterns and wide temperature fluctuation, resulting from global climactic change and instability, have the potential to significantly impact the performance, effectiveness and protectiveness of a given site and associated remedial systems. Vulnerability assessments provide information so that the site and associated remedial systems are prepared for the impacts of the increasing frequency and intensity of severe storms/weather events and associated flooding.

A vulnerability assessment will be included in the final SMP after implementation of the Site remedy.

6.2 Green Remediation Evaluation

NYSDEC's DER-31 Green Remediation requires that green remediation concepts and techniques be considered during all stages of the remedial program including site management, with the goal of improving the sustainability of the cleanup and summarizing

the net environmental benefit of any implemented green technology. This section of the ISMP provides a summary of any green remediation evaluations to be completed for the site during site management, and as reported in the Periodic Review Report (PRR).

The remedy for the Site is anticipated to include the Site cover, and potentially vapor mitigation if occupied buildings are constructed at the Site. As of the writing this ISMP, the remedy has not been implemented and; therefore, under the existing conditions, the Site does not generate waste, use energy, generate emissions, or use water. As a result, a green remediation evaluation is not required as part of this ISMP.

7.0 REPORTING REQUIREMENTS

7.1 Site Management Reports

All Site management inspection, maintenance and monitoring events will be recorded on a Site Inspection Form, located in **Appendix G**. All Site management inspection and maintenance events will be conducted by a qualified person who reports directly to a Qualified Environmental Professional.

All applicable inspection information, forms, or other records generated for the Site during the reporting period will be provided in electronic format to the NYSDEC in accordance with the requirements of **Table 2** and summarized in the Periodic Review Report.

Table 2: Schedule of Interim Monitoring/Inspection Reports

Task/Report	Reporting Frequency*
Interim Site Inspection Reports	Annually, or as otherwise determined by the NYSDEC

* The frequency of events will be conducted as specified until otherwise approved by the NYSDEC project manager.

All interim inspection reports will include, at a minimum:

- Date of event or reporting period;
- Name, company, and position of person(s) conducting inspection activities;
- Descriptions of the activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet);
- Any observations, conclusions, or recommendations; and
- A determination as to whether Site conditions have changed since the last reporting event.

Routine maintenance event reporting forms will include, at a minimum:

- Date of event;
- Name, company, and position of person(s) conducting maintenance activities;
- Description of maintenance activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and
- Other documentation such as copies of invoices for maintenance work, etc., (attached to the checklist/form).

Non-routine maintenance event reporting forms will include, at a minimum:

- Date of event;
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Description of non-routine activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet); and
- Other documentation such as copies of invoices for repair work, etc. (attached to the checklist/form).

Data will be reported in digital format as determined by the NYSDEC. Currently, data is to be supplied electronically and submitted to the NYSDEC EQuIS^{TM} database in accordance with the requirements found at this link:

http://www.dec.ny.gov/chemical/62440.html.

7.1.1 Certification of Institutional Controls

At the end of each certifying period, as determined by the NYSDEC project manager, a qualified environmental professional as defined in 6 NYCRR Part 375 or Professional Engineer licensed to practice and registered in New York State will prepare the following certification will be provided to the NYSDEC project manager:

"For each institutional control identified for the site, I certify that all of the following statements are true:

- *The institutional control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;*
- *Nothing has occurred that would impair the ability of the control to protect the public health and environment;*
- *Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;*

- *Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;*
- *If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;*
- *Use of the site is compliant with the environmental easement.*
- *The information presented in this report is accurate and complete.*

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, Steven Turybury, of Marsh Engineering D.P.C, am certifying as Owner's Designated Site Representative for the site."

7.2 Periodic Review Report

It is anticipated that a PRR will be submitted to the NYSDEC project manager beginning sixteen (16) months after the Site remedy has been completed and a Certificate of Completion or equivalent document e.g., Satisfactory Completion Letter, is issued. The PRR requirements will be defined in the SMP after completion of the Site remedy.

8.0 REFERENCES

6 NYCRR Part 375, Environmental Remediation Programs. December 14, 2006.

NYSDEC DER-10 – "Technical Guidance for Site Investigation and Remediation".

NYSDEC, 1998. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1. June 1998 (April 2000 addendum).

2005, Phase I Environmental Site Assessment on Lighthouse Pointe Property, Conestoga Rovers and Associates for Lighthouse Pointe Property Associates.

2006, Remedial Investigation on Lighthouse Pointe Property, Conestoga Rovers and Associates for Lighthouse Pointe Property Associates.

2009, Additional Characterization Investigation Results for Lighthouse Pointe Property, Conestoga Rovers and Associates for Lighthouse Pointe Property Association.

June 10, 2013, Phase II Environmental Site Assessment Report, Lighthouse Pointe Site Targeted Brownfields Assessment, City of Rochester and Town of Irondequoit, New York, CDM Smith for USEPA.

6 NYCRR Part 375, Environmental Remediation Programs. December 14, 2006.

NYSDEC DER-10 – “Technical Guidance for Site Investigation and Remediation”.

NYSDEC, 1998. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1. June 1998 (April 2000 addendum).

FIGURES

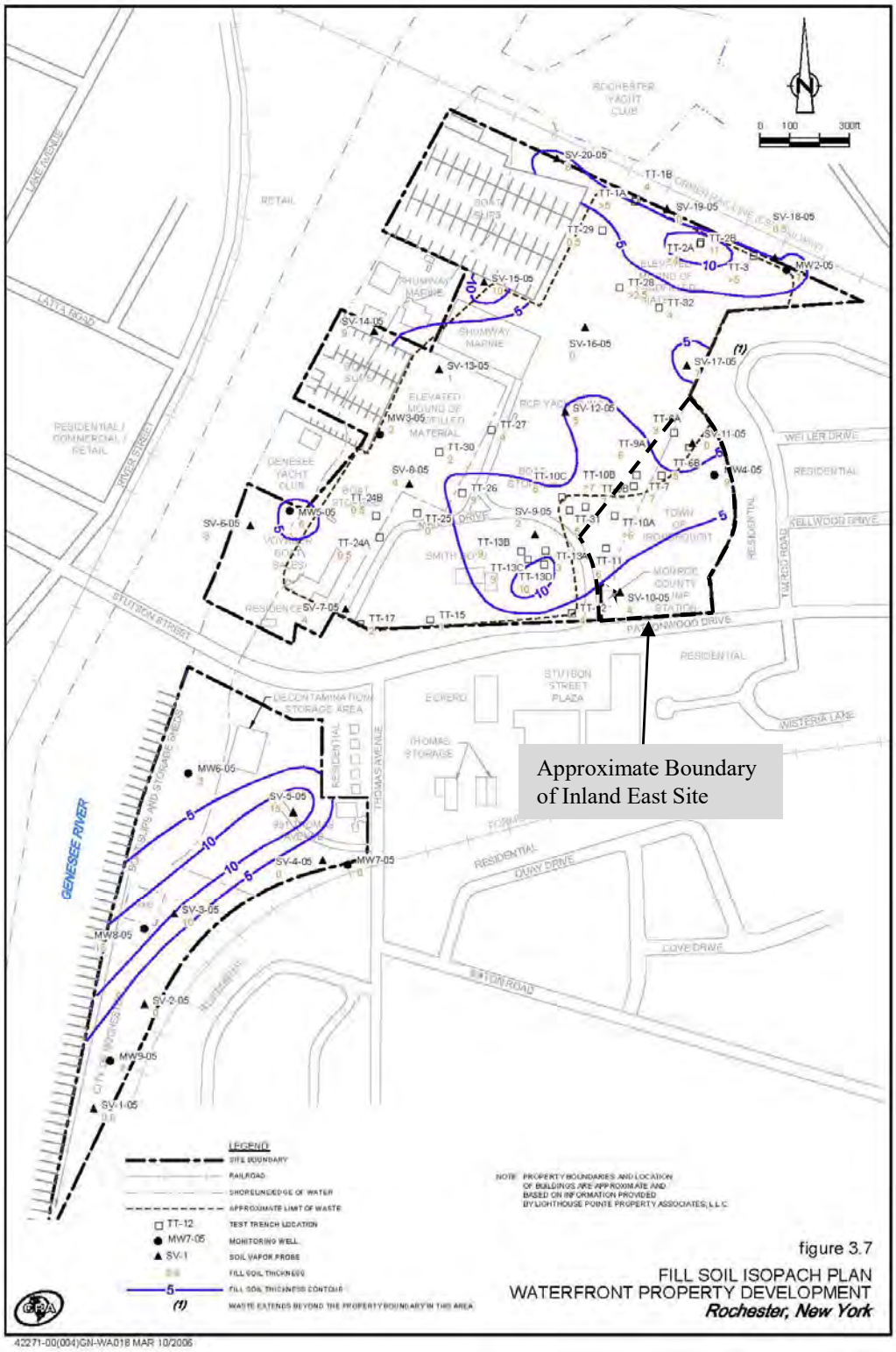
N

Title:	Site Location Map Inland East Site Irondequoit, New York
Prepared For:	Lighthouse Pointe Property Associates LLC 100 South Clinton Avenue, Rochester, New York 14604

MARSH ENGINEERING D.P.C.
Marsh Engineering D.P.C.
271 Marsh Road-Suite 2
Pittsford, New York 14534
(585) 248-2413
Fax (585) 248-2834

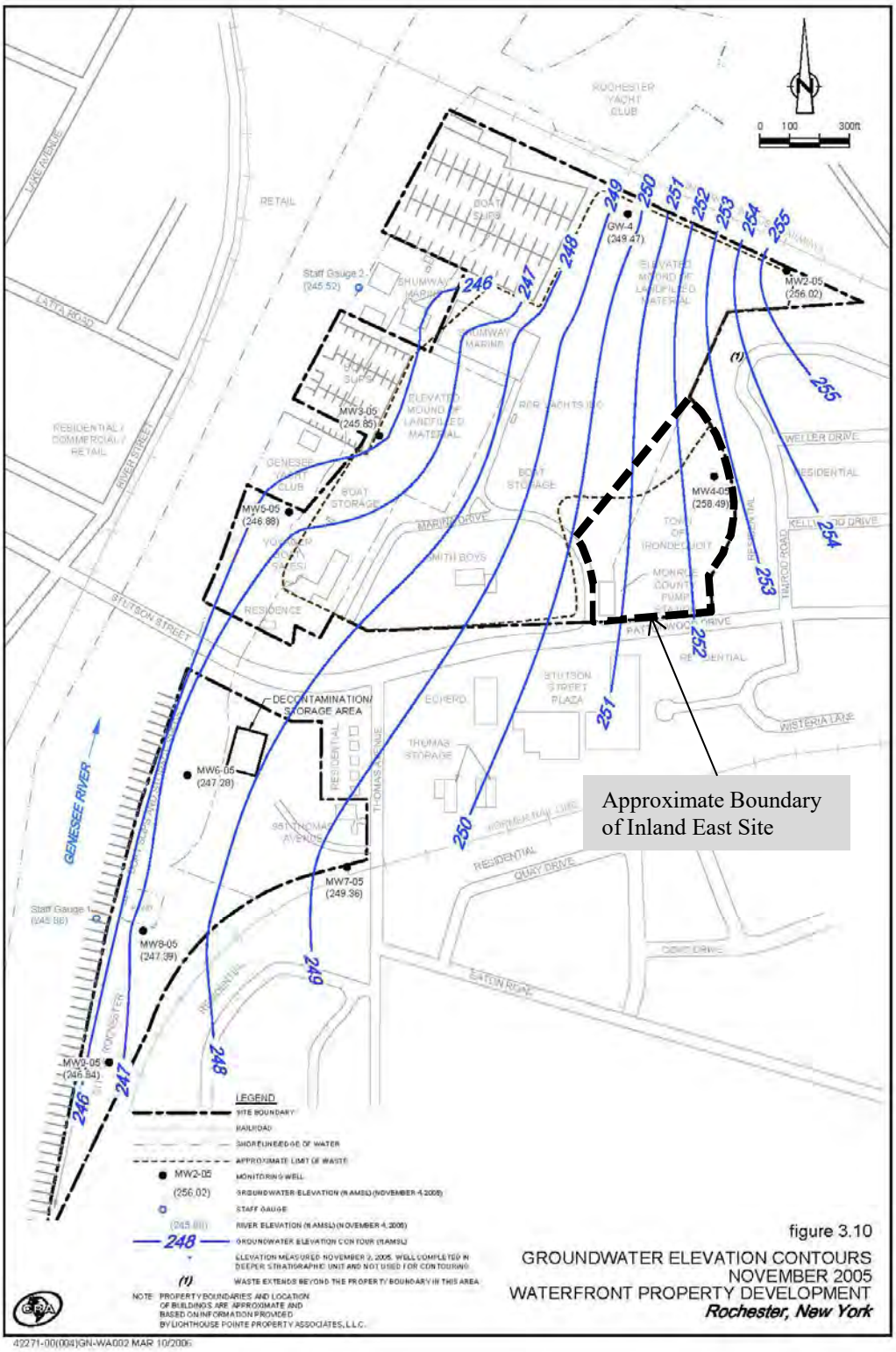
Project	776.002
Date	December 2025
Scale	Not to Scale
Drawn	BWA
Checked	MPR
File Name	Site Location Map
Figure	1

Title: Inland East Site Map Irondequoit, New York	MARSH ENGINEERING D.P.C. Marsh Engineering D.P.C. 271 Marsh Road-Suite 2 Pittsford, New York 14534 (585) 248-2413 Fax (585) 248-2834	Project 776.002A Date 3/30/2021 Scale NTS	BWA Checked MPR File Name Site Location	Figure 2
Prepared For: Lighthouse Pointe Property Associates LLC 100 South Clinton Avenue, Rochester, New York 14604				



Title: Fill Soil Isopach Plan, CRA 2006 Lighthouse Pointe Inland Site	MARSH ENGINEERING D.P.C.	Project 776.002 Date 1/5/2026 Scale Not To Scale	Drawn BWA Checked MPR File Name Fill Map	Figure 3
Prepared For: Lighthouse Pointe Property Associates LLC 100 South Clinton Avenue, Rochester, New York 14604	Marsh Engineering, D.P.C 271 Marsh Road-Suite 2 Pittsford, New York 14534 (585) 248-2413 Fax (585) 248-2834			

Title: Surface Materials Figure Inland East Site	MARSH ENGINEERING D.P.C. Marsh Engineering D.P.C. 271 Marsh Road-Suite 2 Pittsford, New York 14534 (585) 248-2413 Fax (585) 248-2834	Project 776.002A Date 3/30/2021 Scale NTS	BWA Checked MPR File Name Site Location	Figure 4
Prepared For: Lighthouse Pointe Property Associates LLC 100 South Clinton Avenue, Rochester, New York 14604				



Title: Groundwater Elevation Contours, CRA 2006 Lighthouse Pointe Inland Site	MARSH ENGINEERING D.P.C. Marsh Engineering D.P.C. 271 Marsh Road-Suite 2 Pittsford, New York 14534 (585) 248-2413 Fax (585) 248-2834	Project: 776.002A Date: 3/30/2021 Scale: See Scale Bar	Drawn: PVS Checked: MPR File Name: Figure 4	Figure: 5
Prepared For: Lighthouse Pointe Property Associates LLC 100 South Clinton Avenue Rochester, New York 14604				

APPENDIX A – LIST OF SITE CONTACTS

Name	Phone/Email Address
Site Owner: Town of Irondequoit Attn. Michelle Nichols	 336-6017 mnichols@irondequoit.gov
Remedial Party: Charles Morgan, Lighthouse Pointe	(585) 330-7501 cdmorgan70@aol.com
Qualified Environmental Professional: Michael Rumrill	585-248-2413 mrumrill@leaderlink.com
Remedial Engineer: Steven Turybury, P.E.	585-248-2413 sturybury@leaderlink.com
NYSDEC DER Project Manager: Mackenzie Rees, P.E.	585-226-226-5409 Mackenzie.Rees@dec.ny.gov
NYSDEC DER Project Manager's Supervisor: David Pratt, P.E.	585-226-5449 David.Pratt@dec.ny.gov
NYSDOH Project Manager: Ben Caligiuri	518-402-7860 Benjamin.Caligiuri@health.ny.gov
Adjacent property owner: Skip Shumway	(585) 342-3030 skip@shumwaymarine.com
Remedial Party Attorney: Alan J. Knauf	585-546-8430 aknauf@nyenvlaw.com

APPENDIX B – EXCAVATION WORK PLAN (EWP)

B-1 NOTIFICATION

It is not anticipated that excavation of soil will be conducted prior to implementing the site remedy; however, if an unforeseen need occurs, an EWP is included in this ISMP and presented below.

Note, if excavation becomes necessary while this ISMP is in effect, a site and task-specific Health and Safety Plan (HASP) will be required.

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, or breach or alter the site's existing cover materials, the site owner or their representative will notify the NYSDEC contacts listed in the table below. **Table B-1** includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in **Appendix A**.

Table B-1: Notifications*

Mackenzie Rees, P.E.	585-226-5409 Mackenzie.Rees@dec.ny.gov
David Pratt, P.E.	585-226-5449 David.Pratt@dec.ny.gov
Chief, NYSDEC Site Control	518-402-9553 DERSiteControl@dec.ny.gov
Ben Caligiuri	518-402-7860 Benjamin.Caligiuri@health.ny.gov

* Note: Notifications are subject to change and will be updated as necessary.

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent of excavation, plans/drawings for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated, any modifications of truck routes, and any work that may impact an engineering control;
- A summary of environmental conditions anticipated to be encountered in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;

- A schedule for the work, detailing the start and completion of all intrusive work, and submittals (e.g., reports) to the NYSDEC documenting the completed intrusive work;
- A summary of the applicable components of this EWP;
- A statement that the work will be performed in compliance with this EWP, 29 CFR 1910.120 and 29 CFR 1926 Subpart P;
- A copy of the contractor's HASP, in electronic format;
- Identification of disposal facilities for potential waste streams; and
- Identification of sources of any anticipated backfill, along with the required request to import form and all supporting documentation including, but not limited to, chemical testing results.

The NYSDEC project manager will review the notification and may impose additional requirements for the excavation that are not listed in this EWP. The alteration, restoration and modification of Institutional Controls (ICs) must conform with Article 145 Section 7209 of the Education Law regarding the application professional seals and alterations.

The CAMP will be followed during all ground intrusive work. Readings from the CAMP instruments will be provided to the NYSDEC and the NYSDOH's Project Managers weekly at a minimum. Any CAMP exceedances will be reported to the NYSDEC and NYSDOH project manager's the same day or the following business day if after hours, along with the reason for the exceedance, what was done to correct it, and if the corrective action was effective. Appendix 1B of the NYSDEC's DER-10/Technical Guidance for Site Investigation and Remediation provides guidance for techniques to control fugitive dust and particulates during construction activities.

B-2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based (e.g. photoionization detector) soil screening will be performed during all excavations into known or potentially contaminated material (remaining contamination) or a breach of the cover system. An environmental professional working directly for a Qualified Environmental Professional (QEP) will perform the screening. Soil screening will be performed when invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work.

Soil will be segregated based on previous environmental data and screening results into material that requires off-site disposal and material that requires testing to determine if the material can be reused on-site as soil beneath a cover or if the material can be used as cover soil. Further discussion of off-site disposal of materials and on-site reuse is provided in Section B-6 of this Appendix.

B-3 SOIL STAGING METHODS

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by the NYSDEC.

B-4 MATERIALS EXCAVATION AND LOAD-OUT

A qualified environmental professional as defined in 6 NYCRR Part 375, a P.E. who is licensed and registered in New York State, or a qualified person who directly reports to a P.E. who is licensed and registered in New York State will oversee (i.e. be on-site) all invasive work and the excavation and load-out of all excavated material.

The owner of the property and remedial party (if applicable) and its contractors are responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this ISMP is posed by utilities or easements on the site. A site utility stakeout will be completed for all utilities prior to any ground intrusive activities at the site.

Loaded vehicles leaving the site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements). Trucks transporting contaminated soil must have either tight-fitting opaque covers that are secured on the sides and/or back, or opaque covers that are locked on all sides.

A truck wash will be operated on-site, as appropriate. An environmental professional will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the site until the activities performed under this section are complete. Truck wash waters will be collected and disposed of off-site at a permitted facility in an appropriate manner.

Locations where vehicles enter or exit the site shall be inspected daily for evidence of off-site soil tracking.

The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials. Material accumulated from the street cleaning and egress cleaning activities will

be disposed off-site at a permitted landfill facility in accordance with all applicable local, State, and Federal regulations.

B-5 MATERIALS TRANSPORT OFF-SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the site will be secured with either tight-fitting opaque covers that are secured on the sides and/or back, or opaque covers that are locked on all sides. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

All trucks loaded with site materials will exit the vicinity of the site using only pre-approved truck routes. The most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport. It is anticipated that trucks will transport site materials off-site to the Waste Management – High Acres Landfill & Recycling Center (High Acres) located at 425 Perinton Parkway, in the Town of Fairport, Monroe County, New York. The route from the Site to High Acres for materials off-Site disposal is shown on **Attachment B-1**. If laboratory analyses indicates that alternative disposal facilities are required, or are more appropriate, **Attachment B-1** and the route description will be modified.

Trucks will be prohibited from stopping and idling in the neighborhood outside the project site.

Egress points for truck and equipment transport from the site will be kept clean of dirt and other materials during site remediation and development. See Section (B-4) Material Excavation and Load-Out for additional information and see Section (B-6) Materials Disposal Off-site for additional information regarding disposal.

Queuing of trucks will be performed on-site to minimize off-site disturbance. Off-site queuing will be prohibited.

B-6 MATERIALS DISPOSAL OFF-SITE

All material excavated and removed from the site will be treated as contaminated and regulated material and will be transported and disposed off-site in a permitted facility in accordance with all local, State and Federal regulations. If disposal of material from this site is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC project manager. Unregulated off-site management of materials from this site will not occur without prior formal NYSDEC project manager approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, (e.g. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C&D debris recovery facility). Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Interim Site Inspection Report. This documentation will include, but will not be limited to: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled consistent with 6 NYCRR Parts 360, 361, 362, 363, 364 and 365. Material that does not meet Unrestricted SCOs is prohibited from being taken to a New York State C&D debris recovery facility (6 NYCRR Subpart 360-15 registered or permitted facility).

B-7 MATERIALS REUSE ON-SITE

The qualified environmental professional, as defined in 6 NYCRR Part 375, will ensure that procedures defined for materials reuse in this ISMP are followed and that unacceptable material (i.e. contaminated) does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for reuse on-site will be placed below the demarcation layer or impervious surface, and will not be reused within the cover system or within landscaping berms. Contaminated on-site material may only be used beneath the site cover as backfill for subsurface utility lines with prior approval from the DEC project manager.

Proposed materials for reuse on-site must be sampled for full suite analytical parameters including per- and polyfluoroalkyl substances (PFAS) and 1,4-dioxane. The sampling frequency will be in accordance with DER-10 Table 5.4(e)10 unless prior approval is obtained from the NYSDEC project manager for modification of the sampling frequency. The analytical results of soil/fill material testing must meet the site use criteria presented in NYSDEC DER-10 Appendix 5 – Allowable Constituent Levels for Imported Fill or Soil for all constituents listed, and the NYSDEC Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances, April 2023 (or date of current version, whichever is later) guidance values. Approvals for modifications to the analytical parameters must be obtained from the NYSDEC project manager prior to the sampling event.

Soil/fill material for reuse on-site will be segregated and staged as described in **Sections B-2** and **B-3** of this EWP. The anticipated size and location of stockpiles will be provided in the 15-day notification to the NYSDEC project manager. Stockpile locations will be based on the location of site excavation activities and proximity to nearby site features. Material reuse on-site will comply with requirements of NYSDEC DER-10 Section 5.4(e)4. Any modifications to the requirements of DER-10 Section 5.4(e)4 must be approved by the NYSDEC project manager prior to reuse on-site.

B-8 FLUIDS MANAGEMENT

All liquids to be removed from the site, including but not limited to, excavation dewatering, decontamination waters and groundwater monitoring well purge and development waters,

will be handled, transported and disposed off-site at a permitted facility in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the site, and will be managed off-site at a permitted facility, unless prior approval is obtained from NYSDEC.

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a SPDES permit.

B-9 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities under this ISMP, the existing soil cover will be restored to pre-existing conditions. A demarcation layer, consisting of orange snow fencing material, white geotextile or equivalent material, etc. will be placed to provide a visual reference to the top of the remaining contamination zone, the zone that requires adherence to special conditions for disturbance of remaining contaminated soil defined in this ISMP. If the type of existing soil cover changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), this will constitute a modification of the site existing cover. A figure showing the modified surface will be included in the subsequent Interim Site Inspection Report and in an updated SMP.

B-10 BACKFILL FROM OFF-SITE SOURCES

All materials proposed for import onto the site will be approved by the qualified environmental professional, as defined in 6 NYCRR Part 375, and will be in compliance with provisions in this ISMP prior to receipt at the site. A Request to Import/Reuse Fill or Soil form, which can be found at http://www.dec.ny.gov/regulations/67386.html, will be prepared and submitted to the NYSDEC project manager allowing a minimum of 5 business days for review. A copy of the form is included as **Attachment B-2**.

Material from industrial sites, spill sites, other environmental remediation sites, or potentially contaminated sites will not be imported to the site.

All imported soil will meet the backfill and cover soil quality standards established in 6 NYCRR 375-6.7(d) and DER-10 Appendix 5 for restricted residential use. Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards are listed in DER-10, Table 5.4(e). Soil that meet 'general' fill requirements under 6 NYCRR Part 360.13, but do not meet backfill or cover soil objectives for this site, will not be imported onto the site without prior approval by NYSDEC project manager. Soil material will be sampled for the full suite of analytical parameters, including PFAS and 1, 4-dioxane. Sampling frequency will be in accordance with DER-10 Table 5.4(e)10 unless prior approval is obtained from the NYSDEC project manager for modification of the sampling frequency. Solid waste will not be imported onto the site.

Trucks entering the site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

B-11 STORMWATER POLLUTION PREVENTION

Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by the NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the ISMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

Silt fencing or hay bales will be installed around the entire perimeter of the construction area.

B-12 EXCAVATION CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition. The NYSDEC project manager will be promptly notified of the discovery.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for a full list of analytes [TAL metals, TCL volatiles and semi-volatiles (including 1,4-dioxane), TCL pesticides and PCBs, and PFAS], unless the site history and previous sampling results provide sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC project manager for approval prior to sampling. Any tanks will be closed as per NYSDEC regulations and guidance.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone within two hours to NYSDEC’s Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the Interim Site Inspection Report.

B-13 COMMUNITY AIR MONITORING PLAN

The NYSDOH Generic Community Air Monitoring Plan ("CAMP") is included as **Appendix E**. The CAMP includes both VOC and dust monitoring requirements. Provisions of the CAMP will be required during any intrusive activities at the site.

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

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

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

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

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

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

planned work be implemented during hours (e.g. weekends or evenings) when building occupancy is at a minimum.

B-14 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-site. If nuisance odors are identified at the site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. The NYSDEC and NYSDOH project managers will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the remedial party's Remediation Engineer, and any measures that are implemented will be discussed in the Interim Site Inspection Report.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soil. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

B-15 DUST CONTROL PLAN

Particulate monitoring must be conducted according to the CAMP provided in Section B-13. If particulate levels at the site exceed the thresholds listed in the CAMP or if airborne dust is observed on the site or leaving the site, the dust suppression techniques listed below will be employed. The remedial party will also take measures listed below to prevent dust production on the site.

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved using a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

B-16 OTHER NUISANCES

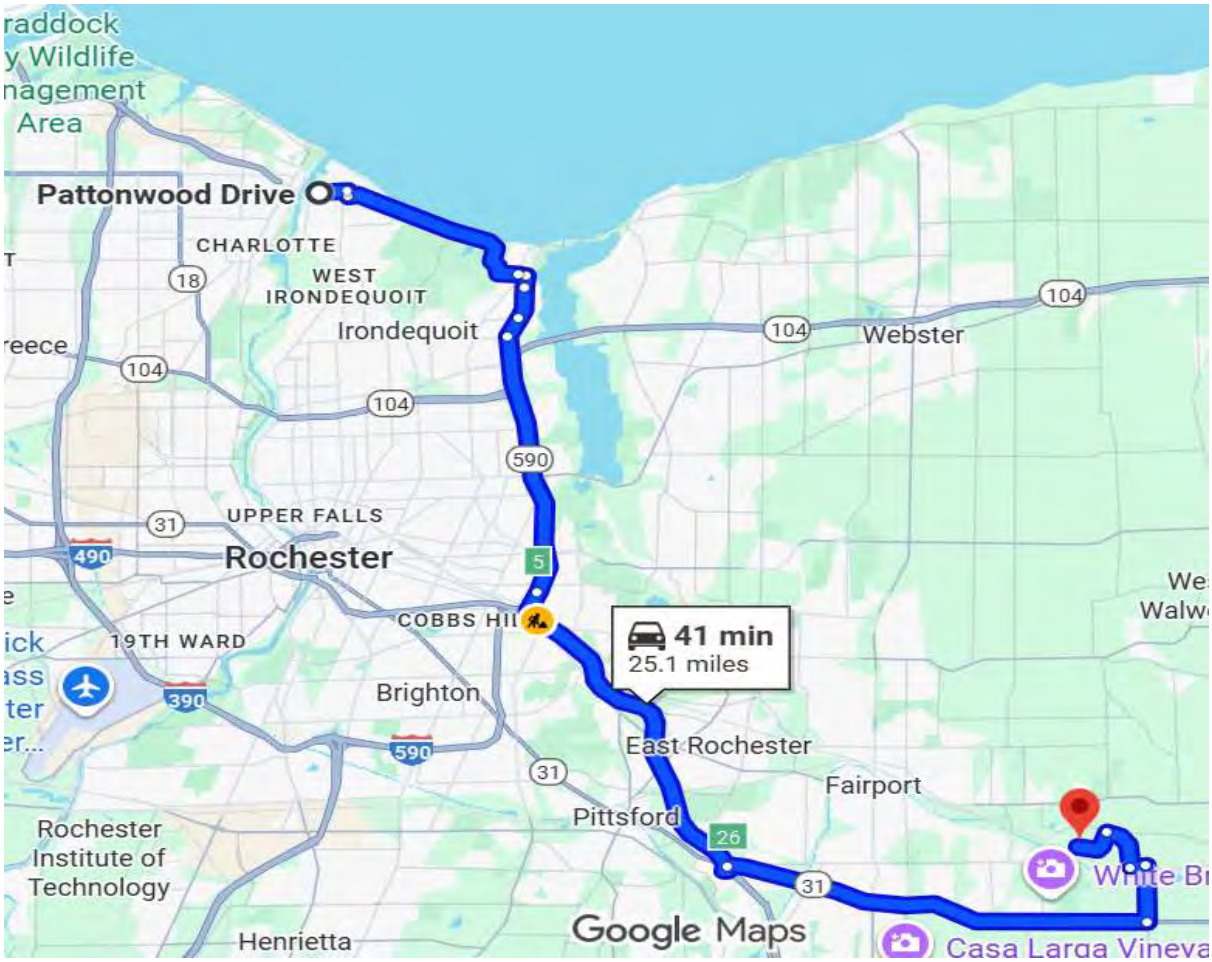
A plan for rodent control will be developed and utilized by the contractor prior to and during site clearing and site grubbing, and during all remedial work.

A plan will be developed and utilized by the contractor for all remedial work to ensure compliance with local noise control ordinances.

ATTACHMENT B-1

DIRECTIONS TO HIGH ACRES LANDFILL & RECYCLING CENTER

Attachment B1 – Directions to High Acres Landfill & Recycling Center



- Head east on Pattonwood towards Timrod Drive
- Turn Right onto St. Paul Boulevard
- Turn Left onto Lakeshore Boulevard
- Continue onto Durand Boulevard
- At the traffic circle, take the 1st exit onto Sea Breeze Drive
- At the next traffic circle, take the 2nd exit to stay on Sea Breeze Drive
- At the next traffic circle, take the 3rd exit to stay on Sea Breeze Drive
- Take the exit onto Rt. 590 South
- Take exit to Rt. 490 East towards Victor
- Take Exit 26 to merge onto NY-31 East/Palmira
- Turn Left onto Wayneport Road
- Turn Left onto Quaker Road/Perinton Parkway
- Turn into High Acres Landfill

ATTACHMENT B-2

REQUEST TO IMPORT/REUSE FILL OR SOIL

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Request to Import/Reuse Fill or Soil

This form is based on the information required by DER-10, Section 5.4(e) and 6NYCRR Part 360.13. Use of this form is not a substitute for reading the applicable regulations and Technical Guidance document.

SECTION 1 – SITE BACKGROUND

The allowable site use is: Choose an item

Have Ecological Resources been identified? Choose an item

Is this soil originating from the site? Choose an item

How many cubic yards of soil will be imported/reused? Choose an item

If greater than 1000 cubic yards will be imported, enter volume to be imported:

SECTION 2 – MATERIAL OTHER THAN SOIL

Is the material to be imported gravel, rock or stone? Choose an item

Does it contain less than 10%, by weight, material that passes a size 100 sieve? Choose an item

Is this virgin material from a permitted mine or quarry? Choose an item

Is this material recycled concrete or brick from a DEC registered processing facility? Choose an item

SECTION 3 - SAMPLING

Provide a brief description of the number and type of samples collected in the space below:

Example Text: 5 discrete samples were collected and analyzed for VOCs. 2 composite samples were collected and analyzed for SVOCs, Inorganics & PCBs/Pesticides.

If the material meets requirements of DER-10 section 5.4(e)5 (other material), no chemical testing needed.

SECTION 3 CONT'D - SAMPLING

Provide a brief written summary of the sampling results or attach evaluation tables (compare to DER-10, Appendix 5):

Example Text: Arsenic was detected up to 17 ppm in 1 (of 5) samples; the allowable level is 16 ppm.

If Ecological Resources have been identified use the "If Ecological Resources are Present" column in Appendix 5.

SECTION 4 – SOURCE OF FILL

Name of person providing fill and relationship to the source:

Location where fill was obtained:

Identification of any state or local approvals as a fill source:

If no approvals are available, provide a brief history of the use of the property that is the fill source:

Provide a list of supporting documentation included with this request:

The information provided on this form is accurate and complete.

_____ _____

Signature Date

_____

Print Name

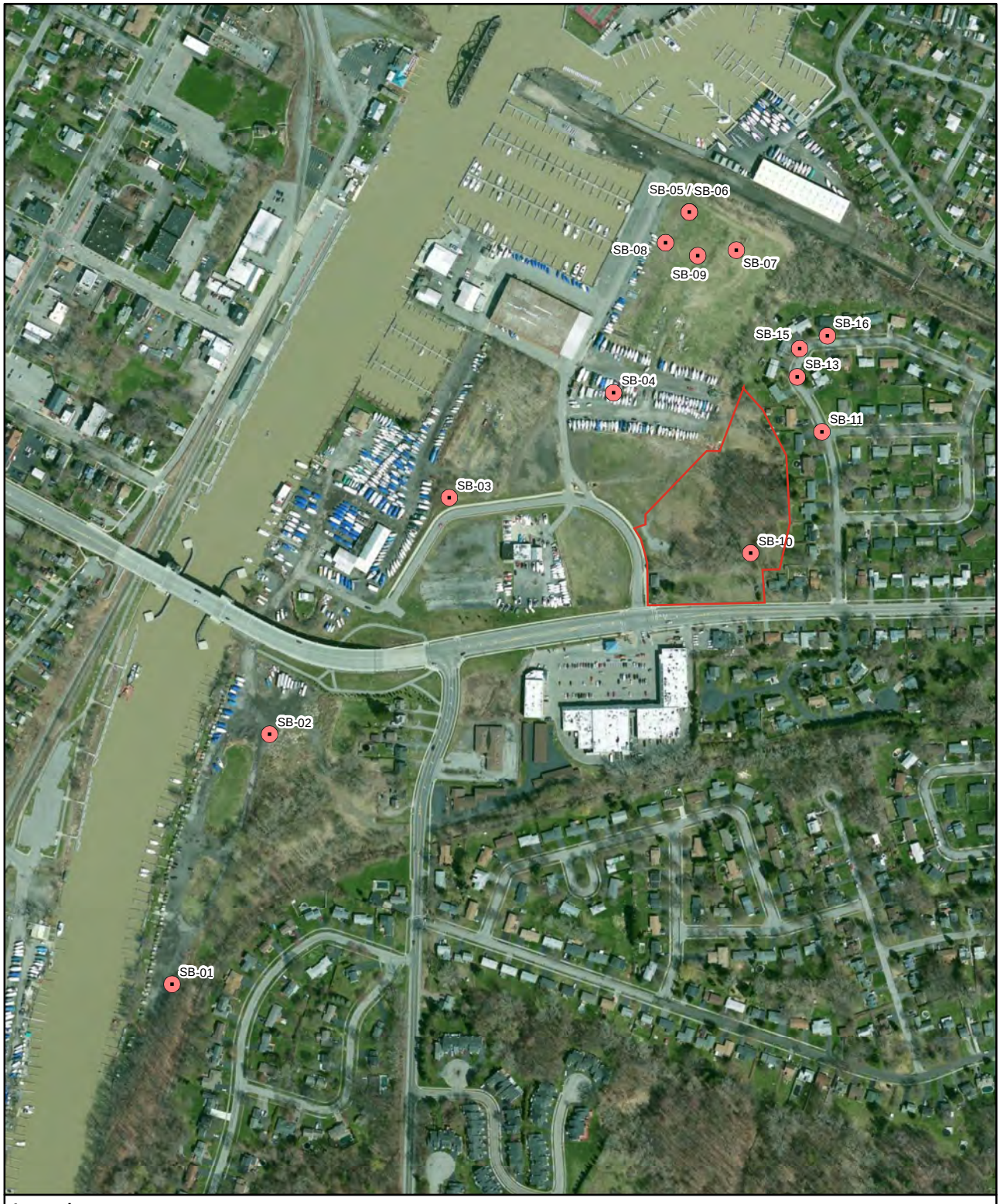
_____

Firm

Revised April 2023

APPENDIX C

PREVIOUS INVESTIGATION REPORT FIGURES



Legend

Soil Boring Locations

N

0 150 300 600 Feet

1:6,000

Figure 2-2
Phase II ESA Soil Boring Sample Locations
Lighthouse Pointe Site
Targeted Brownfield Assessment
City of Rochester and Town of Irondequoit, New York

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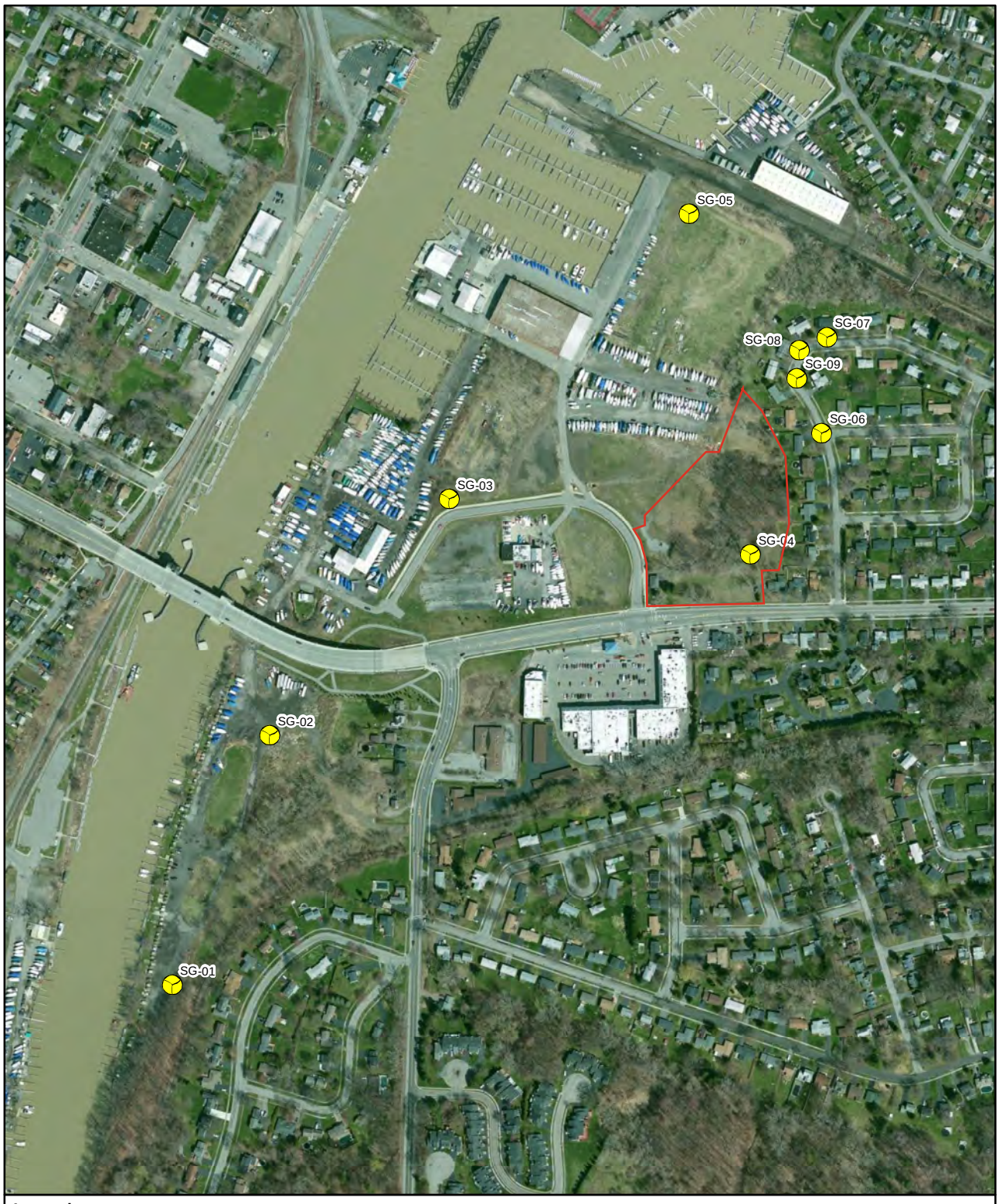

Legend

Soil Vapor Sample Locations

N

0 150 300 600 Feet

1:6,000

Figure 2-3
Phase II ESA Soil Vapor Probe Sample Locations
Lighthouse Pointe Site
Targeted Brownfield Assessment
City of Rochester and Town of Irondequoit, New York

CDM Smith

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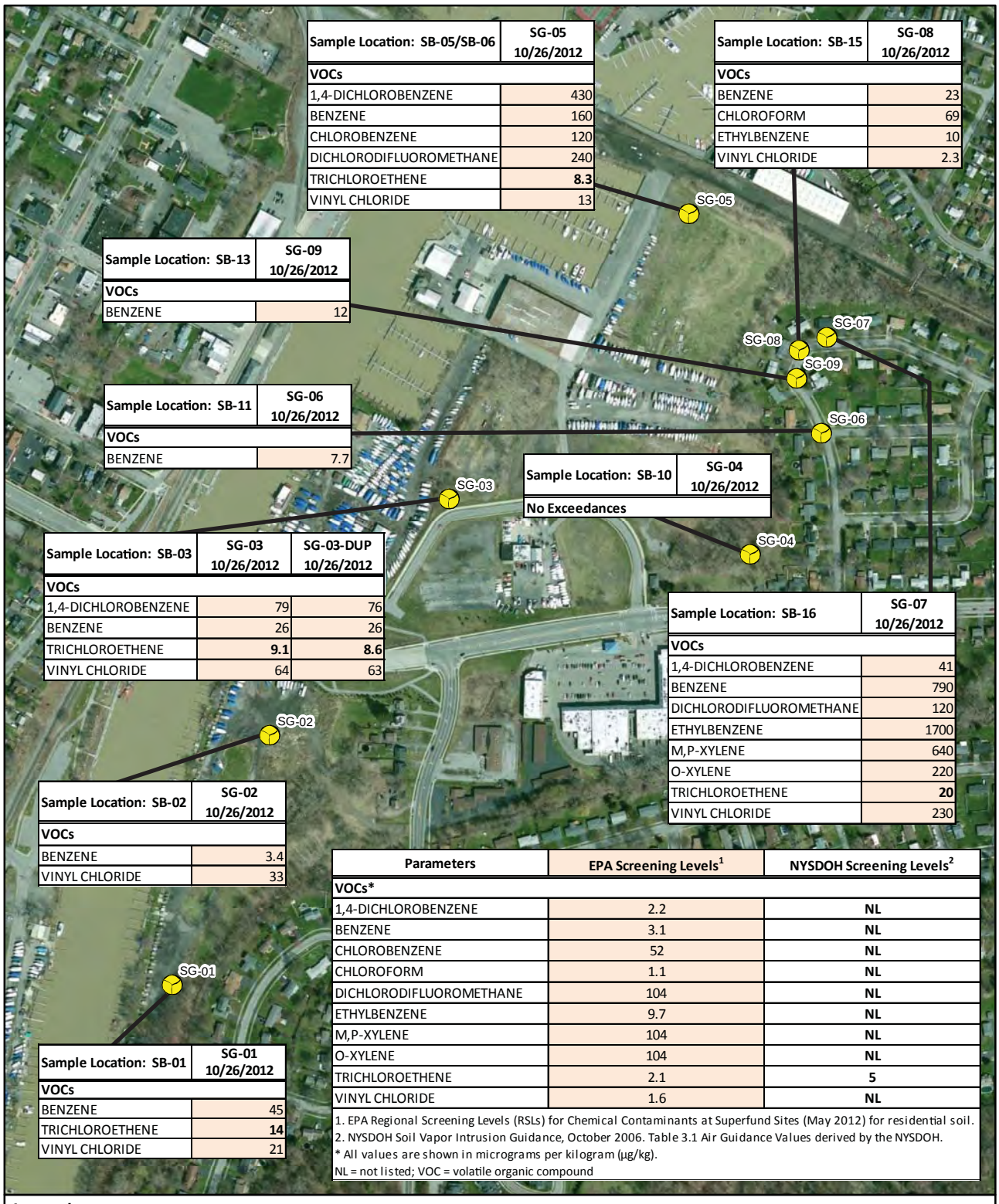


Sample Location: SB-05/SB-06	SG-05 10/26/2012
VOCs	
1,4-DICHLOROBENZENE	430
BENZENE	160
CHLOROBENZENE	120
DICHLORODIFLUOROMETHANE	240
TRICHLOROETHENE	**8.3**
VINYL CHLORIDE	13

Sample Location: SB-15	SG-08 10/26/2012
VOCs	
BENZENE	23
CHLOROFORM	69
ETHYLBENZENE	10
VINYL CHLORIDE	2.3

Sample Location: SB-13	SG-09 10/26/2012
VOCs	
BENZENE	12

Sample Location: SB-11	SG-06 10/26/2012
VOCs	
BENZENE	7.7

Sample Location: SB-10	SG-04 10/26/2012
No Exceedances	

Sample Location: SB-03	SG-03 10/26/2012	SG-03-DUP 10/26/2012
VOCs		
1,4-DICHLOROBENZENE	79	76
BENZENE	26	26
TRICHLOROETHENE	**9.1**	**8.6**
VINYL CHLORIDE	64	63

Sample Location: SB-16	SG-07 10/26/2012
VOCs	
1,4-DICHLOROBENZENE	41
BENZENE	790
DICHLORODIFLUOROMETHANE	120
ETHYLBENZENE	1700
M,P-XYLENE	640
O-XYLENE	220
TRICHLOROETHENE	**20**
VINYL CHLORIDE	230

Sample Location: SB-02	SG-02 10/26/2012
VOCs	
BENZENE	3.4
VINYL CHLORIDE	33

Sample Location: SB-01	SG-01 10/26/2012
VOCs	
BENZENE	45
TRICHLOROETHENE	**14**
VINYL CHLORIDE	21

Parameters	EPA Screening Levels[1]	NYSDOH Screening Levels[2]
VOCs*		
1,4-DICHLOROBENZENE	2.2	**NL**
BENZENE	3.1	**NL**
CHLOROBENZENE	52	**NL**
CHLOROFORM	1.1	**NL**
DICHLORODIFLUOROMETHANE	104	**NL**
ETHYLBENZENE	9.7	**NL**
M,P-XYLENE	104	**NL**
O-XYLENE	104	**NL**
TRICHLOROETHENE	2.1	**5**
VINYL CHLORIDE	1.6	**NL**

1. EPA Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites (May 2012) for residential soil.
2. NYSDOH Soil Vapor Intrusion Guidance, October 2006. Table 3.1 Air Guidance Values derived by the NYSDOH.
* All values are shown in micrograms per kilogram (µg/kg).
NL = not listed; VOC = volatile organic compound

Legend

Soil Vapor Sample Locations

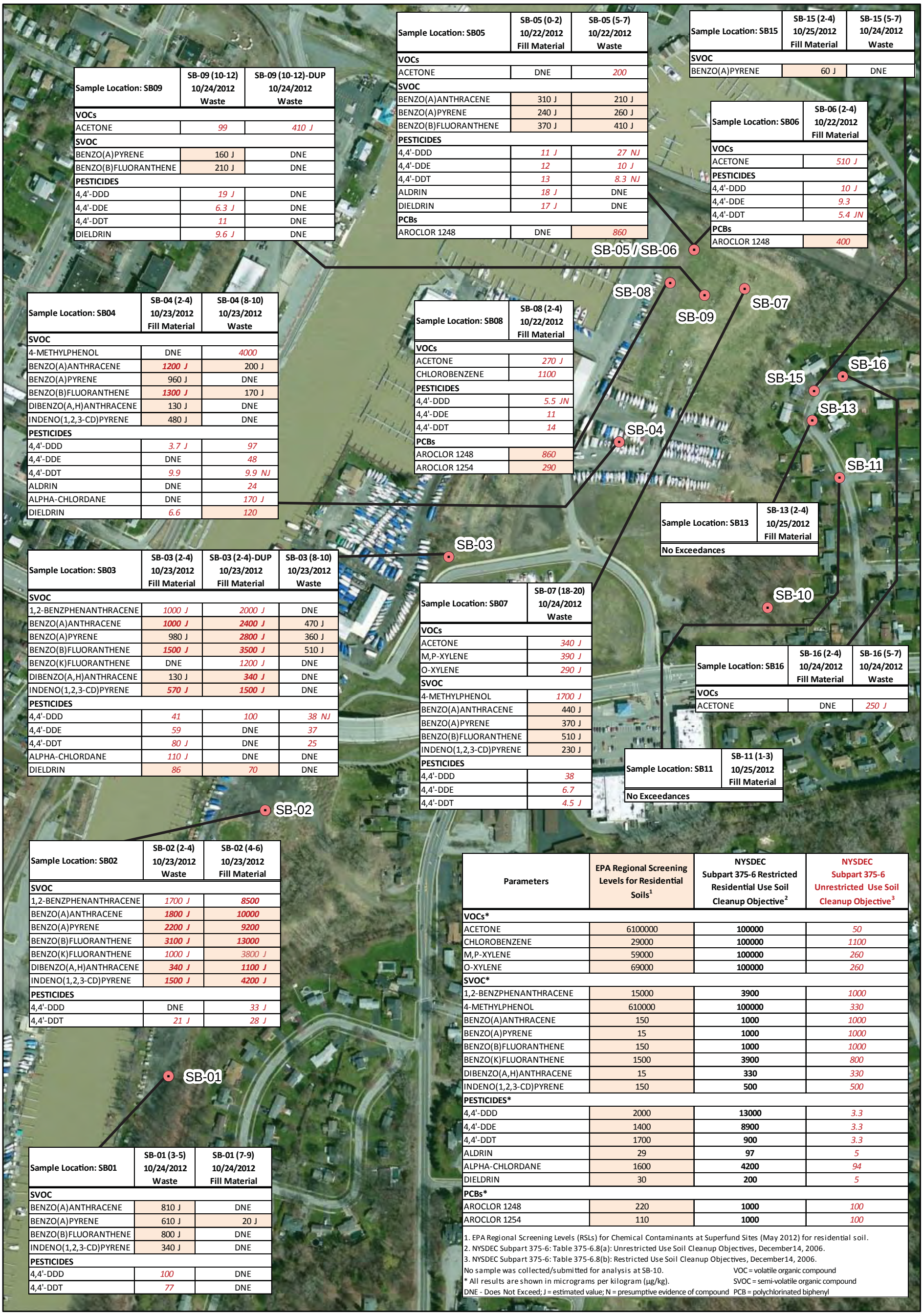
N

0 150 300 600 Feet

1:6,000

CDM Smith

Figure 3-1
Soil Vapor VOC Exceedances
Lighthouse Pointe Site
Targeted Brownfield Assessment
City of Rochester and Town of Irondequoit, New York



Sample Location: SB09	SB-09 (10-12) 10/24/2012 Waste	SB-09 (10-12)-DUP 10/24/2012 Waste
VOCs		
ACETONE	*99*	*410 J*
SVOC		
BENZO(A)PYRENE	160 J	DNE
BENZO(B)FLUORANTHENE	210 J	DNE
PESTICIDES		
4,4'-DDD	*19 J*	DNE
4,4'-DDE	*6.3 J*	DNE
4,4'-DDT	*11*	DNE
DIELDRIN	*9.6 J*	DNE

Sample Location: SB05	SB-05 (0-2) 10/22/2012 Fill Material	SB-05 (5-7) 10/22/2012 Waste
VOCs		
ACETONE	DNE	*200*
SVOC		
BENZO(A)ANTHRACENE	310 J	210 J
BENZO(A)PYRENE	240 J	260 J
BENZO(B)FLUORANTHENE	370 J	410 J
PESTICIDES		
4,4'-DDD	*11 J*	*27 NJ*
4,4'-DDE	*12*	*10 J*
4,4'-DDT	*13*	*8.3 NJ*
ALDRIN	*18 J*	DNE
DIELDRIN	*17 J*	DNE
PCBs		
AROCLOR 1248	DNE	*860*

Sample Location: SB15	SB-15 (2-4) 10/25/2012 Fill Material	SB-15 (5-7) 10/24/2012 Waste
SVOC		
BENZO(A)PYRENE	60 J	DNE

Sample Location: SB06	SB-06 (2-4) 10/22/2012 Fill Material
VOCs	
ACETONE	*510 J*
PESTICIDES	
4,4'-DDD	*10 J*
4,4'-DDE	*9.3*
4,4'-DDT	*5.4 JN*
PCBs	
AROCLOR 1248	*400*

Sample Location: SB04	SB-04 (2-4) 10/23/2012 Fill Material	SB-04 (8-10) 10/23/2012 Waste
SVOC		
4-METHYLPHENOL	DNE	*4000*
BENZO(A)ANTHRACENE	***1200 J***	200 J
BENZO(A)PYRENE	960 J	DNE
BENZO(B)FLUORANTHENE	***1300 J***	170 J
DIBENZO(A,H)ANTHRACENE	130 J	DNE
INDENO(1,2,3-CD)PYRENE	480 J	DNE
PESTICIDES		
4,4'-DDD	*3.7 J*	*97*
4,4'-DDE	DNE	*48*
4,4'-DDT	*9.9*	*9.9 NJ*
ALDRIN	DNE	*24*
ALPHA-CHLORDANE	DNE	*170 J*
DIELDRIN	*6.6*	*120*

Sample Location: SB08	SB-08 (2-4) 10/22/2012 Fill Material
VOCs	
ACETONE	*270 J*
CHLOROBENZENE	*1100*
PESTICIDES	
4,4'-DDD	*5.5 JN*
4,4'-DDE	*11*
4,4'-DDT	*14*
PCBs	
AROCLOR 1248	*860*
AROCLOR 1254	*290*

Sample Location: SB13	SB-13 (2-4) 10/25/2012 Fill Material
No Exceedances	

Sample Location: SB03	SB-03 (2-4) 10/23/2012 Fill Material	SB-03 (2-4)-DUP 10/23/2012 Fill Material	SB-03 (8-10) 10/23/2012 Waste
SVOC			
1,2-BENZPHENANTHRACENE	*1000 J*	*2000 J*	DNE
BENZO(A)ANTHRACENE	***1000 J***	***2400 J***	470 J
BENZO(A)PYRENE	980 J	***2800 J***	360 J
BENZO(B)FLUORANTHENE	***1500 J***	***3500 J***	510 J
BENZO(K)FLUORANTHENE	DNE	*1200 J*	DNE
DIBENZO(A,H)ANTHRACENE	130 J	***340 J***	DNE
INDENO(1,2,3-CD)PYRENE	***570 J***	***1500 J***	DNE
PESTICIDES			
4,4'-DDD	*41*	*100*	*38 NJ*
4,4'-DDE	*59*	DNE	*37*
4,4'-DDT	*80 J*	DNE	*25*
ALPHA-CHLORDANE	*110 J*	DNE	DNE
DIELDRIN	*86*	*70*	DNE

Sample Location: SB07	SB-07 (18-20) 10/24/2012 Waste
VOCs	
ACETONE	*340 J*
M,P-XYLENE	*390 J*
O-XYLENE	*290 J*
SVOC	
4-METHYLPHENOL	*1700 J*
BENZO(A)ANTHRACENE	440 J
BENZO(A)PYRENE	370 J
BENZO(B)FLUORANTHENE	510 J
INDENO(1,2,3-CD)PYRENE	230 J
PESTICIDES	
4,4'-DDD	*38*
4,4'-DDE	*6.7*
4,4'-DDT	*4.5 J*

Sample Location: SB16	SB-16 (2-4) 10/24/2012 Fill Material	SB-16 (5-7) 10/24/2012 Waste
VOCs		
ACETONE	DNE	*250 J*

Sample Location: SB11	SB-11 (1-3) 10/25/2012 Fill Material
No Exceedances	

Sample Location: SB02	SB-02 (2-4) 10/23/2012 Waste	SB-02 (4-6) 10/23/2012 Fill Material
SVOC		
1,2-BENZPHENANTHRACENE	*1700 J*	***8500***
BENZO(A)ANTHRACENE	***1800 J***	***10000***
BENZO(A)PYRENE	***2200 J***	***9200***
BENZO(B)FLUORANTHENE	***3100 J***	***13000***
BENZO(K)FLUORANTHENE	*1000 J*	*3800 J*
DIBENZO(A,H)ANTHRACENE	***340 J***	***1100 J***
INDENO(1,2,3-CD)PYRENE	***1500 J***	***4200 J***
PESTICIDES		
4,4'-DDD	DNE	*33 J*
4,4'-DDT	*21 J*	*28 J*

Sample Location: SB01	SB-01 (3-5) 10/24/2012 Waste	SB-01 (7-9) 10/24/2012 Fill Material
SVOC		
BENZO(A)ANTHRACENE	810 J	DNE
BENZO(A)PYRENE	610 J	20 J
BENZO(B)FLUORANTHENE	800 J	DNE
INDENO(1,2,3-CD)PYRENE	340 J	DNE
PESTICIDES		
4,4'-DDD	*100*	DNE
4,4'-DDT	*77*	DNE

Parameters	EPA Regional Screening Levels for Residential Soils[1]	NYSDEC Subpart 375-6 Restricted Residential Use Soil Cleanup Objective[2]	NYSDEC Subpart 375-6 Unrestricted Use Soil Cleanup Objective[3]
VOCs*			
ACETONE	6100000	**100000**	*50*
CHLOROBENZENE	29000	**100000**	*1100*
M,P-XYLENE	59000	**100000**	*260*
O-XYLENE	69000	**100000**	*260*
SVOC*			
1,2-BENZPHENANTHRACENE	15000	**3900**	*1000*
4-METHYLPHENOL	610000	**100000**	*330*
BENZO(A)ANTHRACENE	150	**1000**	*1000*
BENZO(A)PYRENE	15	**1000**	*1000*
BENZO(B)FLUORANTHENE	150	**1000**	*1000*
BENZO(K)FLUORANTHENE	1500	**3900**	*800*
DIBENZO(A,H)ANTHRACENE	15	**330**	*330*
INDENO(1,2,3-CD)PYRENE	150	**500**	*500*
PESTICIDES*			
4,4'-DDD	2000	**13000**	*3.3*
4,4'-DDE	1400	**8900**	*3.3*
4,4'-DDT	1700	**900**	*3.3*
ALDRIN	29	**97**	*5*
ALPHA-CHLORDANE	1600	**4200**	*94*
DIELDRIN	30	**200**	*5*
PCBs*			
AROCLOR 1248	220	**1000**	*100*
AROCLOR 1254	110	**1000**	*100*

1. EPA Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites (May 2012) for residential soil.
2. NYSDEC Subpart 375-6: Table 375-6.8(a): Unrestricted Use Soil Cleanup Objectives, December14, 2006.
3. NYSDEC Subpart 375-6: Table 375-6.8(b): Restricted Use Soil Cleanup Objectives, December14, 2006.

No sample was collected/submitted for analysis at SB-10.
* All results are shown in micrograms per kilogram (µg/kg).
DNE - Does Not Exceed; J = estimated value; N = presumptive evidence of compound

VOC = volatile organic compound
SVOC = semi-volatile organic compound
PCB = polychlorinated biphenyl

Legend

- Lighthouse Pointe Soil Boring Locations

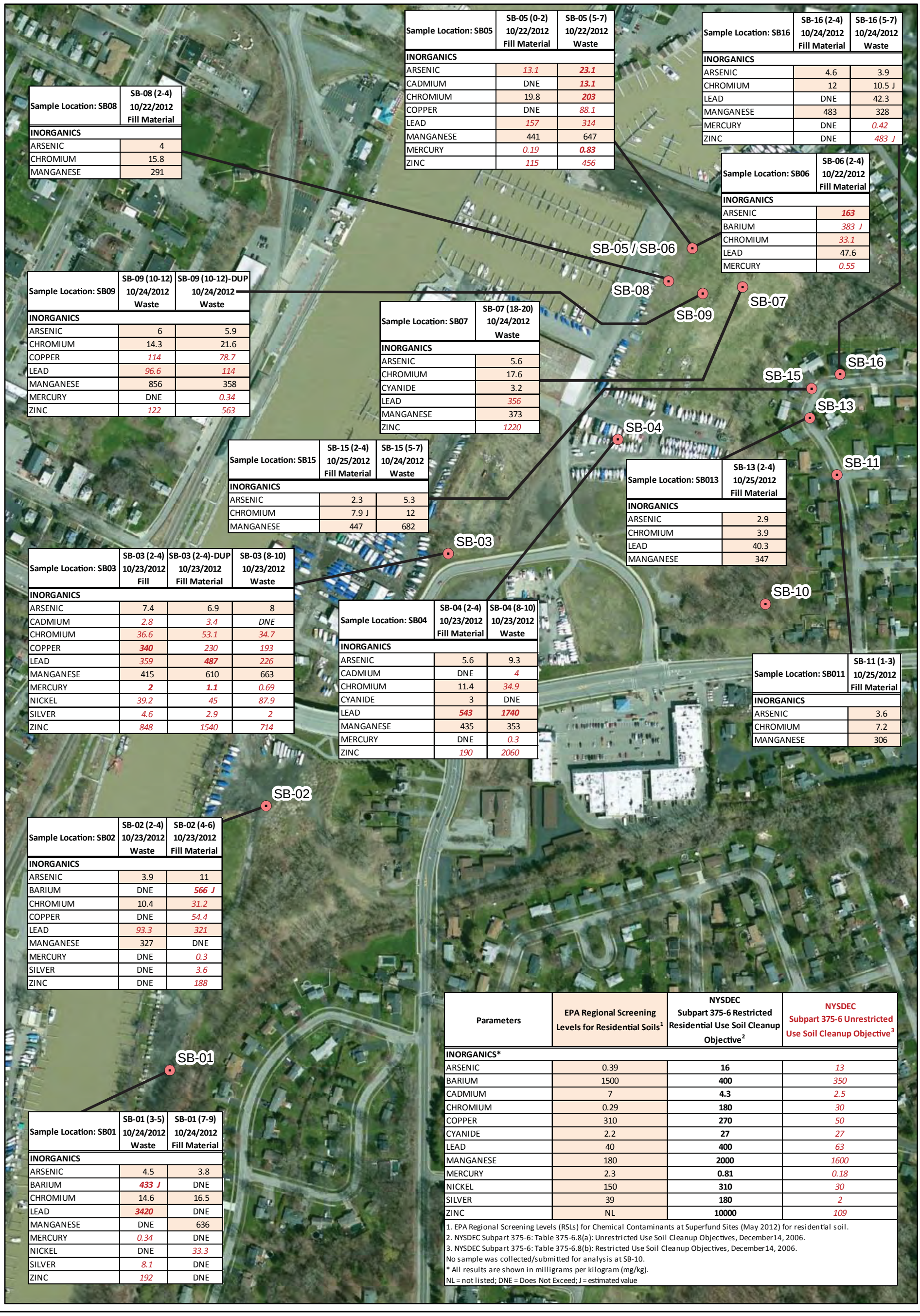
N

300 150 0 300 Feet

1:3,600

CDM Smith

Figure 3-2
Subsurface Soil Organic Compound Exceedances
Lighthouse Pointe Site
Targeted Brownfield Assessment
City of Rochester and Town of Irondequoit, New York



Sample Location: SB08	SB-08 (2-4) 10/22/2012 Fill Material
INORGANICS	
ARSENIC	4
CHROMIUM	15.8
MANGANESE	291

Sample Location: SB05	SB-05 (0-2) 10/22/2012 Fill Material	SB-05 (5-7) 10/22/2012 Waste
INORGANICS		
ARSENIC	*13.1*	***23.1***
CADMIUM	DNE	***13.1***
CHROMIUM	19.8	***203***
COPPER	DNE	*88.1*
LEAD	*157*	*314*
MANGANESE	441	647
MERCURY	*0.19*	***0.83***
ZINC	*115*	*456*

Sample Location: SB16	SB-16 (2-4) 10/24/2012 Fill Material	SB-16 (5-7) 10/24/2012 Waste
INORGANICS		
ARSENIC	4.6	3.9
CHROMIUM	12	10.5 J
LEAD	DNE	42.3
MANGANESE	483	328
MERCURY	DNE	*0.42*
ZINC	DNE	*483 J*

Sample Location: SB06	SB-06 (2-4) 10/22/2012 Fill Material
INORGANICS	
ARSENIC	***163***
BARIUM	*383 J*
CHROMIUM	*33.1*
LEAD	47.6
MERCURY	*0.55*

Sample Location: SB09	SB-09 (10-12) 10/24/2012 Waste	SB-09 (10-12)-DUP 10/24/2012 Waste
INORGANICS		
ARSENIC	6	5.9
CHROMIUM	14.3	21.6
COPPER	*114*	*78.7*
LEAD	*96.6*	*114*
MANGANESE	856	358
MERCURY	DNE	*0.34*
ZINC	*122*	*563*

Sample Location: SB07	SB-07 (18-20) 10/24/2012 Waste
INORGANICS	
ARSENIC	5.6
CHROMIUM	17.6
CYANIDE	3.2
LEAD	*356*
MANGANESE	373
ZINC	*1220*

Sample Location: SB15	SB-15 (2-4) 10/25/2012 Fill Material	SB-15 (5-7) 10/24/2012 Waste
INORGANICS		
ARSENIC	2.3	5.3
CHROMIUM	7.9 J	12
MANGANESE	447	682

Sample Location: SB013	SB-13 (2-4) 10/25/2012 Fill Material
INORGANICS	
ARSENIC	2.9
CHROMIUM	3.9
LEAD	40.3
MANGANESE	347

Sample Location: SB03	SB-03 (2-4) 10/23/2012 Fill	SB-03 (2-4)-DUP 10/23/2012 Fill Material	SB-03 (8-10) 10/23/2012 Waste
INORGANICS			
ARSENIC	7.4	6.9	8
CADMIUM	*2.8*	*3.4*	*DNE*
CHROMIUM	*36.6*	*53.1*	*34.7*
COPPER	***340***	*230*	*193*
LEAD	*359*	***487***	*226*
MANGANESE	415	610	663
MERCURY	***2***	***1.1***	*0.69*
NICKEL	*39.2*	*45*	*87.9*
SILVER	*4.6*	*2.9*	*2*
ZINC	*848*	*1540*	*714*

Sample Location: SB04	SB-04 (2-4) 10/23/2012 Fill Material	SB-04 (8-10) 10/23/2012 Waste
INORGANICS		
ARSENIC	5.6	9.3
CADMIUM	DNE	*4*
CHROMIUM	11.4	*34.9*
CYANIDE	3	DNE
LEAD	***543***	***1740***
MANGANESE	435	353
MERCURY	DNE	*0.3*
ZINC	*190*	*2060*

Sample Location: SB011	SB-11 (1-3) 10/25/2012 Fill Material
INORGANICS	
ARSENIC	3.6
CHROMIUM	7.2
MANGANESE	306

Sample Location: SB02	SB-02 (2-4) 10/23/2012 Waste	SB-02 (4-6) 10/23/2012 Fill Material
INORGANICS		
ARSENIC	3.9	11
BARIUM	DNE	***566 J***
CHROMIUM	10.4	*31.2*
COPPER	DNE	*54.4*
LEAD	*93.3*	*321*
MANGANESE	327	DNE
MERCURY	DNE	*0.3*
SILVER	DNE	*3.6*
ZINC	DNE	*188*

Sample Location: SB01	SB-01 (3-5) 10/24/2012 Waste	SB-01 (7-9) 10/24/2012 Fill Material
INORGANICS		
ARSENIC	4.5	3.8
BARIUM	***433 J***	DNE
CHROMIUM	14.6	16.5
LEAD	***3420***	DNE
MANGANESE	DNE	636
MERCURY	*0.34*	DNE
NICKEL	DNE	*33.3*
SILVER	*8.1*	DNE
ZINC	*192*	DNE

Parameters	EPA Regional Screening Levels for Residential Soils[1]	NYSDEC Subpart 375-6 Restricted Residential Use Soil Cleanup Objective[2]	NYSDEC Subpart 375-6 Unrestricted Use Soil Cleanup Objective[3]
INORGANICS*			
ARSENIC	0.39	**16**	*13*
BARIUM	1500	**400**	*350*
CADMIUM	7	**4.3**	*2.5*
CHROMIUM	0.29	**180**	*30*
COPPER	310	**270**	*50*
CYANIDE	2.2	**27**	*27*
LEAD	40	**400**	*63*
MANGANESE	180	**2000**	*1600*
MERCURY	2.3	**0.81**	*0.18*
NICKEL	150	**310**	*30*
SILVER	39	**180**	*2*
ZINC	NL	**10000**	*109*

1. EPA Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites (May 2012) for residential soil.
2. NYSDEC Subpart 375-6: Table 375-6.8(a): Unrestricted Use Soil Cleanup Objectives, December14, 2006.
3. NYSDEC Subpart 375-6: Table 375-6.8(b): Restricted Use Soil Cleanup Objectives, December14, 2006.
No sample was collected/submitted for analysis at SB-10.
* All results are shown in milligrams per kilogram (mg/kg).
NL = not listed; DNE = Does Not Exceed; J = estimated value

Legend

- Lighthouse Pointe Soil Boring Locations

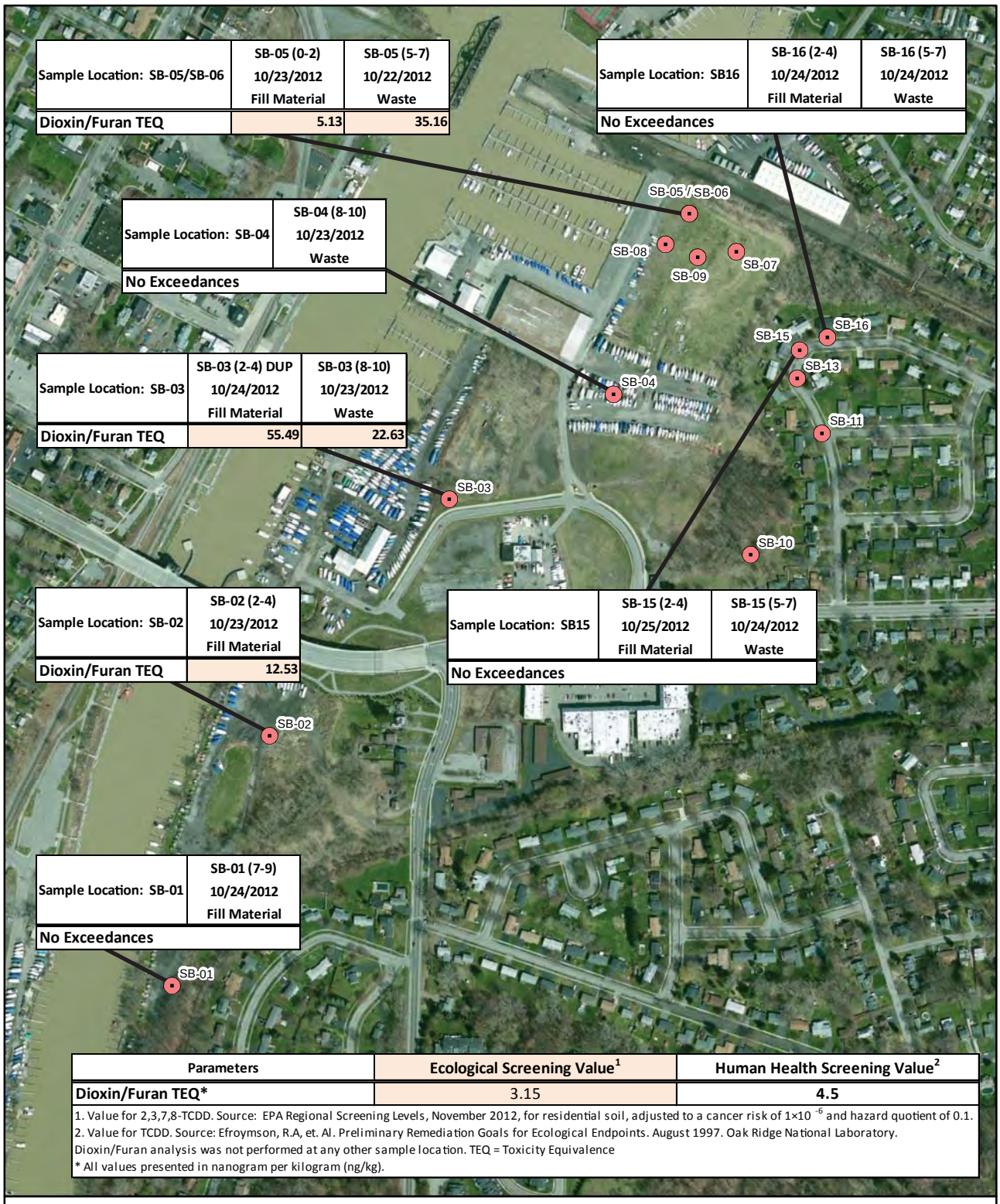
N

300 150 0 300 Feet

1:3,600

CDM Smith

Figure 3-3
Subsurface Soil Inorganic Analyte Exceedances
Lighthouse Pointe Site
Targeted Brownfield Assessment
City of Rochester and Town of Irondequiot, New York



Parameters	Ecological Screening Value[1]	Human Health Screening Value[2]
Dioxin/Furan TEQ*	3.15	4.5

1. Value for 2,3,7,8-TCDD. Source: EPA Regional Screening Levels, November 2012, for residential soil, adjusted to a cancer risk of 1×10^{-6} and hazard quotient of 0.1.
2. Value for TCDD. Source: Efroymson, R.A, et. Al. Preliminary Remediation Goals for Ecological Endpoints. August 1997. Oak Ridge National Laboratory.
Dioxin/Furan analysis was not performed at any other sample location. TEQ = Toxicity Equivalence
* All values presented in nanogram per kilogram (ng/kg).

Legend

Soil Boring Locations

N

0 150 300 600 Feet

1:6,000

CDM Smith

Figure 3-4
Subsurface Soil Dioxin/Furan TEQ Exceedances
Lighthouse Pointe Site
Targeted Brownfield Assessment
City of Rochester and Town of Irondequoit, New York

APPENDIX D

PREVIOUS INVESTIGATION REPORT TABLES

TABLE 15

GROUNDWATER ANALYTICAL RESULTS SUMMARY
WATERFRONT PROPERTY DEVELOPMENT
ROCHESTER, NEW YORK

Sample Location:			*MW-1-05*	*MW-2-05*	*MW-3-05*	*MW-4-05*	*MW-4-05*	*MW-5-05*
Sample ID:			*W-42271-110305-WA-02*	*W-42271-110305-WA-01*	*W-42271-110405-WA-05*	*W-42271-110305-WA-03*	*W-42271-110305-WA-03D*	*W-42271-110405-WA-06*
Sample Date		*New York State Ambient Groundwater Standard*	*11/3/2005*	*11/3/2005*	*11/4/2005*	*11/3/2005*	*11/3/2005 Duplicate*	*11/4/2005*
Parameter	*Units*	*or Guidance Value*						
Volatile Organic Compounds								
1,1,1-Trichloroethane	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	1 S	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	µg/L	5 G	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	0.04 S	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	0.0006 S	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	µg/L	3 S	1.0 U	1.0 U	0.38 J	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	µg/L	0.6 S	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	µg/L	1 S	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	3 S	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	µg/L	3 S	1.0 U	1.0 U	1.2	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl Ethyl Ketone)	µg/L	50 G	10 U	10 U	1.0 J	10 U	10 U	0.81 J
2-Hexanone	µg/L	50 G	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	NC	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	µg/L	50 G	10 U	10 U	2.0 J	10 U	10 U	3.2 J
Benzene	µg/L	1 S	1.0 U	1.0 U	1.0	1.0 U	1.0 U	0.34 J
Bromodichloromethane	µg/L	50 G	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	µg/L	50 G	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl Bromide)	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	µg/L	60 G	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.51 J
Carbon tetrachloride	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	µg/L	5 S	1.0 U	1.0 U	2.7	1.0 U	1.0 U	0.27 J
Chloroethane	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	µg/L	7 S	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl Chloride)	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	µg/L	NC	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	µg/L	NC	1.0 U	1.0 U	2.7	0.12 J	1.0 U	0.15 J
Dibromochloromethane	µg/L	50 G	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	5 S	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 UJ
Ethylbenzene	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene	µg/L	5 S	1.0 U	1.0 U	1.9	1.0 U	1.0 U	1.0 U
Methyl acetate	µg/L	NC	10 U	10 U	10 U	10 U	10 U	10 U
Methyl cyclohexane	µg/L	NC	1.0 U	1.0 U	0.83 J	1.0 U	1.0 U	1.0 U
Methyl Tert Butyl Ether	µg/L	10 G	3.0 J	5.0 U	0.89 J	5.0 U	5.0 U	0.28 J
Methylene chloride	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	µg/L	5 S	1.0 U	1.0 U	0.25 J	0.20 J	1.0 U	0.30 J
trans-1,2-Dichloroethene	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	µg/L	NC	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	µg/L	2 S	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylene (total)	µg/L	NC	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1.1 J

TABLE 15

GROUNDWATER ANALYTICAL RESULTS SUMMARY
WATERFRONT PROPERTY DEVELOPMENT
ROCHESTER, NEW YORK

Sample Location:			*MW-1-05*	*MW-2-05*	*MW-3-05*	*MW-4-05*	*MW-4-05*	*MW-5-05*
Sample ID:			*W-42271-110305-WA-02*	*W-42271-110305-WA-01*	*W-42271-110405-WA-05*	*W-42271-110305-WA-03*	*W-42271-110305-WA-03D*	*W-42271-110405-WA-06*
Sample Date		*New York State Ambient Groundwater Standard*	*11/3/2005*	*11/3/2005*	*11/4/2005*	*11/3/2005*	*11/3/2005 Duplicate*	*11/4/2005*
Parameter	*Units*	*or Guidance Value*						
Semivolatile Organic Compounds								
1,4-Dioxane	µg/L	NC	1.0 J	10 U	10 UJ	10 U	10 U	10 UJ
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether	µg/L	5 S	10 U	10 U	10 U	10 U	10 U	10 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	µg/L	NC	0 U	0 U	0 U	0 U	0 U	0 U
2,4,5-Trichlorophenol	µg/L	NC	10 U	10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol	µg/L	NC	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	µg/L	5 S	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	µg/L	50 G	10 U	10 U	10 U	10 U	10 U	0.51 J
2,4-Dinitrophenol	µg/L	10 G	50 U	50 U	50 U	50 U	50 U	50 U
2,4-Dinitrotoluene	µg/L	5 S	10 U	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	µg/L	5 S	10 U	10 U	10 U	10 U	10 U	10 U
2-Chloronaphthalene	µg/L	10 G	10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	µg/L	NC	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	µg/L	NC	10 U	10 U	10 U	10 U	10 U	1.8 J
2-Methylphenol	µg/L	NC	10 U	10 U	10 U	10 U	10 U	0.45 J
2-Nitroaniline	µg/L	5 S	50 U	50 U	50 U	50 U	50 U	50 U
2-Nitrophenol	µg/L	NC	10 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	µg/L	5 S	50 U	50 U	50 U	50 U	50 U	50 UJ
3-Nitroaniline	µg/L	5 S	50 U	50 U	50 U	50 U	50 U	50 U
4,6-Dinitro-2-methylphenol	µg/L	NC	50 U	50 U	50 U	50 U	50 U	50 U
4-Bromophenyl phenyl ether	µg/L	NC	10 U	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	µg/L	NC	10 U	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	µg/L	5 S	10 U	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl phenyl ether	µg/L	NC	10 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol	µg/L	NC	10 U	10 U	0.56 J	10 U	10 U	10 U
4-Nitroaniline	µg/L	5 S	50 U	50 U	50 U	50 U	50 U	50 U
4-Nitrophenol	µg/L	NC	50 U	50 U	50 UJ	50 U	50 U	50 UJ
Acenaphthene	µg/L	20 G	10 U	10 U	10 U	10 U	10 U	2.4 J
Acenaphthylene	µg/L	NC	10 U	10 U	10 U	10 U	10 U	10 U
Acetophenone	µg/L	NC	10 U	10 U	10 U	10 U	10 U	10 U
Anthracene	µg/L	50 G	10 U	10 U	10 U	10 U	10 U	1.3 J
Atrazine	µg/L	7.5 S	10 U	10 U	10 U	10 U	10 U	10 U
Benzaldehyde	µg/L	NC	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)anthracene	µg/L	0.002 G	10 U	10 U	10 U	10 U	10 U	**1.8 J**
Benzo(a)pyrene	µg/L	ND S	10 U	10 U	10 U	10 U	10 U	1.1 J
Benzo(b)fluoranthene	µg/L	0.002 G	10 U	10 U	10 U	10 U	10 U	**1.1 J**
Benzo(g,h,i)perylene	µg/L	NC	10 U	10 U	10 U	10 U	10 U	0.71 J
Benzo(k)fluoranthene	µg/L	0.002 G	10 U	10 U	10 U	10 U	10 U	**0.79 J**
Biphenyl	µg/L	5 S	10 U	10 U	10 U	10 U	10 U	0.42 J
bis(2-Chloroethoxy)methane	µg/L	5 S	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethyl)ether	µg/L	1 S	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	µg/L	5 S	10 U	10 U	10 U	10 U	10 U	10 UJ
Butyl benzylphthalate	µg/L	50 G	10 U	10 U	10 U	10 U	10 U	10 UJ
Caprolactam	µg/L	NC	10 U	10 U	10 U	10 U	10 U	10 U
Carbazole	µg/L	NC	10 U	10 U	10 U	10 U	10 U	5.3 J
Chrysene	µg/L	0.002 G	10 U	10 U	10 U	10 U	10 U	**1.6 J**
Dibenz(a,h)anthracene	µg/L	NC	10 U	10 U	10 U	10 U	10 U	10 U
Dibenzofuran	µg/L	NC	10 U	10 U	10 U	10 U	10 U	1.6 J
Diethyl phthalate	µg/L	50 G	10 U	10 U	10 U	10 U	10 U	10 U
Dimethyl phthalate	µg/L	50 G	10 U	10 U	10 U	10 U	10 U	10 U

TABLE 15

GROUNDWATER ANALYTICAL RESULTS SUMMARY
WATERFRONT PROPERTY DEVELOPMENT
ROCHESTER, NEW YORK

Sample Location:			*MW-1-05*	*MW-2-05*	*MW-3-05*	*MW-4-05*	*MW-4-05*	*MW-5-05*
Sample ID:			*W-42271-110305-WA-02*	*W-42271-110305-WA-01*	*W-42271-110405-WA-05*	*W-42271-110305-WA-03*	*W-42271-110305-WA-03D*	*W-42271-110405-WA-06*
Sample Date		*New York State Ambient Groundwater Standard or Guidance Value*	*11/3/2005*	*11/3/2005*	*11/4/2005*	*11/3/2005*	*11/3/2005 Duplicate*	*11/4/2005*
Parameter	*Units*							
Di-n-butylphthalate	µg/L	50 S	10 U	0.44 J	10 U	10 U	10 U	10 U
Di-n-octyl phthalate	µg/L	50 G	10 U	10 U	10 U	10 U	10 U	10 U
Fluoranthene	µg/L	50 G	10 U	10 U	0.40 J	10 U	10 U	4.0 J
Fluorene	µg/L	50 G	10 U	10 U	10 U	10 U	10 U	2.5 J
Hexachlorobenzene	µg/L	0.04 S	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	µg/L	0.5 S	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	µg/L	5 S	50 UJ	50 UJ	50 UJ	50 UJ	50 UJ	50 UJ
Hexachloroethane	µg/L	5 S	10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	µg/L	0.002 G	10 U	10 U	10 U	10 U	10 U	**0.68 J**
Isophorone	µg/L	50 G	10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene	µg/L	10 G	10 U	10 U	0.69 J	10 U	10 U	**13**
Nitrobenzene	µg/L	0.4 S	10 U	10 U	10 U	10 U	10 U	10 U
N-Nitrosodi-n-propylamine	µg/L	NC	10 U	10 U	10 U	10 U	10 U	10 U
N-Nitrosodiphenylamine	µg/L	50 G	10 U	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol	µg/L	1 S	10 U	10 U	10 U	10 U	10 U	10 U
Phenanthrene	µg/L	50 G	10 U	10 U	0.44 J	10 U	10 U	6.2 J
Phenol	µg/L	1 S	10 U	10 U	10 U	10 U	10 U	**4.6 J**
Pyrene	µg/L	50 G	10 U	10 U	10 U	10 U	10 U	3.9 J
Metals								
Aluminum	µg/L	NC	168000	27500	40200	104000 J	48700 J	73900
Antimony	µg/L	3 S	**6.7 J**	60.0 UJ	**13.3 J**	60.0 UJ	60.0 UJ	**197 J**
Arsenic	µg/L	25 S	**125**	13.0	**60.8**	**46.7 J**	18.3 J	**94.3**
Barium	µg/L	1000 S	**2040**	271	**2660**	**1550**	**1090**	**4580**
Beryllium	µg/L	3 G	**11.3**	5.0 U	2.6 J	**4.8 J**	2.2 J	**3.9 J**
Cadmium	µg/L	5 S	**7.5**	5.0 U	**14.2**	2.7 J	5.0 U	**5.2**
Calcium	µg/L	NC	340000 J	179000 J	206000 J	819000 J	304000 J	223000 J
Chromium Total	µg/L	50 S	**288**	31.4	**119**	**164 J**	**68.4 J**	**110**
Cobalt	µg/L	5 S	**124**	**20.2 J**	**33.7 J**	**77.9 J**	**31.2 J**	**49.0 J**
Copper	µg/L	200 S	**643**	56.4	**724**	193 J	71.9 J	**1000**
Cyanide (total)	mg/L	200 S	0.010 U	0.010 U	0.15	0.010 U	0.010 U	0.010 U
Iron	µg/L	300 S	**313000**	**37300**	**161000**	**193000 J**	**77600 J**	**169000**
Lead	µg/L	25 S	**479 J**	**40.7 J**	**1700 J**	**102 J**	**42.3 J**	**28200 J**
Magnesium	µg/L	35000 G	**122000**	**40400**	**70100**	**200000 J**	**96600 J**	**62700**
Manganese	µg/L	300 S	**4150**	**3480**	**1770**	**5880 J**	**2310 J**	**3120**
Mercury	µg/L	0.7 S	**2.1**	0.20 U	**3.5**	0.15 J	0.20 U	**0.80**
Nickel	µg/L	100 S	**357**	42.9	**169**	**178 J**	71.1 J	**139**
Potassium	µg/L	NC	54700	13200	42300	22800	13900	22000
Selenium	µg/L	10 S	**22.5**	5.0 U	2.6 J	5.0 U	5.0 U	5.0 U
Silver	µg/L	50 S	4.1 J	10.0 U	7.5 J	10.0 U	10.0 U	5.1 J
Sodium	µg/L	20000 S	**54700**	13000	**79800**	15400	15500	**30600**
Thallium	µg/L	0.5 G	**5.9 J**	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Vanadium	µg/L	NC	305	46.9 J	75.2	235 J	99.6 J	122
Zinc	µg/L	2000 G	1400	160	**5810**	465 J	187 J	1780
Polychlorinated biphenyls (PCBs)								
Aroclor-1016 (PCB-1016)	µg/L	NC	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1221 (PCB-1221)	µg/L	NC	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

TABLE 15

GROUNDWATER ANALYTICAL RESULTS SUMMARY
WATERFRONT PROPERTY DEVELOPMENT
ROCHESTER, NEW YORK

Sample Location:			*MW-1-05*	*MW-2-05*	*MW-3-05*	*MW-4-05*	*MW-4-05*	*MW-5-05*
Sample ID:			*W-42271-110305-WA-02*	*W-42271-110305-WA-01*	*W-42271-110405-WA-05*	*W-42271-110305-WA-03*	*W-42271-110305-WA-03D*	*W-42271-110405-WA-06*
Sample Date		*New York State Ambient Groundwater Standard*	*11/3/2005*	*11/3/2005*	*11/4/2005*	*11/3/2005*	*11/3/2005 Duplicate*	*11/4/2005*
Parameter	*Units*	*or Guidance Value*						
Aroclor-1232 (PCB-1232)	µg/L	NC	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1242 (PCB-1242)	µg/L	NC	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1248 (PCB-1248)	µg/L	NC	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1254 (PCB-1254)	µg/L	NC	1.0 U	1.0 U	0.17 J	1.0 U	1.0 U	0.096 J
Aroclor-1260 (PCB-1260)	µg/L	NC	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Pesticides								
4,4'-DDD	µg/L	0.3 S	0.050 U	0.050 U	0.044 J	0.050 U	0.050 U	0.017 J
4,4'-DDE	µg/L	0.2 S	0.050 U	0.050 U	0.014 J	0.050 U	0.050 U	0.050 U
4,4'-DDT	µg/L	0.2 S	0.050 U	0.050 U	0.050 UJ	0.050 U	0.023 J	0.050 UJ
Aldrin	µg/L	ND S	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
alpha-BHC	µg/L	0.01 S	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
alpha-Chlordane	µg/L	NC	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
beta-BHC	µg/L	0.04 S	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
delta-BHC	µg/L	0.04 S	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.0069 J
Dieldrin	µg/L	0.004 S	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Endosulfan I	µg/L	NC	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Endosulfan II	µg/L	NC	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Endosulfan sulfate	µg/L	NC	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Endrin	µg/L	ND S	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Endrin aldehyde	µg/L	5 S	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Endrin ketone	µg/L	5 S	0.050 U	0.050 U	0.050 UJ	0.050 U	0.050 U	0.050 UJ
gamma-BHC (Lindane)	µg/L	0.05 S	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
gamma-Chlordane	µg/L	NC	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Heptachlor	µg/L	0.04 S	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Heptachlor epoxide	µg/L	0.03 S	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Methoxychlor	µg/L	35 S	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.10 UJ
Toxaphene	µg/L	0.06 S	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U

Notes:

ND() - Not detected at the detection limit listed in parentheses.
S - New York State ambient water quality standard.
G - New York State ambient groundwater quality guidance value.
N/A - Not analyzed.
Exceedance of New York State Ambient Groundwater Standard or Guidance Value.

TABLE 15

GROUNDWATER ANALYTICAL RESULTS SUMMARY
WATERFRONT PROPERTY DEVELOPMENT
ROCHESTER, NEW YORK

Sample Location:			*MW-6-05*	*MW-7-05*	*MW-8-05*	*MW-9-05*
Sample ID:			*W-42271-110405-WA-04*	*W-42271-110405-WA-11*	*W-42271-110405-WA-08*	*W-42271-110405-WA-07*
Sample Date		*New York State Ambient Groundwater Standard or Guidance Value*	*11/4/2005*	*11/4/2005*	*11/4/2005*	*11/4/2005*
Parameter	*Units*					
Volatile Organic Compounds						
1,1,1-Trichloroethane	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	1 S	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	µg/L	5 G	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	0.04 S	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	0.0006 S	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	µg/L	3 S	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	µg/L	0.6 S	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	µg/L	1 S	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	3 S	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	µg/L	3 S	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl Ethyl Ketone)	µg/L	50 G	2.3 J	10 U	1.2 J	9.1 J
2-Hexanone	µg/L	50 G	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	NC	10 U	10 U	10 U	10 U
Acetone	µg/L	50 G	8.8 J	10 U	3.5 J	27
Benzene	µg/L	1 S	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	µg/L	50 G	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	µg/L	50 G	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl Bromide)	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	µg/L	60 G	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	µg/L	5 S	1.0 U	1.0 U	0.36 J	1.0 U
Chloroethane	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	µg/L	7 S	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl Chloride)	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	µg/L	NC	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	µg/L	NC	0.20 J	1.0 U	0.27 J	1.0 U
Dibromochloromethane	µg/L	50 G	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	5 S	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Ethylbenzene	µg/L	5 S	0.29 J	1.0 U	1.0 U	1.0 U
Isopropylbenzene	µg/L	5 S	0.25 J	1.0 U	1.0 U	1.0 U
Methyl acetate	µg/L	NC	10 U	10 U	10 U	10 U
Methyl cyclohexane	µg/L	NC	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Tert Butyl Ether	µg/L	10 G	7.8	5.0 U	0.27 J	5.0 U
Methylene chloride	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	µg/L	5 S	0.34 J	0.25 J	0.40 J	0.55 J
trans-1,2-Dichloroethene	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	µg/L	NC	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	µg/L	5 S	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	µg/L	2 S	1.0 U	1.0 U	1.0 U	1.0 U
Xylene (total)	µg/L	NC	0.53 J	2.0 U	2.0 U	2.0 U

TABLE 15

GROUNDWATER ANALYTICAL RESULTS SUMMARY
WATERFRONT PROPERTY DEVELOPMENT
ROCHESTER, NEW YORK

Sample Location:			*MW-6-05*	*MW-7-05*	*MW-8-05*	*MW-9-05*
Sample ID:			*W-42271-110405-WA-04*	*W-42271-110405-WA-11*	*W-42271-110405-WA-08*	*W-42271-110405-WA-07*
Sample Date		*New York State Ambient Groundwater Standard or Guidance Value*	*11/4/2005*	*11/4/2005*	*11/4/2005*	*11/4/2005*
Parameter	*Units*					
Semivolatile Organic Compounds						
1,4-Dioxane	µg/L	NC	10 UJ	10 UJ	10 UJ	10 UJ
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	µg/L	5 S	10 U	10 U	10 U	10 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	µg/L	NC	0 U	0 U	0 U	0 U
2,4,5-Trichlorophenol	µg/L	NC	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol	µg/L	NC	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	µg/L	5 S	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	µg/L	50 G	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	µg/L	10 G	50 U	50 U	50 U	50 U
2,4-Dinitrotoluene	µg/L	5 S	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	µg/L	5 S	10 U	10 U	10 U	10 U
2-Chloronaphthalene	µg/L	10 G	10 U	10 U	10 U	10 U
2-Chlorophenol	µg/L	NC	10 U	10 U	10 U	10 U
2-Methylnaphthalene	µg/L	NC	10 U	10 U	10 U	10 U
2-Methylphenol	µg/L	NC	10 U	10 U	10 U	10 U
2-Nitroaniline	µg/L	5 S	50 U	50 U	50 U	50 U
2-Nitrophenol	µg/L	NC	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	µg/L	5 S	50 U	50 U	50 UJ	50 U
3-Nitroaniline	µg/L	5 S	50 U	50 U	50 U	50 U
4,6-Dinitro-2-methylphenol	µg/L	NC	50 U	50 U	50 UJ	50 U
4-Bromophenyl phenyl ether	µg/L	NC	10 U	10 U	10 UJ	10 U
4-Chloro-3-methylphenol	µg/L	NC	10 U	10 U	10 U	10 U
4-Chloroaniline	µg/L	5 S	10 U	10 U	10 U	10 U
4-Chlorophenyl phenyl ether	µg/L	NC	10 U	10 U	10 U	10 U
4-Methylphenol	µg/L	NC	10 U	10 U	10 U	0.61 J
4-Nitroaniline	µg/L	5 S	50 U	50 U	50 U	50 U
4-Nitrophenol	µg/L	NC	50 UJ	50 UJ	50 UJ	50 UJ
Acenaphthene	µg/L	20 G	10 U	10 U	10 U	10 U
Acenaphthylene	µg/L	NC	10 U	10 U	10 U	10 U
Acetophenone	µg/L	NC	10 U	10 U	10 U	10 U
Anthracene	µg/L	50 G	10 U	10 U	10 UJ	10 U
Atrazine	µg/L	7.5 S	10 U	10 U	10 U	10 U
Benzaldehyde	µg/L	NC	10 U	10 U	10 U	10 U
Benzo(a)anthracene	µg/L	0.002 G	10 U	10 U	10 UJ	10 U
Benzo(a)pyrene	µg/L	ND S	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	µg/L	0.002 G	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	µg/L	NC	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	µg/L	0.002 G	10 U	10 U	10 U	10 U
Biphenyl	µg/L	5 S	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	µg/L	5 S	10 U	10 U	10 U	10 U
bis(2-Chloroethyl)ether	µg/L	1 S	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	µg/L	5 S	10 U	10 U	10 UJ	10 U
Butyl benzylphthalate	µg/L	50 G	10 U	10 U	10 UJ	10 U
Caprolactam	µg/L	NC	1.5 J	10 U	0.79 J	1.2 J
Carbazole	µg/L	NC	10 U	10 U	10 U	10 U
Chrysene	µg/L	0.002 G	10 U	10 U	10 UJ	10 U
Dibenz(a,h)anthracene	µg/L	NC	10 U	10 U	10 U	10 U
Dibenzofuran	µg/L	NC	10 U	10 U	10 U	10 U
Diethyl phthalate	µg/L	50 G	10 U	10 U	10 U	10 U
Dimethyl phthalate	µg/L	50 G	10 U	10 U	10 U	10 U

TABLE 15

GROUNDWATER ANALYTICAL RESULTS SUMMARY
WATERFRONT PROPERTY DEVELOPMENT
ROCHESTER, NEW YORK

Sample Location:			*MW-6-05*	*MW-7-05*	*MW-8-05*	*MW-9-05*
Sample ID:			*W-42271-110405-WA-04*	*W-42271-110405-WA-11*	*W-42271-110405-WA-08*	*W-42271-110405-WA-07*
Sample Date		*New York State Ambient Groundwater Standard or Guidance Value*	*11/4/2005*	*11/4/2005*	*11/4/2005*	*11/4/2005*
Parameter	*Units*					
Di-n-butylphthalate	µg/L	50 S	0.91 J	10 U	10 UJ	10 U
Di-n-octyl phthalate	µg/L	50 G	10 U	10 U	10 U	10 U
Fluoranthene	µg/L	50 G	10 U	10 U	10 UJ	10 U
Fluorene	µg/L	50 G	10 U	10 U	10 U	10 U
Hexachlorobenzene	µg/L	0.04 S	10 U	10 U	10 UJ	10 U
Hexachlorobutadiene	µg/L	0.5 S	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	µg/L	5 S	50 UJ	50 UJ	50 UJ	50 UJ
Hexachloroethane	µg/L	5 S	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	µg/L	0.002 G	10 U	10 U	10 U	10 U
Isophorone	µg/L	50 G	10 U	10 U	10 U	10 U
Naphthalene	µg/L	10 G	10 U	10 U	10 U	10 U
Nitrobenzene	µg/L	0.4 S	10 U	10 U	10 U	10 U
N-Nitrosodi-n-propylamine	µg/L	NC	10 U	10 U	10 U	10 U
N-Nitrosodiphenylamine	µg/L	50 G	10 U	10 U	10 UJ	10 U
Pentachlorophenol	µg/L	1 S	10 U	10 U	10 UJ	10 U
Phenanthrene	µg/L	50 G	10 U	10 U	10 UJ	10 U
Phenol	µg/L	1 S	10 U	10 U	10 U	10 U
Pyrene	µg/L	50 G	10 U	10 U	10 UJ	10 U
Metals						
Aluminum	µg/L	NC	51400	179000	78300	19200
Antimony	µg/L	3 S	60.0 UJ	**7.5 J**	**6.6 J**	60.0 UJ
Arsenic	µg/L	25 S	**29.8**	**98.0**	**55.0**	8.8 J
Barium	µg/L	1000 S	677	**1470**	**3060**	406
Beryllium	µg/L	3 G	2.6 J	**8.6**	**4.0 J**	5.0 U
Cadmium	µg/L	5 S	2.0 J	4.7 J	**6.1**	5.0 U
Calcium	µg/L	NC	263000 J	953000 J	147000 J	148000 J
Chromium Total	µg/L	50 S	**75.8**	**262**	**160**	25.8
Cobalt	µg/L	5 S	**35.9 J**	**146**	**63.3**	**11.8 J**
Copper	µg/L	200 S	158	**445**	**373**	14.0 J
Cyanide (total)	mg/L	200 S	0.010 U	0.010 U	0.032 J	0.010 U
Iron	µg/L	300 S	**117000**	**313000**	**248000**	**24300**
Lead	µg/L	25 S	**177 J**	**172 J**	**1480 J**	**26.2 J**
Magnesium	µg/L	35000 G	**76600**	**228000**	**59800**	**36600**
Manganese	µg/L	300 S	**3080**	**9660**	**2230**	**1690**
Mercury	µg/L	0.7 S	0.26	0.39	**1.5**	0.20 U
Nickel	µg/L	100 S	89.0	**301**	**176**	26.0 J
Potassium	µg/L	NC	13200	40500	18500	10500
Selenium	µg/L	10 S	5.0 U	5.0 U	5.0 U	5.0 U
Silver	µg/L	50 S	10.0 U	10.0 U	13.1	10.0 U
Sodium	µg/L	20000 S	**36900**	**139000**	**23100**	**34500**
Thallium	µg/L	0.5 G	10.0 U	**4.8 J**	10.0 U	10.0 U
Vanadium	µg/L	NC	84.8	336	126	31.7 J
Zinc	µg/L	2000 G	421	878	**2760**	71.1
Polychlorinated biphenyls (PCBs)						
Aroclor-1016 (PCB-1016)	µg/L	NC	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1221 (PCB-1221)	µg/L	NC	1.0 U	1.0 U	1.0 U	1.0 U

TABLE 15

GROUNDWATER ANALYTICAL RESULTS SUMMARY
WATERFRONT PROPERTY DEVELOPMENT
ROCHESTER, NEW YORK

Sample Location:			*MW-6-05*	*MW-7-05*	*MW-8-05*	*MW-9-05*
Sample ID:			*W-42271-110405-WA-04*	*W-42271-110405-WA-11*	*W-42271-110405-WA-08*	*W-42271-110405-WA-07*
Sample Date		*New York State Ambient Groundwater Standard*	*11/4/2005*	*11/4/2005*	*11/4/2005*	*11/4/2005*
Parameter	*Units*	*or Guidance Value*				
Aroclor-1232 (PCB-1232)	µg/L	NC	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1242 (PCB-1242)	µg/L	NC	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1248 (PCB-1248)	µg/L	NC	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1254 (PCB-1254)	µg/L	NC	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1260 (PCB-1260)	µg/L	NC	1.0 U	1.0 U	1.0 U	1.0 U
Pesticides						
4,4'-DDD	µg/L	0.3 S	0.10 U	0.050 U	0.050 U	0.050 U
4,4'-DDE	µg/L	0.2 S	0.10 U	0.050 U	0.050 U	0.050 U
4,4'-DDT	µg/L	0.2 S	0.10 UJ	0.050 UJ	0.050 UJ	0.050 UJ
Aldrin	µg/L	ND S	0.10 U	0.050 U	0.050 U	0.050 U
alpha-BHC	µg/L	0.01 S	0.10 U	0.050 U	0.050 U	0.050 U
alpha-Chlordane	µg/L	NC	0.10 U	0.050 U	0.050 U	0.050 U
beta-BHC	µg/L	0.04 S	0.10 U	0.050 U	0.050 U	0.050 U
delta-BHC	µg/L	0.04 S	0.10 U	0.050 U	0.050 U	0.050 U
Dieldrin	µg/L	0.004 S	0.10 U	0.050 U	0.050 U	0.050 U
Endosulfan I	µg/L	NC	0.10 U	0.050 U	0.050 U	0.050 U
Endosulfan II	µg/L	NC	0.10 U	0.050 U	0.050 U	0.050 U
Endosulfan sulfate	µg/L	NC	0.10 U	0.050 U	0.050 U	0.050 U
Endrin	µg/L	ND S	0.10 U	0.050 U	0.050 U	0.050 U
Endrin aldehyde	µg/L	5 S	0.10 U	0.050 U	0.050 U	0.050 U
Endrin ketone	µg/L	5 S	0.10 UJ	0.050 UJ	0.050 UJ	0.050 UJ
gamma-BHC (Lindane)	µg/L	0.05 S	0.10 U	0.050 U	0.050 U	0.050 U
gamma-Chlordane	µg/L	NC	0.10 U	0.050 U	0.050 U	0.050 U
Heptachlor	µg/L	0.04 S	0.10 U	0.050 U	0.050 U	0.050 U
Heptachlor epoxide	µg/L	0.03 S	0.10 U	0.050 U	0.050 U	0.050 U
Methoxychlor	µg/L	35 S	0.20 UJ	0.10 UJ	0.10 UJ	0.10 UJ
Toxaphene	µg/L	0.06 S	4.0 U	2.0 U	2.0 U	2.0 U

Notes:

ND() - Not detected at the detection limit listed in parentheses.
S - New York State ambient water quality standard.
G - New York State ambient groundwater quality guidance value.
N/A - Not analyzed.
Exceedance of New York State Ambient Groundwater Standard or Guidance Value.

Table 16

SUMMARY OF 2009 GROUNDWATER SAMPLING RESULTS
LIGHTHOUSE POINTE - RIVERFRONT
ROCHESTER, NEW YORK

Location Name		*New York*	*MW-3-05*	*MW-5-05*	*MW-5-05*	*MW-6-05*	*MW-7-05*	*MW-8-05*	*MW-9-05*
Sample Name		*State Ambient*	*WG-42271-041309-005*	*WG-42271-041309-007*	*WG-42271-041309-009*	*WG-42271-041309-006*	*WG-42271-041309-010*	*WG-42271-041309-011*	*WG-42271-041309-008*
Sample Date		*Groundwater Standard*	*4/13/2009*	*4/13/2009*	*4/13/2009*	*4/13/2009*	*4/13/2009*	*4/13/2009*	*4/13/2009*
		or Guidance Value			*Duplicate*				
Parameters	*Units*								
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1,2,2-Tetrachloroethane	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1,2-Trichloroethane	µg/L	1 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1-Dichloroethane	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1-Dichloroethene	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,2,4-Trichlorobenzene	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	0.04 S	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	0.0006 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,2-Dichlorobenzene	µg/L	3 S	0.29 J	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,2-Dichloroethane	µg/L	0.6 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,2-Dichloropropane	µg/L	1 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,3-Dichlorobenzene	µg/L	3 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,4-Dichlorobenzene	µg/L	3 S	0.88 J	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
2-Butanone (Methyl Ethyl Ketone)	µg/L	50 G	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
2-Hexanone	µg/L	50 G	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
4-Methyl-2-Pentanone	µg/L	NC	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Acetone	µg/L	50 G	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Benzene	µg/L	1 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Bromodichloromethane	µg/L	50 G	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Bromoform	µg/L	50 G	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Bromomethane (Methyl Bromide)	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Carbon disulfide	µg/L	60 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Carbon tetrachloride	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Chlorobenzene	µg/L	5 S	2.0	0.26 J	0.26 J	ND(1.0)	ND(1.0)	0.29 J	ND(1.0)
Chloroethane	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Chloroform (Trichloromethane)	µg/L	7 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	0.18 J	ND(1.0)	ND(1.0)
Chloromethane (Methyl Chloride)	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
cis-1,2-Dichloroethene	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
cis-1,3-Dichloropropene	µg/L	NC	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Cyclohexane	µg/L	NC	3.1	0.14 J	0.12 J	ND(1.0)	ND(1.0)	0.22 J	ND(1.0)
Dibromochloromethane	µg/L	50 G	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Dichlorodifluoromethane (CFC-12)	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	0.69 J	ND(1.0)
Ethylbenzene	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Isopropylbenzene	µg/L	5 S	0.50 J	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Methyl acetate	µg/L	NC	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Methyl cyclohexane	µg/L	NC	1.5	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Methyl Tert Butyl Ether	µg/L	10 G	0.71 J	0.29 J	0.33 J	0.54 J	ND(5.0)	0.18 J	ND(5.0)
Methylene chloride	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Styrene	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Tetrachloroethene	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Toluene	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
trans-1,2-Dichloroethene	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
trans-1,3-Dichloropropene	µg/L	NC	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Trichloroethene	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Trichlorofluoromethane (CFC-11)	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Trifluorotrichloroethane (Freon 113)	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Vinyl chloride	µg/L	2 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)

Table 16

SUMMARY OF 2009 GROUNDWATER SAMPLING RESULTS
LIGHTHOUSE POINTE - RIVERFRONT
ROCHESTER, NEW YORK

Location Name		*New York*	*MW-3-05*	*MW-5-05*	*MW-5-05*	*MW-6-05*	*MW-7-05*	*MW-8-05*	*MW-9-05*
Sample Name		*State Ambient*	*WG-42271-041309-005*	*WG-42271-041309-007*	*WG-42271-041309-009*	*WG-42271-041309-006*	*WG-42271-041309-010*	*WG-42271-041309-011*	*WG-42271-041309-008*
Sample Date		*Groundwater Standard*	*4/13/2009*	*4/13/2009*	*4/13/2009*	*4/13/2009*	*4/13/2009*	*4/13/2009*	*4/13/2009*
		or Guidance Value			*Duplicate*				
Parameters	*Units*								
Xylene (total)	µg/L	NC	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
Semi-Volatile Organic Compounds									
1,4-Dioxane	µg/L	NC	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
2,2'-oxybis(1-Chloropropane)	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
2,4,5-Trichlorophenol	µg/L	NC	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
2,4,6-Trichlorophenol	µg/L	NC	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
2,4-Dichlorophenol	µg/L	5 S	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
2,4-Dimethylphenol	µg/L	50 G	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
2,4-Dinitrophenol	µg/L	10 G	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
2,4-Dinitrotoluene	µg/L	5 S	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
2,6-Dinitrotoluene	µg/L	5 S	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
2-Chloronaphthalene	µg/L	10 G	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
2-Chlorophenol	µg/L	NC	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
2-Methylnaphthalene	µg/L	NC	ND(0.20)	0.49	0.49	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
2-Methylphenol	µg/L	NC	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
2-Nitroaniline	µg/L	5 S	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
2-Nitrophenol	µg/L	NC	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
3,3'-Dichlorobenzidine	µg/L	5 S	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
3-Nitroaniline	µg/L	5 S	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
4,6-Dinitro-2-methylphenol	µg/L	NC	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
4-Bromophenyl phenyl ether	µg/L	NC	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
4-Chloro-3-methylphenol	µg/L	NC	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
4-Chloroaniline	µg/L	5 S	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
4-Chlorophenyl phenyl ether	µg/L	NC	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
4-Methylphenol	µg/L	NC	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
4-Nitroaniline	µg/L	5 S	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
4-Nitrophenol	µg/L	NC	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
Acenaphthene	µg/L	20 G	0.37	1.3	1.3	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Acenaphthylene	µg/L	NC	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Acetophenone	µg/L	NC	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Anthracene	µg/L	50 G	ND(0.20)	0.40	0.36	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Atrazine	µg/L	7.5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Benzaldehyde	µg/L	NC	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Benzo(a)anthracene	µg/L	0.002 G	ND(0.20)	**0.36**	**0.25**	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Benzo(a)pyrene	µg/L	NC	ND(0.20)	0.29	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Benzo(b)fluoranthene	µg/L	0.002 G	ND(0.20)	**0.39**	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Benzo(g,h,i)perylene	µg/L	NC	ND(0.20)	0.19 J	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Benzo(k)fluoranthene	µg/L	0.002 G	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Biphenyl	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
bis(2-Chloroethoxy)methane	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
bis(2-Chloroethyl)ether	µg/L	1 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
bis(2-Ethylhexyl)phthalate	µg/L	5 S	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
Butyl benzylphthalate	µg/L	50 G	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Caprolactam	µg/L	NC	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
Carbazole	µg/L	NC	ND(1.0)	1.1	1.0	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Chrysene	µg/L	0.002 G	ND(0.20)	**0.29**	**0.24**	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)

Table 16
SUMMARY OF 2009 GROUNDWATER SAMPLING RESULTS
LIGHTHOUSE POINTE - RIVERFRONT
ROCHESTER, NEW YORK

Location Name		*New York*	*MW-3-05*	*MW-5-05*	*MW-5-05*	*MW-6-05*	*MW-7-05*	*MW-8-05*	*MW-9-05*
Sample Name		*State Ambient*	*WG-42271-041309-005*	*WG-42271-041309-007*	*WG-42271-041309-009*	*WG-42271-041309-006*	*WG-42271-041309-010*	*WG-42271-041309-011*	*WG-42271-041309-008*
Sample Date		*Groundwater Standard*	*4/13/2009*	*4/13/2009*	*4/13/2009*	*4/13/2009*	*4/13/2009*	*4/13/2009*	*4/13/2009*
		or Guidance Value			*Duplicate*				
Parameters	*Units*								
Dibenz(a,h)anthracene	µg/L	NC	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Dibenzofuran	µg/L	NC	ND(1.0)	0.78 J	0.77 J	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Diethyl phthalate	µg/L	50 G	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Dimethyl phthalate	µg/L	50 G	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Di-n-butylphthalate	µg/L	50 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Di-n-octyl phthalate	µg/L	50 G	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Fluoranthene	µg/L	50 G	ND(0.20)	0.93	0.60	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Fluorene	µg/L	50 G	0.21	1.2	1.2	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Hexachlorobenzene	µg/L	0.04 S	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Hexachlorobutadiene	µg/L	0.5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Hexachlorocyclopentadiene	µg/L	5 S	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Hexachloroethane	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Indeno(1,2,3-cd)pyrene	µg/L	0.002 G	ND(0.20)	**0.21**	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Isophorone	µg/L	50 G	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Naphthalene	µg/L	10 G	ND(0.20)	0.70	0.69	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Nitrobenzene	µg/L	0.4 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
N-Nitrosodi-n-propylamine	µg/L	NC	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
N-Nitrosodiphenylamine	µg/L	50 G	ND(1.0)	0.41 J	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Pentachlorophenol	µg/L	1 S	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
Phenanthrene	µg/L	50 G	ND(0.20)	1.4	1.3	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Phenol	µg/L	1 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Pyrene	µg/L	50 G	ND(0.20)	0.74	0.47	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Metals									
Aluminum (Dissolved)	µg/L	NC	ND(200)	ND(200)	ND(200)	ND(200)	ND(200)	ND(200)	ND(200)
Antimony (Dissolved)	µg/L	3 S	0.16 BJ	0.66 BJ	0.53 BJ	0.41 BJ	ND(2.0)	ND(2.0)	0.42 BJ
Arsenic (Dissolved)	µg/L	25 S	2.2 BJ	4.2 BJ	4.2 BJ	0.90 BJ	1.0 BJ	2.9 BJ	1.1 BJ
Barium (Dissolved)	µg/L	1000 S	**1740**	**1030**	**1020**	41.2 B	245	994	129 B
Beryllium (Dissolved)	µg/L	3 G	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Cadmium (Dissolved)	µg/L	5 S	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	1.3 B	ND(2.0)	ND(2.0)
Calcium (Dissolved)	µg/L	NC	195000	154000	151000	65800	138000	77400	107000
Chromium Total (Dissolved)	µg/L	50 S	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	5.9 B	ND(10.0)	ND(10.0)
Cobalt (Dissolved)	µg/L	NC	3.5	0.60 B	0.66 B	0.25 B	0.20 B	0.70 B	2.1
Copper (Dissolved)	µg/L	200 S	ND(25.0)	ND(25.0)	ND(25.0)	ND(25.0)	ND(25.0)	ND(25.0)	ND(25.0)
Iron (Dissolved)	µg/L	300 S	**39400 J**	**27900 J**	**27500 J**	**1440**	215	**27900 J**	**4240**
Lead (Dissolved)	µg/L	25 S	ND(3.0)	ND(3.0)	ND(3.0)	ND(3.0)	ND(3.0)	ND(3.0)	ND(3.0)
Magnesium (Dissolved)	µg/L	35000 G	**73500**	23800	23400	9360	32200	20500	16600
Manganese (Dissolved)	µg/L	300 S	245 J	**1160 J**	**1140 J**	166 J	50.8 J	204 J	**342 J**
Mercury (Dissolved)	µg/L	0.7 S	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Nickel (Dissolved)	µg/L	100 S	ND(40.0)	ND(40.0)	ND(40.0)	ND(40.0)	8.6 B	ND(40.0)	ND(40.0)
Potassium (Dissolved)	µg/L	NC	43000 J	10100 J	9990 J	1570 BJ	2480 BJ	11300 J	3990 BJ
Selenium (Dissolved)	µg/L	10 S	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
Silver (Dissolved)	µg/L	50 S	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)	8.6 B	ND(10.0)	ND(10.0)
Sodium (Dissolved)	µg/L	20000 S	**82900**	17700	17400	**22600**	**119000**	16600	17500
Thallium (Dissolved)	µg/L	0.5 G	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Vanadium (Dissolved)	µg/L	NC	0.67 B	0.89 B	0.95 B	ND(50.0)	4.9 B	1.3 B	0.78 B
Zinc (Dissolved)	µg/L	2000 G	ND(20.0)	27.4 J	28.5 J	165 J	9.1 BJ	14.4 BJ	206 J

Table 16

SUMMARY OF 2009 GROUNDWATER SAMPLING RESULTS
LIGHTHOUSE POINTE - RIVERFRONT
ROCHESTER, NEW YORK

Location Name		*New York*	*MW-3-05*	*MW-5-05*	*MW-5-05*	*MW-6-05*	*MW-7-05*	*MW-8-05*	*MW-9-05*
Sample Name		*State Ambient*	*WG-42271-041309-005*	*WG-42271-041309-007*	*WG-42271-041309-009*	*WG-42271-041309-006*	*WG-42271-041309-010*	*WG-42271-041309-011*	*WG-42271-041309-008*
Sample Date		*Groundwater Standard or Guidance Value*	*4/13/2009*	*4/13/2009*	*4/13/2009 Duplicate*	*4/13/2009*	*4/13/2009*	*4/13/2009*	*4/13/2009*
Parameters	*Units*								
PCBs									
Aroclor-1016 (PCB-1016)	µg/L	NC	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Aroclor-1221 (PCB-1221)	µg/L	NC	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Aroclor-1232 (PCB-1232)	µg/L	NC	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Aroclor-1242 (PCB-1242)	µg/L	NC	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Aroclor-1248 (PCB-1248)	µg/L	NC	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Aroclor-1254 (PCB-1254)	µg/L	NC	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Aroclor-1260 (PCB-1260)	µg/L	NC	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Total PCBs	µg/L	0.09 S	--	--	--	--	--	--	--
Pesticides									
4,4'-DDD	µg/L	0.3 S	0.012 J	ND(0.10)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
4,4'-DDE	µg/L	0.2 S	ND(0.050)	ND(0.10)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
4,4'-DDT	µg/L	0.2 S	ND(0.050)	ND(0.10)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Aldrin	µg/L	NC	ND(0.050)	ND(0.10)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
alpha-BHC	µg/L	0.01 S	ND(0.050)	ND(0.10)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
alpha-Chlordane	µg/L	NC	ND(0.050)	ND(0.10)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
beta-BHC	µg/L	0.04 S	0.033 J	ND(0.10)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
delta-BHC	µg/L	0.04 S	ND(0.050)	ND(0.10)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Dieldrin	µg/L	0.004 S	ND(0.050)	ND(0.10)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	**0.010 J**
Endosulfan I	µg/L	NC	ND(0.050)	ND(0.10)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Endosulfan II	µg/L	NC	ND(0.050)	ND(0.10)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Endosulfan sulfate	µg/L	NC	ND(0.050)	ND(0.10)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Endrin	µg/L	NC	ND(0.050)	ND(0.10)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Endrin aldehyde	µg/L	5 S	ND(0.050)	ND(0.10)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Endrin ketone	µg/L	5 S	ND(0.050)	ND(0.10)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
gamma-BHC (Lindane)	µg/L	0.05 S	ND(0.050)	ND(0.10)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
gamma-Chlordane	µg/L	NC	ND(0.050)	ND(0.10)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Heptachlor	µg/L	0.04 S	ND(0.050)	ND(0.10)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Heptachlor epoxide	µg/L	0.03 S	ND(0.050)	ND(0.10)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Methoxychlor	µg/L	35 S	ND(0.10)	ND(0.20)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
Toxaphene	µg/L	0.06 S	ND(2.0)	ND(4.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)

Notes:

ND( )	Not detected at the detection limit listed in parentheses.
S	New York State ambient water quality standard.
G	New York State ambient groundwater quality guidance value.
N/A	Not analyzed
	Exceedance of New York State Ambient Groundwater Standard or Guidance Value.

Table 16

SUMMARY OF 2009 GROUNDWATER SAMPLING RESULTS
LIGHTHOUSE POINTE - INLAND
IRONDEQUOIT, NEW YORK

Location Name		*New York*	*GW-4*	*MW-1-05*	*MW-2-05*	*MW-4-05*
Sample Name		*State Ambient*	*WG-42271-041309-012*	*WG-42271-041309-001*	*WG-42271-041309-002*	*WG-42271-041309-004*
Sample Date		*Groundwater Standard or Guidance Value*	*4/13/2009*	*4/13/2009*	*4/13/2009*	*4/13/2009*
Parameters	*Units*					
Volatile Organic Compounds						
1,1,1-Trichloroethane	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1,2,2-Tetrachloroethane	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1,2-Trichloroethane	µg/L	1 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1-Dichloroethane	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1-Dichloroethene	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,2,4-Trichlorobenzene	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	0.04 S	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	0.0006 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,2-Dichlorobenzene	µg/L	3 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,2-Dichloroethane	µg/L	0.6 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,2-Dichloropropane	µg/L	1 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,3-Dichlorobenzene	µg/L	3 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,4-Dichlorobenzene	µg/L	3 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
2-Butanone (Methyl Ethyl Ketone)	µg/L	50 G	ND(10)	ND(10)	ND(10)	ND(10)
2-Hexanone	µg/L	50 G	ND(10)	ND(10)	ND(10)	ND(10)
4-Methyl-2-Pentanone	µg/L	NC	ND(10)	ND(10)	ND(10)	ND(10)
Acetone	µg/L	50 G	ND(10)	ND(10)	ND(10)	ND(10)
Benzene	µg/L	1 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Bromodichloromethane	µg/L	50 G	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Bromoform	µg/L	50 G	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Bromomethane (Methyl Bromide)	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Carbon disulfide	µg/L	60 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Carbon tetrachloride	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Chlorobenzene	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Chloroethane	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Chloroform (Trichloromethane)	µg/L	7 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Chloromethane (Methyl Chloride)	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
cis-1,2-Dichloroethene	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
cis-1,3-Dichloropropene	µg/L	NC	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Cyclohexane	µg/L	NC	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Dibromochloromethane	µg/L	50 G	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Dichlorodifluoromethane (CFC-12)	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Ethylbenzene	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Isopropylbenzene	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Methyl acetate	µg/L	NC	ND(10)	ND(10)	ND(10)	ND(10)
Methyl cyclohexane	µg/L	NC	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Methyl Tert Butyl Ether	µg/L	10 G	1.8 J	2.1 J	ND(5.0)	ND(5.0)

Table 16
SUMMARY OF 2009 GROUNDWATER SAMPLING RESULTS
LIGHTHOUSE POINTE - INLAND
IRONDEQUOIT, NEW YORK

Location Name		*New York*	*GW-4*	*MW-1-05*	*MW-2-05*	*MW-4-05*
Sample Name		*State Ambient*	*WG-42271-041309-012*	*WG-42271-041309-001*	*WG-42271-041309-002*	*WG-42271-041309-004*
Sample Date		*Groundwater Standard or Guidance Value*	*4/13/2009*	*4/13/2009*	*4/13/2009*	*4/13/2009*
Parameters	*Units*					
Methylene chloride	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Styrene	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Tetrachloroethene	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Toluene	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
trans-1,2-Dichloroethene	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
trans-1,3-Dichloropropene	µg/L	NC	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Trichloroethene	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Trichlorofluoromethane (CFC-11)	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Trifluorotrichloroethane (Freon 113)	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Vinyl chloride	µg/L	2 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Xylene (total)	µg/L	NC	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
Semi-Volatile Organic Compounds						
1,4-Dioxane	µg/L	NC	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
2,2'-oxybis(1-Chloropropane)	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
2,4,5-Trichlorophenol	µg/L	NC	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
2,4,6-Trichlorophenol	µg/L	NC	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
2,4-Dichlorophenol	µg/L	5 S	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
2,4-Dimethylphenol	µg/L	50 G	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
2,4-Dinitrophenol	µg/L	10 G	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
2,4-Dinitrotoluene	µg/L	5 S	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
2,6-Dinitrotoluene	µg/L	5 S	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
2-Chloronaphthalene	µg/L	10 G	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
2-Chlorophenol	µg/L	NC	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
2-Methylnaphthalene	µg/L	NC	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
2-Methylphenol	µg/L	NC	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
2-Nitroaniline	µg/L	5 S	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
2-Nitrophenol	µg/L	NC	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
3,3'-Dichlorobenzidine	µg/L	5 S	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
3-Nitroaniline	µg/L	5 S	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
4,6-Dinitro-2-methylphenol	µg/L	NC	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
4-Bromophenyl phenyl ether	µg/L	NC	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
4-Chloro-3-methylphenol	µg/L	NC	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
4-Chloroaniline	µg/L	5 S	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
4-Chlorophenyl phenyl ether	µg/L	NC	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
4-Methylphenol	µg/L	NC	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
4-Nitroaniline	µg/L	5 S	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
4-Nitrophenol	µg/L	NC	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)

Table 16

SUMMARY OF 2009 GROUNDWATER SAMPLING RESULTS
LIGHTHOUSE POINTE - INLAND
IRONDEQUOIT, NEW YORK

Location Name		*New York*	*GW-4*	*MW-1-05*	*MW-2-05*	*MW-4-05*
Sample Name		*State Ambient*	*WG-42271-041309-012*	*WG-42271-041309-001*	*WG-42271-041309-002*	*WG-42271-041309-004*
Sample Date		*Groundwater Standard or Guidance Value*	*4/13/2009*	*4/13/2009*	*4/13/2009*	*4/13/2009*
Parameters	*Units*					
Acenaphthene	µg/L	20 G	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Acenaphthylene	µg/L	NC	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Acetophenone	µg/L	NC	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Anthracene	µg/L	50 G	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Atrazine	µg/L	7.5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Benzaldehyde	µg/L	NC	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Benzo(a)anthracene	µg/L	0.002 G	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Benzo(a)pyrene	µg/L	NC	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Benzo(b)fluoranthene	µg/L	0.002 G	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Benzo(g,h,i)perylene	µg/L	NC	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Benzo(k)fluoranthene	µg/L	0.002 G	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Biphenyl	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
bis(2-Chloroethoxy)methane	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
bis(2-Chloroethyl)ether	µg/L	1 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
bis(2-Ethylhexyl)phthalate	µg/L	5 S	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
Butyl benzylphthalate	µg/L	50 G	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Caprolactam	µg/L	NC	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
Carbazole	µg/L	NC	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Chrysene	µg/L	0.002 G	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Dibenz(a,h)anthracene	µg/L	NC	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Dibenzofuran	µg/L	NC	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Diethyl phthalate	µg/L	50 G	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Dimethyl phthalate	µg/L	50 G	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Di-n-butylphthalate	µg/L	50 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Di-n-octyl phthalate	µg/L	50 G	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Fluoranthene	µg/L	50 G	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Fluorene	µg/L	50 G	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Hexachlorobenzene	µg/L	0.04 S	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Hexachlorobutadiene	µg/L	0.5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Hexachlorocyclopentadiene	µg/L	5 S	ND(10)	ND(10)	ND(10)	ND(10)
Hexachloroethane	µg/L	5 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Indeno(1,2,3-cd)pyrene	µg/L	0.002 G	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Isophorone	µg/L	50 G	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Naphthalene	µg/L	10 G	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Nitrobenzene	µg/L	0.4 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
N-Nitrosodi-n-propylamine	µg/L	NC	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
N-Nitrosodiphenylamine	µg/L	50 G	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Pentachlorophenol	µg/L	1 S	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)

Table 16
SUMMARY OF 2009 GROUNDWATER SAMPLING RESULTS
LIGHTHOUSE POINTE - INLAND
IRONDEQUOIT, NEW YORK

Location Name		*New York*	*GW-4*	*MW-1-05*	*MW-2-05*	*MW-4-05*
Sample Name		*State Ambient*	*WG-42271-041309-012*	*WG-42271-041309-001*	*WG-42271-041309-002*	*WG-42271-041309-004*
Sample Date		*Groundwater Standard or Guidance Value*	*4/13/2009*	*4/13/2009*	*4/13/2009*	*4/13/2009*
Parameters	***Units***					
Phenanthrene	µg/L	50 G	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Phenol	µg/L	1 S	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Pyrene	µg/L	50 G	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Metals						
Aluminum (Dissolved)	µg/L	NC	ND(200)	ND(200)	ND(200)	ND(200)
Antimony (Dissolved)	µg/L	3 S	0.15 BJ	0.35 BJ	ND(2.0)	ND(2.0)
Arsenic (Dissolved)	µg/L	25 S	**50.0 J**	4.9 BJ	2.8 BJ	1.6 BJ
Barium (Dissolved)	µg/L	1000 S	215	273	69.7 B	423
Beryllium (Dissolved)	µg/L	3 G	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Cadmium (Dissolved)	µg/L	5 S	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
Calcium (Dissolved)	µg/L	NC	160000	286000	281000	65300
Chromium Total (Dissolved)	µg/L	50 S	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)
Cobalt (Dissolved)	µg/L	NC	2.3	3.5	3.2	ND(1.0)
Copper (Dissolved)	µg/L	200 S	ND(25.0)	ND(25.0)	ND(25.0)	ND(25.0)
Iron (Dissolved)	µg/L	300 S	**36700 J**	**6370 J**	**18500 J**	**620**
Lead (Dissolved)	µg/L	25 S	ND(3.0)	ND(3.0)	ND(3.0)	ND(3.0)
Magnesium (Dissolved)	µg/L	35000 G	**53600**	**104000**	**68800**	24100
Manganese (Dissolved)	µg/L	300 S	**760 J**	**536 J**	**3310 J**	22.2 J
Mercury (Dissolved)	µg/L	0.7 S	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Nickel (Dissolved)	µg/L	100 S	ND(40.0)	7.2 B	4.9 B	ND(40.0)
Potassium (Dissolved)	µg/L	NC	27100 J	42900 J	4510 BJ	1280 BJ
Selenium (Dissolved)	µg/L	10 S	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
Silver (Dissolved)	µg/L	50 S	ND(10.0)	ND(10.0)	ND(10.0)	ND(10.0)
Sodium (Dissolved)	µg/L	20000 S	**43800**	**55200**	**22800**	10800
Thallium (Dissolved)	µg/L	0.5 G	ND(0.50)	ND(0.50)	ND(0.50)	0.21 B
Vanadium (Dissolved)	µg/L	NC	1.4 B	ND(50.0)	ND(50.0)	ND(50.0)
Zinc (Dissolved)	µg/L	2000 G	ND(20.0)	11.2 BJ	7.4 BJ	11.4 BJ
PCBs						
Aroclor-1016 (PCB-1016)	µg/L	NC	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Aroclor-1221 (PCB-1221)	µg/L	NC	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Aroclor-1232 (PCB-1232)	µg/L	NC	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Aroclor-1242 (PCB-1242)	µg/L	NC	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Aroclor-1248 (PCB-1248)	µg/L	NC	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Aroclor-1254 (PCB-1254)	µg/L	NC	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Aroclor-1260 (PCB-1260)	µg/L	NC	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)

Table 16
SUMMARY OF 2009 GROUNDWATER SAMPLING RESULTS
LIGHTHOUSE POINTE - INLAND
IRONDEQUOIT, NEW YORK

Location Name		*New York*	*GW-4*	*MW-1-05*	*MW-2-05*	*MW-4-05*
Sample Name		*State Ambient*	*WG-42271-041309-012*	*WG-42271-041309-001*	*WG-42271-041309-002*	*WG-42271-041309-004*
Sample Date		*Groundwater Standard or Guidance Value*	*4/13/2009*	*4/13/2009*	*4/13/2009*	*4/13/2009*
Parameters	***Units***					
Total PCBs	µg/L	0.09 S	--	--	--	--
Pesticides						
4,4'-DDD	µg/L	0.3 S	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
4,4'-DDE	µg/L	0.2 S	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
4,4'-DDT	µg/L	0.2 S	0.020 J	ND(0.050)	ND(0.050)	ND(0.050)
Aldrin	µg/L	NC	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
alpha-BHC	µg/L	0.01 S	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
alpha-Chlordane	µg/L	NC	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
beta-BHC	µg/L	0.04 S	ND(0.050)	0.039 J	ND(0.050)	ND(0.050)
delta-BHC	µg/L	0.04 S	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Dieldrin	µg/L	0.004 S	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Endosulfan I	µg/L	NC	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Endosulfan II	µg/L	NC	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Endosulfan sulfate	µg/L	NC	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Endrin	µg/L	NC	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Endrin aldehyde	µg/L	5 S	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Endrin ketone	µg/L	5 S	ND(0.050)	0.0078 J	ND(0.050)	ND(0.050)
gamma-BHC (Lindane)	µg/L	0.05 S	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
gamma-Chlordane	µg/L	NC	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Heptachlor	µg/L	0.04 S	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Heptachlor epoxide	µg/L	0.03 S	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Methoxychlor	µg/L	35 S	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
Toxaphene	µg/L	0.06 S	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)

Notes:

ND( )	Not detected at the detection limit listed in parentheses.
S	New York State ambient water quality standard.
G	New York State ambient groundwater quality guidance value.
N/A	Not analyzed
	Exceedance of New York State Ambient Groundwater Standard or Guidance Value.

Table 3-1
Soil Gas Result Detections
Lighthouse Pointe Site
City of Rochester and Town of Irondequoit, New York

Sample Location Sample ID Sample Date	Unit	EPA Screening Levels[1]	NYSDOH Screening Levels[2]	SB-01 SG-01 10/26/2012	SB-02 SG-02 10/26/2012	SB-03 SG-03 10/26/2012	SB-03 SG-03-DUP 10/26/2012	SB-10** SG-04 10/26/2012	SB-05/SB-06 SG-05 10/26/2012	SB-11 SG-06 10/26/2012	SB-16 SG-07 10/26/2012	SB-15 SG-08 10/26/2012	SB-13 SG-09 10/26/2012
VOCs													
1,1,1-TRICHLOROETHANE	µg/m^3	5214	**NL**	1.1 U	3.3 U	5.5 U	5.5 U	0.11 U	5.5 U	0.19	16 U	1.1 U	0.44 U
1,1-DICHLOROETHENE	µg/m^3	209	**NL**	2.3	2.4 U	4 U	4 U	0.079 U	4 U	0.079 U	12 U	0.79 U	0.32 U
1,2,4-TRIMETHYLBENZENE	µg/m^3	NL	**NL**	6.3	2.9 U	42	41	1.4	170	5.3	600	16	2.3
1,2-DICHLOROBENZENE	µg/m^3	209	**NL**	1.2 U	3.6 U	6 U	6 U	1.2 U	16	1.2 U	18 U	1.2 U	1.2 U
1,2-DICHLOROTETRAFLUOROETHANE; FLUOROCARBON	µg/m^3	NL	**NL**	1.4 U	4.2 U	450	440	0.14 U	1800 D	0.16	770	7	11
1,3,5-TRIMETHYLBENZENE	µg/m^3	NL	**NL**	3.2	2.9 U	4.9 U	4.9 U	0.76	100	3.3	530	7.1	2.5
1,4-DICHLOROBENZENE	µg/m^3	2.2	**NL**	1.2 U	3.6 U	79	76	1.2 U	430	1.2 U	41	1.2 U	1.2 U
2-BUTANONE (MEK)	µg/m^3	5214	**NL**	9	51	7.4 U	7.4 U	2.6	60	2.7	22 U	17	2.7
2-HEXANONE	µg/m^3	31	**NL**	2 U	6.1 U	10 U	10 U		10 U		31 U	7	
4-ETHYLTOLUENE	µg/m^3	NL	**NL**	1.1	2.9 U	4.9 U	4.9 U	0.51	4.9 U	1.2	380	3.8	0.4
4-METHYL-2-PENTANONE (MIBK)	µg/m^3	3129	**NL**	2 U	6.1 U	10 U	10 U	2 U	10 U	2 U	31 U	10	2 U
ACETONE	µg/m^3	32329	**NL**	39	160	59 U	59 U	15	160	15	180 U	60	13
BENZENE	µg/m^3	3.1	**NL**	45	3.4	26	26	1.4	160	7.7	790	23	12
CARBON DISULFIDE	µg/m^3	730	**NL**	11	23	8.9	8.6	35	120	19	23 U	21	6.1
CARBON TETRACHLORIDE	µg/m^3	4.1	**NL**	1.3 U	3.8 U	6.3 U	6.3 U	0.13 U	6.3 U	0.25	19 U	1.3 U	0.51 U
CHLOROBENZENE	µg/m^3	52	**NL**	0.92 U	2.7 U	4.6 U	4.6 U	0.92 U	120	0.92 U	14 U	0.92 U	0.92 U
CHLOROFORM	µg/m^3	1.1	**NL**	0.98 U	2.9 U	4.9 U	4.9 U	0.17	4.9 U	0.098 U	15 U	69	0.39 U
cis-1,2-DICHLOROETHENE	µg/m^3	NL	**NL**	30	9	27	27	0.079 U	16	0.079 U	19	4.2	0.32 U
DICHLORODIFLUOROMETHANE	µg/m^3	104	**NL**	4.4	7.4 U	94	94	0.76	240	2.7	120	3.1	4.5
ETHYLBENZENE	µg/m^3	9.7	**NL**	3.3	2.6 U	9	8.2	1.2	8.6	3.2	1700	10	2
m,p-XYLENE	µg/m^3	104	**NL**	49	7	21	21	5	54	17	640	34	12
METHYL METHACRYLATE	µg/m^3	NL	**NL**	2 U	6.1 U	37	36	2 U	10 U	2 U	740	2 U	2 U
METHYL TERT-BUTYL ETHER	µg/m^3	94	**NL**	1.4	2.2 U	3.6 U	3.6 U	6.3	3.6 U	0.21	11 U	0.72 U	0.29 U
NAPHTHALENE	µg/m^3	NL	**NL**	11	7.8 U	13 U	13 U	2.6 U	13 U	2.6 U	39 U	2.6 U	2.6 U
N-HEPTANE	µg/m^3	NL	**NL**	82	34	90	86	2	290	25	1500	39	110
o-XYLENE	µg/m^3	104	**NL**	6.3	2.6 U	6.1	6.1	1.4	19	3.6	220	11	1.8
TETRACHLOROETHENE	µg/m^3	41.7	**100**	12	4.1 U	11	11	1.1	6.8 U	1.9	20 U	40	2.5
TOLUENE	µg/m^3	5214	**NL**	13	2.3 U	14	14	6.1	72	20	69	59	22
trans-1,2-DICHLOROETHENE	µg/m^3	63	**NL**	5.2	2.4 U	4 U	4 U	0.079 U	4 U	0.079 U	12 U	0.79 U	0.32 U
TRICHLOROETHENE	µg/m^3	2.1	**5**	**14**	3.2 U	**9.1**	**8.6**	0.18	**8.3**	0.24	**20**	1	0.43 U
TRICHLOROFLUOROMETHANE	µg/m^3	730	**NL**	1.1 U	3.4 U	5.6 U	5.6 U	0.64	5.6 U	1.3	17 U	1.3	1.1
VINYL CHLORIDE	µg/m^3	1.6	**NL**	21	33	64	63	0.1 U	13	0.1 U	230	2.3	0.41 U

Notes:
1. EPA Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites (May 2012) for residential soil, adjusted to cancer risk of 1E-6 and hazard quotient
   Target Subslab and Exterior Soil Gas Concentraqtions are obtained from the OSWER Vapor Intrusion Assessmetn, Vaport Intrusion Svreening Levels Calculator Version 1.0 (EPA March 2012).
2. NYSDOH Soil Vapor Intrusion Guidance, October 2006. Table 3.1 Air Guidance Values derived by the NYSDOH.
3. Results in shaded cells exceede EPA Screening Levels for that compound.
4. Results in bold exceed the NYSDOH Screening Levels for that compound.
5. Cells shaded gray represents a non-reportable results.
   **indicates sample was taken within the Inland East Site, all other samples were collected off-site.

Acronyms:
EPA = United States Environmental Protection Agency
NYSDOH = New York State Department of Health
µg/m^3 = microgram per cubic meter
NL = Not Listed

Qualifiers:
U = Analyte was analyzed for but not detected.

Table 3-2
Soil Analytical Results
VOC and SVOC Detections
Lighthouse Pointe Site
City of Rochester and Town of Irondequoit, New York

Sample Location / Sample ID / Sample Date / Sample Matrix	Unit	EPA Regional Screening Levels for Residential Soils[1]	NYSDEC Subpart 375-6 Restricted Residential Use Soil Cleanup Objective[2]	NYSDEC Subpart 375-6 Unrestricted Use Soil Cleanup Objective[3]	SB01 SB-01 (3-5) 10/24/2012 Waste	SB01 SB-01 (7-9) 10/24/2012 Fill Material	SB02 SB-02 (2-4) 10/23/2012 Waste	SB02 SB-02 (4-6) 10/23/2012 Fill Material	SB03 SB-03 (2-4) 10/23/2012 Fill Material	SB03 SB-03 (2-4)-DUP 10/23/2012 Fill Material	SB03 SB-03 (8-10) 10/23/2012 Waste	SB04 SB-04 (2-4) 10/23/2012 Fill Material	SB04 SB-04 (8-10) 10/23/2012 Waste	SB05 SB-05 (0-2) 10/22/2012 Fill Material	SB05 SB-05 (5-7) 10/22/2012 Waste
VOCs															
1,2-DICHLOROBENZENE	µg/kg	190000	**100000**	*1100*	0.38 J	5.1 U	5.6 U	6.9 U	5.6 U	5.8 R	890 U	6.1 U	13	6.5 R	5.2 J
1,3-DICHLOROBENZENE	µg/kg	NL	**49000**	*2400*	0.41 J	5.1 U	5.6 U	6.9 U	5.6 U	5.8 R	890 U	6.1 U	10 U	6.5 R	9.4 U
1,4-DICHLOROBENZENE	µg/kg	2400	**13000**	*1800*	0.68 J	5.1 U	5.6 U	6.9 U	5.6 U	5.8 R	84 J	6.1 U	54	6.5 R	25
2-BUTANONE (MEK)	µg/kg	2800000	**100000**	*NL*	12 J	10 U	11 U	14 U	11 U	12 U	1800 U	12 U	37	13 U	67
ACETONE	µg/kg	6100000	**100000**	*50*	35	10 U	3.5 J	30	11 U	12 U	1800 U	12 U	90	13 U	*200*
BENZENE	µg/kg	1100	**4800**	*60*	4.1 J	5.1 U	5.6 U	6.9 U	5.6 U	5.8 U	890 U	6.1 U	10 J	6.5 U	2.1 J
CARBON DISULFIDE	µg/kg	82000	**NL**	*NL*	8.7 J	5.1 U	5.6 U	6.9 U	5.6 U	5.8 UJ	890 U	6.1 U	13	6.5 U	13
CHLOROBENZENE	µg/kg	29000	**100000**	*1100*	8.6 U	5.1 U	5.6 U	6.9 U	5.6 U	5.8 U	890 U	6.1 U	18	6.5 U	1.8 J
CYCLOHEXANE	µg/kg	117000	**NL**	*NL*	1.3 J	5.1 U	0.36 J	6.9 U	5.6 U	5.8 U	890 U	6.1 U	0.89 J	6.5 U	1.2 J
ETHYLBENZENE	µg/kg	5400	**41000**	*1000*	1.4 J	5.1 U	5.6 U	6.9 U	5.6 U	0.27 J	890 U	6.1 U	2.1 J	6.5 U	1.1 J
ISOPROPYLBENZENE	µg/kg	259098	**NL**	*NL*	0.57 J	5.1 U	5.6 U	6.9 U	5.6 U	5.8 U	890 U	6.1 U	61	6.5 U	10
M,P-XYLENE	µg/kg	59000	**100000**	*260*	100 J	5.1 U	0.51 J	6.9 U	0.33 J	0.38 J	23 J	0.3 J	12	6.5 U	4 J
METHYLCYLOHEXANE	µg/kg	NL	**NL**	*NL*	1.3 J	5.1 U	0.52 J	6.9 U	5.6 U	5.8 U	58 J	0.37 J	1.5 J	6.5 U	2.4 J
O-XYLENE	µg/kg	69000	**100000**	*260*	5.1 J	5.1 U	0.29 J	6.9 U	5.6 U	0.21 J	890 U	6.1 U	5 J	6.5 U	2.9 J
TETRACHLOROETHENE	µg/kg	8600	**19000**	*1300*	2.4 J	5.1 U	5.6 U	0.58 J	0.47 J	1.9 J	890 U	0.73 J	10 U	6.5 U	9.4 U
TOLUENE	µg/kg	723996	**100000**	*700*	3.1 J	0.21 J	0.71 J	6.9 U	1.1 J	0.83 J	24 J	0.44 J	3.7 J	6.5 U	3.8 J
TRICHLOROETHENE	µg/kg	440	**21000**	*470*	0.87 J	5.1 U	5.6 U	6.9 U	5.6 U	5.8 U	890 U	6.1 U	10 U	6.5 U	9.4 U
TRICHLOROFLUOROMETHANE	µg/kg	79000	**NL**	*NL*	0.7 J	0.37 J	0.31 J	6.9 U	0.82 J	0.31 J	890 U	0.32 J	0.5 J	6.5 U	0.49 J
SVOC															
1,1'-BIPHENYL	µg/kg	5100	**NL**	*NL*	8600 U	180 U	5900 U	7000 U	1900 U	6300 U	7700 U	2000 U	190 J	2100 U	3300 U
1,2-BENZPHENANTHRACENE	µg/kg	15000	**3900**	*1000*	540 J	23 J	*1700 J*	***8500***	*1000 J*	*2000 J*	400 J	910 J	340 J	270 J	290 J
2,4-DIMETHYLPHENOL	µg/kg	120000	**NL**	*NL*	8600 U	180 U	5900 U	7000 U	1900 U	6300 U	7700 U	2000 U	3400 U	2100 U	3300 U
2-METHYLNAPHTHALENE	µg/kg	23000	**NL**	*NL*	370 J	180 U	5900 U	7000 U	1900 U	6300 U	7700 U	2000 U	440 J	2100 U	310 J
4-METHYLPHENOL	µg/kg	610000	**100000**	*330*	8600 U	68 J	5900 U	7000 U	1900 U	6300 U	7700 U	2000 U	*4000*	2100 U	3300 U
ACENAPHTHENE	µg/kg	340000	**100000**	*20000*	8600 U	180 U	5900 U	1300 J	75 J	6300 U	7700 U	180 J	3400 U	2100 U	3300 U
ACENAPHTHYLENE	µg/kg	340000	**100000**	*100000*	8600 U	180 U	5900 U	320 J	90 J	270 J	7700 U	2000 U	3400 U	2100 U	3300 U
ACETOPHENONE	µg/kg	780000	**NL**	*NL*	8600 U	180 U	5900 U	7000 U	1900 U	6300 U	7700 U	2000 U	3400 U	2100 U	3300 U
ANTHRACENE	µg/kg	1700000	**100000**	*100000*	320 J	11 J	370 J	3400 J	250 J	630 J	7700 U	500 J	3400 U	73 J	3300 U
BENZO(A)ANTHRACENE	µg/kg	150	**1000**	*1000*	810 J	23 J	***1800 J***	***10000***	***1000 J***	***2400 J***	470 J	***1200 J***	200 J	310 J	210 J
BENZO(A)PYRENE	µg/kg	15	**1000**	*1000*	610 J	20 J	***2200 J***	***9200***	980 J	***2800 J***	360 J	960 J	3400 U	240 J	260 J
BENZO(B)FLUORANTHENE	µg/kg	150	**1000**	*1000*	800 J	27 J	***3100 J***	***13000***	***1500 J***	***3500 J***	510 J	***1300 J***	170 J	370 J	410 J
BENZO(G,H,I)PERYLENE	µg/kg	170000	**100000**	*100000*	8600 U	7.8 J	850 J	2700 J	210 J	910 J	7700 U	210 J	3400 U	2100 U	3300 U
BENZO(K)FLUORANTHENE	µg/kg	1500	**3900**	*800*	8600 U	8.9 J	*1000 J*	*3800 J*	490 J	*1200 J*	7700 U	460 J	3400 U	110 J	3300 U
BENZYL BUTYL PHTHALATE	µg/kg	260000	**NL**	*NL*	8600 U	14 J	5900 U	7000 U	1900 U	6300 U	7700 U	2000 U	190 J	2100 U	170 J
CARBAZOLE	µg/kg	NL	**NL**	*NL*	8600 U	180 U	5900 U	1100 J	110 J	6300 U	7700 U	240 J	3400 U	2100 U	3300 U
DIBENZO(A,H)ANTHRACENE	µg/kg	15	**330**	*330*	8600 U	180 U	***340 J***	***1100 J***	130 J	***340 J***	7700 U	130 J	3400 U	2100 U	3300 U
DIBENZOFURAN	µg/kg	7800	**NL**	*NL*	8600 U	180 U	5900 U	680 J	1900 U	6300 U	7700 U	120 J	3400 U	2100 U	3300 U
DIETHYL PHTHALATE	µg/kg	4900000	**NL**	*NL*	8600 U	7.1 J	5900 U	7000 U	1900 U	6300 U	390 J	2000 U	3400 U	2100 U	3300 U
Di-n-octylphthalate	µg/kg	73000	**NL**	*NL*	8600 U	180 U	5900 U	7000 U	1900 U	6300 U	7700 U	2000 U	3400 U	2100 U	3300 U
FLUORANTHENE	µg/kg	230000	**100000**	*100000*	1300 J	54 J	3100 J	21000	2200	4800 J	1300 J	2500	410 J	330 J	350 J
FLUORENE	µg/kg	230000	**100000**	*30000*	340 J	180 U	5900 U	1600 J	79 J	6300 U	7700 U	220 J	3400 U	2100 U	3300 U
INDENO(1,2,3-CD)PYRENE	µg/kg	150	**500**	*500*	340 J	14 J	***1500 J***	***4200 J***	***570 J***	***1500 J***	7700 U	480 J	3400 U	140 J	130 J
NAPHTHALENE	µg/kg	3600	**100000**	*12000*	350 J	36 J	5900 U	360 J	1900 U	6300 U	7700 U	87 J	890 J	2100 U	190 J
N-NITROSODIPHENYLAMINE	µg/kg	99000	**NL**	*NL*	8600 U	180 U	5900 U	7000 U	1900 U	6300 U	7700 U	2000 U	3400 U	2100 U	260 J
PHENANTHRENE	µg/kg	1700000	**100000**	*100000*	1600 J	53 J	1100 J	13000	1100 J	2100 J	730 J	2000	980 J	230 J	380 J
PHENOL	µg/kg	1800000	**100000**	*330*	8600 U	9.2 J	5900 U	7000 U	1900 U	6300 U	7700 U	2000 U	140 J	2100 U	3300 U
PYRENE	µg/kg	170000	**100000**	*100000*	970 J	45 J	2600 J	15000	1600 J	4200 J	830 J	1900 J	310 J	260 J	310 J

Table 3-2
Soil Analytical Results
VOC and SVOC Detections
Lighthouse Pointe Site
City of Rochester and Town of Irondequoit, New York

Sample Location / Sample ID / Sample Date / Sample Matrix	Unit	EPA Regional Screening Levels for Residential Soils[1]	NYSDEC Subpart 375-6 Restricted Residential Use Soil Cleanup Objective[2]	NYSDEC Subpart 375-6 Unrestricted Use Soil Cleanup Objective[3]	SB06 SB-06 (2-4) 10/22/2012 Fill Material	SB07 SB-07 (18-20) 10/24/2012 Waste	SB08 SB-08 (2-4) 10/22/2012 Fill Material	SB09 SB-09 (10-12) 10/24/2012 Waste	SB09 -09 (10-12)-DU 10/24/2012 Waste	SB11 SB-11 (1-3) 10/25/2012 Fill Material	SB13 SB-13 (2-4) 10/25/2012 Fill Material	SB15 SB-15 (2-4) 10/25/2012 Fill Material	SB15 SB-15 (5-7) 10/24/2012 Waste	SB16 SB-16 (2-4) 10/24/2012 Fill Material	SB16 SB-16 (5-7) 10/24/2012 Waste
VOCs															
1,2-DICHLOROBENZENE	ug/kg	190000	**100000**	*1100*	38 J	170 J	53 J	6.9	37 J	5.5 U	5.1 U	5.8 U	5.8 U	5.5 U	360 U
1,3-DICHLOROBENZENE	ug/kg	NL	**49000**	*2400*	530 U	510 U	410 U	6.2 U	480 U	5.5 U	5.1 U	5.8 U	5.8 U	5.5 U	360 U
1,4-DICHLOROBENZENE	ug/kg	2400	**13000**	*1800*	670	350 J	160 J	65	310 J	5.5 U	5.1 U	5.8 U	5.8 U	5.5 U	130 J
2-BUTANONE (MEK)	ug/kg	2800000	**100000**	*NL*	400 J	440 J	820 U	28	950 U	11 U	10 U	12 U	6.3 J	11 U	710 U
ACETONE	ug/kg	6100000	**100000**	*50*	*510 J*	*340 J*	*270 J*	*99*	*410 J*	11 U	10 U	12 U	19	11 U	*250 J*
BENZENE	ug/kg	1100	**4800**	*60*	530 U	510 U	410 U	4 J	480 U	1 J	0.78 J	5.8 U	5.8 U	5.5 U	360 U
CARBON DISULFIDE	ug/kg	82000	**NL**	*NL*	71 J	510 U	38 J	6.2 U	480 U	5.5 U	5.1 U	5.8 U	5.8 U	5.5 U	360 U
CHLOROBENZENE	ug/kg	29000	**100000**	*1100*	30 J	510 U	*1100*	86	270 J	5.5 U	5.1 U	5.8 U	5.8 U	5.5 U	360 U
CYCLOHEXANE	ug/kg	117000	**NL**	*NL*	530 U	510 U	410 U	0.64 J	480 U	1 J	0.81 J	5.8 U	5.8 U	5.5 U	360 U
ETHYLBENZENE	ug/kg	5400	**41000**	*1000*	530 U	270 J	410 U	4.5 J	27 J	5.5 U	5.1 U	5.8 U	5.8 U	5.5 U	160 J
ISOPROPYLBENZENE	ug/kg	259098	**NL**	*NL*	110 J	130 J	160 J	24	160 J	5.5 U	5.1 U	5.8 U	5.8 U	5.5 U	29 J
M,P-XYLENE	ug/kg	59000	**100000**	*260*	17 J	*390 J*	410 U	20	94 J	1 J	0.79 J	0.15 J	5.8 U	0.16 J	200 J
METHYLCYLOHEXANE	ug/kg	NL	**NL**	*NL*	530 U	510 U	410 U	2.3 J	480 U	2 J	1.5 J	5.8 U	5.8 U	5.5 U	40 J
O-XYLENE	ug/kg	69000	**100000**	*260*	11 J	*290 J*	410 U	3.3 J	21 J	0.32 J	0.24 J	5.8 U	5.8 U	5.5 U	120 J
TETRACHLOROETHENE	ug/kg	8600	**19000**	*1300*	530 U	510 U	410 U	0.31 J	480 U	5.5 U	5.1 U	5.8 U	5.8 U	5.5 U	360 U
TOLUENE	ug/kg	723996	**100000**	*700*	14 J	95 J	8.5 J	1.9 J	17 J	1.5 J	0.95 J	0.17 J	0.13 J	0.24 J	13 J
TRICHLOROETHENE	ug/kg	440	**21000**	*470*	530 U	510 U	410 U	6.2 U	480 U	5.5 U	5.1 U	5.8 U	5.8 U	5.5 U	360 U
TRICHLOROFLUOROMETHANE	ug/kg	79000	**NL**	*NL*	530 U	510 U	410 U	6.2 U	480 U	5.5 U	5.1 U	5.8 U	5.8 U	0.41 J	360 U
SVOC															
1,1'-BIPHENYL	ug/kg	5100	**NL**	*NL*	7900 U	2600 U	1200 U	1100 U	2400 U	940 U	180 U	980 U	200 U	190 U	840 U
1,2-BENZPHENANTHRACENE	ug/kg	15000	**3900**	*1000*	7900 U	420 J	1200 U	160 J	2400 U	940 U	180 U	59 J	200 U	190 U	840 U
2,4-DIMETHYLPHENOL	ug/kg	120000	**NL**	*NL*	7900 U	140 J	1200 U	1100 U	2400 U	940 U	180 U	980 U	200 U	190 U	840 U
2-METHYLNAPHTHALENE	ug/kg	23000	**NL**	*NL*	7900 U	110 J	52 J	1100 U	2400 U	940 U	180 U	980 U	200 U	190 U	840 U
4-METHYLPHENOL	ug/kg	610000	**100000**	*330*	7900 U	*1700 J*	1200 U	1100 U	2400 U	940 U	180 U	980 U	200 U	190 U	840 U
ACENAPHTHENE	ug/kg	340000	**100000**	*20000*	7900 U	120 J	1200 U	1100 U	2400 U	940 U	180 U	980 U	200 U	190 U	840 U
ACENAPHTHYLENE	ug/kg	340000	**100000**	*100000*	7900 U	2600 U	1200 U	1100 U	2400 U	940 U	180 U	980 U	200 U	190 U	840 U
ACETOPHENONE	ug/kg	780000	**NL**	*NL*	7900 U	2600 U	1200 U	1100 U	2400 U	43 J	59 J	980 U	63 J	190 U	840 U
ANTHRACENE	ug/kg	1700000	**100000**	*100000*	7900 U	230 J	1200 U	1100 U	2400 U	940 U	180 U	980 U	200 U	190 U	840 U
BENZO(A)ANTHRACENE	ug/kg	150	**1000**	*1000*	7900 U	440 J	1200 U	140 J	100 J	940 U	180 U	58 J	200 U	190 U	840 U
BENZO(A)PYRENE	ug/kg	15	**1000**	*1000*	7900 U	370 J	1200 U	160 J	2400 U	940 U	180 U	60 J	200 U	190 U	840 U
BENZO(B)FLUORANTHENE	ug/kg	150	**1000**	*1000*	7900 U	510 J	1200 U	210 J	96 J	42 J	180 U	91 J	200 U	190 U	840 U
BENZO(G,H,I)PERYLENE	ug/kg	170000	**100000**	*100000*	7900 U	2600 U	1200 U	54 J	2400 U	940 U	180 U	980 U	200 U	190 U	840 U
BENZO(K)FLUORANTHENE	ug/kg	1500	**3900**	*800*	7900 U	160 J	1200 U	82 J	2400 U	940 U	180 U	980 U	200 U	190 U	840 U
BENZYL BUTYL PHTHALATE	ug/kg	260000	**NL**	*NL*	7900 U	160 J	1200 U	1100 U	2400 U	940 U	180 U	980 U	200 U	190 U	840 U
CARBAZOLE	ug/kg	NL	**NL**	*NL*	7900 U	120 J	1200 U	1100 U	2400 U	940 U	180 U	980 U	200 U	190 U	840 U
DIBENZO(A,H)ANTHRACENE	ug/kg	15	**330**	*330*	7900 U	2600 U	1200 U	1100 U	2400 U	940 U	180 U	980 U	200 U	190 U	840 U
DIBENZOFURAN	ug/kg	7800	**NL**	*NL*	7900 U	2600 U	1200 U	1100 U	2400 U	940 U	180 U	980 U	200 U	190 U	840 U
DIETHYL PHTHALATE	ug/kg	4900000	**NL**	*NL*	7900 U	110 J	1200 U	1100 U	220 J	940 U	180 U	980 U	200 U	190 U	840 U
Di-n-octylphthalate	ug/kg	73000	**NL**	*NL*	7900 U	100 J	1200 U	42 J	140 J	940 U	180 U	980 U	200 U	190 U	840 U
FLUORANTHENE	ug/kg	230000	**100000**	*100000*	7900 U	1200 J	1200 U	380 J	160 J	37 J	180 U	110 J	200 U	190 U	840 U
FLUORENE	ug/kg	230000	**100000**	*30000*	7900 U	140 J	1200 U	1100 U	2400 U	940 U	180 U	980 U	200 U	190 U	840 U
INDENO(1,2,3-CD)PYRENE	ug/kg	150	**500**	*500*	7900 U	230 J	1200 U	120 J	2400 U	940 U	180 U	44 J	200 U	190 U	840 U
NAPHTHALENE	ug/kg	3600	**100000**	*12000*	7900 U	920 J	69 J	59 J	100 J	940 U	180 U	980 U	200 U	190 U	48 J
N-NITROSODIPHENYLAMINE	ug/kg	99000	**NL**	*NL*	7900 U	2600 U	1200 U	1100 U	2400 U	940 U	180 U	980 U	200 U	190 U	840 U
PHENANTHRENE	ug/kg	1700000	**100000**	*100000*	440 J	1200 J	60 J	250 J	170 J	940 U	9.8 J	39 J	10 J	190 U	840 U
PHENOL	ug/kg	1800000	**100000**	*330*	7900 U	120 J	1200 U	1100 U	2400 U	940 U	19 J	980 U	15 J	190 U	840 U
PYRENE	ug/kg	170000	**100000**	*100000*	7900 U	840 J	1200 U	320 J	140 J	940 U	180 U	84 J	200 U	190 U	840 U

APPENDIX E

GENERIC COMMUNITY AIR MONITORING PLAN

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

Overview

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

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

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

Community Air Monitoring Plan

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

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

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

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

VOC Monitoring, Response Levels, and Actions

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

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

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

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

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

Particulate Monitoring, Response Levels, and Actions

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

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

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

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

Fugitive Dust and Particulate Monitoring

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

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

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

    a. Objects to be measured: Dust, mists or aerosols;
    b. Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
    c. Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; +/- 1.5 g/m3 for sixty second averaging;
    d. Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
    e. Resolution: 0.1% of reading or 1g/m3, whichever is larger;
    f. Particle Size Range of Maximum Response: 0.1-10;
    g. Total Number of Data Points in Memory: 10,000;
    h. Logged Data: Each data point with average concentration, time/date and data point number
    i. Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL

concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;

j. Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
k. Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
l. Operating Temperature: -10 to 50° C (14 to 122° F);
m. Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

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

   The action level will be established at 150 ug/m3 (15 minutes average). While conservative, this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

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

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

   a. Applying water on haul roads;
   b. Wetting equipment and excavation faces;
   c. Spraying water on buckets during excavation and dumping;
   d. Hauling materials in properly tarped or watertight containers;

e. Restricting vehicle speeds to 10 mph;
f. Covering excavated areas and material after excavation activity ceases; and
g. Reducing the excavation size and/or number of excavations.

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

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

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

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Considerations should be given to implementing the planned activities when potentially exposed populations area 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-specified 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 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 work.
- If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m3, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m3 or less at the monitoring point.
- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and action should be pre-determined as necessary for each site.

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

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

APPENDIX F

HEALTH AND SAFETY PLAN

APPENDIX F

HEALTH AND SAFETY PLAN

Lighthouse Pointe Inland East
Monroe County
Irondequoit, New York

NYSDEC BCP Site No. C828141

Prepared for:

Lighthouse Pointe Property Associates LLC
100 S. Clinton Ave., Suite 2600
Rochester, New York 14604

Prepared by:

Marsh Engineering DPC
271 Marsh Road, Suite 2
Pittsford, New York 14534

December 2025

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1.0 INTRODUCTION

The purpose of this Health and Safety Plan ("HASP") is to provide guidelines for responding to potential health and safety issues that may be encountered during the Site activities at the Lighthouse Pointe Inland East site located in Irondequoit, Monroe County, New York (NYSDEC BCP Site No. C828212) ("Site"). A Site Map is included as **Figure F-1**.

This HASP has been prepared for the sole use of Marsh Engineering DPC ("Marsh") employees. This HASP may be used by, or modified by, those retained by Marsh to assist with the implementation of the Interim Site Management Plan ("ISMP") to reflect the policies of their firms (and their role in the project); however, Marsh does not take responsibility for anyone other than Marsh employees. Others retained by Marsh to assist with the implementation of the ISMP can also provide their own HASP with the condition that their HASP is no less stringent than this HASP. If additional health and safety concerns are identified, or the Site conditions have changed, at the time of Site work that are not included in this HASP, this HASP will be amended.

The requirements of this HASP are applicable to all personnel and their authorized visitors approved to be on the Site, but the HASP do not replace or supersede any regulatory requirements of the United States Environmental Protection Agency ("USEPA"), New York State Department of Environmental Conservation ("NYSDEC"), or the Occupational Safety and Health Association ("OSHA").

1.2 Site Location and Conditions

The Lighthouse Pointe Inland East Site is located in the Town of Irondequoit, Monroe County, New York, and encompasses approximately 5.80 acres. The Inland East site is bounded to the south by Pattonwood Drive, to the west by Marina Drive and the Inland site, and to the north and east by residential properties. The Inland East Site is zoned as River Harbor. The Inland East site is primarily undeveloped land wooded land to the east, one (1) building along Marina Drive with a parking lot to the south is located at the Site currently operated by Monroe County Pure Waters. Historic usage of the Site includes a railroad roundhouse (a building used by the railroads to service locomotives), commercial developments between the 1950s and 1960s. A majority of the Inland Site operated as a municipal landfill by the City of Rochester beginning in the late 1940s. The landfill operations were reportedly ceased in 1962, however, may have continued until as late as 1978. A municipal sewage treatment plant used a portion of the Site, and there remains a County operated sewage pump station to the north of Pattonwood Drive. The surrounding area of the Inland East Site primarily include commercial and residential properties. A full description of the site's history is detailed in the ISMP.

2.0 RESPONSIBILITIES

This HASP presents guidelines to minimize the risk of injury, to project personnel, and to provide rapid response in the event of injury. The HASP is applicable only to activities of approved personnel and authorized visitors. The Project Manager will implement the provisions of this HASP for the duration of the ISMP activities. It is the responsibility of employees to follow the requirements of this HASP, and all applicable safety procedures and protocols. Marsh field staff are required to review and understand the HASP prior to conducting work at the project Site. Listed below are Leader project personnel and their responsibilities on the project:

- **Principle-in-Charge**: Michael Rumrill.

  Mr. Rumrill will act in a supervisory capacity for Marsh Engineering, D.P.C.. ("Marsh") employees and their subcontractors and the planned site activities with respect to the project site.

- **Senior Project Manager/Project Manager:** Bruce Ahrens

  The Senior Project Manager will be Bruce Ahrens of Marsh. The Senior Project Manager will have the authority to direct site operations including the performance of this Health and Safety Plan. Mr. Ahrens is responsible for direct oversight and implementation of the project and HASP. Mr. Ahrens will be interacting directly with field personnel.

- **Health and Safety Supervisor**: Dawson Tait

  Mr. Tait is responsible for implementation of the HASP. Mr. Dawson Tait will be the site's Health and Safety Supervisor ("HSS"). Mr. Tait will have the authority to stop work if any operation threatens the health and safety of workers or the public. The HSS may designate a member of the work party for site health and safety responsibilities when the HSS cannot be on site. Any changes to this HASP must be approved by both Tait and Mr. Ahrens.

- **Project Team**

  Personnel on the project team will be responsible for the completion of the ISMP's required tasks. All personnel on the project team will comply with the site safety plan and ensure the HSS or Project Manager is notified of any unsafe conditions. All personnel on the project team participating in field work will have the appropriate 29 CFR 1910.120 training and participate in daily tailgate health and safety meetings. Subcontractors, if used in the future, may supply their own HASPs, or agree to abide by the requirements of this HASP.

2.1 Activities Covered

The activities covered under this HASP include the following:

1. Site-wide Inspections

2.2 Standard Safety Procedures

Standard operating and safety procedures include safety precautions and operating practices that all personnel will follow. These include:

- Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in any area designated contaminated.
- Hands and face must be thoroughly washed upon leaving the work area.
- It is not anticipated that respirators will be required; however, if required based on field monitoring, no facial hair that interferes with a satisfactory fit of the mask-to-face seal is allowed on personnel required to wear respirators. Personnel will use the negative pressure fit test prior to each use of the equipment.
- Contact with contaminated or suspected contaminated surfaces should be avoided. Whenever possible, do not walk through puddles, leachate, discolored surfaces, kneel on ground, lean, sit or place equipment on drums, containers, or the ground.
- Medicine and alcohol can enhance or mask the effects from exposure to volatile chemicals. Prescribed drugs and alcoholic beverages should be avoided, in the off-duty hours, during the project.
- All personnel working on-site must be adequately trained and thoroughly briefed on anticipated hazards, personal protective equipment ("PPE") to be worn, safety practices to be followed, emergency procedures, and communications.
- Work areas for various operational activities will be established, if needed, by the Project Manager, or responsible designee, and the HSS.

3.0 WORK AREA ACCESS AND SITE CONTROL

3.1 Access

Marsh has been retained to implement the requirements of the ISMP on behalf of the owners of the Site, FRS Properties, LLC and Ontario Properties, Inc. ("Owners"). Marsh is not responsible for individuals not employed directly by Marsh, or individuals/organizations retained by the Owners to conduct Site activities. It is the responsibility of all parties visiting the Site to perform inspection, monitoring, or sampling activities to acknowledge the HASP by signing the Sign In/Sign Out log (**Attachment A**), or to present their own HASP. All parties visiting or working on the Site must be familiar with this HASP and the associated site hazards.

When conducting ISMP inspection activities, Marsh and the Owners will prevent individuals not involved in the project from entering the work area. A daily Sign In/Sign Out sheet will be required to be completed for all employees, workers, and visitors entering the work area of the Site. As stated above, a copy of the Sign In/Sign Out is included in **Attachment A**. Each person entering the site will acknowledge that they were made aware of the HASP requirements by signing the Safety Meeting Sign-In Sheet. The Safety Meeting Sign In Seet is an acknowledgement that the worker has reviewed the site HASP and were informed of potential health and safety issues at the Site. A copy of the Safety Meeting Attendance Sheet is included as **Attachment C**.

3.2 Site Control

Identification of site control work zones is not required during performing site inspections associated with the ISMP.

However, if additional work is required that involves soil disturbance activities, the Project Manager and/or contractor will clearly lay out and identify work areas in the field and will limit equipment, operations and personnel within these areas. There are three basic zones for each work area: Exclusion Zone; Contamination Reduction Zone; and Support Zone. As work proceeds the location of the identified zone on the site will change as needed. Each zone is defined below:

a. "Exclusion Zone" - This area will include all areas where environmental monitoring has shown, or it is suspected that a contamination may exist and be a potential exposure problem to workers. The level of personal protective equipment ("PPE") required in these areas will be determined by the site HSS. The area will be clearly delineated from the decontamination area. As work within the hazardous zone proceeds, the delineating boundary will be relocated as necessary to prevent the accidental contamination of nearby people and equipment. The Exclusion Zone will be delineated by plastic caution tape, barriers, or fencing (e.g. chain link, snow, or orange plastic fencing).

b. Contamination Reduction Zone - This zone will occur at the interface of "Contaminated" and "Clean" areas and will provide for the decontamination of equipment and materials and the transfer of equipment from the Clean Area to the Exclusion Zone. This area will contain

all required emergency equipment, etc. This area will be clearly delineated by plastic tape, barriers or fencing (e.g., chain link, snow, or orange plastic fencing).

c. Support Zone ("Clean" Area) - This area is the remainder of the work area and project Site. The "Clean" area will be clearly delineated, and procedures implemented to prevent active or passive contamination from the work area.

The functions of the "Clean" area includes:

1. An entry area for personnel, material, and equipment to the contaminated zone area of site operations through the neutral zone.
2. An exit for decontaminated personnel, materials, and equipment from the Contamination Reduction Zone area of site operations.
3. A clean storage area for safety and work equipment.

4.0 POTENTIAL HEALTH AND SAFETY HAZARDS

This section lists some potential health and safety hazards that workers and visitors may encounter at the Site during ISMP inspection activities, and some actions to be implemented to control and reduce the associated risks to health and safety. This is not intended to be a complete listing of any and all potential health and safety hazards. New or different hazards may be encountered as site environmental and work conditions change.

The potential hazards that may be experienced during the performance of the ISMP activities include:

- chemical exposures from contact with contaminated soil and/or surface water
- hazards associated with working near an area where vehicular traffic may exist
- slip, trip, and fall hazards
- cold and heat stress from performing inspections/work while working in cold or hot temperatures and wearing protective clothing.
- poisonous plants such as poison ivy.
- biological exposures (snakes, insects, tics, etc.)

Monitoring for the presence of organic vapors will be conducted during ISMP inspections. To prevent unnecessary exposures to vapors and to limit the potential for cross-contamination, work areas, if required by future activities that are anticipated to encounter contaminated materials, will be limited from general access. The formation of distinctive work zones will assist in reducing the potential hazards that may be encountered when working at this facility. To further reduce the potential for accidents that involve moving vehicles, Marsh will coordinate each field inspection activity with the Owners' Site Manager(s). To reduce accidents from occurring that involve slip, trip and fall hazards and hypothermia, work will be discussed with, or monitored when appropriate, by the Site HSS, and workers will be encouraged to use the "buddy-system".

4.1 Chemical Hazards

Potential chemical hazards are associated with the historical use of the Site. These potential chemicals include pesticides, semi-volatile organic compounds ("SVOCs"), metals (Mercury, Chromium, and Lead), and polychlorinated biphenyls ("PCBs"). Potential routes of exposure to these contaminants can be through inhalation, ingestion, and/or dermal contact. It is anticipated that the potential exposure to these chemicals by workers performing ISMP inspection activities is low; however, Marsh will use equipment to monitor for volatile organic compounds ("VOCs") at the Site during inspection activities. Marsh will notify workers at the site if monitoring equipment indicates a potential exposure to chemical hazards. Safety data sheets ("SDS") for the potential chemical hazards are provided in **Attachment B**.

4.2 Physical and Environmental Hazards

Physical hazards at the Site during the ISMP are primarily associated with slip, trip, and fall hazards. In the future, if work that includes intrusive activities is required, potential hazards may also include excavating equipment, drilling equipment, moving of vehicles, and use of electric and pneumatic tools. The physical hazards associated with potential future work at the Site and from the tools and equipment being used includes, but are not limited to slip, trip, and fall hazards, crushing hazards, cuts from debris or equipment/tools, electrical hazards, working on irregular or unstable surfaces, and getting struck by moving equipment, vehicles, or objects under a load or having stored potential energy. In those potential future activities, workers should inspect working surfaces prior to moving equipment throughout the Site and anticipated the hazards of the activity to be conducted. Unsafe surface shall be marked with highly visible material.

Weather related hazards include sunburns, heat and cold stress, lighting, rain, snow, ice, etc. Supervisors and workers should be aware of the weather forecast each day and maintain the appropriate apparel and protective equipment for the weather. **Attachment D** provides guidelines for cold and heat stress management.

4.3 Hazard Control

Environmental health and safety hazards will be addressed using engineering controls first. Where engineering controls cannot be used to eliminate the hazards, PPE will be specified based on air monitoring readings and the potential chemical hazards present. It is anticipated that Level D PPE will be worn and provide enough protection for each task included in the ISMP. Sample collection and handling, if required in the future, will be performed using nitrile gloves. To minimize hazards to lab personnel, sample volumes will be no larger than necessary, and the outside of all sample containers will be wiped clean prior to shipment.

5.0 PERSONNEL TRAINING AND PROTECTION

5.1 Personnel Training Requirements

All personnel working at the site to perform ISMP inspection activities with the potential to be in contact with contaminated substances/materials (in shallow soil, surface water, or air) must have completed the 40-hour requirements of 29 CFR 1910.120 hazardous waste operations and emergency response and completed an 8-hour refresher course within one year of the work completed at the Site.

All Marsh personnel are required to review this HASP prior to completing work at the site. All contractors are required to review the HASP, inform their workers of the site HASP, and prepare a HASP of their own as they deem appropriate.

5.2 Personnel Protection

All Marsh personnel will be provided with appropriate PPE. Each individual will be properly trained in the use of safety equipment before the start of field activities. All equipment and clothing will be cleaned and maintained in proper condition by the personnel. The Site HSS, or designee, will monitor the use/maintenance of PPE to ensure proper procedures are followed.

PPE will be worn at all times designated by this HASP. Levels of protective clothing and equipment are not expected to exceed Level D.

Level D PPE will be used during field inspection activities associated with the ISMP tasks at the Site. Level D protection includes the use of:

- Work Clothes (long sleeve shirt and pants)
- Hard hats;
- Safety glasses/goggles;
- High visibility vest
- Leather, steel toe boots;
- Hearing protection, as required, when noises hinder hearing above speaking level; and
- Appropriate gloves, as required (e.g., nitrile).

PPE may be upgraded based on observations by Marsh field personnel, other site workers, the Project Manager, or the HSS. If respirators are required during future site activities, personnel are required to be properly trained, fit tested, medically approved, and use National Institute of Occupational Safety and Health (NIOSH) approved equipment.

If personnel are aware of a potential failure of PPE, personnel are required to stop and leave the work area immediately. If necessary, the Project Manager or HSS will be notified regarding the failure and make a decision whether the failure has affected the health and safety of workers where action should be taken. The Project Manager or HSS will make the determination whether work shall continue when the PPE failure has been identified and repaired.

5.3 Medical Surveillance

Marsh conducts a Medical Surveillance Program in accordance with 29 CFR 1910.120. The purpose of the program is to provide for the protection of Marsh personnel, and to fulfill OSHA regulatory compliance requirements. OSHA mandates protection for employees with possibly hazardous exposures under the "general duty clause" and specific substance standards. The content and services of the program are consistent with applicable federal and state regulations, OSHA regulations, and NIOSH recommendations.

6.0 AIR MONITORING

According to 29 CFR 1910.120(h), air monitoring will be used to identify and quantify airborne levels of hazardous substances and health hazards to determine the appropriate level of employee protection required for personnel working onsite. Air monitoring instruments will be calibrated and maintained by the vendor in accordance with the manufacturer's specifications. In addition to the OSHA requirement, the site also has a Generic Community Air Monitoring Plan ("CAMP") that will be implemented in the future, if/when intrusive work it to be conducted, to control fugitive emissions (dust and VOCs) at the site. The CAMP is attached to the ISMP as Appendix E.

6.1 Personal Air Monitoring

Personal health and safety air monitoring will consist of monitoring VOCs with a photoionization detector ("PID"), Rae Systems MiniRae Meter, or equivalent. The air monitoring equipment will be programmed to identify action levels that are exceeded. The following concentrations will be utilized for action levels at the Site:

- PID readings of >5 ppm to 10 part per million ("ppm") above background in the breathing zone, sustained for >1 minute.

  Action: Stop work activities and move away from the vapor source. Consider vapor suppression actions. If PID readings drop to within 5 ppm above background, work may resume with continuous air monitoring.

- PID readings of 10 ppm to >25 ppm above background at breathing zone, sustained for > 1 minute.

  Action: Stop work and monitor to document levels decrease below 10 ppm. If levels don't subside, either use suppression techniques or call the Project Manager to evaluate an upgrade to Level C protection (use of respirators).

- PID readings of >25 ppm above background at breathing zone, sustained for >1 minute. Action: Stop work and contact the Project Manager.

Air monitoring results as well as wind direction and speed (estimates) will be documented in the Site logbook and field log forms .

If any of the above readings are exceeded in the breathing zone, personnel are required to notify the Project Manager.

6.2 Site Perimeter Monitoring

Site inspection work included in the ISMP will not require perimeter monitoring. If in the future ground intrusive activities are required, perimeter monitoring will be conducted for particulates and VOCs as described in the generic CAMP (included as Appendix E to the ISMP).

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7.0 DECONTAMINATION

7.1 Personnel Decontamination

Upon leaving the work area, workers and visitors shall decontaminate footwear as needed. Under normal inspection conditions associated with the ISMP, brushing/removal of any soil from boots or coveralls will be sufficient.

If in the future ground intrusive activities are required, where workers have soiled gloves or coveralls, detailed personal decontamination procedures will be required, since work clothing or PPE may become contaminated in the event of an unexpected splash or spill or contact with contaminated substances. Minor splashes on clothing and footwear can be cleaned with soap and water. It is anticipated that a minimum of Level D decontamination will be continually in effect at the site. On those occasions when higher levels of protection are required, appropriate decontamination procedures will be used. The extent of the decontamination procedures will be at the discretion of the site HSS.

In general, decontamination involves removing potentially contaminated soil from gloves and clothing, followed by scrubbing with a non-phosphate soap/water solution and clean water rinses. As a general rule, protective clothing will be removed in the reverse order as it was put on: gloves and boots off first, followed by protective suits and then breathing apparatus. As different types of waste are generated, the team members will segregate the waste into different drums. Potentially contaminated soil and sediment will be placed into one drum and decontamination waste fluid into a second drum. All disposable items will be placed into a dry goods container. Wash water used for decontamination will be poured into a designated drum at the end of the workday. When a drum has been filled the container/drum will be labeled with date and identified by the type of waste (solid, liquid, or dry waste).

Certain parts of contaminated PPE may be difficult to decontaminate. If they are grossly contaminated, they may need to be discarded. Rubber components can be soaked in soap and water and scrubbed with a brush. In addition to being decontaminated, all respirators, non-disposable protective clothing, and other personal articles must be sanitized before they can be used again. The manufacturer's instruction should be followed in sanitizing the respirator masks. The Site HSS will be responsible for supervising the proper protective equipment.

All decontamination wastewaters will be collected and disposed of according to applicable regulations. This disposal will be done at the direction of the Project Manager.

7.2 Equipment Decontamination Procedures

The only field equipment associated with the ISMP tasks is a field PID. With proper handling of the PID, decontamination will not be required beyond wiping the equipment to remove any dust.

In the event future site activities require ground intrusive activities, equipment (e.g., tools, monitoring equipment, etc.) that has been in contact with potentially impacted material will be staged in an area within the limits of the existing exclusion zone or will be thoroughly decontaminated prior to leaving the site. Decontamination will consist of cleaning of the entire piece of equipment to the satisfaction of the HSS. Decontamination will be a multi-process task, first all loose dirt or other foreign materials will be removed from equipment surface. Scrubbing with a synthetic wire brush may be required to remove materials that adhere to the surfaces. After the loose dirt is removed, the equipment will be washed using a detergent and water solution and a wire brush followed by successive rinses with clean water. When required, washing with hot water from a power washer may be substituted for a synthetic wire brush. The tool will then be dried with a rag or paper towel.

Dirty equipment will be staged on plastic sheeting in such a manner that decontamination waters can be collected and disposed of in accordance with applicable regulations. Clean equipment not in use will be covered with plastic and stored at a designated storage area.

Heavy equipment working within an area with known contaminated soil will be decontaminated as necessary at the end of the workday (i.e., operator controls or cab area) or before the equipment leaves the work area. Waste generated from decontamination will be segregated into solid and liquid wastes and placed into an appropriate drum. Decontamination will focus on those areas of the equipment that has been in contact with the contaminated materials, i.e., tires, caterpillar tracks, drill pipe and augers, and excavator buckets, etc. In most cases decontamination will involve a 2-step process; removal of soil and contaminated materials and washing with either a power washer or long handled brush. At the end of the workday, all wastes will be collected and containerized.

8.0 EMERGENCY ACTION

During the ISMP inspection activities, the Project Manager, HSS, or any personnel conducting field work is responsible for implementing an emergency action whenever there is either a threat to human health or an environmental hazard. Potential situations requiring emergency actions may include actual or imminent fires, explosions, spills, confrontations with unauthorized individuals, or medical emergencies.

The individual discovering the emergency situation is to notify the Project Manager or HSS who will then notify the facility manager and/or the appropriate organizations described in **Attachment E**.

8.1 Assessment

The Project Manager or HSS is responsible for ascertaining any potential health or environmental hazards and determining the need for evacuation and notification of the proper authorities. For medical emergencies that occur at the site, site personnel can ascertain the need for emergency services.

In the event of an emergency situation, employees are to leave the work area immediately. Employees are to walk or drive out of the Site as quickly as possible and wait at the assigned safe area.

The assigned safe area will be the Marina Drive and Great Lakes Seaway Trail intersection.

Employees are not authorized or trained to provide rescue and medical efforts. Rescue and medical efforts will be provided by local authorities.

Cell phones will be used to notify off-site personnel of emergencies. If personnel are to be transported to a hospital, a map and directions to the Rochester General Hospital located at 1425 Portland Avenue in Rochester are included as **Figure F2** to this HASP. Emergency contact phone numbers are attached in **Attachment E.**

8.2 Responsibilities

The Project Manager and HSS have primary responsibility for responding to emergency situations. This includes taking appropriate measure to ensure the safety of site personnel and the public. The Project Manager and HSS are responsible for ensuring that appropriate authorities notified, and follow-up reports completed.

8.3 Evacuation Routes/Procedures

In the event of an emergency that necessitates an evacuation of the site, an evacuation alarm notification should be made verbally, using hand signals by the Site Supervisor, supplemented by sounding three long blasts from a vehicle horn. The safe area is at the Marina Drive and Great Lakes Seaway Trail intersection to the site in case of an emergency so that all personnel can be accounted for.

Personnel will remain at that area until the re-entry is authorized by the Project Manager.

8.4 Accidents and Injuries

Any accidents and injuries to a worker are to be immediately reported to the HSS. The HSS will verify that the appropriately trained personnel have been notified to respond to accidents and injuries. Any accident and injury will be reported to the Project Manager who will then track the injury in accordance with OSHA's Injury and Illness Recordkeeping and Recording Requirements.

8.5 Emergency Equipment

The following equipment, based on the potential site hazard, will be maintained in the field vehicle:

- First Aid Kit

8.6 Site Communications Plan

Communication between personnel in performing the site inspection is essential. The following communications signals will be used during ISMP activities at the Site:

Hands clutching throat – Out of air/cannot breathe

Hands on top of head – Need assistance

Thumbs up – I am all right/I understand

Thumbs down – No/negative

Arms waving upright – Send backup support

Grip partners wrist – Exit area immediately

These communication signals will also be used during any future work activities performed at the site.

8.7 Route to Hospital

As stated above, the nearest hospital to the Site is the Rochester General Hospital located at 1425 Portland Avenue in Rochester, New York. **Figure F-2** provides the directions to the hospital and **Attachment E** provides the emergency telephone numbers.

9.0 TAILGATE SAFETY MEETINGS

The HSS or the designated representative will conduct daily tailgate safety meetings each workday and will be mandatory for all site personnel. The meetings will provide information on the anticipated site conditions and the work to be completed that day. **Attachment C** contains a form for documenting Safety Meetings. Completed forms will be retained in Marsh's project file.

Additional safety meetings will be held on an as-required basis.

10.0 JOB SAFETY ANALYSIS

The suggested actions to be taken under this plan are not to be substituted for good judgment on the part of all Site workers and visitors. At all times, the HSS, or on-site designee, has responsibility for Site safety and his/her instructions must be followed. The following list is intended to identify hazards at the site during the ISMP site inspections. Additional hazards may be identified that are not included below and will be added to this HASP when identified.

- Cuts, Punctures and Other Injuries

  Potential Hazard: There is the potential for the presence of sharp or jagged edges on rock, metal materials, and other sharp objects. Serious cuts and punctures can result in loss of blood and infection.

  Protective Action: Steel-toe boots with steel shanks and long pants should be work when conducting work at the site. Kevlar or cut resistant gloves should be used when handling sharp objects.

  The Project Manager is responsible for making First Aid supplies available at the work site to treat minor injuries. The HSS is responsible for arranging the transportation of authorized on-site personnel to medical facilities when First Aid treatment in not sufficient. Do not move seriously injured workers. All injuries requiring treatment are to be reported to the Project Manager. Serious injuries are to be reported immediately to the HSS.

- Injury Due to Exposure of Chemical Hazards

  Potential Hazards: Potential exposure to contaminants may be encountered during ISMP inspections at the site. Inhalation of organic vapors can cause headache, stupor, drowsiness, confusion and other health effects. Skin contact can cause irritation, chemical burn, or dermatitis. Dust particulates could also present an inhalation hazard. Inhalation of high concentrations of dust can cause irritation of the eyes and skin; coughing; chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis.

  Protective Action: The presence of potential chemicals may be detected by their odor and by monitoring instrumentation. Dust particulates, if soil is to be disturbed, may be detected by monitoring instruments. Workers will not work in when hazardous concentrations of potential vapors are present until the HSS has evaluated the site conditions, and the appropriate PPE can be worn. Monitoring (refer to Section 6.0) of the work area will be performed, as required.

- Injuries Due to Extreme Hot or Cold Weather Conditions

  Potential Hazards: Extreme hot weather conditions can cause heat exhaustion, heat stress and heat stroke. Extreme cold weather conditions can cause hypothermia.

Protective Action: Precaution measures should be taken such as dress appropriately for cold weather conditions. If necessary, work shall not be conducted or take necessary measures to heat up the body. To protect from heat stress, drink plenty of fluid before and during work. Take adequate number of breaks to prevent fatigue.

11.0 SUBCONTRACTOR RESPONSIBILITIES

It is not anticipated that subcontractors will be required during implementation of the ISMP site inspections.

Marsh is the manager for the site activities associated with the ISMP; therefore, is responsible for site health and safety of its employees. In the event that future site activities require the use of subcontractors, Marsh will inform site contractors of this HASP, and make this HASP available on-site at all times work is being performed. All project site contractors are responsible for:

- Attending a general health and safety briefing given by Marsh summarizing the requirements of this HASP. Each new employee must be briefed on site-specific safety procedures.
- Providing their own company-provided PPE, or agree to follow the requirements of this HASP.
- Providing documentation that their employees have been trained in health and safety in accordance with applicable federal, state, and local laws and regulations.
- Providing evidence of medical surveillance and medical approvals for their employees.
- Designating their own Site Safety Supervisor responsible for ensuring that their employees comply with their own HASP and taking any other additional measures required by their site activities.

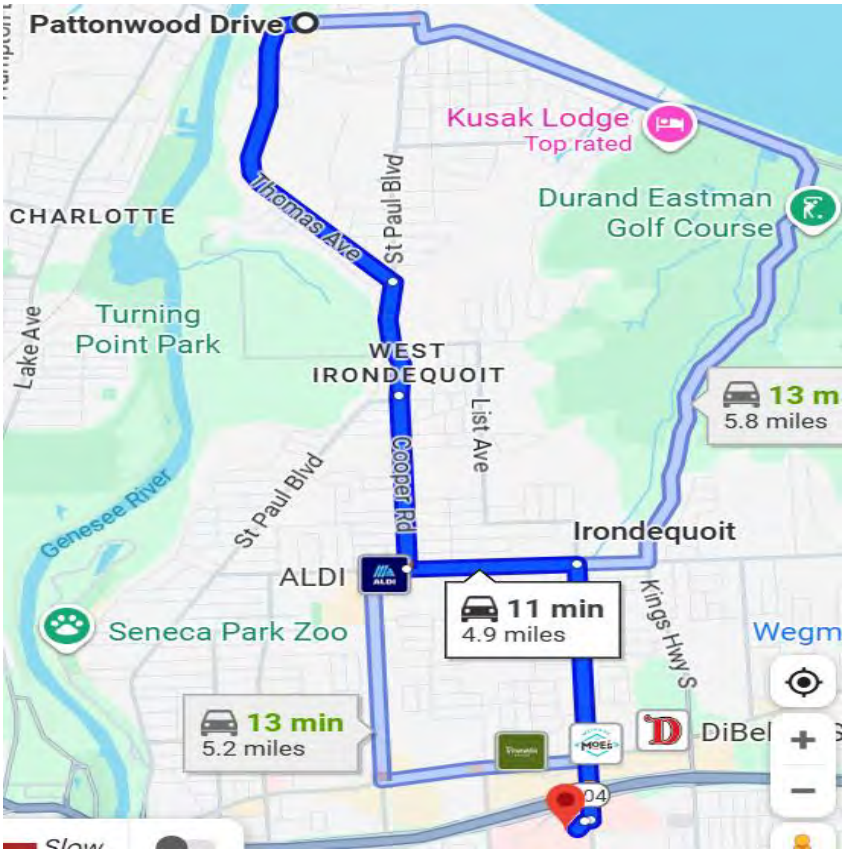
FIGURES

NORTH

Approximate Site Boundary

Title: Site Map Irondequoit, New York	MARSH ENGINEERING D.P.C. Marsh Engineering D.P.C. 271 Marsh Road-Suite 2 Pittsford, New York 14534 (585) 248-2413 Fax (585) 248-2834	Project 776.002A Date 1/6/2026 Scale NTS	BWA Checked MPR File Name Site Location	Figure F-1
Prepared For: Lighthouse Pointe Property Associates LLC 100 South Clinton Avenue, Rochester, New York 14604				

Figure F-2
Route to Hospital



- Head West on Pattonwood Drive
- Turn Left on Thomas Avenue
- Turn Right onto St. Paul Boulevard
- Continue Straight onto Cooper Boulevard
- Turn Left onto Titus Avenue
- Turn Right onto Right onto Portland Avenue
- Turn Right into Rochester General Hospital

Attachment A

Sign In/Sign Out Sheets

Sign In/Sign Out Sheet

(Print additional sheets as required)

NAME	COMPANY	DATE	TIME IN	TIME OUT

Attachment B

Safety Data Sheets

SAFETY DATA SHEET

Benzene

Section 1. Identification

GHS product identifier : Benzene

Chemical name : benzene

Other means of identification : Phenyl hydride; Benzol; benzene, pure; benzene, crude; BENZOL DILUENT; Cyclohexatriene; Benzene (I,T); BENZENE, UNREFINED; COAL NAPHTHA; annulene; carbon oil

Product type : Liquid.

Product use : Synthetic/Analytical chemistry.

Synonym : Phenyl hydride; Benzol; benzene, pure; benzene, crude; BENZOL DILUENT; Cyclohexatriene; Benzene (I,T); BENZENE, UNREFINED; COAL NAPHTHA; annulene; carbon oil

SDS # : 001062

Supplier's details : Airgas USA, LLC and its affiliates
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253

24-hour telephone : 1-866-734-3438

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : FLAMMABLE LIQUIDS - Category 2
SKIN IRRITATION - Category 2
EYE IRRITATION - Category 2A
GERM CELL MUTAGENICITY - Category 1
CARCINOGENICITY - Category 1
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : Highly flammable liquid and vapor.
Causes skin irritation.
Causes serious eye irritation.
May cause genetic defects.
May cause cancer.
Causes damage to organs through prolonged or repeated exposure.
May form explosive mixtures with air.

Precautionary statements

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

Prevention : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves, protective clothing and eye or face protection. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use explosion-proof electrical, ventilating or lighting equipment. Use non-sparking tools. Take action to prevent static discharges. Keep container tightly closed. Do not breathe vapor. Do not eat, drink or smoke when using this product. Wash thoroughly after handling.

Section 2. Hazards identification

Response : IF exposed or concerned: Get medical advice or attention. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. IF ON SKIN: Wash with plenty of water. If skin irritation occurs: Get medical advice or attention. 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 or attention.

Storage : Store locked up. Store in a well-ventilated place. Keep cool.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Substance

Chemical name : benzene

Other means of identification : Phenyl hydride; Benzol; benzene, pure; benzene, crude; BENZOL DILUENT; Cyclohexatriene; Benzene (I,T); BENZENE, UNREFINED; COAL NAPHTHA; annulene; carbon oil

Product code : 001062

CAS number/other identifiers

CAS number : 71-43-2

Ingredient name	%	CAS number
benzene	100	71-43-2

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Section 4. First aid measures

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : No known significant effects or critical hazards.

Skin contact : Causes skin irritation.

Frostbite : Try to warm up the frozen tissues and seek medical attention.

Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:, pain or irritation, watering, redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:, irritation, redness

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use dry chemical, CO_2, water spray (fog) or foam.

Unsuitable extinguishing media : Do not use water jet.

Specific hazards arising from the chemical : Highly flammable liquid and vapor. Runoff to sewer may create fire or explosion hazard. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Do not ingest. Empty containers retain product residue and can be hazardous. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Do not reuse container. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Do not breathe vapor or mist. Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Store locked up. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
benzene	**ACGIH TLV (United States, 1/2021).** **Absorbed through skin.** STEL: 8 mg/m³ 15 minutes. STEL: 2.5 ppm 15 minutes. TWA: 1.6 mg/m³ 8 hours. TWA: 0.5 ppm 8 hours. **NIOSH REL (United States, 10/2020).** STEL: 1 ppm 15 minutes. TWA: 0.1 ppm 10 hours. **OSHA PEL (United States, 5/2018).** STEL: 5 ppm 15 minutes. TWA: 1 ppm 8 hours. **OSHA PEL 1989 (United States, 3/1989).** STEL: 5 ppm 15 minutes. TWA: 1 ppm 8 hours. **OSHA PEL Z2 (United States, 2/2013).** AMP: 50 ppm 10 minutes. CEIL: 25 ppm TWA: 10 ppm 8 hours.

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

Section 8. Exposure controls/personal protection

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid. [Watery liquid.]

Color : Colorless. Yellowish.

Odor : Characteristic.

Odor threshold : Not available.

pH : Not available.

Melting point : 5.49°C (41.9°F)

Boiling point : 80.09°C (176.2°F)

Critical temperature : 288.95°C (552.1°F)

Flash point : Closed cup: -11°C (12.2°F)

Evaporation rate : 3.5 (butyl acetate = 1)

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Lower: 1.2%
Upper: 7.8%

Vapor pressure : 10 kPa (75.01 mm Hg)

Vapor density : 2.7 (Air = 1)

Specific Volume (ft ^{3}/lb) : 1.1403

Gas Density (lb/ft ^{3}) : 0.877 (20°C / 68 to °F)

Relative density : 0.88

Solubility : Not available.

Solubility in water : 1.88 g/l

Partition coefficient: n-octanol/water : 2.13

Auto-ignition temperature : 498°C (928.4°F)

Decomposition temperature : Not available.

Flow time (ISO 2431) : Not available.

Molecular weight : 78.12 g/mole

Aerosol product

Heat of combustion : -40611960 J/kg

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.

Section 10. Stability and reactivity

Incompatible materials : Reactive or incompatible with the following materials:
oxidizing materials

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
benzene	LC50 Inhalation Gas. LD50 Oral	Rat Rat	10000 ppm 930 mg/kg	7 hours -

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
benzene	Eyes - Moderate irritant Eyes - Severe irritant Skin - Mild irritant Skin - Mild irritant Skin - Moderate irritant	Rabbit Rabbit Rat Rabbit Rabbit	- - - - -	88 mg 24 hours 2 mg 8 hours 60 uL 24 hours 15 mg 24 hours 20 mg	- - - - -

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Classification

Product/ingredient name	OSHA	IARC	NTP
benzene	+	1	Known to be a human carcinogen.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
benzene	Category 1	-	-

Aspiration hazard

Not available.

Section 11. Toxicological information

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : No known significant effects or critical hazards.

Skin contact : Causes skin irritation.

Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:, pain or irritation, watering, redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:, irritation, redness

Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : Causes damage to organs through prolonged or repeated exposure.

Carcinogenicity : May cause cancer. Risk of cancer depends on duration and level of exposure.

Mutagenicity : May cause genetic defects.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
benzene	Acute EC50 1600000 µg/l Fresh water	Algae - Selenastrum sp.	96 hours
	Acute EC50 9.23 mg/l Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 21 mg/l Marine water	Crustaceans - Artemia salina	48 hours
	Acute LC50 5.28 ul/L Fresh water	Fish - Oncorhynchus gorbuscha - Fry	96 hours
	Chronic EC10 >1360 mg/l Fresh water	Algae - Desmodesmus subspicatus	96 hours
	Chronic NOEC 98 mg/l Fresh water	Daphnia - Daphnia magna	21 days
	Chronic NOEC 1.5 to 5.4 ul/L Marine	Fish - Morone saxatilis - Juvenile	4 weeks

Section 12. Ecological information

	water	(Fledgling, Hatchling, Weanling)	

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
benzene	2.13	11	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

United States - RCRA Toxic hazardous waste "U" List

Ingredient	CAS #	Status	Reference number
Benzene (I,T)	71-43-2	Listed	U019

Section 14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
UN number	UN1114	UN1114	UN1114	UN1114	UN1114
UN proper shipping name	BENZENE	BENZENE	Benzene	BENZENE	BENZENE
Transport hazard class(es)	3 	3 	3 	3 	3 
Packing group	II	II	II	II	II
Environmental hazards	No.	No.	No.	No.	No.

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

Section 14. Transport information

Additional information

DOT Classification : **Reportable quantity** 10 lbs / 4.54 kg [1.3675 gal / 5.1767 L]. Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.
Limited quantity Yes.
Quantity limitation Passenger aircraft/rail: 5 L. Cargo aircraft: 60 L.

TDG Classification : Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.18-2.19 (Class 3).
Explosive Limit and Limited Quantity Index 1
Passenger Carrying Road or Rail Index 5

IATA : **Quantity limitation** Passenger and Cargo Aircraft: 5 L. Cargo Aircraft Only: 60 L. Limited Quantities - Passenger Aircraft: 1 L.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to IMO instruments : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption**: Not determined
Clean Water Act (CWA) 307: benzene
Clean Water Act (CWA) 311: benzene

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Refer to Section 2: Hazards Identification of this SDS for classification of substance.

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	benzene	71-43-2	100
Supplier notification	benzene	71-43-2	100

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

Section 15. Regulatory information

Massachusetts : This material is listed.

New York : This material is listed.

New Jersey : This material is listed.

Pennsylvania : This material is listed.

California Prop. 65

⚠ **WARNING**: This product can expose you to Benzene, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Ingredient name	No significant risk level	Maximum acceptable dosage level
Benzene	Yes.	Yes.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Australia : This material is listed or exempted.

Canada : This material is listed or exempted.

China : This material is listed or exempted.

Europe : This material is listed or exempted.

Japan : **Japan inventory (CSCL)**: This material is listed or exempted.
Japan inventory (ISHL): This material is listed or exempted.

New Zealand : This material is listed or exempted.

Philippines : This material is listed or exempted.

Republic of Korea : This material is listed or exempted.

Taiwan : This material is listed or exempted.

Thailand : This material is listed or exempted.

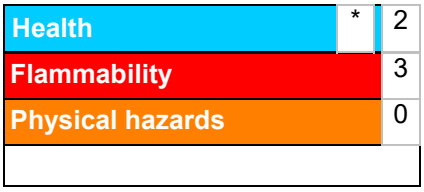
Turkey : This material is listed or exempted.

United States : This material is active or exempted.

Viet Nam : This material is listed or exempted.

Section 16. Other information

Hazardous Material Information System (U.S.A.)



Section 16. Other information

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

National Fire Protection Association (U.S.A.)

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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Procedure used to derive the classification

Classification	Justification
FLAMMABLE LIQUIDS - Category 2	Expert judgment
SKIN IRRITATION - Category 2	Expert judgment
EYE IRRITATION - Category 2A	Expert judgment
GERM CELL MUTAGENICITY - Category 1	Expert judgment
CARCINOGENICITY - Category 1	Expert judgment
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 1	Expert judgment

History

Date of printing : 3/15/2022

Date of issue/Date of revision : 3/15/2022

Date of previous issue : 10/7/2021

Version : 1.01

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

References : Not available.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

SAFETY DATA SHEET

Revision Date 09-Feb-2024 **Revision Number** 5

1. Identification

Product Name **1,2-Benzanthracene**

Cat No. : **AC105250000; AC105250010; AC105252500**

CAS No 56-55-3
Synonyms Benzóa!anthracene; Tetraphene

Recommended Use Laboratory chemicals.
Uses advised against Food, drug, pesticide or biocidal product use.

Details of the supplier of the safety data sheet

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

Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

Emergency Telephone Number
For information **US** call: 001-800-227-6701 / **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)

Carcinogenicity	Category 1B

Label Elements

Signal Word
Danger

Hazard Statements
May cause cancer

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
Response
IF exposed or concerned: Get medical attention/advice
Storage
Store locked up
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
Very toxic to aquatic life with long lasting effects
WARNING. Cancer - https://www.p65warnings.ca.gov/.

3. Composition/Information on Ingredients

Component	CAS No	Weight %
Benz[a]anthracene	56-55-3	99

4. First-aid measures

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

Skin Contact Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Immediate medical attention is required.

Inhalation Remove from exposure, lie down. Remove to fresh air. If not breathing, give artificial respiration. Immediate medical attention is required.

Ingestion Call a physician immediately. Clean mouth with water.

Most important symptoms and effects No information available.

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media Water spray. Carbon dioxide (CO_2). Dry chemical. Chemical foam.

Unsuitable Extinguishing Media No information available

Flash Point No information available
Method - No information available

Autoignition Temperature Not applicable

Explosion Limits
Upper No data available

Lower	No data available
Sensitivity to Mechanical Impact	No information available
Sensitivity to Static Discharge	No information available

Specific Hazards Arising from the Chemical
Do not allow run-off from fire-fighting to enter drains or water courses.

Hazardous Combustion Products
Carbon monoxide (CO). Carbon dioxide (CO_2).
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
0	1	0	N/A

6. Accidental release measures

Personal Precautions	Ensure adequate ventilation. Use personal protective equipment as required.
Environmental Precautions	Do not flush into surface water or sanitary sewer system. Do not allow material to contaminate ground water system. Prevent product from entering drains. Local authorities should be advised if significant spillages cannot be contained.
Methods for Containment and Clean Up	Sweep up and shovel into suitable containers for disposal.

7. Handling and storage

Handling	Do not breathe dust. Do not get in eyes, on skin, or on clothing. Handle product only in closed system or provide appropriate exhaust ventilation.
Storage.	Keep in a dry, cool and well-ventilated place. Keep container tightly closed. Incompatible Materials. Strong oxidizing agents.

8. Exposure controls / personal protection

Exposure Guidelines	This product does not contain any hazardous materials with occupational exposure limitsestablished by the region specific regulatory bodies.
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.
Recommended Filter type:	Particulates filter conforming to EN 143.
Hygiene Measures	Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Powder Solid
Appearance	Beige
Odor	Odorless
Odor Threshold	No information available
pH	No information available
Melting Point/Range	158 - 161 °C / 316.4 - 321.8 °F
Boiling Point/Range	437.6 °C / 819.7 °F
Flash Point	No information available
Evaporation Rate	Not applicable
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	Not applicable
Specific Gravity	No information available
Solubility	No information available
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	Not applicable
Decomposition Temperature	No information available
Viscosity	Not applicable
Molecular Formula	C18 H12
Molecular Weight	228.29

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 Carbon monoxide (CO), Carbon dioxide (CO_2)

Hazardous Polymerization No information available.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information No acute toxicity information is available for this product

Component Information

Toxicologically Synergistic Products No information available

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

Irritation No information available

Sensitization No information available

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

Component	CAS No	IARC	NTP	ACGIH	OSHA	Mexico
Benz[a]anthracene	56-55-3	Group 2B	Reasonably Anticipated	A2	X	A2

Mutagenic Effects Ames test: positive.

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

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

Aspiration hazard No information available

Symptoms / effects,both acute and delayed No information available

Endocrine Disruptor Information

Component	EU - Endocrine Disrupters Candidate List	EU - Endocrine Disruptors - Evaluated Substances	Japan - Endocrine Disruptor Information
Benz[a]anthracene	Group III Chemical	Not applicable	Not applicable

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

12. Ecological information

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

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Benz[a]anthracene	Not listed	Not listed	EC50 = 0.26 mg/L 15 min	EC50: = 0.0042 mg/L, 48h (Daphnia magna)

Persistence and Degradability May persist

Bioaccumulation/ Accumulation No information available.

Mobility . Is not likely mobile in the environment due its low water solubility.

Component	log Pow
Benz[a]anthracene	5.61

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
Benz[a]anthracene - 56-55-3	U018	-

14. Transport information

DOT Not regulated
TDG Not regulated
IATA
UN-No UN3077
Proper Shipping Name ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.*
Hazard Class 9
Packing Group III
IMDG/IMO
UN-No UN3077

Proper Shipping Name	Environmentally hazardous substances, solid, n.o.s.
Hazard Class	9
Packing Group	III

15. Regulatory information

United States of America Inventory

Component	CAS No	TSCA	TSCA Inventory notification - Active-Inactive	TSCA - EPA Regulatory Flags
Benz[a]anthracene	56-55-3	X	ACTIVE	-

Legend:
TSCA US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)
X - Listed
'-' - Not Listed

TSCA - Per 40 CFR 751, Regulation of Certain Chemical Substances & Mixtures, Under TSCA Section 6(h) (PBT) Not applicable

TSCA 12(b) - Notices of Export Not applicable

International Inventories
Canada (DSL/NDSL), Europe (EINECS/ELINCS/NLP), Philippines (PICCS), Japan (ENCS), Japan (ISHL), Australia (AICS), China (IECSC), Korea (KECL).

Component	CAS No	DSL	NDSL	EINECS	PICCS	ENCS	ISHL	AICS	IECSC	KECL
Benz[a]anthracene	56-55-3	-	X	200-280-6	-	-		-	X	-

KECL - NIER number or KE number (http://ncis.nier.go.kr/en/main.do)

U.S. Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372. Note that PBT chemicals are not eligible for the de minimis exemption. For these chemicals, supplier notification limits are provided.
> 0 % = no low concentration cut-off set, supplier notification limit applies.

Component	CAS No	Weight %	SARA 313 - Threshold Values %	SARA 313 - Reporting threasholds
Benz[a]anthracene	56-55-3	99	> 0 %	RT = 100 lb

SARA 311/312 Hazard Categories
Should this product meet EPCRA 311/312 Tier reporting criteria at 40 CFR 370, refer to Section 2 of this SDS for appropriate classifications.

CWA (Clean Water Act)

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Benz[a]anthracene	-	-	-	X

Clean Air Act Not applicable

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) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355).

Component	Hazardous Substances RQs	CERCLA Extremely Hazardous Substances RQs	SARA Reportable Quantity (RQ)
Benz[a]anthracene	10 lb	-	10 lb 4.54 kg

California Proposition 65 This product contains the following Proposition 65 chemicals.

Component	CAS No	California Prop. 65	Prop 65 NSRL	Category
Benz[a]anthracene	56-55-3	Carcinogen	0.033 µg/day	Carcinogen

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Benz[a]anthracene	X	X	X	X	X

U.S. Department of Transportation

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

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

Other International Regulations

Mexico - Grade No information available

Authorisation/Restrictions according to EU REACH

Component	CAS No	REACH (1907/2006) - Annex XIV - Substances Subject to Authorization	REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous Substances	REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC)
Benz[a]anthracene	56-55-3	-	Use restricted. See item 72. (see link for restriction details) Use restricted. See item 28. (see link for restriction details) Use restricted. See item 50[c]. (see link for restriction details) Use restricted. See item 75. (see link for restriction details)	SVHC Candidate list - 200-280-6 - Carcinogenic, Article 57a;PBT, Article 57d;vPvB, Article 57e

After the sunset date the use of this substance requires either an authorization or can only be used for exempted uses, e.g. use in scientific research and development which includes routine analytics or use as intermediate.

REACH links

https://echa.europa.eu/authorisation-list
https://echa.europa.eu/substances-restricted-under-reach
https://echa.europa.eu/candidate-list-table

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

Component	CAS No	OECD HPV	Persistent Organic Pollutant	Ozone Depletion Potential	Restriction of Hazardous Substances (RoHS)
Benz[a]anthracene	56-55-3	Not applicable	Not applicable	Not applicable	Not applicable

Contains component(s) that meet a 'definition' of per & poly fluoroalkyl substance (PFAS)?
Not applicable

Other International Regulations

Component	CAS No	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements	Rotterdam Convention (PIC)	Basel Convention (Hazardous Waste)
Benz[a]anthracene	56-55-3	Not applicable	Not applicable	Not applicable	Not applicable

16. Other information

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

Revision Date 09-Feb-2024
Print Date 09-Feb-2024
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 25-Mar-2024 **Revision Number** 4

1. Identification

Product Name **Benzo[a]pyrene**

Cat No. : **15856**

CAS No 50-32-8
Synonyms Benzo[def]chrysene.; 3,4-Benzopyrene; 3,4-Benzpyrene

Recommended Use Laboratory chemicals.
Uses advised against Food, drug, pesticide or biocidal product use.

Details of the supplier of the safety data sheet

Company
Thermo Fisher Scientific Chemicals, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Tel: 800-343-0660
Fax: 800-322-4757

Emergency Telephone Number
For information **US** call: 001-800-227-6701 / **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 Sensitization	Category 1
Germ Cell Mutagenicity	Category 1B
Carcinogenicity	Category 1A
Reproductive Toxicity	Category 1B

Label Elements

Signal Word
Danger

Hazard Statements
May cause an allergic skin reaction
May cause genetic defects

May cause cancer
May damage fertility. May damage the unborn child

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
Avoid breathing dust/fume/gas/mist/vapors/spray
Contaminated work clothing should not be allowed out of the workplace
Wear protective gloves
Response
IF exposed or concerned: Get medical attention/advice
Skin
IF ON SKIN: Wash with plenty of soap and water
If skin irritation or rash occurs: Get medical advice/attention
Wash contaminated clothing before reuse
Storage
Store locked up
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
Very toxic to aquatic life with long lasting effects
WARNING. Cancer - https://www.p65warnings.ca.gov/.

3. Composition/Information on Ingredients

Component	CAS No	Weight %
Benzo[a]pyrene	50-32-8	> 96

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 Remove 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. Get medical attention if symptoms occur.

Most important symptoms and effects None reasonably foreseeable. . May cause allergic skin reaction. 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

Unsuitable Extinguishing Media No information available

Flash Point No information available
Method - No information available

Autoignition Temperature Not applicable
Explosion Limits
Upper No data available
Lower No data available
Sensitivity to Mechanical Impact No information available
Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical
Do not allow run-off from fire-fighting to enter drains or water courses.

Hazardous Combustion Products
Carbon monoxide (CO). Carbon dioxide (CO_2).
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
2	1	0	N/A

6. Accidental release measures

Personal Precautions Ensure adequate ventilation. Use personal protective equipment as required. Avoid dust formation.

Environmental Precautions Do not flush into surface water or sanitary sewer system. Do not allow material to contaminate ground water system. Prevent product from entering drains. Local authorities should be advised if significant spillages cannot be contained.

Methods for Containment and Clean Up Sweep up and shovel into suitable containers for disposal. Keep in suitable, closed containers for disposal.

7. Handling and storage

Handling Wear personal protective equipment/face protection. Ensure adequate ventilation. Do not get in eyes, on skin, or on clothing. Avoid ingestion and inhalation. Avoid dust formation.

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

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH	Mexico OEL (TWA)
Benzo[a]pyrene		TWA: 0.2 mg/m³		

Legend

OSHA - Occupational Safety and Health Administration

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.
Recommended Filter type:	Particulates filter conforming to EN 143.
Hygiene Measures	Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Powder Solid
Appearance	Dark yellow
Odor	aromatic
Odor Threshold	No information available
pH	Not applicable
Melting Point/Range	175 - 179 °C / 347 - 354.2 °F
Boiling Point/Range	495 °C / 923 °F @ 760 mmHg
Flash Point	No information available
Evaporation Rate	Not applicable
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	Not applicable
Specific Gravity	No information available
Solubility	Insoluble in water
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	Not applicable
Decomposition Temperature	No information available
Viscosity	Not applicable
Molecular Formula	C20H12
Molecular Weight	252.31

10. Stability and reactivity

Reactive Hazard	None known, based on information available
Stability	Stable under normal conditions.
Conditions to Avoid	Incompatible products.
Incompatible Materials	Oxidizing agent
Hazardous Decomposition Products	Carbon monoxide (CO), Carbon dioxide (CO_2)
Hazardous Polymerization	Hazardous polymerization does not occur.
Hazardous Reactions	None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information
Component Information
Toxicologically Synergistic Products No information available

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

Irritation No information available

Sensitization May cause sensitization by skin contact

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

Component	CAS No	IARC	NTP	ACGIH	OSHA	Mexico
Benzo[a]pyrene	50-32-8	Group 1	Reasonably Anticipated	A2	X	A2

IARC (International Agency for Research on Cancer)

NTP: (National Toxicity Program)

ACGIH: (American Conference of Governmental Industrial Hygienists)

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

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

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

Aspiration hazard No information available

Symptoms / effects,both acute and delayed Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing

Endocrine Disruptor Information

Component	EU - Endocrine Disrupters Candidate List	EU - Endocrine Disruptors - Evaluated Substances	Japan - Endocrine Disruptor Information
Benzo[a]pyrene	Group III Chemical	Not applicable	Not applicable

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

12. Ecological information

Ecotoxicity
Very 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.

Persistence and Degradability May persist

Bioaccumulation/ Accumulation No information available.

Mobility Is not likely mobile in the environment due its low water solubility.

Component	log Pow
Benzo[a]pyrene	6.06

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
Benzo[a]pyrene - 50-32-8	U022	-

14. Transport information

DOT

UN-No UN3077
Proper Shipping Name Environmentally hazardous substances, solid, n.o.s.
Technical Name Benzo[a]pyrene
Hazard Class 9
Packing Group III

TDG

UN-No UN3077
Proper Shipping Name Environmentally hazardous substances, solid, n.o.s.
Hazard Class 9
Packing Group III

IATA

UN-No UN3077
Proper Shipping Name Environmentally hazardous substances, solid, n.o.s.
Hazard Class 9
Packing Group III

IMDG/IMO

UN-No UN3077
Proper Shipping Name Environmentally hazardous substances, solid, n.o.s.
Hazard Class 9
Packing Group III

15. Regulatory information

United States of America Inventory

Component	CAS No	TSCA	TSCA Inventory notification - Active-Inactive	TSCA - EPA Regulatory Flags
Benzo[a]pyrene	50-32-8	X	ACTIVE	-

Legend:
TSCA US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)
X - Listed
'-' - Not Listed

TSCA - Per 40 CFR 751, Regulation of Certain Chemical Substances & Mixtures, Under TSCA Section 6(h) (PBT) Not applicable

TSCA 12(b) - Notices of Export Not applicable

International Inventories

Canada (DSL/NDSL), Europe (EINECS/ELINCS/NLP), Philippines (PICCS), Japan (ENCS), Japan (ISHL), Australia (AICS), China (IECSC), Korea (KECL).

Component	CAS No	DSL	NDSL	EINECS	PICCS	ENCS	ISHL	AICS	IECSC	KECL
Benzo[a]pyrene	50-32-8	X	-	200-028-5	X	-		-	X	KE-05-0184

KECL - NIER number or KE number (http://ncis.nier.go.kr/en/main.do)

U.S. Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372. Note that PBT chemicals are not eligible for the de minimis exemption. For these chemicals, supplier notification limits are provided.
> 0 % = no low concentration cut-off set, supplier notification limit applies.

Component	CAS No	Weight %	SARA 313 - Threshold Values %	SARA 313 - Reporting threasholds
Benzo[a]pyrene	50-32-8	> 96	> 0 %	RT = 100 lb

SARA 311/312 Hazard Categories
Should this product meet EPCRA 311/312 Tier reporting criteria at 40 CFR 370, refer to Section 2 of this SDS for appropriate classifications.

CWA (Clean Water Act)

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Benzo[a]pyrene	-	-	X	X

Clean Air Act Not applicable

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) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355).

Component	Hazardous Substances RQs	CERCLA Extremely Hazardous Substances RQs	SARA Reportable Quantity (RQ)
Benzo[a]pyrene	1 lb	-	1 lb 0.454 kg

California Proposition 65 This product contains the following Proposition 65 chemicals.

Component	CAS No	California Prop. 65	Prop 65 NSRL	Category
Benzo[a]pyrene	50-32-8	Carcinogen	0.06 µg/day	Carcinogen

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Benzo[a]pyrene	X	X	X	X	X

U.S. Department of Transportation
Reportable Quantity (RQ): Y
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

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

Other International Regulations

Mexico - Grade No information available

Authorisation/Restrictions according to EU REACH

Component	CAS No	REACH (1907/2006) - Annex XIV - Substances Subject to Authorization	REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous Substances	REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC)
Benzo[a]pyrene	50-32-8	-	Use restricted. See item 72. (see link for restriction details) Use restricted. See item 30. (see link for restriction details) Use restricted. See item 28. (see link for restriction details) Use restricted. See item 50[a]. (see link for restriction details) Use restricted. See item 29. (see link for restriction details) Use restricted. See item 75. (see link for restriction details)	SVHC Candidate list - 200-028-5 - Carcinogenic (article 57a); Mutagenic (Article 57b); Toxic for reproduction (Article 57c); PBT (Article 57d); vPvB (Article 57e)

After the sunset date the use of this substance requires either an authorization or can only be used for exempted uses, e.g. use in scientific research and development which includes routine analytics or use as intermediate.

REACH links
https://echa.europa.eu/authorisation-list
https://echa.europa.eu/substances-restricted-under-reach
https://echa.europa.eu/candidate-list-table

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

Component	CAS No	OECD HPV	Persistent Organic Pollutant	Ozone Depletion Potential	Restriction of Hazardous Substances (RoHS)
Benzo[a]pyrene	50-32-8	Not applicable	Annex III - Substance subject to release reduction	Not applicable	Not applicable

Contains component(s) that meet a 'definition' of per & poly fluoroalkyl substance (PFAS)?
See table for values

PFAS Legend
Listed = Meets the PFAS definition of the named authority

Other International Regulations

Component	CAS No	Seveso III Directive (2012/18/EC) - Qualifying Quantities	Seveso III Directive (2012/18/EC) - Qualifying Quantities	Rotterdam Convention (PIC)	Basel Convention (Hazardous Waste)

		for Major Accident Notification	for Safety Report Requirements		
Benzo[a]pyrene	50-32-8	Not applicable	Not applicable	Not applicable	Not applicable

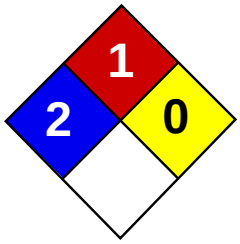
16. Other information

Prepared By
Health, Safety and Environmental Department
Email: chem.techinfo@thermofisher.com
www.thermofisher.com

Revision Date 25-Mar-2024
Print Date 25-Mar-2024
Revision Summary New emergency telephone response service provider.

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



Health	2
Fire	1
Reactivity	0
Personal Protection	E

Material Safety Data Sheet
Chromium MSDS

Section 1: Chemical Product and Company Identification

Product Name: Chromium

Catalog Codes: SLC4711, SLC3709

CAS#: 7440-47-3

RTECS: GB4200000

TSCA: TSCA 8(b) inventory: Chromium

CI#: Not applicable.

Synonym: Chromium metal; Chrome; Chromium Metal Chips 2" and finer

Chemical Name: Chromium

Chemical Formula: Cr

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Chromium	7440-47-3	100

Toxicological Data on Ingredients: Chromium LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant), of eye contact (irritant), of inhalation. Slightly hazardous in case of ingestion.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, lungs, liver, upper respiratory tract. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: 580°C (1076°F)

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances:
Slightly flammable to flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards:
Moderate fire hazard when it is in the form of a dust (powder) and burns rapidly when heated in flame. Chromium is attacked vigorously by fused potassium chlorate producing vivid incandescence. Pyrophoric chromium unites with nitric oxide with incandescence. Incandescent reaction with nitrogen oxide or sulfur dioxide.

Special Remarks on Explosion Hazards:
Powdered Chromium metal +fused ammonium nitrate may react violently or explosively. Powdered Chromium will explode spontaneously in air.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids, alkalis.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.5 (mg/m3) from ACGIH (TLV) [United States] TWA: 1 (mg/m3) from OSHA (PEL) [United States] TWA: 0.5 (mg/m3) from NIOSH [United States] TWA: 0.5 (mg/m3) [United Kingdom (UK)] TWA: 0.5 (mg/m3) [Canada]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Metal solid.)

Odor: Odorless.

Taste: Not available.

Molecular Weight: 52 g/mole

Color: Silver-white to Grey.

pH (1% soln/water): Not applicable.

Boiling Point: 2642°C (4787.6°F)

Melting Point: 1900°C (3452°F) +/- !0 deg. C

Critical Temperature: Not available.

Specific Gravity: 7.14 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility:
Insoluble in cold water, hot water. Soluble in acids (except Nitric), and strong alkalies.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Excess heat, incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, acids, alkalis.

Corrosivity: Not available.

Special Remarks on Reactivity:
Incompatible with molten Lithium at 180 deg. C, hydrogen peroxide, hydrochloric acid, sulfuric acid, most caustic alkalies and alkali carbonates, potassium chlorate, sulfur dioxide, nitrogen oxide, bromine pentafluoride. It may react violently or ignite with bromine pentafluoride. Chromium is rapidly attacked by fused sodium hydroxide + potassium nitrate. Potentially hazardous incompatibility with strong oxidizers.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available. LC50: Not available.

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. May cause damage to the following organs: kidneys, lungs, liver, upper respiratory tract.

Other Toxic Effects on Humans:
Hazardous in case of skin contact (irritant), of inhalation. Slightly hazardous in case of ingestion.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:
May cause cancer based on animal data. There is no evidence that exposure to trivalent chromium causes cancer in man.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: May cause skin irritation. Eyes: May cause mechanical eye irritation. Inhalation: May cause irritation of the respiratory tract and mucous membranes of the respiratory tract. Ingestion: May cause gastrointestinal tract irritation with nausea, vomiting, diarrhea. Chronic Potential Health Effects: Inhalation: The effects of chronic exposure include irritation , sneezing, reddness of the throat, bronchospasm, asthma, cough, polyps, chronic inflammation, emphysema, chronic bronchitis, pharyngitis, bronchopneumonia, pneumoconoisis. Effects on the nose from chronic chromium exposure include irritation, ulceration, and perforation of the nasal septum. Inflammation and ulceration of the larynx may also occur. Ingestion or Inhalation: Chronic exposure may cause liver and kidney damage.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Chromium Illinois toxic substances disclosure to employee act: Chromium Illinois chemical safety act: Chromium New York release reporting list: Chromium Rhode Island RTK hazardous substances: Chromium Pennsylvania RTK: Chromium Minnesota: Chromium Michigan critical material: Chromium Massachusetts RTK: Chromium Massachusetts spill list: Chromium New Jersey: Chromium New Jersey spill list: Chromium Louisiana spill reporting: Chromium California Director's List of Hazardous Substances: Chromium TSCA 8(b) inventory: Chromium SARA 313 toxic chemical notification and release reporting: Chromium CERCLA: Hazardous substances.: Chromium: 5000 lbs. (2268 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): Not controlled under WHMIS (Canada).

DSCL (EEC):
R40- Limited evidence of carcinogenic effect S36/37/39- Wear suitable protective clothing, gloves and eye/face protection. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 1

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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SAFETY DATA SHEET

Version 6.10
Revision Date 10/16/2024
Print Date 10/17/2024

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Dibenz[*a*,*h*]anthracene

Product Number : BCR138
Brand : Sigma-Aldrich
Index-No. : 601-041-00-2
CAS-No. : 53-70-3

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

Identified uses : Laboratory chemicals, Synthesis of substances

Uses advised against : The product is being supplied under the TSCA R&D Exemption (40 CFR Section 720.36). It is the recipient's responsibility to comply with the requirements of the R&D exemption. The product may not be used for a non-exempt commercial purpose under TSCA unless appropriate consent is granted in writing by MilliporeSigma.

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Carcinogenicity (Category 1B), H350
Short-term (acute) aquatic hazard (Category 1), H400
Long-term (chronic) aquatic hazard (Category 1), H410

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

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal Word Danger

Hazard Statements

H350	May cause cancer.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary Statements

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

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

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms : 1,2:5,6-Dibenzanthracene

Formula : $C_{22}H_{14}$
Molecular weight : 278.35 g/mol
CAS-No. : 53-70-3
EC-No. : 200-181-8
Index-No. : 601-041-00-2

Component	Classification	Concentration
Dibenz[a,h]anthracene		
	Carc. 1B; Aquatic Acute 1; Aquatic Chronic 1; H350, H400, H410 Concentration limits: >= 0.01 %: Carc. 1B, H350; M-Factor - Aquatic Acute: 100 - Aquatic Chronic: 100	<= 100 %

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

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.

In case of eye contact
After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

If swallowed
After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

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

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

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Water Foam Carbon dioxide (CO2) Dry powder

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Carbon oxides
Combustible.
Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 Advice for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information
Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Avoid generation and inhalation of dusts in all circumstances. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions

Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully. Dispose of properly. Clean up affected area. Avoid generation of dusts.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
Work under hood. Do not inhale substance/mixture.

Hygiene measures
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Tightly closed. Dry. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.
Storage stability Recommended storage temperature
2 - 8 °C
Storage class
Storage class (TRGS 510): 6.1C: Combustible, acute toxic Cat.3 / toxic compounds or compounds which causing chronic effects

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Dibenz[a,h]anthracene	53-70-3	PEL	0.2 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Dibenz[a,h]anthracene	53-70-3	1-Hydroxypyrene	2.5 µg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			
		3-hydroxybenzo(a)pyrene		Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

Personal protective equipment

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

Skin protection
Handle with impervious gloves.

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

Body Protection
protective clothing

Respiratory protection
Recommended Filter type: Filter type P3
The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.
required when dusts are generated.
Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odor	No data available
c)	Odor Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/ range: 262 - 265 °C (504 - 509 °F) - lit.
f)	Initial boiling point and boiling range	524 °C 975 °F - lit.
g)	Flash point	()Not applicable
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapor pressure	No data available
l)	Vapor density	No data available
m)	Density	No data available
	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Autoignition	No data available

	temperature	
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	Not classified as explosive.
t)	Oxidizing properties	none

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
The following applies in general to flammable organic substances and mixtures: in correspondingly fine distribution, when whirled up a dust explosion potential may generally be assumed.

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions
Violent reactions possible with:
strong oxidising agents

10.4 Conditions to avoid
no information available

10.5 Incompatible materials
No data available

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

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
Oral: No data available
Inhalation: No data available
Dermal: No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
Presumed to have carcinogenic potential for humans

IARC: 2A - Group 2A: Probably carcinogenic to humans (Dibenz[a,h]anthracene)

NTP: RAHC - Reasonably anticipated to be a human carcinogen (Dibenz[a,h]anthracene)

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Additional Information

RTECS: HN2625000
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Lungs -

SECTION 12: Ecological information

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

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

12.6 Endocrine disrupting properties
No data available

12.7 Other adverse effects

Discharge into the environment must be avoided.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14: Transport information

DOT (US)

UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Dibenz[a,h]anthracene)
Reportable Quantity (RQ): 1 lbs
Poison Inhalation Hazard: No

IMDG

UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Dibenz[a,h]anthracene)
Marine pollutant : yes
Marine pollutant : no

IATA

UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Dibenz[a,h]anthracene)

Further information

EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

SECTION 15: Regulatory information

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Dibenz[a,h]anthracene	53-70-3	1	1

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Chronic Health Hazard

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

Dibenz[a,h]anthracene	53-70-3	>= 90 - <= 100 %

Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 112 (40 CFR 61):

Dibenz[a,h]anthracene	53-70-3	>= 90 - <= 100 %

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.
This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.
This product contains the following toxic pollutants listed under the U.S. Clean Water Act Section 307

Dibenz[a,h]anthracene	53-70-3	>= 90 - <= 100 %

This product contains the following priority pollutants related to the U.S. Clean Water Act:

Dibenz[a,h]anthracene	53-70-3	>= 90 - <= 100 %

US State Regulations

Massachusetts Right To Know

Dibenz[a,h]anthracene	53-70-3

Pennsylvania Right To Know

Dibenz[a,h]anthracene	53-70-3

Maine Chemicals of High Concern

Product does not contain any listed chemicals

Vermont Chemicals of High Concern

Product does not contain any listed chemicals

Washington Chemicals of High Concern

Product does not contain any listed chemicals

California Prop. 65

WARNING: This product can expose you to chemicals including Dibenz[a,h]anthracene, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

The ingredients of this product are reported in the following inventories:

TSCA : All substances listed as active on the TSCA inventory

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16: Other information

Further information

The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

The branding on the header and/or footer of this document may temporarily not visually match the product purchased as we transition our branding. However, all of the information in the document regarding the product remains unchanged and matches the product ordered. For further information please contact mlsbranding@sial.com.

Version: 6.10 Revision Date: 10/16/2024 Print Date: 10/17/2024

SAFETY DATA SHEET

Version 6.10
Revision Date 06/25/2025
Print Date 06/26/2025

SECTION 1. IDENTIFICATION

1.1 Product identifiers

Product name : Dieldrin

Product Number : 33491
Brand : Sigma-Aldrich
Index-No. : 602-049-00-9
CAS-No. : 60-57-1

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

Identified uses : Laboratory chemicals, Synthesis of substances

Uses advised against : The product is being supplied under the TSCA R&D Exemption (40 CFR Section 720.36). It is the recipient's responsibility to comply with the requirements of the R&D exemption. The product may not be used for a non-exempt commercial purpose under TSCA unless appropriate consent is granted in writing by MilliporeSigma.

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity (Oral) : Category 2

Acute toxicity (Dermal) : Category 1

Carcinogenicity	:	Category 2
Specific target organ toxicity - repeated exposure	:	Category 1
Short-term (acute) aquatic hazard	:	Category 1
Long-term (chronic) aquatic hazard	:	Category 1

Other hazards

None known.

GHS label elements

Hazard pictograms :

Signal Word : Danger

Hazard Statements : H300 + H310 Fatal if swallowed or in contact with skin.
H351 Suspected of causing cancer.
H372 Causes damage to organs through prolonged or repeated exposure.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements :

Prevention:

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P260 Do not breathe dust.
P262 Do not get in eyes, on skin, or on clothing.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P273 Avoid release to the environment.
P280 Wear protective gloves, protective clothing, eye protection and face protection.

Response:

P301 + P310 + P330 IF SWALLOWED: Immediately call a POISON CENTER/ doctor. Rinse mouth.
P302 + P352 + P310 IF ON SKIN: Wash with plenty of water. Immediately call a POISON CENTER/ doctor.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P361 + P364 Take off immediately all contaminated

clothing and wash it before reuse.
P391 Collect spillage.

Storage:

P405 Store locked up.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

Components

Chemical name	CAS No./Unique ID	Concentration (% w/w)	Trade secret
Dieldrin	60-57-1*	>= 80 - <= 100	TSC

* Indicates that the identifier is a CAS No.
TSC- the actual concentration or concentration range is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

General advice : First aiders need to protect themselves.
Show this safety data sheet to the doctor in attendance.

If inhaled : After inhalation: fresh air. Call in physician.

In case of skin contact : In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Call a physician immediately.

In case of eye contact : After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

If swallowed : If swallowed: give water to drink (two glasses at most). Seek medical advice immediately. In exceptional cases only, if medical care is not available within one hour, induce vomiting (only in persons who are wide awake and fully conscious), administer activated charcoal (20 - 40 g in a 10% slurry) and consult a doctor as quickly as possible.

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

Protection of first-aiders	:	For personal protection see section 8.
Notes to physician	:	No data available

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Water Foam Carbon dioxide (CO2) Dry powder
Unsuitable extinguishing media	:	For this substance/mixture no limitations of extinguishing agents are given.
Specific hazards during fire fighting	:	Combustible. Development of hazardous combustion gases or vapours possible in the event of fire.
Hazardous combustion products	:	Carbon oxides Hydrogen chloride gas
Specific extinguishing methods	:	No data available
Further information	:	Suppress (knock down) gases/vapours/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.
Special protective equipment for fire-fighters	:	Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Advice for non-emergency personnel: Avoid generation and inhalation of dusts in all circumstances. Avoid substance contact. Ensure adequate ventilation.

Evacuate the danger area, observe emergency procedures, consult an expert.
Advice for emergency responders:
For personal protection see section 8.

Environmental precautions : Do not let product enter drains.

Methods and materials for containment and cleaning up : Cover drains. Collect, bind, and pump off spills.
Observe possible material restrictions (see sections 7 and 10).
Take up carefully. Dispose of properly. Clean up affected area.
Avoid generation of dusts.

SECTION 7. HANDLING AND STORAGE

For precautions see section 2.2.

Advice on safe handling : Work under hood. Do not inhale substance/mixture.

Further information on storage conditions : Tightly closed.
Dry.
Keep in a well-ventilated place.
Keep locked up or in an area accessible only to qualified or authorised persons.

Storage class : 6.1A, Combustible, acute toxic Cat. 1 and 2 / very toxic hazardous materials

Recommended storage temperature : Recommended storage temperature see product label.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Dieldrin	60-57-1	TWA (Inhalable fraction and vapor)	0.1 mg/m3	ACGIH
		TWA	0.25 mg/m3	NIOSH REL
		TWA	0.25 mg/m3	OSHA Z-1

Engineering measures : No data available

Personal protective equipment

Respiratory protection	:	required when dusts are generated. Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.
Recommended Filter type:	:	Filter type P3

The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Hand protection

Material	:	Nitrile rubber
Break through time	:	480 min
Glove thickness	:	0.11 mm
Protective index	:	Full contact
Manufacturer	:	Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Material	:	Nitrile rubber
Break through time	:	480 min
Glove thickness	:	0.11 mm
Protective index	:	Splash contact
Manufacturer	:	Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Manufacturer	:	data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
Remarks	:	Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.
Eye protection	:	Use equipment for eye protection tested and

		approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses
Skin and body protection	:	protective clothing
Hygiene measures	:	Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	solid
Color	:	No data available
Odor	:	No data available
Odor Threshold	:	No data available
pH	:	No data available
Melting point/ range	:	289 - 291 °F / 143 - 144 °C Method: lit.
Boiling point/boiling range	:	No data available
Flash point	:	Not applicable
Evaporation rate	:	No data available
Flammability (solid, gas)	:	No data available
Flammability (liquids)	:	No data available
Burning rate	:	No data available
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapor pressure	:	No data available
Relative vapour density	:	No data available
Relative density	:	No data available
Density	:	No data available

Solubility(ies)		
Water solubility	:	slightly soluble (68 °F / 20 °C)
Partition coefficient: n-octanol/water	:	No data available
Autoignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	No data available
Flow time	:	No data available
Explosive properties	:	Not classified as explosive.
Oxidizing properties	:	none
Molecular weight	:	380.91 g/mol
Particle characteristics		
Particle size	:	No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	The following applies in general to flammable organic substances and mixtures: in correspondingly fine distribution, when whirled up a dust explosion potential may generally be assumed.
Chemical stability	:	The product is chemically stable under standard ambient conditions (room temperature) .
Possibility of hazardous reactions	:	Violent reactions possible with: Strong oxidizing agents
Conditions to avoid	:	no information available
Incompatible materials	:	No data available
Hazardous decomposition products	:	In the event of fire: see section 5

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 38.3 mg/kg
Remarks: (RTECS)
Inhalation: No data available
Acute toxicity estimate Dermal - 5.1 mg/kg
(Expert judgement)
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
Suspected of causing cancer.

IARC: 2A - Group 2A: Probably carcinogenic to humans (Dieldrin)

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

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Causes damage to organs through prolonged or repeated exposure.
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Aspiration hazard
No data available

11.2 Additional Information

RTECS: IO1750000
Discomfort, Headache, Nausea, Vomiting, Dizziness, Tremors, tonic convulsions, clonic spasms, Coma., respiratory failure
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Blood - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Dieldrin:

Toxicity to fish	:	LC50 (Lepomis cyanellus): 0.011 mg/l End point: mortality Exposure time: 96 h Test Type: static test Remarks: (ECOTOX Database)
M-Factor (Acute aquatic toxicity)	:	100
M-Factor (Chronic aquatic toxicity)	:	10

Persistence and degradability

No data available

Bioaccumulative potential

No data available

Mobility in soil

No data available

Other adverse effects

Product:

Ozone-Depletion Potential	:	Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

Components:

Dieldrin:

Additional ecological information	:	Discharge into the environment must be avoided.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	Waste material must be disposed of in accordance

with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

UN/ID No.	:	UN 2811
Proper shipping name	:	Toxic solid, organic, n.o.s. (Dieldrin)
Class	:	6.1
Packing group	:	I
Labels	:	Division 6.1 - Toxic substances
Packing instruction (cargo aircraft)	:	673
Packing instruction (passenger aircraft)	:	Not permitted for transport

IMDG-Code

UN number	:	UN 2811
Proper shipping name	:	TOXIC SOLID, ORGANIC, N.O.S. (Dieldrin)
Class	:	6.1
Packing group	:	I
Labels	:	6.1
EmS Code	:	F-A, S-A
Marine pollutant	:	yes

Transport in bulk according to IMO instruments

Not applicable for product as supplied.

National Regulations

49 CFR Road

UN/ID/NA number	:	UN 2811
Proper shipping name	:	Toxic solids, organic, n.o.s. (Dieldrin)
Class	:	6.1
Packing group	:	I
Labels	:	Division 6.1 - Toxic substances
ERG Code	:	154
Marine pollutant	:	yes
Poison Inhalation Hazard	:	No

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety

Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Dieldrin	60-57-1	1	1

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Acute Health Hazard
Chronic Health Hazard

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

Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

The following Hazardous Substances are listed under the U.S. CleanWater Act, Section 311, Table 116.4A:

Dieldrin 60-57-1 >= 90 - <= 100 %

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:

Dieldrin 60-57-1 >= 90 - <= 100 %

This product contains the following toxic pollutants listed under the U.S. Clean Water Act Section 307

Dieldrin 60-57-1 >= 90 - <= 100 %

This product contains the following priority pollutants related to the U.S. Clean Water Act:

Dieldrin 60-57-1 >= 90 - <= 100 %

US State Regulations

Massachusetts Right To Know

Dieldrin 60-57-1

Pennsylvania Right To Know

Dieldrin 60-57-1

Maine Chemicals of High Concern

Product does not contain any listed chemicals

Vermont Chemicals of High Concern

Product does not contain any listed chemicals

Washington Chemicals of High Concern

Product does not contain any listed chemicals

California Prop. 65

WARNING: This product can expose you to chemicals including Dieldrin, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

International Regulations

Rotterdam Convention (Prior Informed Consent) : Dieldrin

Stockholm Convention (Persistent Organic Pollutants) : Dieldrin

The components of this product are reported in the following inventories:

TSCA : Product contains substance(s) not listed on TSCA inventory.

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16. OTHER INFORMATION

Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA	:	8-hour, time-weighted average
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
OSHA Z-1 / TWA	:	8-hour time weighted average

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx -

Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Revision Date : 06/25/2025

The branding on the header and/or footer of this document may temporarily not visually match the product purchased as we transition our branding. However, all of the information in the document regarding the product remains unchanged and matches the product ordered. For further information please contact mlsbranding@sial.com.

US / EN

SAFETY DATA SHEET

Revision Date 03-Apr-2024 **Revision Number** 5

1. Identification

Product Name **Ethylbenzene**

Cat No. : **L05908**

Synonyms No information available

Recommended Use Laboratory chemicals.
Uses advised against Food, drug, pesticide or biocidal product use.

Details of the supplier of the safety data sheet

Company
Thermo Fisher Scientific Chemicals, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Tel: 800-343-0660
Fax: 800-322-4757

Emergency Telephone Number
For information **US** call: 001-800-227-6701 / **Europe** call: +32 14 57 52 11
Emergency Number **US:**001-201-796-7100 / **Europe:** +32 14 57 52 99
CHEMTREC Tel. No. **US:**001-800-424-9300 / **Europe:**001-703-527-3887

2. Hazard(s) identification

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

Flammable liquids	Category 2
Acute Inhalation Toxicity - Vapors	Category 4
Germ Cell Mutagenicity	Category 1B
Carcinogenicity	Category 1A
Specific target organ toxicity - (repeated exposure)	Category 2
Aspiration Toxicity	Category 1

Label Elements

Signal Word
Danger

Hazard Statements
Highly flammable liquid and vapor
May be fatal if swallowed and enters airways
Harmful if inhaled

May cause genetic defects
May cause cancer
May cause damage to organs through prolonged or repeated exposure

Precautionary Statements
Prevention
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Use only outdoors or in a well-ventilated area
Do not breathe 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
Use explosion-proof electrical/ventilating/lighting equipment
Use only non-sparking tools
Take precautionary measures against static discharge
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 (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
Ingestion
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
Do NOT induce vomiting
Fire
In case of fire: Use CO2, dry chemical, or foam for extinction
Storage
Store locked up
Store in a well-ventilated place. Keep cool
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. Cancer and Reproductive Harm - https://www.p65warnings.ca.gov/.

3. Composition/Information on Ingredients

Component	CAS No	Weight %
Ethylbenzene	100-41-4	99.88
Benzene	71-43-2	0.12

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 Remove to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms occur. Risk of serious damage to the lungs (by aspiration).

Ingestion Clean mouth with water and drink afterwards plenty of water. Do NOT induce vomiting. Call a physician or poison control center immediately. If vomiting occurs naturally, have victim lean forward.

Most important symptoms and effects None reasonably foreseeable. . Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media Water mist may be used to cool closed containers.

Unsuitable Extinguishing Media No information available

Flash Point 15 °C / 59 °F

Method - No information available

Autoignition Temperature No information available

Explosion Limits

Upper No data available

Lower No data available

Sensitivity to Mechanical Impact No information available

Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical

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

Hazardous Combustion Products

Carbon oxides.

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
3	3	0	N/A

6. Accidental release measures

Personal Precautions Ensure adequate ventilation. Use personal protective equipment as required. Remove all sources of ignition. Take precautionary measures against static discharges.

Environmental Precautions Do not flush into surface water or sanitary sewer system.

Methods for Containment and Clean Up Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.

7. Handling and storage

Handling Wear personal protective equipment/face protection. Ensure adequate ventilation. Do not get in eyes, on skin, or on clothing. Avoid ingestion and inhalation. Keep away from open flames, hot surfaces and sources of ignition. Use only non-sparking tools. To avoid ignition

of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Take precautionary measures against static discharges.

Storage. Keep container tightly closed in a dry and well-ventilated place. Keep away from heat, sparks and flame.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH	Mexico OEL (TWA)
Ethylbenzene	TWA: 20 ppm	(Vacated) TWA: 100 ppm (Vacated) TWA: 435 mg/m³ (Vacated) STEL: 125 ppm (Vacated) STEL: 545 mg/m³ TWA: 100 ppm TWA: 435 mg/m³	IDLH: 800 ppm TWA: 100 ppm TWA: 435 mg/m³ STEL: 125 ppm STEL: 545 mg/m³	TWA: 20 ppm
Benzene	TWA: 0.5 ppm STEL: 2.5 ppm Skin	(Vacated) TWA: 10 ppm Ceiling: 25 ppm (Vacated) STEL: 50 ppm (Vacated) Ceiling: 25 ppm TWA: 10 ppm TWA: 1 ppm STEL: 5 ppm	IDLH: 500 ppm TWA: 0.1 ppm STEL: 1 ppm	TWA: 0.5 ppm STEL: 2.5 ppm

Legend

ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
NIOSH: NIOSH - National Institute for Occupational Safety and Health

Engineering Measures Ensure adequate ventilation, especially in confined areas. Use explosion-proof electrical/ventilating/lighting equipment.

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.

Recommended Filter type: Organic gases and vapours filter. Type A. Brown. conforming to EN14387.

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

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	aromatic
Odor Threshold	No information available
pH	Not applicable
Melting Point/Range	-95 °C / -139 °F
Boiling Point/Range	135 - 136 °C / 275 - 276.8 °F
Flash Point	15 °C / 59 °F
Evaporation Rate	No information available

Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	No information available
Vapor Density	No information available
Density	0.867
Specific Gravity	No information available
Solubility	No information available
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	No information available
Decomposition Temperature	No information available
Viscosity	No information available

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Stable under normal conditions.

Conditions to Avoid Keep away from open flames, hot surfaces and sources of ignition.

Incompatible Materials Strong oxidizing agents

Hazardous Decomposition Products Carbon oxides

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information

Oral LD50 Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.

Dermal LD50 Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.

Vapor LC50 Category 4. ATE = 10 - 20 mg/l.

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Ethylbenzene	3500 mg/kg (Rat)	15400 mg/kg (Rabbit)	17.2 mg/L (Rat) 4 h
Benzene	LD50 = 810 mg/kg (Rat)	LD50 > 8200 mg/kg (Rabbit)	LC50 = 44.66 mg/L (Rat) 4 h

Toxicologically Synergistic Products No information available

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

Irritation No information available

Sensitization No information available

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

Component	CAS No	IARC	NTP	ACGIH	OSHA	Mexico
Ethylbenzene	100-41-4	Group 2B	Not listed	A3	X	A3
Benzene	71-43-2	Group 1	Known	A1	X	A1

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 Hygienists)	*A1 - Known Human Carcinogen* *A2 - Suspected Human Carcinogen* *A3 - Animal Carcinogen*
	ACGIH: (American Conference of Governmental Industrial Hygienists)
Mexico - Occupational Exposure Limits - Carcinogens	*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 None known
STOT - repeated exposure None known

Aspiration hazard No information available

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

Endocrine Disruptor Information No information available

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

12. Ecological information

Ecotoxicity

The product contains following substances which are hazardous for the environment. Contains a substance which is:. Toxic to aquatic organisms.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Ethylbenzene	EC50: 2.6 - 11.3 mg/L, 72h static (Pseudokirchneriella subcapitata) EC50: 1.7 - 7.6 mg/L, 96h static (Pseudokirchneriella subcapitata) EC50: > 438 mg/L, 96h (Pseudokirchneriella subcapitata) EC50: = 4.6 mg/L, 72h (Pseudokirchneriella subcapitata)	LC50: 9.1 - 15.6 mg/L, 96h static (Pimephales promelas) LC50: 11.0 - 18.0 mg/L, 96h static (Oncorhynchus mykiss) LC50: = 4.2 mg/L, 96h semi-static (Oncorhynchus mykiss) LC50: 7.55 - 11 mg/L, 96h flow-through (Pimephales promelas) LC50: = 32 mg/L, 96h static (Lepomis macrochirus) LC50: = 9.6 mg/L, 96h static (Poecilia reticulata)	EC50 = 9.68 mg/L 30 min EC50 = 96 mg/L 24 h	EC50: 1.8 - 2.4 mg/L, 48h (Daphnia magna)
Benzene	EC50: = 29 mg/L, 72h (Pseudokirchneriella subcapitata)	LC50: = 22.49 mg/L, 96h static (Lepomis macrochirus) LC50: = 5.3 mg/L, 96h flow-through (Oncorhynchus mykiss) LC50: 70000 - 142000 µg/L, 96h static (Lepomis macrochirus)	Not listed	EC50: = 10 mg/L, 48h (Daphnia magna) EC50: 8.76 - 15.6 mg/L, 48h Static (Daphnia magna)

		LC50: = 28.6 mg/L, 96h static (Poecilia reticulata) LC50: 22330 - 41160 µg/L, 96h static (Pimephales promelas) LC50: 10.7 - 14.7 mg/L, 96h flow-through (Pimephales promelas)		

Persistence and Degradability Persistence is unlikely

Bioaccumulation/ Accumulation No information available.

Mobility No information available.

Component	log Pow
Ethylbenzene	3.6
Benzene	2.13

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
Benzene - 71-43-2	U019	-

14. Transport information

DOT

UN-No UN1175
Proper Shipping Name ETHYLBENZENE
Hazard Class 3
Packing Group II

TDG

UN-No UN1175
Proper Shipping Name ETHYLBENZENE
Hazard Class 3
Packing Group II

IATA

UN-No UN1175
Proper Shipping Name ETHYLBENZENE
Hazard Class 3
Packing Group II

IMDG/IMO

UN-No UN1175
Proper Shipping Name ETHYLBENZENE
Hazard Class 3
Packing Group II

15. Regulatory information

United States of America Inventory

Component	CAS No	TSCA	TSCA Inventory notification - Active-Inactive	TSCA - EPA Regulatory Flags
Ethylbenzene	100-41-4	X	ACTIVE	-
Benzene	71-43-2	X	ACTIVE	-

Legend:
TSCA US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)
X - Listed

'-' - Not Listed

TSCA - Per 40 CFR 751, Regulation of Certain Chemical Substances & Mixtures, Under TSCA Section 6(h) (PBT) Not applicable

TSCA 12(b) - Notices of Export Not applicable

International Inventories

China, X = listed, Australia, U.S.A. (TSCA), Canada (DSL/NDSL), Europe (EINECS/ELINCS/NLP), Australia (AICS), Korea (KECL), China (IECSC), Japan (ENCS), Philippines (PICCS), Taiwan (TCSI), Japan (ISHL), New Zealand (NZIoC), Japan (ISHL).

Component	CAS No	DSL	NDSL	EINECS	PICCS	ENCS	ISHL	AICS	IECSC	KECL
Ethylbenzene	100-41-4	X	-	202-849-4	X	X	X	X	X	KE-13532
Benzene	71-43-2	X	-	200-753-7	X	X	X	X	X	KE-02150

KECL - NIER number or KE number (http://ncis.nier.go.kr/en/main.do)

U.S. Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

Component	CAS No	Weight %	SARA 313 - Threshold Values %	SARA 313 - Reporting threasholds
Ethylbenzene	100-41-4	99.88	0.1 %	-
Benzene	71-43-2	0.12	0.1 %	-

SARA 311/312 Hazard Categories

Should this product meet EPCRA 311/312 Tier reporting criteria at 40 CFR 370, refer to Section 2 of this SDS for appropriate classifications.

CWA (Clean Water Act)

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Ethylbenzene	X	1000 lb	X	X
Benzene	X	10 lb	X	X

Clean Air Act

Component	HAPS Data	Class 1 Ozone Depletors	Class 2 Ozone Depletors
Ethylbenzene	X		-
Benzene	X		-

OSHA - Occupational Safety and Health Administration Not applicable

Component	Specifically Regulated Chemicals	Highly Hazardous Chemicals
Benzene	5 ppm STEL 0.5 ppm Action Level 1 ppm TWA	-

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) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355).

Component	Hazardous Substances RQs	CERCLA Extremely Hazardous Substances RQs	SARA Reportable Quantity (RQ)
Ethylbenzene	1000 lb	-	1000 lb

			454 kg
Benzene	10 lb	-	10 lb 4.54 kg

California Proposition 65 This product contains the following Proposition 65 chemicals.

Component	CAS No	California Prop. 65	Prop 65 NSRL	Category
Ethylbenzene	100-41-4	Carcinogen	54 µg/day 41 µg/day	Carcinogen
Benzene	71-43-2	Carcinogen Developmental Male Reproductive	6.4 µg/day 13 µg/day	Developmental Carcinogen

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Ethylbenzene	X	X	X	X	X
Benzene	X	X	X	X	X

U.S. Department of Transportation

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

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

Other International Regulations

Mexico - Grade No information available

Authorisation/Restrictions according to EU REACH

Component	CAS No	REACH (1907/2006) - Annex XIV - Substances Subject to Authorization	REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous Substances	REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC)
Ethylbenzene	100-41-4	-	-	-
Benzene	71-43-2	-	Use restricted. See item 72. (see link for restriction details) Use restricted. See item 5. (see link for restriction details) Use restricted. See item 28. (see link for restriction details) Use restricted. See item 29. (see link for restriction details) Use restricted. See item 75. (see link for restriction details)	-

REACH links

https://echa.europa.eu/substances-restricted-under-reach

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

Component	CAS No	OECD HPV	Persistent Organic Pollutant	Ozone Depletion Potential	Restriction of Hazardous Substances (RoHS)
Ethylbenzene	100-41-4	Listed	Not applicable	Not applicable	Not applicable
Benzene	71-43-2	Listed	Not applicable	Not applicable	Not applicable

Contains component(s) that meet a 'definition' of per & poly fluoroalkyl substance (PFAS)?
Not applicable

Other International Regulations

Component	CAS No	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements	Rotterdam Convention (PIC)	Basel Convention (Hazardous Waste)
Ethylbenzene	100-41-4	Not applicable	Not applicable	Not applicable	Not applicable
Benzene	71-43-2	Not applicable	Not applicable	Not applicable	Not applicable

16. Other information

Prepared By
Health, Safety and Environmental Department
Email: chem.techinfo@thermofisher.com
www.thermofisher.com

Revision Date 03-Apr-2024
Print Date 03-Apr-2024
Revision Summary New emergency telephone response service provider.

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

Lead

SAFETY DATA SHEET

1 PRODUCT AND SUPPLIER IDENTIFICATION

Product Name: Lead - pellets, shot, sheet, foil, rod, wire, target

Formula: Pb

Supplier: ESPI Metals

1050 Benson Way

Ashland, OR 97520

Telephone: 800-638-2581

Fax: 541-488-8313

Email: sales@espimetals.com

Emergency: Infotrac 800-535-5053 (US) or 352-323-3500 (24 hour)

Recommended Uses: Scientific Research

2 HAZARDS IDENTIFICATION

GHS Classification (29 CFR 1910.1200): Acute toxicity, category 4, Carcinogenicity, category 2, Reproductive toxicity, category 2.

GHS Label Elements:

Signal Word: Warning

Hazard Statements: H302 Harmful if swallowed, H332 Harmful if inhaled, H351 Suspected of causing cancer, H361 Suspected of damaging fertility or the unborn child.

Precautionary Statements: P260 Do not breath dust/fume/gas/mist/vapors/spray, P264 Wash hands thoroughly after handling, P281 Use personal protective equipment as required, P301+P304+P312 IF SWALLOWED OR INHALED: Call a POISON CENTER or doctor/physician if you feel unwell.

3 COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient: Lead

CAS#: 7439-92-1

%: 100

EC#: 231-100-4

4 FIRST AID MEASURES

General Measures: Under normal handling and use, exposure to solid forms of this material present few health hazards. Subsequent operations such as grinding, melting or welding may produce hazardous dust or fumes which can be inhaled or come in contact with the skin or eyes. Emergency responders should take care to avoid secondary exposure to lead particulate. Wear appropriate protective equipment.

INHALATION: Remove to fresh air, keep warm and quiet, give oxygen if breathing is difficult. Seek immediate medical attention.

INGESTION: Rinse mouth with water. Do not induce vomiting. Seek immediate medical attention. Never induce vomiting or give anything by mouth to an unconscious person.

SKIN: Remove contaminated clothing, wash affected area with soap and water. Seek medical attention. Wash contaminated clothing before reusing.

EYES: Flush eyes with lukewarm water, including under upper and lower eyelids, for at least 15 minutes. Seek medical attention.

Most Important Symptoms/ Effects, Acute and Delayed: May cause irritation. See section 11 for more information.

Indication of Immediate Medical Attention and Special Treatment: No other information available.

5 FIREFIGHTING MEASURES

Extinguishing Media: Use suitable extinguishing agent for surrounding materials and type of fire.

Unsuitable Extinguishing Media: No information available.

Specific Hazards Arising from the Material: This product does not present fire or explosion hazards as shipped. Fine dust from processing is a weak to moderate fire hazard if allowed to accumulate and subjected to an ignition source. Under fire conditions toxic fumes of lead oxide may be released.

Special Protective Equipment and Precautions for Firefighters: Full face, self-contained breathing apparatus and full protective clothing when necessary.

6 ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures: Wear appropriate respiratory

and protective equipment specified in section 8. Avoid creating dusts. Avoid breathing dust or fume. Isolate spill area and provide ventilation.

Methods and Materials for Containment and Cleaning Up: For larger pieces - pick up mechanically. For chips or dust - vacuum using a HEPA filter. Place in properly labeled closed containers. Avoid creating dusts. Do not use compressed air.

Environmental Precautions: Do not allow to enter drains or to be released to the environment.

7 HANDLING AND STORAGE

Precautions for Safe Handling: Handle in a well-ventilated area. Avoid creating dust. Avoid exposure to high temperature. Avoid breathing dust or fumes. Avoid contact with skin and eyes. Wash thoroughly before eating or smoking. See section 8 for information on personal protection equipment.

Conditions for Safe Storage, Including Any Incompatibilities: Store in a sealed container. Store in a cool, dry area. Protect from moisture. Do not store together with strong oxidizers or acids. See section 10 for more information on incompatible materials.

8 EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits: Lead

OSHA/ PEL: 50 µg/m^3

ACGIH/ TLV: 0.05 mg/m^3

Appropriate Engineering Controls: Whenever possible the use of local exhaust ventilation or other engineering controls is the preferred method of controlling exposure to airborne dust and fume to meet established occupational exposure limits. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating or smoking. Do not blow dust off clothing or skin with compressed air. Clothing worn in areas of exposure to lead dust or fume should be restricted to the workplace and laundered regularly.

Individual Protection Measures, Such as Personal Protective Equipment:

Respiratory Protection: When potential exposures are above the occupational limits, approved respirators must be used.

Eye Protection: Safety glasses

Skin Protection: Wear impermeable gloves, protective work clothing as necessary.

9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Form: Solid in various forms

Color: Silvery metallic

Odor: Odorless

Odor Threshold: Not determined

pH: N/A

Melting Point: 327.5 ^{o}C

Boiling Point: 1740 ^{o}C

Flash Point: N/A

Evaporation Rate: N/A

Flammability: No data

Upper Flammable Limit: No data

Lower Flammable Limit: No data

Vapor Pressure: 1 mm Hg @ 973 ^{o}C

Vapor Density: N/A

Relative Density (Specific Gravity): 11.34 g/cc

Solubility in H_2O: Insoluble

Partition Coefficient (n-octanol/ water): Not determined

Autoignition Temperature: No data

Decomposition Temperature: No data

Viscosity: N/A

10 STABILITY AND REACTIVITY

Reactivity: No data

Chemical Stability: Stable under recommended storage conditions.

Possibility of Hazardous Reactions: High temperatures will generate toxic lead oxide fumes.

Conditions to Avoid: Avoid creating or accumulating fines or dusts. Avoid high temperatures.

Incompatible Materials: Strong acids, strong oxidizers, halogens and interhalogen compounds.

Hazardous Decomposition Products: Lead oxide fume.

Other: Freshly cut or cast lead surfaces tarnish rapidly due to the formation of an insoluble protective layer of basic lead carbonate.

11 TOXICOLOGICAL INFORMATION

Likely Routes of Exposure: Inhalation, skin, eyes. Product as shipped does not present an inhalation hazard; however subsequent operations may create dusts or fumes which could be inhaled.

Symptoms of Exposure: Skin or eye contact with dust or fume may cause local irritation. Inhalation of dust or fumes may cause headache, nausea, vomiting, abdominal spasms, fatigue, sleep disturbances, weight loss,

anemia, and pain in legs, arms, and joints. An acute short-term dose of lead could cause acute encephalopathy with seizures, coma, and death. However, short-term exposure of this magnitude is rare. Kidney damage, as well as anemia, can occur from acute exposure. Symptoms due to ingestion of lead dust or fume would be similar to those from inhalation. Other health effects such as metallic taste in the mouth and constipation or bloody diarrhea might also be expected to occur.

Acute and Chronic Effects: Lead accumulates in bone and body organs once it enters the body. Elimination from the body is slow. Initial and periodic medical examinations are advised for persons repeatedly exposed to levels above the exposure limits of lead dust or fumes. Once lead enters the body, it can affect a variety of organ systems, including the nervous system, kidneys, reproductive system, blood formation, and gastrointestinal system.

Acute Toxicity: No data

Carcinogenicity: NTP: R - Reasonably anticipated to be a carcinogen IARC: 2B - Possibly carcinogenic to humans

To the best of our knowledge the chemical, physical and toxicological characteristics of the substance are not fully known.

12 ECOLOGICAL INFORMATION

Ecotoxicity: No data

Persistence and Degradability: No data

Bioaccumulative Potential: No data

Mobility in Soil: No data

Other Adverse Effects: Do not allow material to be released to the environment. No further relevant information available.

13 DISPOSAL CONSIDERATIONS

Waste Disposal Method:

Product: Dispose of in accordance with Federal, State and Local regulations.

Packaging: Dispose of in accordance with Federal, State and Local regulations.

14 TRANSPORT INFORMATION

DOT/ ADR/ IATA/ IMDG Regulations: Not regulated

UN Number: N/A

UN Proper Shipping Name: N/A

Transport Hazard Class: N/A

Packing Group: N/A

Marine Pollutant: No

Special Precautions: N/A

15 REGULATORY INFORMATION

TSCA Listed: All components are listed.

Regulation (EC) No 1272/2008 (CLP): Acute toxicity, category 4, Carcinogenicity, category 2, Reproductive toxicity, category 2.

Canada WHMIS Classification (CPR, SOR/88-66): Class D, Division 2, Subdivision A - Very toxic material causing other toxic effects.

HMIS Ratings: Health: 1 Flammability: 0 Physical: 0

NFPA Ratings: Health: 1 Flammability: 0 Reactivity: 0

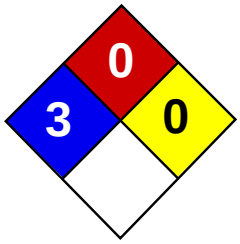
Chemical Safety Assessment: A chemical safety assessment has not been carried out.

16 OTHER INFORMATION

The above information is believed to be correct, but does not purport to be all inclusive and shall be used only as a guide. ESPI Metals shall not be held liable for any damages resulting from handling or from contact with the above product.

Prepared by: ESPI Metals

Revised/Reviewed: September 2014



Material Safety Data Sheet
Mercury MSDS

Section 1: Chemical Product and Company Identification

Product Name: Mercury

Catalog Codes: SLM3505, SLM1363

CAS#: 7439-97-6

RTECS: OV4550000

TSCA: TSCA 8(b) inventory: Mercury

CI#: Not applicable.

Synonym: Quick Silver; Colloidal Mercury; Metallic Mercury; Liquid Silver; Hydragyrum

Chemical Name: Mercury

Chemical Formula: Hg

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Mercury	7439-97-6	100

Toxicological Data on Ingredients: Mercury LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Hazardous in case of skin contact (corrosive, permeator). Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
Hazardous in case of skin contact (permeator). CARCINOGENIC EFFECTS: Classified A5 (Not suspected for human.) by ACGIH. 3 (Not classifiable for human.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to blood, kidneys, liver, brain, peripheral nervous system, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation.

Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. WARM water MUST be used. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards:
When thrown into mercury vapor, boron phosphodiiodide ignites at once. Flame forms with chlorine jet over mercury surface at 200 deg to 300 deg C. Mercury undergoes hazardous reactions in the presence of heat and sparks or ignition.

Special Remarks on Explosion Hazards:
A violent exothermic reaction or possible explosion occurs when mercury comes in contact with lithium and rubidium. CHLORINE DIOXIDE & LIQUID HG, WHEN MIXED, EXPLODE VIOLENTLY. Mercury and Ammonia can produce an

explosive compound. A mixture of the dry carbonyl and oxygen will explode on vigorous shaking with mercury. Methyl azide in the presence of mercury was shown to be potentially explosive.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Corrosive liquid. Poisonous liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, metals.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 25°C (77°F).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.025 from ACGIH (TLV) [United States] SKIN TWA: 0.05 CEIL: 0.1 (mg/m3) from OSHA (PEL) [United States] Inhalation TWA: 0.025 (mg/m3) [United Kingdom (UK)] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid. (Heavy liquid)

Odor: Odorless.

Taste: Not available.

Molecular Weight: 200.59 g/mole

Color: Silver-white

pH (1% soln/water): Not available.

Boiling Point: 356.73°C (674.1°F)

Melting Point: -38.87°C (-38°F)

Critical Temperature: 1462°C (2663.6°F)

Specific Gravity: 13.55 (Water = 1)

Vapor Pressure: Not available.

Vapor Density: 6.93 (Air = 1)

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Very slightly soluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, metals.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Ground mixtures of sodium carbide and mercury, aluminum, lead, or iron can react vigorously. A violent exothermic reaction or possible explosion occurs when mercury comes in contact with lithium and rubidium. Incompatible with boron diiodophosphide; ethylene oxide; metal oxides, metals(aluminum, potassium, lithium, sodium, rubidium); methyl azide; methylsilane, oxygen; oxidants(bromine, peroxyformic acid, chlorine dioxide, nitric acid, tetracarbonynickel, nitromethane, silver perchlorate, chlorates, sulfuric acid, nitrates,); tetracarbonylnickel, oxygen, acetylinic compounds, ammonia, ethylene oxide, methylsiliane, calcium,

Special Remarks on Corrosivity:
The high mobility and tendency to dispersion exhibited by mercury, and the ease with which it forms alloys (amalga) with many laboratory and electrical contact metals, can cause severe corrosion problems in laboratories. Special precautions: Mercury can attack copper and copper alloy materials.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available. LC50: Not available.

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A5 (Not suspected for human.) by ACGIH. 3 (Not classifiable for human.) by IARC. May cause damage to the following organs: blood, kidneys, liver, brain, peripheral nervous system, central nervous system (CNS).

Other Toxic Effects on Humans:
Very hazardous in case of skin contact (irritant), of ingestion, of inhalation. Hazardous in case of skin contact (corrosive, permeator).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:

May affect genetic material. May cause cancer based on animal data. Passes through the placental barrier in animal. May cause adverse reproductive effects(paternal effects- spermatogenesis; effects on fertility - fetotoxicity, post-implantation mortality), and birth defects.

Special Remarks on other Toxic Effects on Humans:

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Class 8: Corrosive material

Identification: : Mercury UNNA: 2809 PG: III

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Mercury California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Mercury Connecticut hazardous material survey.: Mercury Illinois toxic substances disclosure to employee act: Mercury Illinois chemical safety act: Mercury New York acutely hazardous substances: Mercury Rhode Island RTK hazardous substances: Mercury Pennsylvania RTK: Mercury Minnesota: Mercury Massachusetts RTK: Mercury New Jersey: Mercury New Jersey spill list: Mercury Louisiana spill reporting: Mercury California Director's List of Hazardous Substances.: Mercury TSCA 8(b) inventory: Mercury SARA 313 toxic chemical notification and release reporting: Mercury CERCLA: Hazardous substances.: Mercury: 1 lbs. (0.4536 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

DSCL (EEC):
R23- Toxic by inhalation. R33- Danger of cumulative effects. R38- Irritating to skin. R41- Risk of serious damage to eyes. R50/53- Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. S2- Keep out of the

reach of children. S7- Keep container tightly closed. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S39- Wear eye/face protection. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). S46- If swallowed, seek medical advice immediately and show this container or label. S60- This material and its container must be disposed of as hazardous waste. S61- Avoid release to the environment. Refer to special instructions/Safety data sheets.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 0

Personal Protection:

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:22 PM

Last Updated: 05/21/2013 12:00 PM

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name **POLYCHLORINATED BIPHENYLS (PCB)**
Synonym(s) CHLOREXTOL • CHLORINATED BIPHENYL • MONTAR • PCB • PHENOCHLOR

1.2 Uses and uses advised against

Use(s) INSULATION • PLASTICISER • TRANSFORMER LUBRICANT

1.3 Details of the supplier of the safety data sheet

Supplier name **GENERIC REPORT - FOR REFERENCE PURPOSES ONLY**
Address PO Box 21, West Perth, WA, Australia, 6872
Telephone (08) 9322 1711
Fax (08) 9322 1794
Email Not supplied
Website Not supplied

1.4 Emergency telephone number(s)

Emergency (08) 9322 1711

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA
GHS Classification(s) Specific Target Organ Systemic Toxicity (Repeated Exposure): Category 2
Aquatic Toxicity (Chronic): Category 1

2.2 Label elements

Signal word **WARNING**
Pictograms

Hazard statement(s)
H373 May cause damage to organs through prolonged or repeated exposure.
H410 Very toxic to aquatic life with long lasting effects.
Prevention statement(s)
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P273 Avoid release to the environment. This statement does not apply where this is the intended use.
Response statement(s)
P314 Get medical advice/attention if you feel unwell.
P391 Collect spillage.
Disposal statement(s)
P501 Dispose of contents/container in accordance with relevant regulations.

2.3 Other Hazards

No information provided.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	CAS number	EC number	Content
POLYCHLORINATED BIPHENYLS (PCB)	1336-36-3	215-648-1	100%

4. FIRST AID MEASURES

Product name **POLYCHLORINATED BIPHENYLS (PCB)**

4.1 Description of first aid measures

Eye	If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.
Inhalation	If inhaled, remove from contaminated area. To protect rescuer, use a Type A (Organic vapour) respirator or an Air-line respirator (in poorly ventilated areas). Apply artificial respiration if not breathing.
Skin	If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.
Ingestion	For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting.
First aid facilities	No information provided.

4.2 Most important symptoms and effects, both acute and delayed

No information provided.

4.3 Immediate medical attention and special treatment needed

Treat symptomatically.

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Dry agent, carbon dioxide or foam. Prevent contamination of drains and waterways.

5.2 Special hazards arising from the substance or mixture

Combustible. May evolve toxic gases (carbon oxides, dibenzofurans, dioxins, hydrogen chloride, phenols, chlorides, hydrocarbons) when heated to decomposition.

5.3 Advice for firefighters

Evacuate area and contact emergency services. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.

5.4 Hazchem code

2X

2	Water Fog (or fine water spray if fog unavailable)
X	Full protective clothing including Self Contained Breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear Personal Protective Equipment (PPE) as detailed in section 8 of the SDS. Contact emergency services where appropriate.

6.2 Environmental precautions

Prevent product from entering drains and waterways.

6.3 Methods of cleaning up

Contain spillage, then cover / absorb spill with non-combustible absorbent material (vermiculite, sand, or similar), collect and place in suitable containers for disposal. Only trained personnel should undertake clean up.

6.4 Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

7.2 Conditions for safe storage, including any incompatibilities

Store in segregated, locked and signposted compound with bunded floor. Drums may be plastic lined. Ensure area is cool, dry, well ventilated removed from direct sunlight, incompatible substances, heat or ignition sources and foodstuffs. Ensure each container is adequately labelled, protected from physical damage & sealed when not in use. Check regularly for leaks or spills.

Product name **POLYCHLORINATED BIPHENYLS (PCB)**

7.3 Specific end use(s)

No information provided.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

8.1 Control parameters

Exposure standards

Substance	Reference	TWA		STEL	
		ppm	mg/m³	ppm	mg/m³
PCBs (42% Chlorine)	SWA (AUS)	--	1	--	2
PCBs (54% Chlorine)	SWA (AUS)	--	0.5	--	1

Biological limits

No biological limit values have been entered for this product.

8.2 Exposure controls

Engineering Controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Maintain vapour levels below the recommended exposure standard.

PPE

Eye/Face Wear splash-proof goggles.

Hand Wear viton (R) or neoprene gloves.

Body Wear coveralls.

Respiratory Wear a Type A (Organic vapour) respirator. If using product in a confined area, wear an Air-line respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	VARY FROM OILY LIQUID TO WHITE CRYSTALLINE SOLID AND NON CRYSTALLINE RESIN
Odour	MILD AROMATIC ODOUR
Odour Threshold	NOT AVAILABLE
pH	NOT AVAILABLE
Melting Point	NOT AVAILABLE
Boiling Point	340°C to 375°C
Flash Point	NOT AVAILABLE
Evaporation Rate	NOT AVAILABLE
Flammability	COMBUSTIBLE
Upper Explosion Limit	NOT AVAILABLE
Lower Explosion Limit	NOT AVAILABLE
Vapour Pressure	NOT AVAILABLE
Vapour Density	NOT AVAILABLE
Solubility (water)	INSOLUBLE
Partition Coefficient	NOT AVAILABLE
Autoignition Temperature	NOT AVAILABLE
Decomposition Temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive Properties	NOT AVAILABLE
Oxidising Properties	NOT AVAILABLE
Specific Gravity	1.44

9.2 Other information

% Volatiles	NOT AVAILABLE

10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information in sections 10.2 to 10.6.

10.2 Chemical stability

No information provided.

10.3 Possibility of hazardous reactions

No information provided.

10.4 Conditions to avoid

No information provided.

10.5 Incompatible materials

Incompatible with oxidising agents (e.g. hypochlorites), acids (e.g. nitric acid), alkalis (e.g. sodium hydroxide), heat and ignition sources.

10.6 Hazardous decomposition products

May evolve toxic gases (carbon oxides, dibenzofurans, dioxins, hydrogen chloride, phenols, chlorides, hydrocarbons) when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Health hazard summary Toxic. This product has the potential to cause adverse health effects. Use safe work practices to avoid eye or skin contact and inhalation. PCBs are classified as probably carcinogenic to humans (IARC Group 2A). Chronic exposure may result in liver and skin damage. Chronic exposure may result in birth defects. Cumulative poison.

Eye Irritant. Contact may result in irritation, lacrimation, pain and redness.

Inhalation Toxic. Over exposure may result in irritation of the nose and throat, coughing, loss of appetite, nausea and vomiting. Chronic exposure may result in liver damage. PCBs are classified as probably carcinogenic to humans (IARC Group 2A).

Skin Toxic - irritant. Contact may result in irritation, redness, rash, brown-grey pigmentation and chloracne. May be absorbed through skin with harmful effects.

Ingestion Toxic. Ingestion may result in nausea, vomiting, abdominal pain, diarrhoea, dizziness and drowsiness. Chronic exposure may result in liver damage and skin pigmentation.

Toxicity data POLYCHLORINATED BIPHENYLS (PCB) (1336-36-3)
LD50 (Ingestion): 1900 mg/kg (mouse)
LDLo (Skin): 1148 mg/kg/38 days intermittently (rabbit)
TCLo (Inhalation): 0.93 mg/m³/8 hours/20 weeks intermittently (rat)
TDLo (Ingestion): 400 mg/kg (female rat)
TDLo (Intraperitoneal): 700 mg/kg (female rat)

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

12.2 Persistence and degradability

No information provided.

12.3 Bioaccumulative potential

No information provided.

12.4 Mobility in soil

No information provided.

12.5 Results of PBT and vPvB assessment

No information provided.

12.6 Other adverse effects

Product name **POLYCHLORINATED BIPHENYLS (PCB)**

Current evidence suggests that the major source of Polychlorinated biphenyls (PCBs) released to the environment is an environmental cycling process of PCBs previously introduced into the environment. This cycling process involves volatilisation from ground surfaces (water, soil) into the atmosphere with subsequent removal from the atmosphere via wet/dry deposition and then revolatilisation. Monochlorinated biphenyls, dichlorinated biphenyls and trichlorinated biphenyls biodegrade relatively rapidly, tetrachlorinated biphenyls biodegrade slowly, & higher chlorinated biphenyls are resistant to biodegradation.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste disposal PCBs may only be disposed of by authorised methods or organisations. Contact your state EPA or the manufacturer for additional information.

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

	Land Transport (ADG)	Sea Transport (IMDG/IMO)	Air Transport (IATA/ICAO)
14.1 UN number	2315	-	-
14.2 UN proper shipping name	POLYCHLORINATED BIPHENYLS	-	-
14.3 Transport hazard classes			
DG Class	9	-	-
Subsidiary risk(s)	None Allocated	-	-
14.4 Packing group	II	-	-
14.5 Environmental hazards		None Allocated	
14.6 Special precautions for user			
Hazchem Code	2X		

15. REGULATORY INFORMATION

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

Poison schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Classifications N - Dangerous for the environment
Xn - Harmful

Risk phrases

R33:	Danger of cumulative effects.
R50/53:	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety phrases

S2:	Keep out of reach of children.
S35:	This material and its container must be disposed of in a safe way.
S60:	This material and its container must be disposed of as hazardous waste.
S61:	Avoid release to the environment. Refer to special instructions/safety data sheets.

Inventory listing(s) **AUSTRALIA: AICS (Australian Inventory of Chemical Substances)**
All components are listed on AICS, or are exempt.

15.2 Chemical safety assessment

No information provided.

Product name **POLYCHLORINATED BIPHENYLS (PCB)**

16. OTHER INFORMATION

Additional information

This ChemAlert report is for informational purposes in case of accidental exposure to Polychloinated Biphenyls (PCBs)

IARC - GROUP 2A - PROBABLE HUMAN CARCINOGEN. This product contains an ingredient which has demonstrated sufficient evidence to have been classified by the International Agency for Research into Cancer (IARC) as a probable human carcinogen and whose use should be strictly monitored and controlled.

POLYCHLORINATED BIPHENYLS: The use of PCBs has been banned in industry for some time, however problems may occur due to their use in the past. PCBs have been reported to be present within construction jointing sealants and capacitors. Special precautions are required when handling materials which may contain PCBs. Please consult Risk Management Technologies for further information.

HEALTH EFFECTS FROM EXPOSURE:
It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:
The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

COLOUR RATING SYSTEM: RMT has assigned all ChemAlert reports a colour rating of Green, Amber or Red for the sole purpose of providing users with a quick and easy means of determining the hazardous nature of a product. Safe handling recommendations are provided in all ChemAlert reports so as to clearly identify how users can control the hazards and thereby reduce the risk (or likelihood) of adverse effects. As a general guideline, a Green colour rating indicates a low hazard, an Amber colour rating indicates a moderate hazard and a Red colour rating indicates a high hazard.

While all due care has been taken by RMT in the preparation of the Colour Rating System, it is intended as a guide only and RMT does not provide any warranty in relation to the accuracy of the Colour Rating System. As far as is lawfully possible, RMT accepts no liability or responsibility whatsoever for the actions or omissions of any person in reliance on the Colour Rating System.

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
EMS	Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods)
GHS	Globally Harmonized System
GTEPG	Group Text Emergency Procedure Guide
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m³	Milligrams per Cubic Metre
OEL	Occupational Exposure Limit
PEL	Permissible Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
REACH	Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
STEL	Short-Term Exposure Limit
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
SWA	Safe Work Australia
TLV	Threshold Limit Value

Product name **POLYCHLORINATED BIPHENYLS (PCB)**

TWA Time Weighted Average

Report Status This ChemAlert report has been independently compiled by RMT's scientific department utilising the original Safety Data Sheet ('SDS') for the product provided to RMT by the manufacturer. The information is based on the latest chemical and toxicological research and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. It is an independent collation by RMT of information obtained from the original SDS for this product. Its content has not been authorised or verified by the manufacturer / distributor of the chemical to which it relates.

This ChemAlert report does not constitute the manufacturer's original SDS and is not intended to be a replacement for same. It is provided to subscribers of ChemAlert as a reference tool only, is not all-inclusive and does not represent any guarantee as to the properties of the product. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer.

While RMT has taken all due care to include accurate and up-to-date information in this ChemAlert report, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this ChemAlert report.

Prepared By

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Last Reviewed: 05 Feb 2013
Date Printed: 27 Apr 2015
Based on SDS dated: 05 Feb 2013

End of Report

1 Identification

Product identifier

Product name: Trichloroethylene

Stock number: L14474
CAS Number:
79-01-6
EC number:
201-167-4
Index number:
602-027-00-9
Relevant identified uses of the substance or mixture and uses advised against.
Identified use:
SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
SU24 Scientific research and development

Details of the supplier of the safety data sheet
Manufacturer/Supplier:
Alfa Aesar
Thermo Fisher Scientific Chemicals, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Tel: 800-343-0660
Fax: 800-322-4757
Email: tech@alfa.com
www.alfa.com
Information Department: Health, Safety and Environmental Department
Emergency telephone number:
During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

2 Hazard(s) identification

Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)


GHS08 Health hazard

Muta. 2 H341 Suspected of causing genetic defects.
Carc. 1B H350 May cause cancer.


GHS07

Skin Irrit. 2 H315 Causes skin irritation.
Eye Irrit. 2 H319 Causes serious eye irritation.
STOT SE 3 H336 May cause drowsiness or dizziness.
Hazards not otherwise classified No information known.

Label elements
GHS label elements The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)
Hazard pictograms


GHS07 GHS08

Signal word Danger
Hazard statements
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H341 Suspected of causing genetic defects.
H350 May cause cancer.
H336 May cause drowsiness or dizziness.
Precautionary statements
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P281 Use personal protective equipment as required.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
WHMIS classification
D1B - Toxic material causing immediate and serious toxic effects
D2A - Very toxic material causing other toxic effects

Classification system
HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)


Health (acute effects) = 2
Flammability = 0
Physical Hazard = 1

Other hazards
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

(Contd. on page 2)

Product name: Trichloroethylene

(Contd. of page 1)

3 Composition/information on ingredients

Chemical characterization: Substances
CAS# Description:
79-01-6 Trichloroethylene
Identification number(s):
EC number: 201-167-4
Index number: 602-027-00-9

4 First-aid measures

Description of first aid measures
After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.
After skin contact
Immediately wash with water and soap and rinse thoroughly.
Seek immediate medical advice.
After eye contact Rinse opened eye for several minutes under running water. Then consult a doctor.
After swallowing Seek medical treatment.
Information for doctor
Most important symptoms and effects, both acute and delayed
Causes skin irritation.
Causes serious eye irritation.
May cause respiratory irritation.
May cause cancer.
May cause drowsiness or dizziness.
Indication of any immediate medical attention and special treatment needed No further relevant information available.

5 Fire-fighting measures

Extinguishing media
Suitable extinguishing agents Use carbon dioxide, extinguishing powder or foam. Water may be ineffective but may be used for cooling exposed containers.
Special hazards arising from the substance or mixture
If this product is involved in a fire, the following can be released:
Carbon monoxide and carbon dioxide
Hydrogen chloride (HCl)
Advice for firefighters
Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Environmental precautions: Do not allow product to reach sewage system or any water course.
Methods and material for containment and cleaning up:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose of contaminated material as waste according to section 13.
Prevention of secondary hazards: No special measures required.
Reference to other sections
See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

Handling
Precautions for safe handling
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.
Open and handle container with care.
Information about protection against explosions and fires: No information known.

Conditions for safe storage, including any incompatibilities
Storage
Requirements to be met by storerooms and receptacles: No special requirements.
Information about storage in one common storage facility:
Store away from strong bases.
Store away from oxidizing agents.
Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.
Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Control parameters

Components with limit values that require monitoring at the workplace:	
79-01-6 Trichloroethylene (100.0%)	
PEL (USA)	Long-term value: 100 ppm Ceiling limit value: 200; 300* ppm *5-min peak in any 2 hrs
REL (USA)	See Pocket Guide Apps. A and C
TLV (USA)	Short-term value: 135 mg/m³, 25 ppm Long-term value: 54 mg/m³, 10 ppm BEI

(Contd. on page 3)

Product name: Trichloroethylene

(Contd. of page 2)

EL (Canada)	Short-term value: 25 ppm Long-term value: 10 ppm ACGIH A2, IARC 2A
EV (Canada)	Short-term value: 25 ppm Long-term value: 10 ppm

Ingredients with biological limit values:

79-01-6 Trichloroethylene (100.0%)

BEI (USA)	15 mg/L Medium: urine Time: end of shift at end of workweek Parameter: Trichloroacetic acid (nonspecific) 0.5 mg/L Medium: blood Time: end of shift at end of workweek Parameter: Trichloroethanol without hydrolysis (nonspecific) - Medium: blood Time: end of shift at end of workweek Parameter: Trichloroethylene (semi-quantitative) - Medium: end-exhaled air Time: end of shift at end of workweek Parameter: Trichloroethylene (semi-quantitative)

Additional information: No data

Exposure controls
Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes and skin.
Maintain an ergonomically appropriate working environment.
Breathing equipment: Use suitable respirator when high concentrations are present.
Recommended filter device for short term use:
Use a respirator with organic vapor/acid gas cartridges as a backup to engineering controls. Risk assessment should be performed to determine if air-purifying respirators are appropriate. Only use equipment tested and approved under appropriate government standards such as NIOSH (USA) or CEN (EU).
Protection of hands:
Impervious gloves
Check protective gloves prior to each use for their proper condition.
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.
Material of gloves Fluorocarbon rubber (Viton)
Penetration time of glove material (in minutes) 480
Glove thickness 0.7 mm
Eye protection: Safety glasses
Body protection: Protective work clothing.

9 Physical and chemical properties

Information on basic physical and chemical properties
General Information

Appearance:	
Form:	Liquid
Color:	Colorless
Odor:	Chloroform-like
Odor threshold:	Not determined.
pH-value:	Not determined.
Change in condition	
Melting point/Melting range:	-85 °C (-121 °F)
Boiling point/Boiling range:	87 °C (189 °F)
Sublimation temperature / start:	Not determined
Flammability (solid, gaseous)	Not determined.
Ignition temperature:	410 °C (770 °F)
Decomposition temperature:	Not determined
Auto igniting:	Not determined.
Danger of explosion:	Not determined.
Explosion limits:	
Lower:	8 Vol %
Upper:	12.5 Vol %
Vapor pressure at 20 °C (68 °F):	77 hPa (58 mm Hg)
Density at 20 °C (68 °F):	1.46 g/cm³ (12.184 lbs/gal)
Relative density	Not determined.
Vapor density	Not determined.
Evaporation rate	Not determined.
Solubility in / Miscibility with	
Water at 20 °C (68 °F):	1 g/l
Partition coefficient (n-octanol/water):	Not determined.
Viscosity:	
dynamic:	Not determined.
kinematic:	Not determined.
Other information	No further relevant information available.

10 Stability and reactivity

Reactivity No information known.
Chemical stability Stable under recommended storage conditions.

(Contd. on page 4)

Product name: Trichloroethylene

(Contd. of page 3)

Thermal decomposition / conditions to be avoided: Decomposition will not occur if used and stored according to specifications.
Possibility of hazardous reactions Reacts with strong oxidizing agents
Conditions to avoid No further relevant information available.
Incompatible materials:
Bases
Oxidizing agents
Hazardous decomposition products:
Carbon monoxide and carbon dioxide
Hydrogen chloride (HCl)

11 Toxicological information

Information on toxicological effects
Acute toxicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute toxicity data for this substance.

LD/LC50 values that are relevant for classification:

Oral	LD50	2402 mg/kg (mouse)
Dermal	LD50	>20000 mg/kg (rabbit)
Inhalative	LC50/4H	8450 ppm/4H (mouse)

Skin irritation or corrosion: Causes skin irritation.
Eye irritation or corrosion: Causes serious eye irritation.
Sensitization: No sensitizing effects known.
Germ cell mutagenicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains mutation data for this substance.
Carcinogenicity:
May cause cancer.
IARC-1: Carcinogenic to humans: sufficient evidence of carcinogenicity.
NTP-R: Reasonably anticipated to be a carcinogen: limited evidence from studies in humans or sufficient evidence from studies in experimental animals.
EPA-CaH: Carcinogenic to humans.
ACGIH A2: Suspected human carcinogen: Agent is carcinogenic in experimental animals at dose levels, by route(s) of administration, at site(s), of histologic type(s), or by mechanism(s) considered relevant to worker exposure. Available epidemiologic studies are conflicting or insufficient to confirm an increased risk of cancer in exposed humans.
The Registry of Toxic Effects of Chemical Substances (RTECS) contains tumorigenic and/or carcinogenic and/or neoplastic data for this substance.
Reproductive toxicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains reproductive data for this substance.
Specific target organ system toxicity - repeated exposure: No effects known.
Specific target organ system toxicity - single exposure:
May cause respiratory irritation.
May cause drowsiness or dizziness.
Aspiration hazard: No effects known.
Subacute to chronic toxicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains multiple dose toxicity data for this substance.
Additional toxicological information: To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

Carcinogenic categories
OSHA-Ca (Occupational Safety & Health Administration) Substance is not listed.

12 Ecological information

Toxicity
Aquatic toxicity: No further relevant information available.
Persistence and degradability No further relevant information available.
Bioaccumulative potential No further relevant information available.
Mobility in soil No further relevant information available.
Ecotoxical effects:
Remark: Harmful to aquatic organisms
Additional ecological information:
General notes:
Do not allow product to reach ground water, water course or sewage system, even in small quantities.
Danger to drinking water if even extremely small quantities leak into the ground.
May cause long lasting harmful effects to aquatic life.
Avoid transfer into the environment.
Harmful to aquatic organisms
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.
Other adverse effects No further relevant information available.

13 Disposal considerations

Waste treatment methods
Recommendation Consult state, local or national regulations to ensure proper disposal.
Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

14 Transport information

UN-Number	
DOT, IMDG, IATA	UN1710
UN proper shipping name	
DOT	RQ Trichloroethylene
IMDG, IATA	TRICHLOROETHYLENE

Transport hazard class(es)

DOT

Class	6.1 Toxic substances.
Label	6.1
Class	6.1 (T1) Toxic substances

(Contd. on page 5)

Product name: Trichloroethylene

(Contd. of page 4)

Label **IMDG, IATA**	6.1
	
Class	6.1 Toxic substances.
Label	6.1
Packing group **DOT, IMDG, IATA**	III
Environmental hazards:	Not applicable.
Special precautions for user	Warning: Toxic substances
EMS Number:	F-A,S-A
Segregation groups	Liquid halogenated hydrocarbons
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.
Transport/Additional information:	
DOT	
Hazardous substance:	100 lbs, 45.4 kg
Marine Pollutant (DOT):	No
UN "Model Regulation":	UN1710, Trichloroethylene, 6.1, III

15 Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture
GHS label elements The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)
Hazard pictograms

GHS07 GHS08

Signal word Danger
Hazard statements
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H341 Suspected of causing genetic defects.
H350 May cause cancer.
H336 May cause drowsiness or dizziness.
Precautionary statements
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P281 Use personal protective equipment as required.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
National regulations
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
All components of this product are listed on the Canadian Domestic Substances List (DSL).

SARA Section 313 (specific toxic chemical listings)
79-01-6 Trichloroethylene

California Proposition 65

Prop 65 - Chemicals known to cause cancer
79-01-6 Trichloroethylene

Prop 65 - Developmental toxicity
79-01-6 Trichloroethylene

Prop 65 - Developmental toxicity, female Substance is not listed.

Prop 65 - Developmental toxicity, male
79-01-6 Trichloroethylene

Information about limitation of use:
Workers are not allowed to be exposed to this hazardous material. Exceptions can be made by the authorities in certain cases.
For use only by technically qualified individuals.
This product is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372.
Other regulations, limitations and prohibitive regulations
Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.
This substance is included in the Candidate List of Substances of Very High Concern (SVHC) according to Regulation (EC) No. 1907/2006 (REACH).
The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.
Substance is not listed.
Annex XIV of the REACH Regulations (requiring Authorisation for use) Substance is listed.
Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing SDS: Global Marketing Department
Date of preparation / last revision 03/24/2016 / -
Abbreviations and acronyms:
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
vPvB: very Persistent and very Bioaccumulative

(Contd. on page 6)

Product name: Trichloroethylene

(Contd. of page 5)

ACGIH: American Conference of Governmental Industrial Hygienists (USA)
OSHA: Occupational Safety and Health Administration (USA)
NTP: National Toxicology Program (USA)
IARC: International Agency for Research on Cancer
EPA: Environmental Protection Agency (USA)
Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2
Eye Irrit. 2: Serious eye damage/eye irritation, Hazard Category 2
Muta. 2: Germ cell mutagenicity, Hazard Category 2
Carc. 1B: Carcinogenicity, Hazard Category 1B
STOT SE 3: Specific target organ toxicity - Single exposure, Hazard Category 3

USA

Safety Data Sheet

Revision Date: 10/28/16
www.restek.com

1. IDENTIFICATION

Catalog Number / Product Name:	**30279 / cis-1,2-Dichloroethene Standard**
Company:	Restek Corporation
Address:	110 Benner Circle Bellefonte, Pa. 16823
Phone#:	814-353-1300
Fax#:	814-353-1309
Emergency#:	800-424-9300 (CHEMTREC) 703-527-3887 (Outside the US)
Email:	www.restek.com
Revision Number:	8
Intended use:	For Laboratory use only

2. HAZARD(S)IDENTIFICATION

Emergency Overview:

GHS Hazard Symbols:

GHS Classification:
Specific Target Organ Systemic Toxicity (STOT) - Single Exposure Category 1
Flammable Liquid Category 2
Acute Toxicity - Inhalation Dust / Mist Category 3
Acute Toxicity - Dermal Category 3
Acute Toxicity - Oral Category 3

GHS Signal Word:
Danger

GHS Hazard:
Highly flammable liquid and vapour.
Toxic if swallowed, in contact with skin or if inhaled.
Causes damage to organs.

GHS Precautions:

Safety Precautions:
Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilation and lighting equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Do not breathe dust/fume/gas/mist/vapours/spray.
Wash hands and skin thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.

First Aid Measures:
IF SWALLOWED: Immediately call a POISON CENTER/doctor/....
IF ON SKIN: Wash with plenty of soap and water.
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
IF exposed: Call a POISON CENTER or doctor/physician.
Call a POISON CENTER or doctor/physician.
Call a POISON CENTER or doctor/physician if you feel unwell.
Specific treatment see section 4.
Rinse mouth.
Take off immediately all contaminated clothing and wash it before reuse.
In case of fire: Use extinguishing media in section 5 for extinction.

Storage: Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
Store locked up.

Disposal: Dispose of contents/container according to section 13 of the SDS.

Single Exposure Target Organs: No data available.

Repeated Exposure Target Organs: No data available.

3. COMPOSITION / INFORMATION ON INGREDIENT

Chemical Name	CAS #	EINEC #	% Composition
methanol	67-56-1	200-659-6	99.800000
cis-1,2-dichloroethylene	156-59-2	205-859-7	0.200000

4. FIRST-AID MEASURES

Inhalation: Remove to fresh air. If breathing is difficult, have a trained individual administer oxygen. If not breathing, give artificial respiration and have a trained individual administer oxygen. Get medical attention immediately

Eyes: Flush eyes with plenty of water for at least 20 minutes retracting eyelids often. Tilt the head to prevent chemical from transferring to the uncontaminated eye. Get immediate medical attention.

Skin Contact: Wash with soap and water. Remove contaminated clothing and launder. Get medical attention if irritation develops or persists.

Ingestion: Do not induce vomiting and seek medical attention immediately. Drink two glasses of water or milk to dilute. Provide medical care provider with this SDS.

5. FIRE- FIGHTING MEASURES

Extinguishing Media: Use alcohol resistant foam, carbon dioxide, or dry chemical extinguishing agents. Water may be ineffective but water spray can be used extinguish a fire if swept across the base of the flames. Water can absorb heat and keep exposed material from being damaged by fire.

Fire and/or Explosion Hazards: Vapors may be ignited by sparks, flames or other sources of ignition if material is above the flash point giving rise to a fire (Class B). Vapors are heavier than air and may travel to a source of ignition and flash back.

Fire Fighting Methods and Protection: Do not enter fire area without proper protection including self-contained breathing apparatus and full protective equipment. Fight fire from a safe distance and a protected location due to the potential of hazardous vapors and decomposition products. Flammable component(s) of this material may be lighter than water and burn while floating on the surface.

Hazardous Combustion Products: Carbon dioxide, Carbon monoxide

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions and Equipment: Exposure to the spilled material may be severely irritating or toxic. Follow personal protective equipment recommendations found in Section 8 of this SDS. Personal protective equipment needs must be evaluated based on information provided on this sheet and the special circumstances created by the spill including; the material spilled, the quantity of the spill, the area in which the spill occurred, and the expertise of employees in the area responding to the spill. Never exceed any occupational exposure limits.

Methods for Clean-up: Prevent the spread of any spill to minimize harm to human health and the environment if safe to do so. Wear complete and proper personal protective equipment following the recommendation of Section 8 at a minimum. Dike with suitable absorbent material like granulated clay. Gather and store in a sealed container pending a waste disposal evaluation.

7. HANDLING AND STORAGE

Handling Technical Measures and Precautions:	Toxic or severely irritating material. Avoid contacting and avoid breathing the material. Use only in a well ventilated area. Use spark-proof tools and explosion-proof equipment
Storage Technical Measures and Conditions:	Store in a cool dry ventilated location. Isolate from incompatible materials and conditions. Keep container(s) closed. Keep away from sources of ignition

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

United States:

Chemical Name	CAS No.	IDLH	ACGIH STEL	ACGIH TLV-TWA	OSHA Exposure Limit
methanol	67-56-1	6000 ppm IDLH	250 ppm STEL	200 ppm TWA	200 ppm TWA; 260 mg/m3 TWA
cis-1,2-dichloroethylene	156-59-2	ND		200 ppm TWA	No data available.

Personal Protection:

Engineering Measures:	Local exhaust ventilation is recommended when generating excessive levels of vapors from handling or thermal processing.
Respiratory Protection:	Respiratory protection may be required to avoid overexposure when handling this product. General or local exhaust ventilation is the preferred means of protection. Use a respirator if general room ventilation is not available or sufficient to eliminate symptoms.If an exposure limit is exceeded or if an operator is experiencing symptoms of inhalation overexposure as explained in Section 3, provide respiratory protection.
Eye Protection:	Wear chemically resistant safety glasses with side shields when handling this product. Do not wear contact lenses.
Skin Protection:	Wear protective gloves. Inspect gloves for chemical break-through and replace at regular intervals. Clean protective equipment regularly. Wash hands and other exposed areas with mild soap and water before eating, drinking, and when leaving work

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance, color:	No data available.
Odor:	Mild
Physical State:	Liquid
pH:	No data available.
Vapor Pressure:	No data available.
Vapor Density:	1.1 (air = 1)
Boiling Point:	No data available.
Melting Point:	-98 °C
Flash Point:	52
Flammability:	Highly Flammable
Upper Flammable/Explosive Limit, % in air:	36
Lower Flammable/Explosive Limit, % in air:	6
Autoignition Temperature:	464 deg C
Decomposition Temperature:	No data available.
Specific Gravity:	0.791 - 0.792 g/cm3 at 20 °C
Evaporation Rate:	No data available.
Odor Threshold:	No data available.
Solubility:	Moderate; 50-99%
Partition Coefficient: n-octanol in water:	No data available.
VOC % by weight:	99.8
Molecular Weight:	32.04

10. STABILITY AND REACTIVITY

Stability:	Stable under normal conditions.
Conditions to Avoid:	No data available.
Materials to Avoid / Chemical Incompatiability:	Strong oxidizing agents
Hazardous Decomposition Products:	Carbon dioxide Carbon monoxide

11. TOXICOLOGICAL INFORMATION

Routes of Entry:	Inhalation, Skin Contact, Eye Contact, Ingestion
Target Organs Potentially Affected By Exposure:	Eyes, Central nervous system stimulation, Skin, GI

Tract, Respiratory Tract

Chemical Interactions That Change Toxicity: None Known

Immediate (Acute) Health Effects by Route of Exposure:

Inhalation Irritation: Can cause moderate respiratory irritation, dizziness, weakness, fatigue, nausea and headache.

Inhalation Toxicity: Harmful! Can cause systemic damage (see "Target Organs)Methanol can cause central nervous system depression and overexposure can cause damage to the optic nerve resulting in visual impairment or blindness.

Skin Contact: Can cause moderate skin irritation, defatting, and dermatitis. Not likely to cause permanent damage.

Eye Contact: Can cause moderate irritation, tearing and reddening, but not likely to permanently injure eye tissue.

Ingestion Irritation: Irritating to mouth, throat, and stomach. Can cause abdominal discomfort, nausea, vomiting and diarrhea.Highly toxic and may be fatal if swallowed.

Ingestion Toxicity: Toxic if swallowed. May cause target organ failure and/or death.May be fatal if swallowed.

Long-Term (Chronic) Health Effects:

Carcinogenicity: No data.

Reproductive and Developmental Toxicity: Contains a known human reproductive and/or developmental hazard.

Inhalation: Upon prolonged and/or repeated exposure, can cause moderate respiratory irritation, dizziness, weakness, fatigue, nausea and headache.Harmful! Can cause systemic damage upon prolonged and/or repeated exposure (see "Target Organs)

Skin Contact: Upon prolonged or repeated contact, can cause moderate skin irritation, defatting, and dermatitis. Not likely to cause permanent damage.

Ingestion: Toxic if swallowed. May cause target organ failure and/or death.

Component Toxicological Data:

NIOSH:

Chemical Name	CAS No.	LD50/LC50
Methanol	67-56-1	Inhalation LC50 Rat 22500 ppm 8 h

Component Carcinogenic Data:

OSHA:

Chemical Name	CAS No.
No data available.	

ACGIH:

Chemical Name	CAS No.
No data available.	

NIOSH:

Chemical Name	CAS No.
No data available.	

NTP:

Chemical Name	CAS No.
No data available.	

IARC:

Chemical Name	CAS No.	Group No.
No data.		Group 1
No data.		Group 2A
No data.		Group 2B

12. ECOLOGICAL INFORMATION

Overview: Moderate ecological hazard. This product may be dangerous to plants and/or wildlife.

Mobility: No data

Persistence: No data

Bioaccumulation: No data

Degradability: Biodegrades slowly.
Ecological Toxicity Data: No data available.

13. DISPOSAL CONSIDERATIONS

Waste Description of Spent Product: Spent or discarded material is a hazardous waste.
Disposal Methods: Dispose of by incineration following Federal, State, Local, or Provincial regulations.
Waste Disposal of Packaging: Comply with all Local, State, Federal, and Provincial Environmental Regulations.

14. TRANSPORTATION INFORMATION

United States:
DOT Proper Shipping Name: Methanol
UN Number: UN1230
Hazard Class: 3
Packing Group: II

International:
IATA Proper Shipping Name: Methanol
UN Number: UN1230
Hazard Class: 3(6.1)
Packing Group: II

Marine Pollutant: No

Chemical Name	CAS#	Marine Pollutant	Severe Marine Pollutant
No data available.			

15. REGULATORY INFORMATION

United States:

Chemical Name	CAS#	CERCLA	SARA 313	SARA EHS 313	TSCA
methanol	67-56-1	X	X	-	X
cis-1,2-dichloroethylene	156-59-2	X	-	-	X

The following chemicals are listed on CA Prop 65:

Chemical Name	CAS #	Regulation
Methanol	67-56-1	Prop 65 Devolop Tox

State Right To Know Listing:

Chemical Name	CAS#	New Jersey	Massachusetts	Pennsylvania	California
methanol	67-56-1	X	X	X	X
cis-1,2-dichloroethylene	156-59-2	-	X	X	-

16. OTHER INFORMATION

Prior Version Date: 07/22/14
Other Information: Any changes to the SDS compared to previous versions are marked by a vertical line in front of the concerned paragraph.
References: No data available.
Disclaimer: Restek Corporation provides the descriptions, data and information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. It is provided for your guidance only. Because many factors may affect processing or application/use, Restek Corporation recommends you perform an assessment to determine the suitability of a product for your particular purpose prior to use. No warranties of any kind, either expressed or implied, including fitness for a particular purpose, are made regarding prodcuts described, data or information set forth. In no case shall the descriptions, information, or data provided be considered a part of our terms and conditions of sale. Further, the descriptions, data and information furnished hereunder are given gratis. No obligation or liability for the description, data and information given are assumed. All such being given and accepted at your risk.

SAFETY DATA SHEET

Creation Date 16-Sep-2014 **Revision Date** 30-May-2017 **Revision Number** 2

1. Identification

Product Name **trans-1,2-Dichloroethylene, stabilized**

Cat No. : **AC406840000; AC406840250; AC406842500**

Synonyms trans-Acetylene dichloride

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

Details of the supplier of the safety data sheet

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

Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

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

2. Hazard(s) identification

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

Flammable liquids	Category 2
Acute oral toxicity	Category 4
Acute Inhalation Toxicity - Vapors	Category 4

Label Elements

Signal Word
Danger

Hazard Statements
Highly flammable liquid and vapor
Harmful if swallowed
Harmful if inhaled

Precautionary Statements
Prevention
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Avoid breathing dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Keep container tightly closed
Ground/bond container and receiving equipment
Use explosion-proof electrical/ventilating/lighting/equipment
Use only non-sparking tools
Take precautionary measures against static discharge
Wear protective gloves/protective clothing/eye protection/face protection
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
Ingestion
Rinse mouth
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
Fire
In case of fire: Use CO2, dry chemical, or foam for extinction
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
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
Harmful to aquatic life with long lasting effects

3. Composition / information on ingredients

Component	CAS-No	Weight %
trans-1,2-Dichloroethylene	156-60-5	>95

4. First-aid measures

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

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

Inhalation Remove from exposure, lie down. Move to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Obtain medical attention.

Ingestion Do not induce vomiting. Obtain medical attention.

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

Notes to Physician Treat symptomatically

5. Fire-fighting measures

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

Unsuitable Extinguishing Media No information available

Flash Point 6 °C / 42.8 °F

Method - No information available

Autoignition Temperature 440 °C / 824 °F

Explosion Limits
Upper 12.80%
Lower 9.70%
Sensitivity to Mechanical Impact No information available
Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical
Flammable. Vapors may travel to source of ignition and flash back. Containers may explode when heated. Vapors may form explosive mixtures with air. Thermal decomposition can lead to release of irritating gases and vapors. Keep product and empty container away from heat and sources of ignition.

Hazardous Combustion Products
Hydrogen chloride gas Carbon monoxide (CO) Carbon dioxide (CO_2) 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	3	0	N/A

6. Accidental release measures

Personal Precautions Remove all sources of ignition. Take precautionary measures against static discharges. Use personal protective equipment. Ensure adequate ventilation.

Environmental Precautions Do not flush into surface water or sanitary sewer system. See Section 12 for additional ecological information. Avoid release to the environment. Collect spillage.

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

7. Handling and storage

Handling Wear personal protective equipment. Ensure adequate ventilation. Avoid contact with skin and eyes. Do not breathe dust. Use only in area provided with appropriate exhaust ventilation. Use explosion-proof equipment. Use only non-sparking tools. Keep away from open flames, hot surfaces and sources of ignition. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Take precautionary measures against static discharges.

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

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
trans-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.

Personal Protective Equipment

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

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

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

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

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	aromatic
Odor Threshold	No information available
pH	6.5-7.2
Melting Point/Range	-50 °C / -58 °F
Boiling Point/Range	48 °C / 118.4 °F @ 760 mmHg
Flash Point	6 °C / 42.8 °F
Evaporation Rate	No information available
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	12.80%
Lower	9.70%
Vapor Pressure	331 mmHg @ 25 °C
Vapor Density	3.34 (Air = 1.0)
Specific Gravity	1.260
Solubility	Immiscible with water
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	440 °C / 824 °F
Decomposition Temperature	No information available
Viscosity	No information available
Molecular Formula	C2 H2 Cl2
Molecular Weight	96.94

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Stable under normal conditions.

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

Incompatible Materials Bases, Strong acids, Strong oxidizing agents

Hazardous Decomposition Products Hydrogen chloride gas, Carbon monoxide (CO), Carbon dioxide (CO_2), 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
trans-1,2-Dichloroethylene	LD50 = 1235 mg/kg (Rat)	>5 g/kg (Rabbit)	Not listed

Toxicologically Synergistic Products No information available

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

Irritation No information available

Sensitization No information available

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

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
trans-1,2-Dichloroethylene	156-60-5	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure None known

STOT - repeated exposure None known

Aspiration hazard No information available

Symptoms / effects,both acute and delayed 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. See actual entry in RTECS for complete information.

12. Ecological information

Ecotoxicity

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
trans-1,2-Dichloroethylene	Not listed	LC50: = 135 mg/L, 96h static (Lepomis macrochirus)	Not listed	Not listed

Persistence and Degradability Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation No information available.

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

Component	log Pow

trans-1,2-Dichloroethylene	1.48

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
trans-1,2-Dichloroethylene - 156-60-5	U079	-

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	UN1150
Proper Shipping Name	1,2-DICHLOROETHYLENE
Hazard Class	3
Packing Group	II

IMDG/IMO

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

15. Regulatory information

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
trans-1,2-Dichloroethylene	X	X	-	205-860-2	-		X	X	X	X	X

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

U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313 Not applicable

SARA 311/312 Hazard Categories

Acute Health Hazard	Yes
Chronic Health Hazard	No
Fire Hazard	Yes
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
trans-1,2-Dichloroethylene	-	-	-	X

Clean Air Act Not applicable

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
trans-1,2-Dichloroethylene	1000 lb 1 lb	-

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
trans-1,2-Dichloroethylene	X	-	X	-	-

U.S. Department of Transportation

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

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

Other International Regulations

Mexico - Grade No information available

16. Other information

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

Creation Date	16-Sep-2014
Revision Date	30-May-2017
Print Date	30-May-2017
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

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

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Vinyl chloride

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

CAS-No. : 75-01-4

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

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

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

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

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

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

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

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

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

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

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

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

May form explosive peroxides.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

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

Hazardous components

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

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

4. FIRST AID MEASURES

4.1 Description of first aid measures

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

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

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

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

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

4.2 Most important symptoms and effects, both acute and delayed

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

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

Carbon oxides, Hydrogen chloride gas

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

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

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

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

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

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

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

Contents under pressure. Light sensitive.

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

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

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

8.2 Exposure controls

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

Personal protective equipment

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

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

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

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

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

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

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

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

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

	explosive limits	
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	0.911 g/cm3 at 25 °C (77 °F)
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.
Contains the following stabiliser(s):
Hydroquinone (>=0 - <=0.0001 %)
Phenol (>=0 - <=0.01 %)

10.3 Possibility of hazardous reactions
No data available

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

10.5 Incompatible materials
Chemically active metals, Copper

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

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

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

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

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

Human carcinogen.

IARC: 1 - Group 1: Carcinogenic to humans (Vinyl chloride)

NTP: Known to be human carcinogen (Vinyl chloride)

OSHA: OSHA specifically regulated carcinogen (Vinyl chloride)

Reproductive toxicity
No data available

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

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: KU9625000

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

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

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

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

12.6 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

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

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

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

Poison Inhalation Hazard: No

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

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

15. REGULATORY INFORMATION

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

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

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

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

Massachusetts Right To Know Components

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

Pennsylvania Right To Know Components

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

New Jersey Right To Know Components

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

California Prop. 65 Components

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

16. OTHER INFORMATION

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

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

HMIS Rating

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

NFPA Rating

Health hazard:	2
Fire Hazard:	4
Reactivity Hazard:	0

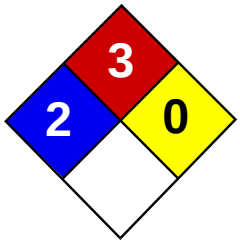
Further information

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

Preparation Information

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

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



Health	2
Fire	3
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Toluene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Toluene

Catalog Codes: SLT2857, SLT3277

CAS#: 108-88-3

RTECS: XS5250000

TSCA: TSCA 8(b) inventory: Toluene

CI#: Not available.

Synonym: Toluol, Tolu-Sol; Methylbenzene; Methacide; Phenylmethane; Methylbenzol

Chemical Name: Toluene

Chemical Formula: C6-H5-CH3 or C7-H8

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Toluene	108-88-3	100

Toxicological Data on Ingredients: Toluene: ORAL (LD50): Acute: 636 mg/kg [Rat]. DERMAL (LD50): Acute: 14100 mg/kg [Rabbit]. VAPOR (LC50): Acute: 49000 mg/m 4 hours [Rat]. 440 ppm 24 hours [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to blood, kidneys, the nervous system, liver, brain, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 480°C (896°F)

Flash Points: CLOSED CUP: 4.4444°C (40°F). (Setaflash) OPEN CUP: 16°C (60.8°F).

Flammable Limits: LOWER: 1.1% UPPER: 7.1%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances:
Flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable liquid, insoluble in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards:
Toluene forms explosive reaction with 1,3-dichloro-5,5-dimethyl-2,4-imidazolididione; dinitrogen tetraoxide; concentrated nitric acid, sulfuric acid + nitric acid; N2O4; AgClO4; BrF3; Uranium hexafluoride; sulfur dichloride. Also forms an explosive mixture with tetranitromethane.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Toxic flammable liquid, insoluble or very slightly soluble in water. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents.

Storage:
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 200 STEL: 500 CEIL: 300 (ppm) from OSHA (PEL) [United States] TWA: 50 (ppm) from ACGIH (TLV) [United States] SKIN TWA: 100 STEL: 150 from NIOSH [United States] TWA: 375 STEL: 560 (mg/m3) from NIOSH [United States] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Sweet, pungent, Benzene-like.

Taste: Not available.

Molecular Weight: 92.14 g/mole

Color: Colorless.

pH (1% soln/water): Not applicable.

Boiling Point: 110.6°C (231.1°F)

Melting Point: -95°C (-139°F)

Critical Temperature: 318.6°C (605.5°F)

Specific Gravity: 0.8636 (Water = 1)

Vapor Pressure: 3.8 kPa (@ 25°C)

Vapor Density: 3.1 (Air = 1)

Volatility: Not available.

Odor Threshold: 1.6 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 2.7

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether, acetone.

Solubility:
Soluble in diethyl ether, acetone. Practically insoluble in cold water. Soluble in ethanol, benzene, chloroform, glacial acetic acid, carbon disulfide. Solubility in water: 0.561 g/l @ 25 deg. C.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ignition sources (flames, sparks, static), incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Incompatible with strong oxidizers, silver perchlorate, sodium difluoride, Tetranitromethane, Uranium Hexafluoride. Frozen Bromine Trifluoride reacts violently with Toluene at -80 deg. C. Reacts chemically with nitrogen oxides, or halogens to form nitrotoluene, nitrobenzene, and nitrophenol and halogenated products, respectively.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 636 mg/kg [Rat]. Acute dermal toxicity (LD50): 14100 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 440 24 hours [Mouse].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. May cause damage to the following organs: blood, kidneys, the nervous system, liver, brain, central nervous system (CNS).

Other Toxic Effects on Humans:
Hazardous in case of skin contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

Special Remarks on Toxicity to Animals:
Lowest Published Lethal Dose: LDL [Human] - Route: Oral; Dose: 50 mg/kg LCL [Rabbit] - Route: Inhalation; Dose: 55000 ppm/40min

Special Remarks on Chronic Effects on Humans:
Detected in maternal milk in human. Passes through the placental barrier in human. Embryotoxic and/or foetotoxic in animal. May cause adverse reproductive effects and birth defects (teratogenic). May affect genetic material (mutagenic)

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects: Skin: Causes mild to moderate skin irritation. It can be absorbed to some extent through the skin. Eyes: Cauess mild to moderate eye irritation with a burning sensation. Splash contact with eyes also causes conjunctivitis, blepharospasm, corneal edema, corneal abraisons. This usually resolves in 2 days. Inhalation: Inhalation of vapor may cause respiratory tract irritation causing coughing and wheezing, and nasal discharge. Inhalation of high concentrations may affect behavior and cause central nervous system effects characterized by nausea, headache, dizziness, tremors, restlessness, lightheadedness, exhilaration, memory loss, insomnia, impaired reaction time, drowsiness, ataxia, hallucinations, somnolence, muscle contraction or spasticity, unconsciousness and coma. Inhalation of high concentration of vapor may also affect the cardiovascular system (rapid heart beat, heart palpitations, increased or decreased blood pressure, dysrhythmia,), respiration (acute pulmonary edema, respiratory depression, apnea, asphyxia), cause vision disturbances and dilated pupils, and cause loss of appetite. Ingestion: Aspiration hazard. Aspiration of Toluene into the lungs may cause chemical pneumonitis. May cause irritation of the digestive tract with nausea, vomiting, pain. May have effects similar to that of acute inhalation. Chronic Potential Health Effects: Inhalation and Ingestion: Prolonged or repeated exposure via inhalation may cause central nervous system and cardiovascular symptoms similar to that of acute inhalation and ingestion as well liver damage/failure, kidney damage/failure (with hematuria, proteinuria, oliguria, renal tubular acidosis), brain damage, weight loss, blood (pigmented or nucleated red blood cells, changes in white blood cell count), bone marrow changes, electrolyte imbalances (Hypokalemia, Hypophostatemia), severe, muscle weakness and Rhabdomyolysis. Skin: Repeated or prolonged skin contact may cause defatting dermatitis.

Section 12: Ecological Information

Ecotoxicity:
Ecotoxicity in water (LC50): 313 mg/l 48 hours [Daphnia (daphnia)]. 17 mg/l 24 hours [Fish (Blue Gill)]. 13 mg/l 96 hours [Fish (Blue Gill)]. 56 mg/l 24 hours [Fish (Fathead minnow)]. 34 mg/l 96 hours [Fish (Fathead minnow)]. 56.8 ppm any hours [Fish (Goldfish)].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 3: Flammable liquid.

Identification: : Toluene UNNA: 1294 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Toluene California prop. 65 (no significant risk level): Toluene: 7 mg/day (value) California prop. 65 (acceptable daily intake level): Toluene: 7 mg/day (value) California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Toluene Connecticut hazardous material survey.: Toluene Illinois

toxic substances disclosure to employee act: Toluene Illinois chemical safety act: Toluene New York release reporting list: Toluene Rhode Island RTK hazardous substances: Toluene Pennsylvania RTK: Toluene Florida: Toluene Minnesota: Toluene Michigan critical material: Toluene Massachusetts RTK: Toluene Massachusetts spill list: Toluene New Jersey: Toluene New Jersey spill list: Toluene Louisiana spill reporting: Toluene California Director's List of Hazardous Substances.: Toluene TSCA 8(b) inventory: Toluene TSCA 8(d) H and S data reporting: Toluene: Effective date: 10/04/82; Sunset Date: 10/0/92 SARA 313 toxic chemical notification and release reporting: Toluene CERCLA: Hazardous substances.: Toluene: 1000 lbs. (453.6 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R11- Highly flammable. R20- Harmful by inhalation. S16- Keep away from sources of ignition - No smoking. S25- Avoid contact with eyes. S29- Do not empty into drains. S33- Take precautionary measures against static discharges.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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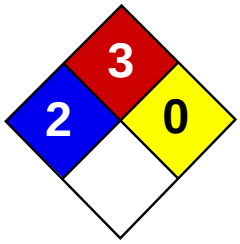
Last Updated: 05/21/2013 12:00 PM



Health	2
Fire	3
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Xylenes MSDS

Section 1: Chemical Product and Company Identification

Product Name: Xylenes

Catalog Codes: SLX1075, SLX1129, SLX1042, SLX1096

CAS#: 1330-20-7

RTECS: ZE2100000

TSCA: TSCA 8(b) inventory: Xylenes

CI#: Not available.

Synonym: Xylenes; Dimethylbenzene; xylol; methyltoluene

Chemical Name: Xylenes (o-, m-, p- isomers)

Chemical Formula: C6H4(CH3)2

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Xylenes	1330-20-7	100

Toxicological Data on Ingredients: Xylenes: ORAL (LD50): Acute: 4300 mg/kg [Rat]. 2119 mg/kg [Mouse]. DERMAL (LD50): Acute: >1700 mg/kg [Rabbit].

Section 3: Hazards Identification

Potential Acute Health Effects: Hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: 3 (Not classifiable for human.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to blood, kidneys, liver, mucous membranes, bone marrow, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 464°C (867.2°F)

Flash Points: CLOSED CUP: 24°C (75.2°F). (Tagliabue.) OPEN CUP: 37.8°C (100°F).

Flammable Limits: LOWER: 1% UPPER: 7%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances:
Highly flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Slightly explosive in presence of open flames and sparks, of heat.

Fire Fighting Media and Instructions:
Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Special Remarks on Fire Hazards: Vapors may travel to source of ignition and flash back.

Special Remarks on Explosion Hazards:
Vapors may form explosive mixtures with air. Containers may explode when heated. May polymerize explosively when heated. An attempt to chlorinate xylene with 1,3-Dichloro-5,5-dimethyl-2,4-imidazolidindione (dichlorohydrantoin) caused a violent explosion

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined

areas; dike if needed. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids.

Storage:
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 100 (ppm) [Canada] TWA: 435 (mg/m3) [Canada] TWA: 434 STEL: 651 (mg/m3) from ACGIH (TLV) [United States] TWA: 100 STEL: 150 (ppm) from ACGIH (TLV) [United States] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Sweetish.

Taste: Not available.

Molecular Weight: 106.17 g/mole

Color: Colorless. Clear

pH (1% soln/water): Not available.

Boiling Point: 138.5°C (281.3°F)

Melting Point: -47.4°C (-53.3°F)

Critical Temperature: Not available.

Specific Gravity: 0.864 (Water = 1)

Vapor Pressure: 0.9 kPa (@ 20°C)

Vapor Density: 3.7 (Air = 1)

Volatility: Not available.

Odor Threshold: 1 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 3.1

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility:
Insoluble in cold water, hot water. Miscible with absolute alcohol, ether, and many other organic liquids.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ignition sources, incompatibles

Incompatibility with various substances: Reactive with oxidizing agents, acids.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Store away from acetic acid, nitric acid, chlorine, bromine, and fluorine.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 2119 mg/kg [Mouse]. Acute dermal toxicity (LD50): >1700 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 5000 4 hours [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: 3 (Not classifiable for human.) by IARC. May cause damage to the following organs: blood, kidneys, liver, mucous membranes, bone marrow, central nervous system (CNS).

Other Toxic Effects on Humans: Hazardous in case of skin contact (irritant, permeator), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals:
Lowest Lethal Dose: LDL [Human] - Route: Oral; Dose: 50 mg/kg LCL [Man] - Route: Oral; Dose: 10000 ppm/6H

Special Remarks on Chronic Effects on Humans:
Detected in maternal milk in human. Passes through the placental barrier in animal. Embryotoxic and/or foetotoxic in animal. May cause adverse reproductive effects (male and femael fertility (spontaneous abortion and fetotoxicity)) and birth defects based animal data.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Causes skin irritation. Can be absorbed through skin. Eyes: Causes eye irritation. Inhalation: Vapor causes respiratory tract and mucous membrane irritation. May affect central nervous system and behavior (General anesthetic/CNS depressant with effects including headache, weakness, memory loss, irritability, dizziness, giddiness, loss of coordination and judgement, respiratory depression/arrest or difficulty breathing, loss of appetite, nausea, vomiting, shivering, and possible coma and death). May also affects blood, sense organs, liver, and peripheral nerves. Ingestion: May cause gastrointestinal irritation including abdominal pain, vomiting, and nausea. May also affect liver and urinary system/ kidneys. May cause effects similar to those of acute inhalation. Chronic Potential Health Effects: Chronic inhalation may affect the urinary system (kidneys) blood (anemia), bone marrow (hyperplasia of bone marrow) brain/behavior/Central Nervous system. Chronic inhalation may alsocause mucosal bleeding. Chronic ingestion may affect the liver and metabolism (loss of appetite) and may affect urinary system (kidney damage)

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 3: Flammable liquid.

Identification: : Xylenes UNNA: 1307 PG: III

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Xylenes Illinois chemical safety act: Xylenes New York acutely hazardous substances: Xylenes Rhode Island RTK hazardous substances: Xylenes Pennsylvania RTK: Xylenes Minnesota: Xylenes Michigan critical material: Xylenes Massachusetts RTK: Xylenes Massachusetts spill list: Xylenes New Jersey: Xylenes New Jersey spill list: Xylenes Louisiana spill reporting: Xylenes California Director's List of Hazardous Substances: Xylenes TSCA 8(b) inventory: Xylenes SARA 302/304/311/312 hazardous chemicals: Xylenes SARA 313 toxic chemical notification and release reporting: Xylenes CERCLA: Hazardous substances.: Xylenes: 100 lbs. (45.36 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R10- Flammable. R21- Harmful in contact with skin. R36/38- Irritating to eyes and skin. S2- Keep out of the reach of children. S36/37- Wear suitable protective clothing and gloves. S46- If swallowed, seek medical advice immediately and show this container or label.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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Last Updated: 05/21/2013 12:00 PM

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Attachment C

SAFETY MEETING ATTENDENCE SHEET

Person/Company	Date

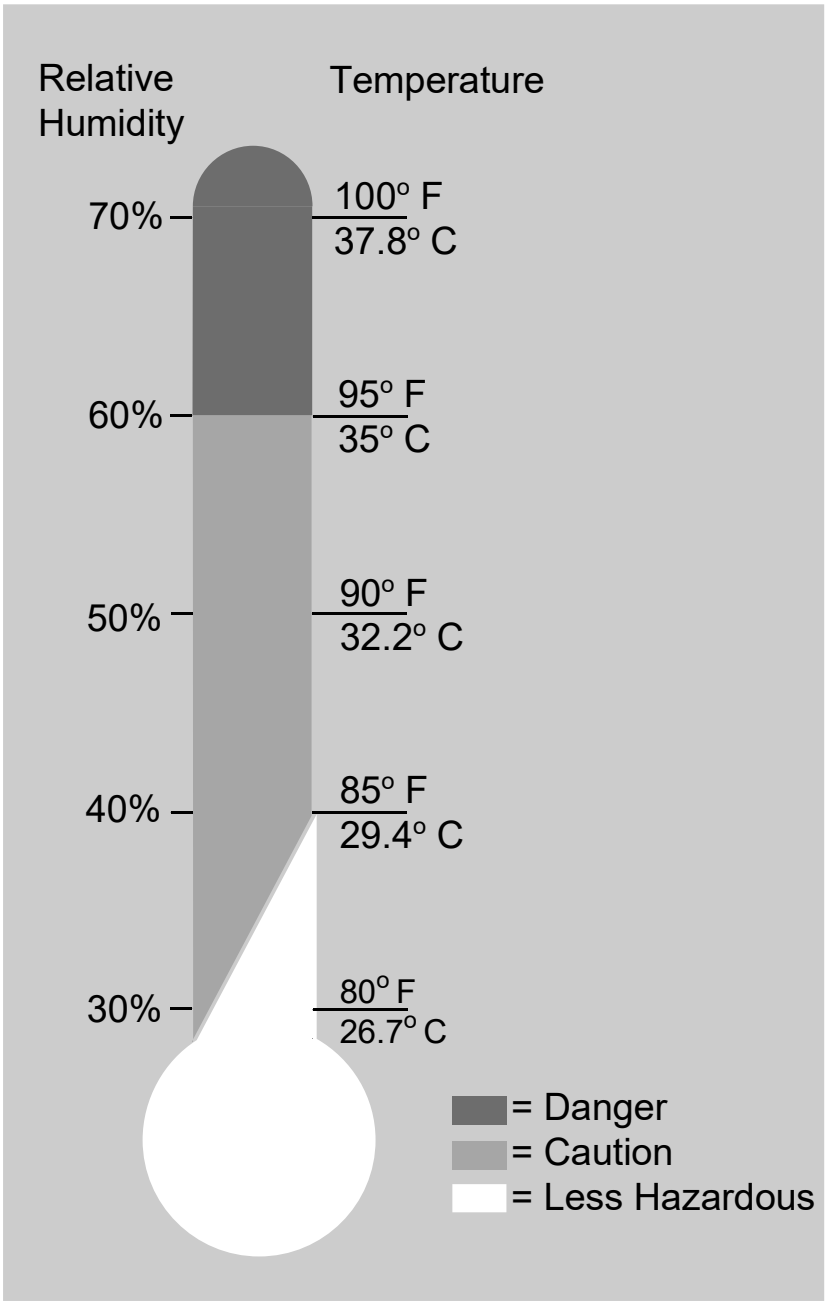
Attachment D

Cold and Heat Stress Guidance

THE HEAT EQUATION

HIGH TEMPERATURE + HIGH HUMIDITY + PHYSICAL WORK = HEAT ILLNESS

When the body is unable to cool itself through sweating, **serious** heat illnesses may occur. The most severe heat-induced illnesses are **heat exhaustion** and **heat stroke**. If actions are not taken to treat heat exhaustion, the illness could progress to heat stroke and possible **death**.



U.S. Department of Labor
Occupational Safety and Health Administration

OSHA 3154
1998

HEAT EXHAUSTION

What Happens to the Body:

HEADACHES, DIZZINESS/LIGHT HEADEDNESS, WEAKNESS, MOOD CHANGES (irritable, or confused/can't think straight), FEELING SICK TO YOUR STOMACH, VOMITING/THROWING UP, DECREASED and DARK COLORED URINE, FAINTING/PASSING OUT, and PALE CLAMMY SKIN.

What Should Be Done:

- Move the person to a cool shaded area to rest. Don't leave the person alone. If the person is dizzy or light headed, lay them on their back and raise their legs about 6-8 inches. If the person is sick to their stomach lay them on their side.
- Loosen and remove any heavy clothing.
- Have the person drink some cool water (a small cup every 15 minutes) if they are not feeling sick to their stomach.
- Try to cool the person by fanning them. Cool the skin with a cool spray mist of water or wet cloth.
- If the person does not feel better in a few minutes call for emergency help (Ambulance or Call 911).

(If heat exhaustion is not treated, the illness may advance to heat stroke.)

HEAT STROKE—A MEDICAL EMERGENCY

What Happens to the Body:

DRY PALE SKIN (no sweating), HOT RED SKIN (looks like a sunburn), MOOD CHANGES (irritable, confused/not making any sense), SEIZURES/FITS, and COLLAPSE/PASSED OUT (will not respond).

What Should Be Done:

- Call for emergency help (Ambulance or Call 911).
- Move the person to a cool shaded area. Don't leave the person alone. Lay them on their back and if the person is having seizures/fits remove any objects close to them so they won't strike against them. If the person is sick to their stomach lay them on their side.
- Remove any heavy and outer clothing.
- Have the person drink some cool water (a small cup every 15 minutes) if they are alert enough to drink anything and not feeling sick to their stomach.
- Try to cool the person by fanning them. Cool the skin with a cool spray mist of water, wet cloth, or wet sheet.
- If ice is available, place ice packs under the arm pits and groin area.

How to Protect Workers

- Learn the signs and symptoms of heat-induced illnesses and what to do to help the worker.
- Train the workforce about heat-induced illnesses.
- Perform the heaviest work in the coolest part of the day.
- Slowly build up tolerance to the heat and the work activity (usually takes up to 2 weeks).
- Use the buddy system (work in pairs).
- Drink plenty of cool water (one small cup every 15-20 minutes)
- Wear light, loose-fitting, breathable (like cotton) clothing.
- •. Take frequent short breaks in cool shaded areas (allow your body to cool down).
- Avoid eating large meals before working in hot environments.
- Avoid caffeine and alcoholic beverages (these beverages make the body lose water and increase the risk for heat illnesses).

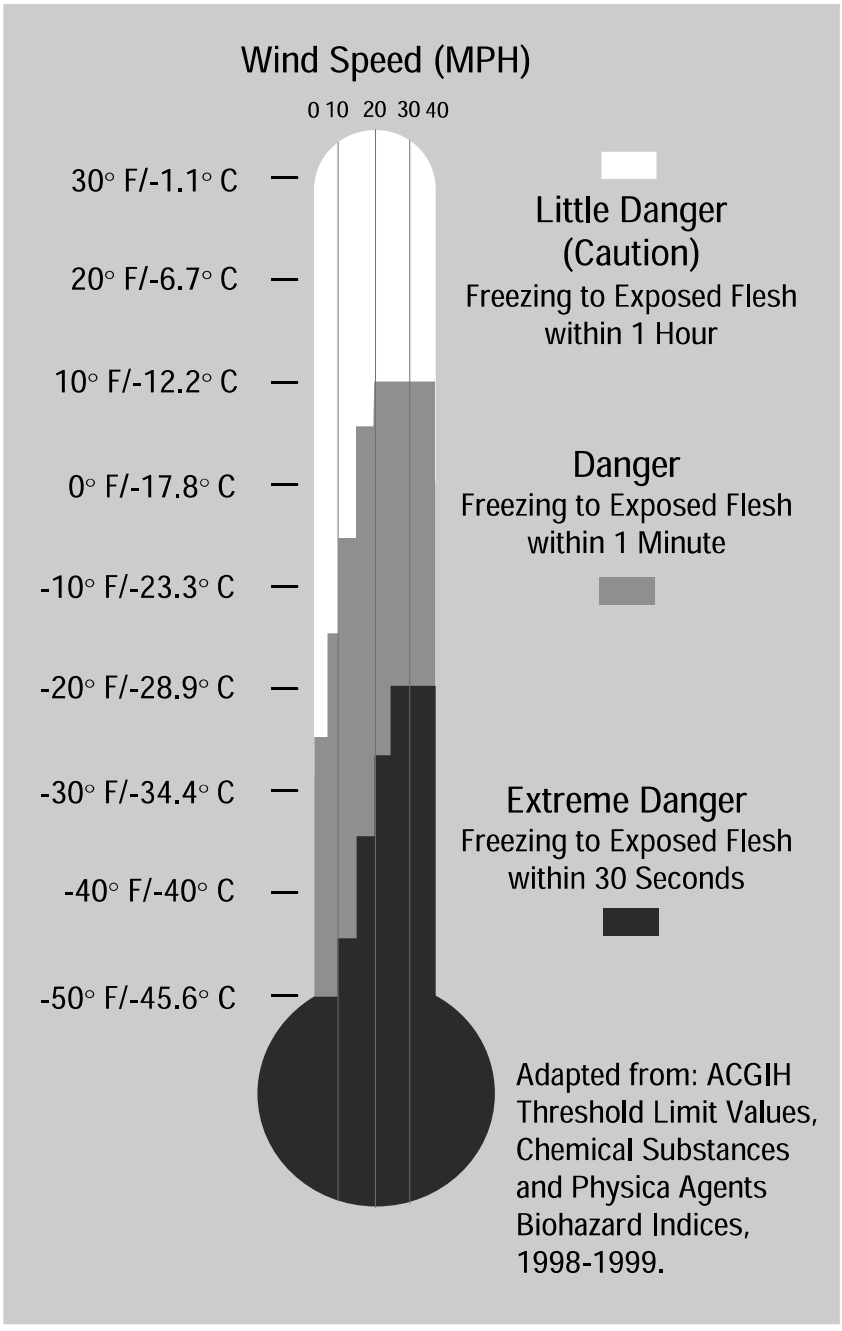
Workers Are at Increased Risk When

- They take certain medication (check with your doctor, nurse, or pharmacy and ask if any medicines you are taking affect you when working in hot environments).
- They have had a heat-induced illness in the past.
- They wear personal protective equipment (like respirators or suits).

THE COLD STRESS EQUATION

LOW TEMPERATURE + WIND SPEED + WETNESS = INJURIES & ILLNESS

When the body is unable to warm itself, serious cold-related illnesses and injuries may occur, and permanent tissue damage and death may result. **Hypothermia** can occur when *land temperatures* are **above** freezing or *water temperatures* are below 98.6°F/37°C. Cold-related illnesses can slowly overcome a person who has been chilled by low temperatures, brisk winds, or wet clothing.



U.S. Department of Labor
Occupational Safety and Health Administration

OSHA 3156
1998

FROST BITE

What Happens to the Body:

FREEZING IN DEEP LAYERS OF SKIN AND TISSUE; PALE, WAXY-WHITE SKIN COLOR; SKIN BECOMES HARD and NUMB; USUALLY AFFECTS THE FINGERS, HANDS, TOES, FEET, EARS, and NOSE.

What Should Be Done: (land temperatures)

- Move the person to a warm dry area. Don't leave the person alone.
- Remove any wet or tight clothing that may cut off blood flow to the affected area.
- **DO NOT** rub the affected area, because rubbing causes damage to the skin and tissue.
- **Gently** place the affected area in a warm (105°F) water bath and monitor the water temperature to **slowly** warm the tissue. Don't pour warm water directly on the affected area because it will warm the tissue too fast causing tissue damage. Warming takes about 25-40 minutes.
- After the affected area has been warmed, it may become puffy and blister. The affected area may have a burning feeling or numbness. When normal feeling, movement, and skin color have returned, the affected area should be dried and wrapped to keep it warm. **NOTE:** If there is a chance the affected area may get cold again, do not warm the skin. If the skin is warmed and then becomes cold again, it will cause severe tissue damage.
- Seek medical attention as soon as possible.

HYPOTHERMIA - (Medical Emergency)

What Happens to the Body:

NORMAL BODY TEMPERATURE (98.6° F/37°C) DROPS TO OR BELOW 95°F (35^0 C); FATIGUE OR DROWSINESS; UNCONTROLLED SHIVERING; COOL BLUISH SKIN; SLURRED SPEECH; CLUMSY MOVEMENTS; IRRITABLE, IRRATIONAL OR CONFUSED BEHAVIOR.

What Should Be Done: (land temperatures)

- Call for emergency help (i.e., Ambulance or Call 911).
- Move the person to a warm, dry area. Don't leave the person alone. Remove any wet clothing and replace with warm, dry clothing or wrap the person in blankets.
- Have the person drink warm, sweet drinks (sugar water or sports-type drinks) if they are alert. **Avoid drinks with caffeine** (coffee, tea, or hot chocolate) or alcohol.
- Have the person move their arms and legs to create muscle heat. If they are unable to do this, place warm bottles or hot packs in the arm pits, groin, neck, and head areas. **DO NOT** rub the person's body or place them in warm water bath. This may stop their heart.

What Should Be Done: (water temperatures)

- Call for emergency help (Ambulance or Call 911). Body heat is lost up to 25 times faster in water.
- **DO NOT** remove any clothing. Button, buckle, zip, and tighten any collars, cuffs, shoes, and hoods because the layer of trapped water closest to the body provides a layer of insulation that slows the loss of heat. Keep the head out of the water and put on a hat or hood.
- Get out of the water as quickly as possible or climb on anything floating. **DO NOT** attempt to swim unless a floating object or another person can be reached because swimming or other physical activity uses the body's heat and reduces survival time by about 50 percent.
- If getting out of the water is not possible, wait quietly and conserve body heat by folding arms across the chest, keeping thighs together, bending knees, and crossing ankles. If another person is in the water, huddle together with chests held closely.

How to Protect Workers

- Recognize the environmental and workplace conditions that lead to potential cold-induced illnesses and injuries.
- Learn the signs and symptoms of cold-induced illnesses/injuries and what to do to help the worker.
- Train the workforce about cold-induced illnesses and injuries.
- Select proper clothing for cold, wet, and windy conditions. Layer clothing to adjust to changing environmental temperatures. Wear a hat and gloves, in addition to underwear that will keep water away from the skin (polypropylene).
- Take frequent short breaks in warm dry shelters to allow the body to warm up.
- Perform work during the warmest part of the day.
- Avoid exhaustion or fatigue because energy is needed to keep muscles warm.
- Use the buddy system (work in pairs).
- Drink warm, sweet beverages (sugar water, sports-type drinks). Avoid drinks with caffeine (coffee, tea, or hot chocolate) or alcohol.
- Eat warm, high-calorie foods like hot pasta dishes.

Workers Are at Increased Risk When…

- They have predisposing health conditions such as cardiovascular disease, diabetes, and hypertension.
- They take certain medication (check with your doctor, nurse, or pharmacy and ask if any medicines you are taking affect you while working in cold environments).
- They are in poor physical condition, have a poor diet, or are older.

Attachment E

Emergency Contact Information

Fires - Spills	
Irondequoit Fire Department	911
Public Services	
Irondequoit Police Emergency	911
Emergency Medical Services	
Rochester General Hospital (Emergency Department)	(585) 922-4000
Route to hospital is included as Figure F-2	

SPILL NOTIFICATION

Agencies

National Response Center	(800) 424-8802
Local DEC Office Region 8	(585) 226-5353
NYSDEC Spill Hotline	(800) 457-7362

Provide the following information to the agencies:

- Name of person making the call
- Company and location
- Type of medical emergency (medical condition)
- Nature of fire (fire calls only)
- Name and estimated amount of chemical released to the environment (spills only)
- Time of release (spills only)
- Remedial action taken to correct the problem

Site Contacts

Mackenzie Rees (NYSDEC DER Project Manager)	(585) 226-5409
Benjamin Caligiuri (Public Health Specialist, NYSDOH)	(518) 402-7868
Bruce Ahrens (Marsh Engineering – Rochester)	(585) 248-2413
Michael Rumrill (Marsh Engineering – Rochester)	(585) 248-2413

APPENDIX G

SITE INSPECTION FORM

Marsh Engineering D.P.C.
Site Inspection Form

Project Name:	**Marsh Personnel:**
Project Number:	**Contractor:**
Time Onsite:	**Time Offsite:**
Description of Activities:	

Signature: _____ Date: _____

This page for sketches. Drawings, additional notes, etc.

APPENDIX H

RESPONSIBILITIES OF OWNER AND RESPONSIBLE PARTY

Responsibilities

The responsibilities for implementing the Interim Site Management Plan ("ISMP") for the Lighthouse Pointe Inland East site ("Site"), NYSDEC Site #C828212 is the responsibility of the Site Owner/Remedial Party ("RP"). The Owner and RP is currently listed as:

Lighthouse Pointe Property Associates, LLC
Rochester, New York 14614
(585) 330-7501

Nothing on this page will supersede the provisions of an Environmental Easement, Decision Document, agreement, or other legally binding document that affects rights and obligations relating to the Site.

Site Owner/RP's Responsibilities:

1) The Owner/RP shall follow the provisions of the SMP as they relate to future construction and excavation at the Site.
2) In accordance with a periodic time frame determined by the NYSDEC, the Owner shall periodically certify, in writing, that all Institutional Controls set forth in an Environmental Easement remain in place and continue to be complied with. The Owner shall provide written certification in the Site's Periodic Review Report ("PRR") certification to the NYSDEC.
3) In the event the Site is delisted, the Owner/RP remains bound by the Deed Restriction and shall submit, upon request by the NYSDEC, a written certification that the Deed Restriction is still in place and has been complied with.
4) The Owner/RP shall grant access to the Site to the NYSDEC and its agents for the purposes of performing activities required under the SMP and assuring compliance with the SMP.
5) The owner is responsible for assuring the security of the remedial components located on its property to the best of its ability. If damage to the remedial components or vandalism is evident, the owner shall notify the site's RP and the NYSDEC in accordance with the timeframes indicated in Section 1.3 (Notifications) if the ISMP.
6) In the event some action or inaction by the Owner/RP adversely impacts the Site, the Owner/RP must notify the NYSDEC in accordance with the time frame indicated in Section 1.3 (Notifications) if the ISMP and coordinate the performance of necessary corrective actions with the RP.
7) The Owner/RP must notify the NYSDEC of any change in ownership of the Site property (identifying the tax map numbers in any correspondence) and provide contact information for the new owner of the Site. 6 NYCRR Part contains notification requirements applicable to any construction or activity changes and changes in ownership. Among the notification requirements is the following: Sixty days prior written notification must be made to the NYSDEC. Notification is to be submitted to the NYSDEC Division of Environmental Remediation's Site Control Section. Notification requirements for a change in use are

detailed in Section 2.4 of the SMP. A 60-Day Advance Notification Form and Instructions are found at http://www.dec.ny.gov/chemical/76250.html.

8) The Owner/RP must follow the ISMP provisions regarding any construction and/or excavation it undertakes at the Site.
9) The Owner/RP shall report to the NYSDEC all activities required for remediation, operation, maintenance, monitoring, and reporting. Such reporting includes, but is not limited to, PRRs and certifications, electronic data deliverables, corrective action work plans and reports, and updated SMPs.
10) If the NYSDEC determines that an update of the ISMP is necessary, the Owner/RP shall update the ISMP and obtain final approval from the NYSDEC.
11) The Owner/RP shall notify the NYSDEC of any changes in ownership and/or control and of any changes in the party/entity responsible for the operation, maintenance, and monitoring of and reporting with respect to any remedial system (i.e., Engineering Controls). The Owner/RP shall provide contact information for the new party/entity. Such activity constitutes a Change of Use pursuant to 375-1.11(d) and requires 60-days prior notice to the NYSDEC. A 60-Day Advance Notification Form and Instructions are found at: http://www.dec.ny.gov/chemical/76250.html.
12) The RP shall notify the NYSDEC of any damage to or modification of the systems as required under Section 1.3 – Notifications, of the ISMP.
13) The Owner/RP is responsible for the proper maintenance of any installed vapor intrusion mitigation systems associated with the site, if applicable.
14) Any change in use, change in ownership, change in site classification (e.g., delisting), reduction or expansion of remediation, and other significant changes related to the site may result in a change in responsibilities and, therefore, necessitate an update to the ISMP and/or updated legal documents. The Owner/RP shall contact the Department to discuss the need to update such documents.

Change in ownership and/or control and/or Site ownership does not affect the Owner/RP's obligations with respect to the Site unless a legally binding document executed by the NYSDEC releases the Owner/RP of its obligations.

Future site owners and RPs and their successors and assigns are required to carry out the activities set forth above.