SITE SPECIFIC HEALTH AND SAFETY PLAN
GENESEE MARINA, INC.
SITE #C828130
118 PETTEN STREET
ROCHESTER, NEW YORK

Prepared For:	Genesee Marina, Inc. 118 Petten Street Rochester, New York
Prepared By:	Day Environmental, Inc. 40 Commercial Street Rochester, New York 14614
Day Project No.:	3903S-06
Date:	June 29, 2007

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1.0 INTRODUCTION

Day Environmental, Inc. (DAY) has prepared this Site Specific Health and Safety Plan (HASP) for work tasks associated with the remedial investigation for volatile organic compounds (VOCs), semi-volatile organic compound (SVOC), and heavy metal contaminated soil and groundwater at 118 Petten Street, Rochester, NY (the Site). This remedial investigation will further evaluate the nature and extent of VOCs, SVOCs, heavy metals, and evaluate for the presence of PCBs and cyanide due to historical uses and previous operations at the Site. This HASP will be used while conducting the Remedial Investigation (RI) at 118 Petten Street, Rochester, New York. The laboratory analytical results from previous soil and groundwater samples indicate the presence of VOCs, SVOCs, and heavy metals at values greater than NYSDEC standards; these are the primary contaminants of concern (COCs) on the Site.

This plan outlines the health and safety procedures, personal protective equipment (PPE), and field monitoring equipment required for monitoring the performance of health and safety requirements during proposed investigation activities. Following the details outlined in the HASP is intended to minimize the potential for injury or exposure to contaminants of concern to DAY employees conducting work on this Site.

1.1 Health and Safety Plan Overview

This HASP has been prepared for DAY personnel for activities conducted during the proposed remedial investigation project work. The procedures and personal protective equipment described in this plan were developed after reviewing the Site environmental data from previous investigations that was provided to DAY. DAY has evaluated the potential hazards that may be encountered during the tasks and project work detailed in the RI Work Plan. The purpose of this HASP is to:

- Establish personnel safety/protection standards that meet or exceed the Occupational Safety and Health Administration (OSHA) Regulations;
- Define responsibilities of different organizations and personnel;
- Establish safe operating procedures relative to the conditions encountered at the project work area;
- Define the project work area;
- Provide for anticipated contingencies that may arise during the course of investigation work; and
- Modify the HASP in response to new environmental data or conditions encountered during implementation of the investigation.

2.0 SITE ACCESS & PERSONNEL

DAY personnel working at the Site must follow this HASP and other appropriate written safe access procedures maintained by DAY.

2.1 Site Access

Site access will be given to DAY personnel, DAY's sub-contractors, and appropriate regulatory agencies involved with the project. DAY and DAY's sub-contractors are responsible for providing a safe work area and securing the project work area during work hours and during non-work hours.

Site Specific Health & Safety Personnel

DAY is responsible for the health and safety of DAY personnel. This responsibility includes:

- Provide overall health and safety oversight for the project;
- Prepare and/or review potential changes to this HASP and edit a task-specific addendum to the HASP, if required; and
- Monitor health and safety performance.

One person may be designated as having the responsibilities of the key personnel listed below for this project. A description of the responsibilities of the key personnel involved in the HASP program is presented below.

Project Manager

The Project Manager (PM) will assist with management of on-Site work tasks. The PM is responsible for:

- Managing the planned work requirements so that work performed adheres to the outlined health and safety procedures;
- Providing guidance so that personnel follow health and safety procedures;
- Reviewing daily work activities and field conditions encountered that may result in potential injury or exposure to contaminants of concerns (COCs) as identified during project work; and
- Providing notification of unsafe conditions noted during fieldwork to Site owner and sub-contractors.

Site Health and Safety Officer

The Site Health and Safety Officer's (SHSO) responsibilities will be implemented by the on-Site representative who will be present during the majority of the field phase of the project. The SHSO will be responsible for the following tasks:

- Implementing the HASP;

- Maintaining a daily record (if relevant to health and safety at the project Site) of personnel activities, monitoring activities and results, exposure incidents, and personnel protection equipment usage;
- Monitoring anticipated hazards and propose modifications (if necessary) for the level of personnel protection and/or work procedures;
- Advising the PM on work activities completed and proposed work tasks or conditions which may impact health and safety requirements;
- Having copies of this HASP available on-Site for review; and
- Recording daily weather conditions (e.g., temperature, wind speed/direction, etc.) if these conditions are relevant to health and safety at the project Site.

The SHSO has the authority to suspend work activities if it is felt that the Site or weather conditions may adversely affect personnel health and safety. The SHSO will notify the PM, sub-contractors, and Site owner of such actions.

On-Site Workers

DAY project personnel involved in the proposed investigation activities are responsible for:

- Reading, understanding, and complying with the requirements of the HASP;
- Taking reasonable precautions to prevent incidents and to report accidents;
- Implementing procedures specified in this HASP, and report deviations to the SHSO; and
- Performing tasks that they are trained to do.

For this project, hard hats, work boots, safety glass, and gloves (Level D) are required for field tasks with the exception of water level measurements.

Copies of 40-hour HAZWOPER/8-hour refresher certificates are provided in Appendix A.

Visitors

Non-Site workers and Site visitors are responsible for:

- Reading, understanding, and complying with the requirements of the HASP;
- Having the required personnel protecting equipment (e.g., hard hats, safety glass, and work boots); and
- Taking reasonable precautions to prevent incidents that may result in injury.

3.0 HEALTH & SAFETY RISK ANALYSES

3.1 Site Overview

The Site is located at:

118 Petten Street
Rochester, New York 14612

A sub-contractor will install the test borings, monitoring wells, and test pits proposed in the RI Work Plan. DAY will supervise these subsurface explorations and select soil and groundwater samples for laboratory testing.

3.2 Hazard Analyses

Physical Hazards

Possible physical hazards associated with the proposed work include, but are not limited to the following:

- Hazards associated with injury from vehicles, backhoe or drilling equipment;
- Hazards associated with investigation activities (i.e., slip or trip into the test pit excavation);
- Underground utilities injury from damage to these utilities (i.e., electric shock, fire, and explosion); and
- Heat and/or cold stress.

Chemical Hazards

The chemicals listed below were detected at the Site in environmental samples at concentrations above NYSDEC Subpart 375-6 Unrestricted Remedial Soil Clean-up Objectives and NYSDEC TOGS 1.1.1 groundwater standards or guidance values. Other chemical compounds were also detected at lower concentrations in each chemical group presented below. Chemical hazards associated with overexposure to volatile organic compounds (VOCs) detected at the Site are presented below. A Material Safety Data Sheet (MSDS) for each compound is included in Appendix B.

Acetone

General Description: A colorless, volatile, extremely flammable liquid, which is widely used as an organic solvent. It is readily soluble in water, ethanol, ether, etc., and itself serves as an important solvent. The most familiar household use of acetone is as the active ingredient in nail polish remover. Acetone is also used to make plastic, fibers, drugs, and other chemicals.

Safety and Health: Swallowing very high levels of acetone can result in unconsciousness and damage to the skin in the mouth. Skin contact can result in irritation and damage to the skin. Kidney, liver, and nerve damage, increased birth defects, and lowered reproduction ability of males (only) occurred in animals exposed long-term. It is not known if these same effects would be exhibited in humans.

Methylene Chloride

General Description: A chemical compound in liquid form widely used as a solvent for organic materials. It is a colorless, volatile liquid with a strong, sweet, vaguely pleasant aroma. Methylene chloride's volatility and ability to dissolve a wide range of organic compounds makes it an ideal solvent for many chemical processes. It is mainly used as a paint stripper and a degreaser.

Safety and Health: Ingestion causes nausea and vomiting, with possible headache, dizziness, or unconsciousness. Inhalation in high concentrations may cause dizziness, unconsciousness, coma, and possible respiratory failure. May cause delayed inflammation of the lungs. Prolonged skin contact or chronic exposure may cause irritation or burns. Strong eye irritant, which may product tearing and a burning sensation.

Toluene

General Description: A chemical compound in liquid form that resembles benzene but is less volatile, less flammable, and less toxic. Toluene is often used as a solvent, a starting material for various industrial chemicals, and as an anti-knock agent for gasoline. This compound is also found in coal-tar light oil and petroleum.

Safety and Health: An eye and skin irritant. Acute systemic effects by inhalation and ingestion may be but are not limited to central nervous system depression, headache, dizziness, and upset stomach. Chronic effects are possible liver damage, cancer, and blindness. The OSHA PEL – 200 ppm during an 8-hour exposure period.

Benzene

General Description: A colorless, flammable, toxic liquid with a pleasant aromatic odor. Derived from petroleum and used in or to manufacture a wide variety of chemical products, including DDT, insecticides, and motor fuels. Used in the manufacture of plastics, synthetic rubber, dyes, and drugs. It is an important industrial solvent and precursor in the production of drugs, plastics, gasoline, synthetic rubber, and dyes. Benzene is a natural constituent of crude oil, but it is usually synthesized from other compounds present in petroleum.

Safety and Health: Benzene is a known carcinogen. Long-term exposure to high levels of benzene in the air can cause leukemia, a fatal cancer of the blood-forming organs. Breathing very high levels of benzene can result in death, while high levels can cause drowsiness, dizziness, rapid heart rate, headaches, tremors, confusion, and unconsciousness. Eating or drinking foods containing high levels of benzene can cause vomiting, irritation of the

stomach, dizziness, sleepiness, convulsions, rapid heart rate, and death. The OSHA PEL – 1 ppm during an 8 hour exposure period.

Ethylbenzene

General Description: A clear, colorless, flammable organic chemical compound liquid at room temperature and pressure. Ethylbenzene is used in the petrochemical industry as an intermediate compound for the production of styrene, which in turn is used for making polystyrene, a commonly used plastic material. Although often present in small amounts in crude oil, ethylbenzene in an acidically catalyzed chemical reaction.

Safety and Health: Ethylbenzene has been designated as a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978 (40 CFR 116.4 (7/1/87). These regulations apply to discharges of this substance [609]. It is also a toxic pollutant designated pursuant to section 307(a)(1) of the Clean Water Act and is subject to effluent limitations (40 CFR 401.15, 7/1/87)[609].

Xylenes (-m, -o, -p)

General Description: Xylenes are volatile organic compounds similar to toluene and ethylbenzene. Xylenes (mixed) are widely used as industrial solvents.

Safety and Health: Can pose a drinking water hazard when they accumulate in groundwater.

Methyl tertiary butyl ether (MTBE)

General Description: A chemical additive, MTBE improves fuel mixing and atomization during cold operation and consequently reduces emissions. MTBE has been blended into both USA and European gasoline for many years, primarily because it has an extremely high octane value which has enabled it to take the place of lead compounds gradually being phased out.

Safety and Health: MTBE so far appears to have no adverse human health effects.

Carbon Disulfide

General Description: A clear, flammable liquid used to manufacture viscose rayon and cellophane, and as a solvent for fats, rubber, resins, waxes, and sulfur, and in matches, fumigants, and pesticides. Carbon disulfide evaporates at room temperature, and the vapor is more than twice as heavy as air. It easily explodes in air and also catches fire very easily.

Safety and Health: At very high levels, carbon disulfide may be life threatening because of its effects on the nervous system. High concentrations of carbon disulfide have caused skin burns when the chemical accidentally touched people's skin.

Chemical hazards associated with overexposure of semi-volatile organic compounds (SVOCs) at the Site are presented below:

Chrysene

General Description: It is a white crystalline substance, but generally colored yellow by impurities. One of the hydrocarbons in coal tar, related to naphthalene and anthracene. Because it is formed when gasoline, garbage, or any animal or plant material burns, it is usually found in smoke and soot. Chrysene is also found in creosote.

Safety and Health: Not classifiable as to its carcinogenicity to humans.

Naphthalene

General Description: A white crystalline solid compound, with a mothball odor, derived from coal tar or petroleum and used in manufacturing dyes, moth repellents, and explosives and as a solvent. Naphthalene is volatile, forming a flammable vapor. It is also used as an antiseptic and insecticide, especially in mothballs.

Safety and Health: An eye and skin irritant. Acute systemic effects by inhalation and ingestion may be but are not limited to headaches, confusion, excitement, nausea/vomiting, abdominal pain, and jaundice. Chronic effects are possible liver damage, kidney damage, and cancer. The OSHA PEL – 10 ppm during an 8-hour exposure period.

Fluoranthene

General Description: A white crystalline hydrocarbon of a complex structure, found as one ingredient of the higher boiling portion of coal tar. It is formed when gasoline, garbage, or any animal or plant material burns, and is usually found in smoke and soot.

Safety and Health: Limited evidence that this may act as a carcinogen. Skin, eye and respiratory irritant. The OSHA PEL – 0.2 ppm during an 8-hour exposure period.

Acenaphthene

General Description: A high-molecular-weight hydrocarbon. It is formed when gasoline, garbage, or any animal or plant material burns, and is usually found in smoke and soot. A chemical compound used in the production of dyes, plastics, and pharmaceuticals. It is also used as an insecticide and fungicide and is present in coal tar and creosote.

Safety and Health: A skin, eye, and respiratory irritant. Chronic effects are possible liver and kidney damage.

Pyrene

General Description: A by-product of the incomplete combustion and thermal decomposition of fossil fuels and organic matter. It is present in tobacco smoke, automobile and diesel exhaust, coal tar, crude oils, and used lubricating oils. One of the less volatile hydrocarbons of coal tar, obtained as a white crystalline substance.

Safety and Health: A skin, eye, and respiratory irritant. The OSHA PEL – 0.2 ppm during an 8-hour exposure period.

Chemical hazard associated with overexposure of heavy metals is presented below:

Arsenic

General Description: A naturally occurring element widely distributed in the earth's crust. Mining activities, smelters, coal and coal combustion by-products, withdrawal sludges, pesticides enhance the natural levels of arsenic. Inorganic arsenic compounds are mainly used to preserve wood. Organic arsenic compounds are used as pesticides, primarily on cotton plants. Arsenic salts are used as pesticides, wood preservative, for glass manufacturing, in alloys, electronics, paint pigment and in the manufacture of dyes.

Safety and Health: An eye and skin irritant. After absorption, arsenic may cause multi-organ failure. The primary target organs initially are gastrointestinal tract, the heart, brain and kidneys. The skin, bone marrow and peripheral nervous system may also be affected. The OSHA PEL – 10 ppm during an 8-hour exposure period.

Barium

General Description: Barium is a soft silvery metallic toxic chemical element. Compounds of this metal are used in small quantities in paints and in glassmaking. This metal oxidizes very easily and when exposed to air is highly reactive with water or alcohol. Barium is decomposed by water or alcohol. Barium is primarily used in sparkplugs, vacuum tubes, fireworks, and in fluorescent lamps.

Safety and Health: All water or acid soluble barium compounds are extremely poisonous. Barium sulfate can be used in medicine only because it does not dissolve, and is eliminated completely from the digestive tract.

Chromium

General Description: A naturally occurring element found in rocks, animals, plants, soil, and in volcanic dust and gases. The metal chromium, which is the Chromium (O) form, is used for making steel. Chromium (VI) and chromium (III) are used for chrome plating, dyes and pigments, leather tanning, and wood preserving.

Safety and Health: A confirmed carcinogen. An eye and skin irritant. Acute systemic effects by inhalation and ingesting may be but are not limited to nosebleeds, and ulcers and holes in the nasal septum, stomach upsets and ulcers, convulsions, kidney and liver damage. The Occupational Safety and Health Administration (OSHA) has set limits of 500 ug water soluble Chromium (III) compounds per cubic meter of workplace air (500 ug/m^3), 1,000 ug/m^3 for metallic chromium (O) and insoluble chromium compounds, and 52 ug/m^3 for chromium (VI) compounds for 8-hour work shifts and 40-hour work weeks.

Mercury

General Description: A naturally occurring metal that has several forms. The metallic mercury is a shiny, silver-white, odorless liquid. If heated, it is a colorless, odorless gas. Metallic mercury is used to produce chlorine gas and caustic soda, and is also used in thermometers, dental fillings, and batteries. Mercury salts are sometimes used in skin lightening creams and as antiseptic creams and ointments.

Safety and Health: Possible human carcinogen. An eye and skin irritant. Acute systemic effects by inhalation and ingestion may be but are not limited to lung damage, nausea, vomiting, diarrhea, and increases in blood pressure or heart rate. Chronic effects are possible damage to the brain, kidneys, and developing fetus. Effects on brain functioning may result in irritability, shyness, tremors, changes in vision or hearing, and memory problems. The OSHA PEL – 0.1 ppm during an 8-hour exposure period.

Lead

General Description: Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust and is produced as a by-product of the burning of fossil fuels, minim, and manufacturing. Lead has many different uses. It is used in the production of batteries, ammunition, metal products (solder and pipes), and devices to shield X-rays. Lead from gasoline, paints and ceramic products, caulking, and pipe solder has been dramatically reduced in recent years due to health concerns.

Safety and Health: Lead can affect almost every organ and system in your body. The most sensitive is the central nervous system, particularly in children. Lead also damages kidneys and the reproductive system. The effects are the same whether it is breathed or swallowed. Acute systemic effects by inhalation and ingestion may be but are not limited to decreased reaction time, weakness in fingers, wrists, or ankles. Lead may cause anemia, a disorder of the blood. It can also damage the male reproductive system.

4.0 SITE CONTROL MEASURES

4.1 Site Control

Site control will minimize potential injury and exposure of COCs to workers and observers. Site control measures also enhance response in emergency situations.

It is anticipated that project work under this program will be generally conducted following Level D health and safety protocol. In the event that an upgrade to Level C health and safety protocol is necessary, a meeting will be held to prepare for Level C health and safety issues and revisions to the HASP. Project work areas and locations to support level C field operations will be defined and divided into distinct areas. The actual extent of the areas is considered task and location specific and will be determined in the field.

4.1.1 Work Zone

The Work Zone is the area in which the potential for chemical contact/exposure may occur. Workers entering this zone will be required to be protected as defined in Section 7.0 of this HALP. The work zone is intended for OSHA-trained workers. Within this zone, the levels of protection may be changed in accordance with Section 7.3 of this HASP. Given the mobile nature of the proposed work, no set work zone will be established. The work zone will be considered a 20-foot radius around the investigation location.

4.1.2 Decontamination Zone

A decontamination zone will be required in the event that Level C health and safety protocol is necessary. The decontamination zone is the area that is established to facilitate the removal of potential contamination from equipment and personnel protective equipment. A decontamination zone will be set up adjacent to the project work area (work zone) to facilitate decontaminating equipment that is used throughout the remediation project work. The location of the decontamination zone will depend on prevailing wind direction and physical Site features.

4.1.3 Support Zone

A support zone may be set up outside the decontamination zone. The support zone will be used to store equipment and first aid supplies. Administrative and other support function may occur within the support zone such as communication systems. Protective clothing (personnel protection equipment) that is used in the work zone may not be used in the support zone except in emergencies.

4.2 Site Security

The SHSO or designated alternate is responsible for controlling access to the active work zone during daytime hours. The sub-contractor is responsible for securing the excavations during

working hours and non-working hours. When necessary to establish a work zone as defined above, the same will be identified by barricades or a barrier fence or tape which will be placed a minimum of 10 feet from the edge of the excavation area. Excavations left open overnight or during non-working hours will be barricaded with orange snow fence or equivalent.

4.3 Buddy System

Field activities in contaminated or otherwise potential hazardous work areas should be conducted, whenever possible, with a buddy who is able to:

- Provide partner with assistance;
- Observe partner for signs of chemical or heat/cold exposure;
- Periodically check the integrity of partner's protective clothing; and
- Notify the SHSO or others if emergency help is needed.

4.4 Site Communications

Communications will be conducted through verbal communications. When out of audible range, verbal communications will be communicated using portable telephones or a 2-way radio.

Communications between workers in various zones shall consist of standard hand signals, voice, or radios. A portable telephone will be used to contact appropriate agencies in the event of an emergency.

4.5 Safe Work Practices

Operating procedures consistent with general safety rules should be followed by all workers. Workers will be conscientious of others working around them and check that they are safe, and working in a safe manner.

General safety rules that will be enforced at the project work areas include the following:

- Monitor the excavation from an upwind location and periodically from a downwind location;
- Smoking will be prohibited in the work zone;
- Eating and chewing gum will be prohibited at work zones;
- Field work will be conducted during daylight hours unless adequate light is provided;
- Anyone authorized to enter the Site will sign the daily field log and will also be required to follow all procedures in this HASP;
- Workers must thoroughly wash their hands prior to leaving the work area and decontamination zones and before eating or drinking; and
- Excessive facial hair should be minimized in the event that respiratory equipment is required for Level C project work.

4.6 Visitors

Visitors may be permitted in the immediate area of active operations with the approval from the SHSO. Visitors will not be allowed to enter into the work zone and decontamination zones. Site visitors will be briefed on appropriate sections of the HASP. The presence of visitors will be documented on the daily log maintained by the SHSO or designated alternate during all Site activities. Visitor vehicles will be restricted to Support Zones. Visitors will not be allowed in work areas during Level C project work.

4.7 Nearest Medical Assistance

First Aid supplies will be located near the area of the work zone, support zone, or in a field vehicle. Additional medical assistance can be summoned by dialing "911".

The nearest hospital is Rochester General Hospital. The emergency route from the Site to this facility is shown on Figure 1 – Hospital Emergency Route.

Additional information regarding driving directions to medical assistance, evacuation routes, and emergency procedures is contained in Section 9.0 of this HASP.

4.8 Safety Equipment

In addition to the PPE necessary to conduct work activities, the following inventory of safety equipment will be available:

- First aid kit;
- Scissors or knife for emergency equipment removal;
- Emergency eye wash;
- Rope for securing objects and use as a lifeline;
- Electrolyte replacement drink – stored in clean area; and
- Fire extinguisher for Class ABC fires.

4.9 Community Air Monitoring Plan

Depending upon the nature of the project-related activities being conducted at the site, real-time air monitoring for volatile organic compounds (VOCs) and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. A Community Air Monitoring Plan (CAMP) will be implemented in accordance with Appendix 1A of the DER-10 guidance document. A copy of DER-10 Appendix 1A is included as Appendix C.

5.0 EMPLOYEE TRAINING

5.1 Pre-assigned & Annual Refresher Training

DAY employees and contractor personnel working on this site will be trained in accordance with OSHA 29 CFR Part 1910.120.

6.0 MEDICAL SURVEILLANCE

DAY employees and contractors will follow their respective individual in-house medical surveillance procedures.

7.0 PERSONAL PROTECTIVE EQUIPMENT

The SHSO has reviewed the environmental and historical sampling data that is relevant to the proposed work to determine potential exposure to COCs and physical hazards. This review resulted in designating the work area as a construction zone. Level D PPE has been designated as the primary level of personnel protection that should be used during project work where contact with soil and groundwater is possible. Upgrading to Level C will be executed as required in the monitoring guidelines outlined.

7.1 Personal Protective Equipment Selection Criteria

PPE requirements selected for each project work task are specified in Section 7.3 of this HASP. Equipment selection was based upon the mechanics of the task and the nature of the hazards that are anticipated. The following criteria were used in the selection of PPE equipment:

- Chemical hazards known or suspected to be present;
- Routes of entry trough which the chemicals could enter the body, e.g., inhalation, ingestion, skin contact; and
- Potential for contaminant/worker contact while performing the specific task or activity.

Based on available data, DAY anticipates that most on-Site or near-site work activities will be performed at Level D protection. However, Level C protection will be available in the event an upgrade is required.

7.1 Selected Personal Protective Equipment Ensembles

The following components of Level D PPE will be available and used as appropriate in accordance with the specifications of this HASP:

- Safety glasses
- Hard hat when working with heavy equipment
- Steel-toed or composite-toed work boots
- Protective gloves (e.g., nitrite) during sampling or handling of potentially contaminated media
- Work clothing as prescribed by weather

It is possible that an upgrade to Level C may be required during the tasks identified during the project work. If an inhalation hazard is present or per the guidelines presented in the PPE reassessment program, Level C will consist of the following:

- Air-purifying respirator with appropriate cartridges
- Outer protective wear, such as Tyvek coverall [Tyveks (Sarans) and PVC acid gear will be required when workers have a potential to be exposed to impacted liquids or particulates].
- Hard hat
- Steel-toed or composite-toed work boots
- Nitrile, neoprene, or PVC overboots, if appropriate
- Nitrile, neoprene, or PVC gloves, if appropriate

- Safety glasses
- Face shield (when projectiles or splashes pose a hazard and when using a half-face respirator)

7.1.1 Levels of Protection

The following anticipated levels of protection will be used for specific work activities. Adjustments to these levels may be required given the Site conditions encountered.

- Groundwater Sampling –Level D
- Test pit excavations, soil borings, monitoring well installation, and collection of soil samples - Level D.

7.2 Personal Protective Equipment Reassessment Program

Air monitoring will be conducted during the project work when excavation of drilling of COC impacted soils is performed. Such monitoring will be conducted within the work zone utilizing photoionization detection (PID) with a 11.7 eV lamp, or equivalent. Monitoring will consist of determining breathing zone concentrations of total volatile organic vapors. The air monitoring equipment utilized will be calibrated and maintained, in accordance with the manufacturer's instructions. The calibrations and checks will be recorded in the field book. This will be performed by field staff at the beginning each day and more frequently, as the conditions warrant.

Background readings will be obtained in the work zone, upwind, downwind, and support zone prior to excavation of COC impacted soil. Following the establishment of background PID measurement, air monitoring will be conducted in the work zone during the soil excavation activities. Periodic PID measurements will be obtained at downwind locations. The PID measurements will be utilized for evaluating potential upgrade to Level C, if necessary. This may be accomplished by comparing PID measurements to health and safety action levels. The action levels for the PID air-monitoring measurements in the worker's breathing zone are provided below:

- Upgrade from Level D to Level C if either of the following conditions exist:
- Total Organic Vapor (TOV) – greater or equal to 5 and less than 50 PID units with compensation made for background readings sustained for a period of at least 10 minutes.
- Downgrade from Level C to Level D if both of the following conditions exist: Total Organic Vapor (TOV) – less than 5 PID units, above background sustained for a period of at least 10 minutes, with subsequent approval to downgrade provided by the Project Manager.

Immediate Evacuation of Area:

- Total Organic Vapor (TOV) – sustained readings greater or equal to 50 PID units in the workers' breathing zone.

- Excavation of unknown soil type or containers.

If evacuation of the area becomes necessary, a meeting will be held to address the air monitoring results and air monitoring may be continued until levels are below evacuation criteria so the area can be reentered.

8.0 DECONTAMINATION PROCEDURES

Field decontamination of PPE (e.g., Boots) will consist of washing contaminated PPE with a mixture of Alconox soap and water. Modification to the decontamination protocol for PPE will be made on-Site as needed.

9.0 EMERGENCY RESPONSE

In the event of an emergency the following procedures will apply:

- Fire – the work area will be evacuated and the fire department will be notified. Telephone 911.

- Injury – Contact emergency medical services (Telephone 911). A qualified person will administer first aid. If injury is not a life or death situation, then self-transport to the hospital is acceptable. Directions to the hospital are attached.

- Chemical Overexposure – If possible, move the victim to a safe location and contact 911 for emergency services. Have a qualified person administer first aid. If the person is conscious self-transport to the hospital is acceptable. If the person is unconscious, notify the appropriate emergency medical services at telephone number 911.

9.1 Available Equipment and Emergency Authorities

DAY and/or Day's sub-contractor will have a cellular telephone. If additional emergency equipment is required, the following local agencies can be called upon for advice, supplies, or additional manpower:

AGENCY	TELEPHONE NUMBER
City of Rochester Fire Department	911
Medical Emergency	911
NYSDEC Project Manager, Charlotte B. Theobald	(585) 266-5354
NYSDOH Project Manager, Debby McNaughton	(585) 423-8069
MCHD Project Manager, Joe Albert	(585) 753-5904

9.2 Driving Directions to Rochester General Hospital

1. Go northwest on Petten Street; approximately 0.1 miles.
2. Turn left onto Lake Avenue, approximately 3.7 miles
3. Turn left onto NY 104-E, approximately 1.7 miles
4. Take the ramp toward Carter Street / Portland Avenue, approximately 0.1 miles.
5. Stay STRAIGHT until the Portland Avenue exit, approximately 1.8 miles
6. Turn right onto Portland Avenue, approximately 0.1 miles.
7. End at Rochester General Hospital, 1425 Portland Avenue, Rochester, NY

SIGNATURE PAGE

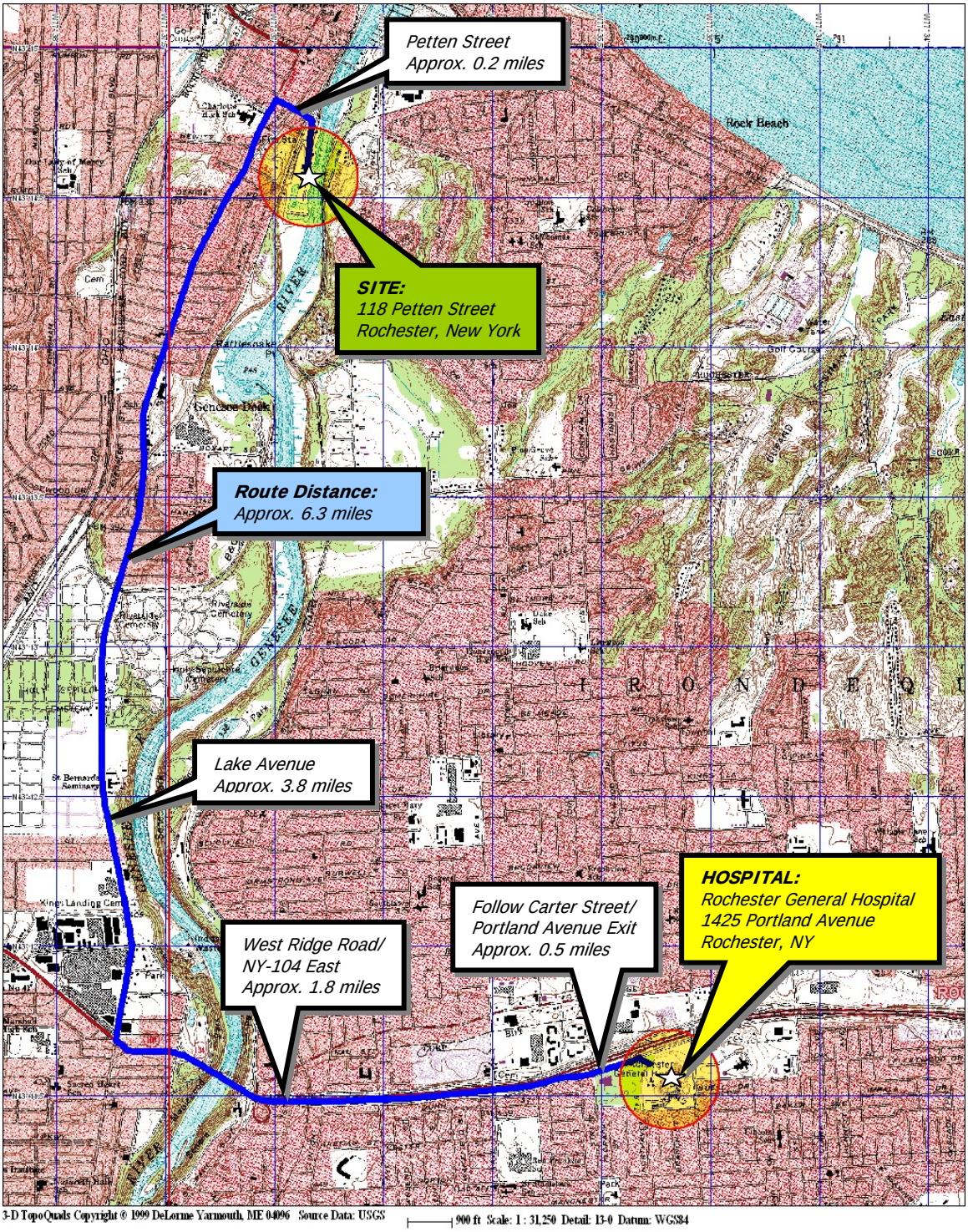
By signing below, I acknowledge that I have been informed of the items covered by this plan.

PRINTED NAME	SIGNATURE

FIGURES

FIGURE 1

HOSPITAL EMERGENCY ROUTE



Drawing Produced From: 3-D TopoQuads, DeLorme Map Co., referencing USGS quad maps Rochester East (NY) 1995 and Rochester West (NY) 1995. Site Lat/Long: N43°14.5' – W77°36.8'

DATE **01-18-2007** DRAWN BY **RJM** SCALE **As Noted**	day DAY ENVIRONMENTAL, INC. ENVIRONMENTAL CONSULTANTS ROCHESTER, NEW YORK 14614-1008 NEW YORK, NEW YORK 10165-1617	PROJECT TITLE **118 PETTEN STREET** **ROCHESTER, NEW YORK** **BCP REMEDIAL INVESTIGATION** DRAWING TITLE **ROUTE TO HOSPITAL**	PROJECT NO. **3903S-06** **FIGURE 1**

APPENDIX A

40- Hour HAZWHOPPER Training Certifications

CERTIFICATE OF COMPLETION

OSHA 8-HOUR HAZARDOUS WASTE SITE WORKER ANNUAL REFRESHER TRAINING

Christie Sunderrajan

is hereby certified as having attended and successfully completed eight hours of Hazardous Waste Site Worker Annual Refresher Training complying with the requirements of applicable regulations as published in 29 CFR 1910.120.

November 6, 2006

Clark K. Price, P.E.
Project Manager, Industrial Compliance
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CERTIFICATE OF COMPLETION

OSHA 8-HOUR HAZARDOUS WASTE SITE WORKER ANNUAL REFRESHER TRAINING

David Day

is hereby certified as having attended and successfully completed eight hours of Hazardous Waste Site Worker Annual Refresher Training complying with the requirements of applicable regulations as published in 29 CFR 1910.120.

November 6, 2006

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OSHA 8-HOUR HAZARDOUS WASTE SITE WORKER ANNUAL REFRESHER TRAINING

Chris Davidson

is hereby certified as having attended and successfully completed eight hours of Hazardous Waste Site Worker Annual Refresher Training complying with the requirements of applicable regulations as published in 29 CFR 1910.120.

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Tony DiNardo

is hereby certified as having attended an successfully completed eight hours of Hazardou Waste Site Worker Annual Refresher Trainir complying with the requirements of applicab regulations as published in 29 CFR 1910.120.

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Tom Roszak

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Ray Kampff

is hereby certified as having attended and successfully completed eight hours of Hazardous Waste Site Worker Annual Refresher Training complying with the requirements of applicable regulations as published in 29 CFR 1910.120.

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OSHA 8-HOUR HAZARDOUS WASTE SITE WORKER ANNUAL REFRESHER TRAINING

Hope Kilmer

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Jeff Danzinger

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November 6, 2006

Christie M. Sunderrajan, E.I.T., CHMM
Senior Engineer, Industrial Compliance
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NIAGARA COUNTY COMMUNITY COLLEGE
NCCC
STATE UNIVERSITY OF NEW YORK
THE SMART PLACE TO START

Niagara County Community College
Corporate Training

Certificate of Completion

This is to certify that:

Dave Gnage

has successfully completed the course entitled

8 Hr. Hazardous Waste Refresher
29 CFR 1910.120 (e)(8)

Director of Corporate Training
Niagara County Community College

April 3, 2007
Date

PPE Training: Level A, B, C

APPENDIX B

MSDA SHEETS

Material Safety Data Sheet

I PRODUCT IDENTIFICATION

Ingredient Name: ACETONE
Ingredient CAS Number: 67-64-1
Ingredient CAS Code: M
OSHA PEL: 1000ppm
OSHA PEL Code: M
ACGIH TLV: 750ppm
ACGIH TLV Code: M
ACGIH STEL: N/P
EPA Reporting Quantity: 5000 LBS
DOT Reporting Quantity: 5000 LBS
Ozone Depleting Chemical: N

II PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: 56.2 °C
Melting/Freezing Point: NA
Vapor Pressure: 181
Vapor Density: 2.0
Specific Gravity: 0.79
Solubility in Water: Complete
Appearance and Odor: Colorless liquid, sweet, pungent odor.
Percent Volatiles by Volume: 100

III STABILITY AND REACTIVITY

Stability Indicator: Yes
Materials to Avoid: Strong oxidizing agents.
Stability Conditions to Avoid: Heat, sparks, and open flame.
Hazardous Decomposition Products: Complete burn: carbon dioxide, water, Incomplete burn: can produce carbon monoxide

IV HEATLTH HAZARDS

Acute and Chronic Effects of Exposure: Irritant to eyes, skin, mucousa. If ingested can cause irritation of the gastro-intestinal tract, narcosis, kidney or liver damage. If inhaled can cause headache, nausea, drowsiness, and coma.

Medical Conditions Aggravated by Exposure: Unknown.

Route of Entry Indicators: Inhalation: yes, Skin: yes, Ingestion: yes
Carcinogenicity Indicators: Unknown.

V FIRST AID, FIRE FIGHTING PROCEDURES, AND SPILL RELEASE PROCEDURES

First Aid:
Eye: Immediately flush with copious amounts of water for at least 15 minutes.
Skin: Immediately wash with soap and copious amounts of water. Wash contaminated clothing before reuse.
Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Ingestion: Give 2 tablespoons syrup of ipecac followed by ¾ glass of water. Repeat if no vomiting in 20 minutes. Get medical attention immediately.

Fire Fighting Procedures:
Use NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing if involved in fire.
Extinguishing Media: Small fire use carbon dioxide or dry chemicals, Large fire use appropriate foam or water spray to reduce flame.
Flash Point: -17 °C
Unusual Fire or Explosion Hazard: Extremely flammable. Vapors form explosive mix in air. Danger when exposed to heat, sparks, fame, or oxidants.
Autoignition Temperature: 869 °F, Lower Limit(s): 2.15, Upper Limit(s): 13

Spill Release Procedures:

Stop leak if possible. Eliminate ignition sources. Isolate spill area. Collect in waste container. Flush area with water wash contamination equipment. Dike large spill to prevent entry to water-way. Report spill to local, state, and federal authorities. Adequately ventilate area.

VI EXPOSURE CONTROLS AND PERSONAL PROTECTION

Respiratory Protection: NIOSH/MSHA approved respirator.

Ventilation: Mechanical exhaust required.

Protective Gloves: Rubber or neoprene.

Eye Protection: Safety glasses.

Other Protective Equipment: Safety shoes, hard hat, face shield, special protective clothes.

VII DISPOSAL CONSIDERATIONS

Waste material should be treated/disposed by authorized waste site. Observe all federal, state, and local laws and regulations and contact the appropriate agency before disposal.

Material Safety Data Sheet

I PRODUCT IDENTIFICATION

Ingredient Name: ACENAPHTHENE
Ingredient CAS Number: 83-32-9
Ingredient CAS Code: M
OSHA PEL: N/K (FP N)
OSHA PEL Code: M
ACGIH TLV: N/K (FP N)
ACGIH TLV Code: M
ACGIH STEL: N/P
EPA Reporting Quantity: 100 LBS
DOT Reporting Quantity: 100 LBS
Ozone Depleting Chemical: N

II PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: 279 °C
Melting/Freezing Point: <35 °C
Vapor Pressure: 10 at 131 °C
Vapor Density: 5.32
Specific Gravity: N/K
Solubility in Water: N/K
Appearance and Odor: White crystals.
Percent Volatiles by Volume: N/K

III STABILITY AND REACTIVITY

Stability Indicator: Yes
Materials to Avoid: Strong oxidizing agents.
Hazardous Decomposition Products: Toxic fumes of carbon monoxide, carbon dioxide.

IV HEATLTH HAZARDS

Acute and Chronic Effects of Exposure: May be harmful by inhalation, ingestion or skin absorption. Causes eye and skin irritation. Material is irritating to mucous membranes and upper respiratory tract. To the best of our knowledge the chemical, physical, and toxicological properties have not yet been thoroughly

investigated.

Medical Conditions Aggravated by Exposure: Unknown.

Route of Entry Indicators: Inhalation: yes, Skin: yes, Ingestion: yes
Carcinogenicity Indicators: NTP: No, IARC: No, OSHA: No

V FIRST AID, FIRE FIGHTING PROCEDURES, AND SPILL RELEASE PROCEDURES

First Aid:
Eye: Immediately flush with copious amounts of water for at least 15 minutes.
Skin: Immediately wash with soap and copious amounts of water. Wash contaminated clothing before reuse.
Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Ingestion: Wash out mouth with water provided person is conscious. Get medical attention.

Fire Fighting Procedures:
Use NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing if involved in fire.
Extinguishing Media: Water spray, carbon dioxide, dry chemical powder or appropriate foam.
Flash Point: N/K
Autoignition Temperature: N/A Lower Limit(s): N/K, Upper Limit(s): N/K

Spill Release Procedures:

Use NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing including rubber boots and heavy rubber gloves. Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and water spill site after material pickup is complete.

VI EXPOSURE CONTROLS AND PERSONAL PROTECTION

Reparatory Protection: NIOSH/MSHA approved respirator.

Ventilation: Mechanical exhaust required.

Protective Gloves: Rubber.

Eye Protection: ANSI approved chemical eyewear.

Other Protective Equipment: Emergency eyewash and deluge shower which meet ANSI design criteria.

VII DISPOSAL CONSIDERATIONS

Dissolve or mix material with combustible solvent and burn in chemical incinerator equipped with an after burner and scrubber. Observe all federal, state, and local laws and regulations.

MATERIAL SAFETY DATA SHEET

I PRODUCT IDENTIFICATION

Trade Name: Arsenic
Chemical Nature: Metallic Element
Formula: As
CAS #: 7440-38-2

II HAZARDOUS INGREDIENTS

Hazardous Component: Arsenic
%: 0-100%
OSHA/PEL: 10 ug(As)/m^3
ACGIH/TLV: 0.01 mg (As)/m^3

III PHYSICAL DATA

Boiling Point 760 mm Hg: 613 °C (Sublimes)
Melting Point: 817 °C
Vapor Density (Air = 1): N/A
Vapor Pressure (mm Hg): 1 mm at 372 °C
% Volatiles by Weight: 0
Solubility in H_2O: Insoluble
Specific Gravity (Water = 1): 5.72 gm/cc
Appearance and Odor: Steel-grey brittle solid, no odor.

IV FIRE AND EXPLOSION HAZARDS DATA

Flash Point (Method used): N/A
Autoignition Temperature: N/A
Flammable Limits: Lower: N/A Upper: N/A

Extinguishing Media: Do not use water. Use carbon dioxide, dry chemical extinguishing agents, dry sand, dry ground dolomite.

Special Firefighting Procedures: Use NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing if involved in fire.

Unusual Fire and Explosion Hazard: Slight explosion hazard in the form of a dust when exposed to flame. Moderate fire hazard in the form of dust when exposed to heat or flame or by chemical reaction.

V HEALTH HAZARD INFORMATION

Routes of Entry: Inhalation, ingestion.

Effects of Exposure: Acute arsenic poisoning (from ingestion) results in marked irritation of the stomach and intestines with nausea, vomiting and diarrhea. In severe cases the vomitus and stools are bloody and the patient goes into collapse and shock with weak, rapid pulse, cold sweats, coma and death. Chronic arsenic poisoning, whether through ingestion or inhalation, may manifest itself in many different ways. There may be disturbances of the digestive system such as loss of appetite, cramps, nausea, constipation or diarrhea. Liver damage may occur, resulting in jaundice. Disturbances of the blood, kidneys and nervous system are not infrequent. Arsenic can cause a variety of skin abnormalities including itching, pigmentation and even cancerous changes. A characteristic of arsenic poisoning is the great variety of symptoms that can be produced. A recognized carcinogen of the skin, lungs, liver. An experimental carcinogen of the mouth, esophagus, larynx, bladder and para nasal sinus. (Sax, Dangerous Properties of Industrial Materials)

Acute Effects:
Inhalation: Causes irritation of mucous membranes and respiratory tract, metallic taste, pharyngitis, bloody nose, perforation of the nasal septum.
Ingestion: May cause vomiting, diarrhea, and nausea.
Skin: Causes moderate irritation, skin sensitization.
Eye: Causes moderate irritation.

Chronic Effects:
Inhalation: May cause cancer (skin and lung).
Ingestion: May cause cancer (skin and lung).
Skin: Can cause eczematous dermatitis, pigmentation, hyperkeratosis.
Eye: No chronic health effects recorded.

Other Health Hazards: There is evidence that arsenic may cross the placental barrier. Arsenic is a neurotoxin. Poisoning may affect the heart, GI system, kidneys and liver.

Medical Conditions Generally Aggravated by Exposure: No data.

Carcinogenicity: NTP: Yes IARC: Yes OSHA: Yes

EMERGENCY AND FIRST AID PROCEDURES:
INHALATION: No specific information available, one should obtain medical attention.
INGESTION: No data available but one should obtain medical attention.
SKIN: Remove contaminated clothing, flood skin with large amounts of water. If irritation persists seek medical attention.
EYE: Immediately flush eyes, including under eyelids, with large amounts of water for at least 15 minutes. Call a physician.

VI REACTIVITY DATA

Stability: Stable

Conditions to Avoid: incompatibles, exposure to air.

Incompatibility (Material to Avoid): Acids, acid fumes, oxidizing agents, halogens, heat, palladium, zinc, platinum, nitrogen trichloride, silver nitrate, acetylenes, chlorosylamine, chromium (VI) oxide, sodium peroxide, dirubidium acetylide.

Hazardous Decomposition Products: At temperatures above the melting point, metal oxide fumes may be evolved. Under reducing conditions (i.e. any strong acid or base plus an active metal) or in the presence of nascent hydrogen, highly toxic arsine gas may be evolved.

Hazardous Polymerization: Will not occur.

VII SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled: Any method which keeps dust to a minimum is acceptable. Vacuuming is preferred for dust. Use approved respiratory protection if possibility of dust/fume exposure exists. Do not use compressed air for cleaning.

Waste Disposal Method: In accordance with Local, State and Federal Waste Disposal Regulations.

VIII SPECIAL PROTECTION INFORMATION

Respiratory Protection: Where airborne exposures may exceed OSHA/ACGIH permissible air concentrations, the minimum respiratory protection recommended is a negative pressure air purifying respirator with cartridges that are NIOSH/MSHA approved against dust, fumes and mists having a TWA less than 0.05 mg/m3.

Ventilation: Glove bag or box preferred.

Protective Gloves: Rubber

Eye/Face Protection: ANSI approved safety goggles with a full face shield.

Other Protective Equipment: Full protective clothing, lab coat and apron, flame and chemical resistant coveralls, is recommended for exposures that exceed permissible air concentrations. All contaminated clothing should be removed before leaving plant premises.

IX SPECIAL PRECAUTIONS

Precautions to Be Taken in Handling and Storage: Use of approved respirators is required for applications where adequate ventilation cannot be provided. Activities which generate dust or fume should be avoided. When melted, the temperature should be kept as low as possible. Keep container tightly closed. Store in a cool, dry, well-ventilated area. Wash thoroughly after use.

Work Practices: Avoid inhalation or ingestion. Practice good housekeeping and personal hygiene procedures. No tobacco or food in the work area. Wash thoroughly before eating or smoking. Shower and change clothes at end of work shift. Do not wear contaminated clothing home. Do not blow dust off clothing with compressed air. Maintain eyewash capable of sustained flushing, safety drench shower and hygienic facilities for washing.

Danger: Poison, causes skin and lung cancer.

MATERIAL SAFETY DATA SHEET

I PRODUCT IDENTIFICATION

Trade Name: Barium
Formula: Ba
CAS #: 7440-39-3

II HAZARDOUS INGREDIENTS

Hazardous Component: Barium
%: 0-100%
OSHA/PEL: 0.5 mg(Ba)/m^3
ACGIH/TLV: 0.5 mg (Ba)/m^3

HMIS Ratings (0-4): Health: 2 Flammability: 2 Reactivity: 2

III PHYSICAL DATA

Boiling Point 760 mm Hg: 1640 °C
Melting Point: 725 °C
Vapor Density (Air = 1): N/A
Vapor Pressure (mm Hg): 13.3 hPa at 1049 °C
% Volatiles by Weight: N/A
Solubility in H_2O: Reacts violently.
Specific Gravity (Water = 1): 3.51 at 20 °C
Appearance and Odor: Silver white metal, odorless.

IV FIRE AND EXPLOSION HAZARDS DATA

Flash Point (Method used): N/A
Autoignition Temperature: N/A
Flammable Limits: Lower: N/A Upper: N/A

Extinguishing Media: FLAMMABLE SOLID!! Use dry chemical/dolomite (powdered limestone). DO NOT USE WATER, CARBON DIOXIDE, OR HALOGENATED EXTINGUISHERS!
Special Fire Fighting Procedures: Firefighters must wear full face, self-contained breathing apparatus with full protective clothing to prevent contact with skin and eyes. Flammable solid.

Unusual Fire & Explosion Hazard: Material readily reacts with water generating flammable and/or explosive hydrogen gas. Do not expose to air and fire. Emits toxic fumes under fire conditions. Isolate with dolomite and allow to burn. Large Fires: Contain and smother with dolomite.

Caution! Fire may reignite after having been extinguished. Blend with large excess of dolomite.

V HEALTH HAZARD INFORMATION

Primary Routes of Exposure: Eye, skin, and inhalation.

Effects of Over Exposure: To the best of our knowledge the chemical, physical, and toxicological properties of barium have not been thoroughly investigated and recorded. Barium poisoning is virtually unknown in industry, although the potential exists when the soluble forms are used. When ingested or given orally, the soluble ionized barium compounds exert a profound effect on all muscles and especially smooth muscles, markedly increasing their contractility. The heart rate is slowed and may stop in systole. Other effects are increased intestinal peristalsis, vascular construction, bladder contraction, and increased voluntary muscle tension.

Acute Effects:
Inhalation: May cause irritation to the nose, throat, and upper respiratory tract.
Ingestion: Causes severe irritation of the mouth, throat and esophagus.
Skin: Contact with skin can cause mild to moderate irritation. Contact with skin can lead to the development of a hypersensitivity (i.e. allergic) in susceptible individuals.
Eye: Can cause mild to moderate irritation to the ocular tissues.

Chronic Effects:
Severe irritation or burns.

Target Organs: Depending on the route, frequency, and duration of exposure, toxicity may occur in the following organs and/or systems: Respiratory System, Eye, Skin, Immune System (Allergic Reactions), Central Nervous System, and Heart.
Medical Conditions Generally Aggravated by Exposure: Respiratory system, skin, immune system and/or specific chemical allergies, central nervous system, and the heart.

Carcinogenicity: NTP: No IARC: No OSHA: No

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: Remove victim to fresh air. If symptoms develop seek immediate medical attention. If not breathing give artificial respiration.
INGESTION: Seek immediate medical attention.
SKIN: Immediately remove any contaminated clothing, carefully brush material off of skin, wash affected area with mild soap and water; seek medical attention if symptoms persist.
EYES: Contamination of the eyes should be treated by immediate and prolonged irrigation with copious amounts of water. Lift upper and lower eye lids frequently. Get prompt medical attention.

NOTE TO PHYSICIAN: Treatment should be directed at preventing absorption, administering to the symptoms as they occur, and providing supportive therapy.

VI REACTIVITY DATA

Stability: Stable

Conditions to Avoid: Water/moisture. Avoid friction, heat, sparks, and flame.

Incompatibility (Material to Avoid): Water or moisture, oxidizing agents, oxygen, acids, halocarbons, carbon dioxide, ammonia.

Hazardous Decomposition Products: Toxic fumes of hydrogen and barium oxide.

Hazardous Polymerization: Will not occur

VII SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled: Wear appropriate respiratory and protective equipment specified in section VIII. Isolate spill area and provide ventilation. Keep unprotected persons away. Shovel spilled product and place in a closed container for further handling and disposal. Do not flush to sewer, stream, or other bodies of water. Keep away from ignition sources.

Waste Disposal Method: Material in the elemental state should be recovered for reuse or recycling. Observe all federal, state & local regulations.

VIII SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type): Avoid breathing dust. Wear a NIOSH/MSHA approved dust respirator.

Ventilation: Provide adequate ventilation. Handle only in protective argon or helium atmosphere or under oil.

Protective Gloves: Leather-palmed, heat resistant gloves.

Eye Protection: Chemical splash goggles and a full face shield. An eye wash facility should be readily available.

Other Protective Equipment: The use of fire resistant outer clothing is advisable.

IX SPECIAL PRECAUTIONS

Precautions to Be Taken in Handling and Storage: Barium metal should be stored in tightly-closed containers under argon or helium atmosphere or a paraffin oil blanket. When handling, wear non-sparking shoes and flame resistant clothing. Avoid friction, heat, sparks, and flame. Use only non-sparking tools and utensils. Ground all equipment, vessels, tables, and other metallic objects that may come into contact with the product. Do not store together with acids, halogens and oxidizing agents. Store away from water/moisture.

Other Precautions: Can autoignite in air. Extremely sensitive to shock, heat, friction and static electricity. Rubber gloves, rubber protective clothing and apron, goggles and gas filter mask should be worn when working in a barium storage area.

Empty Container Precautions: This container is hazardous when empty. Do not use heat, sparks, open flame, torches, or cigarettes on or near empty container. Empty containers can retain product residues. Do not reuse empty container for food, clothing, or other products for human or animal consumption or where skin contact may occur.

Work Practices: Implement engineering and work practice controls to reduce and maintain concentration of exposure at low levels. Do not use tobacco or food in work area. Wash thoroughly after handling, especially before eating, drinking, smoking, or using restroom facilities. Contaminated clothing and shoes should be thoroughly cleaned before reuse. Do not blow dust off clothing or skin with compressed air. Maintain eyewash capable of sustained flushing, safety drench shower and facilities for washing.

Material Safety Data Sheet

I PRODUCT IDENTIFICATION

Ingredient Name: BENZENE
Ingredient CAS Number: 71-43-2
Ingredient CAS Code: M
OSHA PEL: 1 ppm
OSHA PEL Code: M
ACGIH TLV: 10 ppm
ACGIH TLV Code: M
ACGIH STEL: N/P
EPA Reporting Quantity: 10 LBS
DOT Reporting Quantity: 10 LBS
Ozone Depleting Chemical: N

II PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: 80 °C
Melting/Freezing Point: NA
Vapor Pressure: 100
Vapor Density: 2.77
Specific Gravity: 0.884
Solubility in Water: Negligible.
Appearance and Odor: Colorless liquid, aromatic hydrocarbon odor.
Percent Volatiles by Volume: 100

III STABILITY AND REACTIVITY

Stability Indicator: Yes
Materials to Avoid: Strong oxidants.
Hazardous Decomposition Products: NP

IV HEATLTH HAZARDS

Acute and Chronic Effects of Exposure: Eye irritation if in vapor. Dizziness, nausea, incoordination, stupor, unconsciousness, and change in blood composition.

Medical Conditions Aggravated by Exposure: Unknown.

Route of Entry Indicators: Inhalation: NP, Skin: NP, Ingestion: NP
Carcinogenicity Indicators: NTP: NP, IARC: NP, OSHA: NP

V FIRST AID, FIRE FIGHTING PROCEDURES, AND SPILL RELEASE PROCEDURES

First Aid:
Eye: Immediately flush with copious amounts of water for at least 15 minutes. Get medical attention immediately.
Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Fire Fighting Procedures:
Use NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing if involved in fire. Water fog to cool exposed containers.
Unusual Fire or Explosion Hazard: Burns vigorously and emits acid fumes.
Extinguishing Media: Foam, carbon dioxide, dry chemical.
Flash Point: -11 °C
Autoignition Temperature: N/A Lower Limit(s): 1.3, Upper Limit(s): 7.9

Spill Release Procedures:

Use NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing. Protect from ignition.

VI EXPOSURE CONTROLS AND PERSONAL PROTECTION

Respiratory Protection: NIOSH/MSHA approved respirator.

Ventilation: Mechanical exhaust required.

Protective Gloves: Rubber.

Eye Protection: Goggles or face mask.

Other Protective Equipment: As required to prevent skin contact.

VII DISPOSAL CONSIDERATIONS

Burn under controlled conditions. Observe all federal, state, and local laws and regulations.

Material Safety Data Sheet

I PRODUCT IDENTIFICATION

Ingredient Name: CARBON DISULFIDE
Ingredient CAS Number: 75-15-0
Ingredient CAS Code: M
OSHA PEL: 20 ppm
OSHA PEL Code: M
ACGIH TLV: 10 ppm
ACGIH TLV Code: M
ACGIH STEL: N/P
EPA Reporting Quantity: 100 LBS
DOT Reporting Quantity: 100 LBS
Ozone Depleting Chemical: N

II PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: 46.1 °C
Melting/Freezing Point: -111.5 °C
Vapor Pressure: 300 mmHg
Vapor Density: 2.6
Specific Gravity: 1.3
Solubility in Water: 0.22%
Appearance and Odor: Colorless to slightly yellow liquid, near odorless if pure, unpleasant if unpure.
Percent Volatiles by Volume: 100

III STABILITY AND REACTIVITY

Stability Indicator: Yes
Materials to Avoid: Aluminum powders, azides, chlorine, fluorine, rust, nitric oxide, oxidizers, plastic, potassium, sodium, zinc, phenyl copper.
Stability Conditions to Avoid: Heat, sparks, or flames. Containers can explode in heat of fire. Vapor explosion and poison hazard in and outdoors or sewer.
Hazardous Decomposition Products: Thermal decomposition may include oxides of sulfur and carbon.

IV HEATLTH HAZARDS

Acute and Chronic Effects of Exposure: May cause hypotension, hallucinations, dermatitis, eye irritation, conjunctivitis, blurred vision, irregular breathing, deep unconsciousness, lack of corneal and tendon reflexes, liver and kidney damage, retrobular neuritis, erythema, exfoliation, second degree burns, numb lips, tremors, coma, and death.

Signs and Symptoms of Overexposure: May cause headache, dizziness, nausea, coughing, labored breathing, cyanosis, drowsiness, confusion, skin redness, pain, vomiting, fatigue, disorientation, cardiac arrhythmias, peripheral vascular collapse, mydriasis, hyperesthesia, light intoxication, giddiness, muscular pain, ataxia, staggering gait, and hearing loss.

Medical Conditions Aggravated by Exposure: Unknown.

Route of Entry Indicators: Inhalation: yes, Skin: yes, Ingestion: yes
Carcinogenicity Indicators: NTP: No, IARC: No, OSHA: No

V FIRST AID, FIRE FIGHTING PROCEDURES, AND SPILL RELEASE PROCEDURES

First Aid:
Eye: Immediately flush with copious amounts of water for at least 15 minutes. See doctor immediately.
Skin: Immediately wash with soap and copious amounts of water. Remove soiled clothing. Get medical advice.
Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. See doctor immediately.
Ingestion: If conscious, remove by gastric lavage or emisis. Give oxygen if respiration is depressed. Get immediate medical attention.

Fire Fighting Procedures:
Use NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing if involved in fire. Move containers from fire area if possible. Dike fire control water. Do not scatter material. Cool fire exposed containers with water from side.
Unusual Fire or Explosion Hazard: Dangerous fire and explosion hazard when exposed to heat or flame. Vapors are heavier than air and may travel to a source of ignition and flash back.
Extinguishing Media: Dry chemical, carbon dioxide, halon, water spray or standard foam, for large fires use water spray, fog, or standard foam.
Flash Point: -30 °C
Autoignition Temperature: N/A Lower Limit(s): 1.0, Upper Limit(s): 50.0

Spill Release Procedures:

Shut off ignition sources. Do not touch spilled material. Take up with sand or other absorbent material and place into container for later disposal.

VI EXPOSURE CONTROLS AND PERSONAL PROTECTION

Respiratory Protection: NIOSH/MSHA approved respirator.

Ventilation: Provide explosion proof local exhaust or process enclosure ventilation to meet the published exposure limits.

Protective Gloves: Rubber.

Eye Protection: Splash-proof or dust resistant goggles.

Other Protective Equipment: Must wear appropriate protective (impervious) clothing and equipment to prevent skin contact with substance.

VII DISPOSAL CONSIDERATIONS

Disposal must be made in accordance with standard applicable to generators of hazardous waste, 40 CFR 262, EPA hazardous waste number P022.

MATERIAL SAFETY DATA SHEET

I PRODUCT IDENTIFICATION

Trade Name: Chromium
Synonym: Chromium Metal
Chemical Nature: Metallic Element
Formula: Cr
CAS #: 7440-47-3
Molecular Weight: 51.99

II HAZARDOUS INGREDIENTS

Hazardous Component: Chromium
%: 0-100%
OSHA/PEL: 1 mg(Cr)/m^3
ACGIH/TLV: .0.5 mg (Cr)/m^3

HMIS Ratings (0-4): Health: 2 Flammability: 3 Reactivity: 0
HMIS Protective Equipment: F: glasses, gloves, apron, dust mask.

III PHYSICAL DATA

Boiling Point 760 mm Hg: 2672 °C
Melting Point: 1857 °C
Vapor Density (Air = 1): N/A
Vapor Pressure (mm Hg): 1 mm at 1616 °C
% Volatiles by Weight: N/A
Solubility in H_2O: Insoluble
Specific Gravity (Water = 1): 7.19 g/cc
Appearance and Odor: Steel gray, lustrous metal, no odor.

IV FIRE AND EXPLOSION HAZARDS DATA

Flash Point (Method used): N/A
Autoignition Temperature: N/A
Flammable Limits: Lower: N/A Upper: N/A

Extinguishing Media: Non combustible except in powder form use water spray or fog, dry chemical extinguishing agents, carbon dioxide, dry sand.

Special Fire Fighting Procedures: Wear NIOSH/MSHA approved self contained breathing apparatus and protective clothing. Fumes from fire are hazardous. Isolate runoff to prevent environmental pollution.
Unusual Fire & Explosion Hazard: Ignites and is potentially explosive in atmospheres of carbon dioxide. Chromium reacts violently or explosively when heated with ammonium nitrate and bromine pentafluoride. It has an incandescent reaction with nitrogen oxide or sulfur dioxide. Powders prepared by evaporation of mercury form chromium amalgam may be pyrophoric.

V HEALTH HAZARD INFORMATION

Effects of Exposure: Chromium is a confirmed human carcinogen with experimental tumorigenic data. Also a human poison by ingestion with gastrointestinal effects.

Acute Effects:
Inhalation: May cause a red, dry throat.
Ingestion: May cause gastrointestinal disorders.
Skin: May cause abrasive irritation.
Eye: May cause abrasive irritation.

Chronic Effects:
Inhalation: May cause histologic fibrosis of lungs, nasal and/or lung cancer.
Ingestion: No chronic health effects recorded.
Skin: No chronic health effects recorded.
Eye: No chronic health effects recorded.

Target Organs: May affect the respiratory system.
Medical Conditions Generally Aggravated by Exposure: Pre-existing respiratory disorders, pulmonary functions and asthma.

Carcinogenicity: NTP: Yes IARC: Yes OSHA: Yes

EMERGENCY AND FIRST AID PROCEDURES:
INHALATION: Remove victim to fresh air. Keep warm and quiet, give oxygen if breathing is difficult and seek medical attention.
INGESTION: Give 1-2 glasses of milk or water and induce vomiting. Seek medical attention immediately. Never induce vomiting or give anything by mouth to an unconscious person.
SKIN: Remove contaminated clothing, brush material off skin, wash affected area with mild soap and water. Seek medical attention if symptoms persist.
EYE: Flush with lukewarm water, lifting upper and lower eyelids for at least 15 minutes. Seek medical attention if symptoms persist.

VI REACTIVITY DATA

Stability: Stable

Conditions to Avoid: Grinding, crushing, and melting may produce dust and fumes which may require control.

Incompatibility (Material to Avoid): Powder incompatible with ammonium nitrate, hydrogen peroxide, nitric oxide, potassium chlorate, sulfur dioxide, mercury. Otherwise, avoid strong oxidizing agents, ammonium nitrite, bromine pentafluoride and carbon dioxide.

Hazardous Decomposition Products: Toxic chromium oxides fumes.

Hazardous Polymerization: Will not occur.

VII SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled: Wear appropriate respiratory and protective equipment specified in Section VIII-Special Protection Information. Isolate spill area, provide ventilation and extinguish sources of ignition. Vacuum up spill using a high efficiency particulate absolute (HEPA) air filter and place in a closed container for proper disposal. Take care not to raise dust. Use non-sparking tools.

Waste Disposal Method: In accordance with Local, State and Federal Waste Disposal Regulations.

VIII SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type): NIOSH/MSHA approved respirator for dusts and mists.

Ventilation: Use local exhaust to maintain concentration at or below the PEL, TLV levels.

Protective Gloves: Rubber gloves.

Eye Protection: Safety Glasses

Other Protective Equipment: Protective gear suitable to prevent contamination.

IX SPECIAL PRECAUTIONS

Precautions to Be Taken in Handling and Storage: Store in cool, dry area. Store in tightly sealed container. Protect against physical damage. Store away from acids and oxidizers. Wash thoroughly after handling.

Precautionary Labeling: CAUTION! Do not swallow or inhale. Avoid contact with skin and eyes. Wash Thoroughly after handling. Keep container closed.

Work Practices: Implement engineering and work practice controls to reduce and maintain concentration of exposure. 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. Maintain eyewash capable of sustained flushing, safety drench shower and facilities for washing.

Material Safety Data Sheet

I PRODUCT IDENTIFICATION

Ingredient Name: CHRYSENE
Ingredient CAS Number: 218-01-9
Ingredient CAS Code: M
OSHA PEL: 0.2 ppm
OSHA PEL Code: M
ACGIH TLV: A2 9394
ACGIH TLV Code: M
ACGIH STEL: N/P
EPA Reporting Quantity: 100 LBS
DOT Reporting Quantity: 100 LBS
Ozone Depleting Chemical: N

II PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: 448 °C
Melting/Freezing Point: 254 °C
Vapor Pressure: N/K
Specific Gravity: 1.27
Solubility in Water: <0.1%
Appearance and Odor: White-pale yellow solid.
Percent Volatiles by Volume: N/K

III STABILITY AND REACTIVITY

Stability Indicator: Yes
Materials to Avoid: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon dioxide and carbon monoxide on combustion.

IV HEATLTH HAZARDS

Acute and Chronic Effects of Exposure: Cancer suspect agent, irritation, pulmonary edema, sensitizer, dermatitis, dizziness, nausea, convulsions, kidney and liver damage.

Medical Conditions Aggravated by Exposure: Unknown.

Route of Entry Indicators: Inhalation: yes, Skin: no, Ingestion: yes
Carcinogenicity Indicators: NTP: No, IARC: No, OSHA: No

V FIRST AID, FIRE FIGHTING PROCEDURES, AND SPILL RELEASE PROCEDURES

First Aid:
Eye: Immediately flush with copious amounts of water for at least 15 minutes. Seek medical assistance.
Skin: Immediately wash with water.
Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Ingestion: Give water and induce vomiting. Obtain medical assistance for gastric lavage.

Fire Fighting Procedures:
Use NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing if involved in fire.
Unusual Fire or Explosion Hazard: Cancer suspect.
Extinguishing Media: Carbon dioxide, dry chemical, alcohol foam.
Flash Point: Flash Point Text: N/K
Autoignition Temperature: N/A Lower Limit(s): N/A, Upper Limit(s): N/A

Spill Release Procedures:

Provide adequate ventilation. Carefully scoop up and transfer to a closed container.

VI EXPOSURE CONTROLS AND PERSONAL PROTECTION

Respiratory Protection: NIOSH/MSHA approved respirator.

Ventilation: Local exhaust, strong fumehood, avoid all contact.

Protective Gloves: Rubber.

Eye Protection: Chemical workers goggles.

Other Protective Equipment: Protective clothing. Provide safety showers and eyewash station near workplace.

VII DISPOSAL CONSIDERATIONS

Via licensed disposal company. Dispose of according to federal, state and local regulations and laws.

Material Safety Data Sheet

I PRODUCT IDENTIFICATION

Ingredient Name: ETHYLBENZENE
Ingredient CAS Number: 100-41-4
Ingredient CAS Code: M
OSHA PEL: 100 ppm
OSHA PEL Code: M
ACGIH TLV: 100 ppm
ACGIH TLV Code: M
ACGIH STEL: N/P
EPA Reporting Quantity: 1000 LBS
DOT Reporting Quantity: 1000 LBS
Ozone Depleting Chemical: N

II PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: 136 °C
Melting/Freezing Point: -95 °C
Vapor Pressure: 7.1 at 20 °C
Vapor Density: 0.887
Specific Gravity: N/K
Solubility in Water: Insoluble.
Appearance and Odor: Colorless liquid with an aromatic odor.
Percent Volatiles by Volume: N/K

III STABILITY AND REACTIVITY

Stability Indicator: Yes
Materials to Avoid: Strong oxidizing agents.
Hazardous Decomposition Products: Emits toxic fumes under fire conditions.

IV HEATLTH HAZARDS

Acute and Chronic Effects of Exposure: Can cause skin and eye irritation. May be harmful if absorbed through skin. May be harmful if inhaled. May be harmful if swallowed. Can be irritating to mucous membranes. Prolonged exposure may cause nausea, headache, dizziness and/or eye damage. Can cause nervous system injury. Dust and/or vapors. Can cause irritation to respiratory tract.

Medical Conditions Aggravated by Exposure: Unknown.

Route of Entry Indicators: Inhalation: yes, Skin: yes, Ingestion: yes
Carcinogenicity Indicators: NTP: No, IARC: No, OSHA: No

V FIRST AID, FIRE FIGHTING PROCEDURES, AND SPILL RELEASE PROCEDURES

First Aid:
Eye: Immediately flush with copious amounts of water for at least 15 minutes.
Skin: Immediately wash water. If no burns have occurred used soap and water to cleanse skin.
Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Ingestion: Get medical assistance immediately.

Fire Fighting Procedures:
Use NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing if involved in fire.
Extinguishing Media: Carbon dioxide, dry chemical powder or spray.
Flash Point: 22 °C
Autoignition Temperature: N/A Lower Limit(s): 1, Upper Limit(s): 6.7

Spill Release Procedures:

Evacuate area. Wear appropriate OSHA regulated equipment. Ventilate area. Absorb on vermiculite or similar material. Sweep up and place in an appropriate container. Hold for disposal. Wash contaminate D surfaces to remove residues.

VI EXPOSURE CONTROLS AND PERSONAL PROTECTION

Respiratory Protection: NIOSH/MSHA approved respirator.

Ventilation: This chemical should only be handled in a hood.

Protective Gloves: Impervious gloves.

Eye Protection: Chemical workers goggles.

VII DISPOSAL CONSIDERATIONS

Burn in a chemical incinerator equipped with an afterburner. Disposal must be in accordance with local, state and federal regulations.

Material Safety Data Sheet

I PRODUCT IDENTIFICATION

Ingredient Name: FLUORANTHENE
Ingredient CAS Number: 205-99-2
Ingredient CAS Code: M
OSHA PEL: N/K
OSHA PEL Code: M
ACGIH TLV: N/K
ACGIH TLV Code: M
ACGIH STEL: N/P
EPA Reporting Quantity: 1 LBS
DOT Reporting Quantity: 1 LBS
Ozone Depleting Chemical: N

II PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: N/K
Melting/Freezing Point: 334.4 °F
Vapor Pressure: N/K
Vapor Density: N/K
Specific Gravity: N/K
Solubility in Water: N/K
Appearance and Odor: Crystalline solid.
Percent Volatiles by Volume: N/K

III STABILITY AND REACTIVITY

Stability Indicator: Yes
Materials to Avoid: N/K
Hazardous Decomposition Products: N/K

IV HEATLTH HAZARDS

Acute and Chronic Effects of Exposure: N/K

Medical Conditions Aggravated by Exposure: N/K

Route of Entry Indicators: Inhalation: no, Skin: no, Ingestion: no.
Carcinogenicity Indicators: NTP: yes, IARC: yes, OSHA: no.

V FIRST AID, FIRE FIGHTING PROCEDURES, AND SPILL RELEASE PROCEDURES

First Aid:
Eye: Immediately flush with copious amounts of water for at least 15 minutes.
Skin: Immediately wash with copious amounts of water. If not burned wash with soap and water to cleanse.
Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Keep warm.
Ingestion: Don't give liquid or induce vomiting if unconscious or convulsing. If vomiting occurs, watch closely to avoid airway obstruction. Obtain medical attention in all cases.

Fire Fighting Procedures:
Use NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing if involved in fire.
Extinguishing Media: Carbon dioxide, dry chemical powder/spray.
Flash Point: N/K
Unusual Fire or Explosion Hazard: Extremely flammable. Vapors form explosive mix in air. Danger when exposed to heat, sparks, fame, or oxidants.
Autoignition Temperature: N/A, Lower Limit(s): N/K, Upper Limit(s): N/K

Spill Release Procedures:

Evacuate area. Wear appropriate OSHA regulated equipment. Ventilate area. Absorb on vermiculite/similar material. Sweep up and place in appropriate container/hold for disposal. Wash contaminated surfaces to remove any residues.

VI EXPOSURE CONTROLS AND PERSONAL PROTECTION

Respiratory Protection: NIOSH/MSHA approved respirator.

Ventilation: Chemical should be handled only in a hood.

Protective Gloves: N/K

Eye Protection: Eye shields.

Other Protective Equipment: N/K.

VII DISPOSAL CONSIDERATIONS

Burn in a chemical incinerator equipped with an afterburner and scrubber along with federal, state, and local regulations.

MATERIAL SAFETY DATA SHEET

I PRODUCT IDENTIFICATION

Trade Name: Lead
Synonym: Lead Metal
Chemical Nature: Metallic Element
Formula: Pb
CAS #: 7439-92-1
Formula Weight: 207.20

II HAZARDOUS INGREDIENTS

Hazardous Component: Lead
%: 0-100%
OSHA/PEL: 0.5 mg(Pb)/m^3
ACGIH/TLV: .15 mg (Pb)/m^3
Other Limits: AL 30 ug/m^3

HMIS Ratings (0-4): Health: 4 Flammability: 0 Reactivity: 0
HMIS Protective Equipment: F: glasses, gloves, apron, dust mask.

III PHYSICAL DATA

Boiling Point 760 mm Hg: 1740 °C
Melting Point: 327.5 °C
Vapor Density (Air = 1): N/A
Vapor Pressure (mm Hg): 1 mm at 973 °C
% Volatiles by Weight: N/A
Solubility in H_2O: Insoluble
Specific Gravity (Water = 1): 11.3437 at 16 °C
Evaporation Rate: 0
Appearance and Odor: Silver-blue, white pieces and powder, no odor

IV FIRE AND EXPLOSION HAZARDS DATA

Flash Point (Method used): N/A
Autoignition Temperature: N/A
Flammable Limits: Lower: N/A Upper: N/A
Flammability: Non-flammable

Extinguishing Media: Use suitable extinguishing media for surrounding materials and type of fire.
Special Fire Fighting Procedures: Firefighters must wear full face, self-contained breathing apparatus with full protective clothing to prevent contact with skin and eyes. Fumes from fire are hazardous. Isolate runoff to prevent environmental pollution.
Unusual Fire & Explosion Hazard: When heated to decomposition, lead may emit toxic fumes of lead oxide.

V HEALTH HAZARD INFORMATION

Routes of Entry: Inhalation, Ingestion.

Effects of Over Exposure: Some lead compounds are experimental neoplastigens and tumorigens. Lead poisoning is one of the commonest of occupational diseases. The lead must be in such form, and so distributed, as to gain entrance into the body or tissues of the worker in measurable quantity, otherwise no exposure can be said to exist. Some lead compounds are carcinogens of the lungs and kidneys. Lead is a cumulative poison. Increasing amounts build up in the body and eventually reach a point where symptoms and disability occur. Chronic exposure may cause damage to nervous, urinary, blood forming and reproductive systems.

Acute Effects:
Inhalation: May cause irritation to the upper respiratory system, insomnia, dryness of the mouth and a metallic taste.
Ingestion: May cause constipation and abdominal pain, colic, tremors, nausea, vomiting, diarrhea, metallic taste, loss of appetite, irritability and muscle pain. May cause acute lead toxicity.
Skin: May cause irritation.
Eye: May cause irritation.

Chronic Effects:
Inhalation: May cause chronic lead toxicity. May be toxic to the central and peripheral nervous system affecting the cerebellum, spinal cord, motor and sensory nerves.
Ingestion: May cause anemia, gingival lead line, paralysis in the wrist and permanent neurological injury. May cause chronic lead toxicity. May cause nephritis, scarring and shrinking of the kidney tissue.
Skin: No chronic health effects recorded.
Eye: No chronic health effects recorded.

Target Organs: May affect the gastrointestinal tract, central nervous system, kidneys, blood, skin and the gingival tissue.

Medical Conditions Generally Aggravated by Exposure: Pre-existing lung and circulatory disorders.

Carcinogenicity: NTP: No IARC: No OSHA: Yes

EMERGENCY AND FIRST AID PROCEDURES:
INHALATION: Remove victim to fresh air; keep warm and quiet; give oxygen if breathing is difficult and seek medical attention immediately.
INGESTION: Give 1-2 glasses of milk or water and induce vomiting; seek medical attention immediately. Never induce vomiting or give anything by mouth to an unconscious person.
SKIN: Remove any contaminated clothing, brush material off of skin, wash affected area with mild soap and water; seek medical attention if symptoms persist.
EYES: Flush eyes with lukewarm water, lifting upper and lower eyelids, for at least 15 minutes. Seek medical attention if symptoms persist.

VI REACTIVITY DATA

Stability: Stable

Conditions to Avoid: Powdered metal in contact with heat.

Incompatibility (Material to Avoid): Strong oxidizing agents, hydrogen peroxide, sodium acetylide and nitric acid and rubber.

Hazardous Decomposition Products: Fumes of lead oxide.

Hazardous Polymerization: Will not occur

VII SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled: Wear appropriate and protective equipment specified in section VIII. Isolate spill area and provide ventilation. Vacuum up spill using a high efficiency particulate absolute (HEPA) air filter and place in a closed container for proper disposal. Take care not to raise dust.

Waste Disposal Method: In accordance with Local, State and Federal Waste Disposal Regulations.

VIII SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type): Filter - Dust, Fume, Mist. When working with powder use a NIOSH/MSHA approved respirator.

Ventilation: Use local exhaust to control dust and maintain concentration at or below the TLV, PEL. Mechanical exhaust is not recommended.

Protective Gloves: Rubber gloves.

Eye Protection: Safety Glasses

Other Protective Equipment: Protective gear suitable to prevent contamination.

IX SPECIAL PRECAUTIONS

Precautions to Be Taken in Handling and Storage: Store in a tightly sealed container in a cool, dry, well-ventilated area. Wash thoroughly after handling.

Work Practices: Implement engineering and work practice controls to reduce and maintain concentration of exposure at low levels. 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.

MATERIAL SAFETY DATA SHEET

I PRODUCT IDENTIFICATION

Trade Name: Mercury
Synonym: Metallic Mercury, Quicksilver
Chemical Nature: Metallic Element
Formula: Hg
CAS #: 7439-97-6

II HAZARDOUS INGREDIENTS

Hazardous Component: Lead
%: 0-100%
OSHA/PEL: 0.1 mg(Hg)/m^3 (ceiling)
ACGIH/TLV: 0.025 mg (Hg)/m^3 (vapor, skin)

HMIS Ratings (0-4): Health: 2 Flammability: 0 Reactivity: 0

III PHYSICAL DATA

Boiling Point 760 mm Hg: 356.9 °C
Melting Point: 38.87 °C
Vapor Density (Air = 1): 7.0
Vapor Pressure (mm Hg): 0.0012 mm at 20 °C
% Volatiles by Weight: N/A
Solubility in H_2O: Insoluble
Specific Gravity (Water = 1): 13.456 g/cc
Appearance and Odor: Silver-white, heavy, mobile, liquid metal.

IV FIRE AND EXPLOSION HAZARDS DATA

Flash Point (Method used): N/A
Autoignition Temperature: N/A
Flammable Limits: Lower: N/A Upper: N/A

Extinguishing Media: Use suitable extinguishing media for surrounding materials and type of fire.
Special Fire Fighting Procedures: Firefighters must wear full face, self-contained breathing apparatus with full protective clothing to prevent contact with skin and eyes. Move containers from area if possible. Cool containers exposed

to flames with water from side until well after fire is out. Use agents suitable for type of fire. Use water in flooding amounts as a fog. Avoid breathing corrosive and poisonous vapors. Keep upwind.
Unusual Fire & Explosion Hazard: May burn but does not ignite readily. Flammable, poisonous gases may accumulate in tanks and hopper cars. May ignite combustibles (wood, paper, oil). May emit toxic mercury and mercury oxide vapors.

V HEALTH HAZARD INFORMATION

Effects of Over Exposure: Elemental mercury, liquid and vapor, is toxic due to its liquid solubility, lack of charge, and membrane permeability. Inhaled vapors (80%) diffuse rapidly through alveolar membranes into the blood and are systemically transported to body tissues, including the brain. Exposure to high concentrations (>1.2 mg/m3) of vapors for brief periods can cause pneumonitis, chest pains, dyspnea, coughing. Later, stomatitis, gingivitis, and salivation occur. Mercury can be absorbed slowly through the skin. Chronic symptoms involve the central nervous system, with tremors and various neuropsychiatric disturbances. The TLV would be exceeded if the contents of a small mercury clinical thermometer were dispersed in a closed 100' × 100' × 15' room. Gastrointestinal uptake of mercury is low (<5%).

Acute Effects:
Inhalation: Inhalation of a high concentration of mercury vapor can cause almost immediate dyspnea, cough, fever, nausea and vomiting, diarrhea, stomatitis, salivation and metallic taste. Symptoms may resolve or may progress to necrotizing bronchiolitis, pneumonitis, pulmonary edema, and pneumothorax.
Ingestion: When ingested, necrosis begins immediately in the mouth, throat, esophagus and stomach. Within a few minutes, violent pain, profuse vomiting, and severe purging may occur. Patient may die within a few minutes from fluid/electrolyte losses and peripheral vascular collapse, but death (from uremia) is usually delayed 5 to 12 days.
Skin: May cause redness and irritation. Substance may be absorbed through intact skin causing anuria.
Eye: Contact may cause irritation. Solutions are corrosive and may cause corneal injury or burns.

Chronic Effects:
Inhalation: Inhalation of mercury vapor or dusts over a long period causes mercurialism. Findings extremely variable and include tremors, salivation, stomatitis, loosening of teeth, blue lines on gums, pain and numbness in extremities, nephritis, diarrhea, anxiety, headache, weight loss, anorexia, mental depression, insomnia, irritability and instability, hallucinations and evidence of mental deterioration.
Ingestion: No data
Skin: No data
Eye: Mercury may be deposited in the lens of the eye, causing visual disturbances.

EMERGENCY AND FIRST AID PROCEDURES:
INHALATION: Remove to fresh air, give oxygen if breathing is difficult. Seek medical attention.
INGESTION: Gastric lavage with 5% solution of sodium formaldehyde sulfoxylate, followed by 2% NaHO3, and finally leave 250 cc of the sodium formaldehyde sulfoxylate in the stomach.
SKIN: Remove contaminated clothing. Wash affected area with soap and water. Seek medical attention.
EYE: Flush with running water, including under eyelids, for at least 15 minutes. Seek medical attention.

VI REACTIVITY DATA

Stability: Stable

Conditions to Avoid: Thermal decomposition.

Incompatibility (Material to Avoid): Violent reaction: acetylenic compounds, ammonia, boron, diiodophosphide, ethylene oxide, metals (aluminum, potassium, lithium, sodium, rubidium) methyl azide, methyl silane, oxygen, oxidants (bromine, peroxyformic acid, chlorine dioxide, nitric acid, tetracarbonylnickel, nitromethane, silver perchlorate).

Hazardous Decomposition Products: Toxic mercury vapors and mercury oxides.
Hazardous Polymerization: Will not occur

VII SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled: DO NOT TOUCH SPILLED MATERIAL. Stop leak if you can do it without risk. For small spills, take up with sand or other absorbent material and place into containers for later disposal. A mercury spill kit may also be used for small spills in the workplace. For larger spills, dike far ahead of spill for later disposal. Keep unnecessary people away. Isolate hazard area and deny entry.

Waste Disposal Method: In accordance with Local, State and Federal Waste Disposal Regulations.

VIII SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type): Self-contained breathing apparatus can be used up to 5 mg/m3 with a full face piece above 1 mg/m3. Positive pressure-type air supplied breathing equipment has been recommended above 5 mg/m3.

Ventilation: Minimize vapor exposure by using a local exhaust. Operations requiring an exposed mercury surface should reduce the temperature of mercury to limit vaporization. General exhaust is recommended.

Protective Gloves: Wear rubber gloves.

Eye Protection: Chemical safety glasses.

Other Protective Equipment: Wear protective clothing appropriate for the work situation. Separate work and street clothing. Store work clothing in special lockers. Showers to be taken before changing to street clothes.

IX SPECIAL PRECAUTIONS

Precautions to Be Taken in Handling and Storage: Store in closed unbreakable containers (polyethylene) in a cool, dry, well-ventilated area away from sources of heat. Protect containers from physical damage.

Work Practices: Implement engineering and work practice controls to reduce and maintain concentration of exposure. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating or smoking. Shower and change clothes at the end of the work shift. Do not blow dust off clothing or skin with compressed air. Maintain eyewash capable of sustained flushing, safety drench shower and facilities for washing.

Other Precautions: Mercury evaporates very slowly. Spilled mercury forms many tiny globules that will evaporate faster than a single pool and can develop a significant concentration of vapors in an unventilated area. Such vapors can be poisonous, especially if breathed over a long period of time. Heated mercury evolves high levels of toxic vapors. Provide replacement and periodic medical exams for those regularly exposed to mercury, with emphasis directed to central nervous system, skin, lungs, liver, kidneys and gastrointestinal tract.

Material Safety Data Sheet

I PRODUCT IDENTIFICATION

Ingredient Name: METHYLENE CHLORIDE
Ingredient CAS Number: 75-09-2
Ingredient CAS Code: M
OSHA PEL: 25 ppm
OSHA PEL Code: M
ACGIH TLV: 50 ppm
ACGIH TLV Code: M
ACGIH STEL: N/P
EPA Reporting Quantity: 1000 LBS
DOT Reporting Quantity: 1000 LBS
Ozone Depleting Chemical: N

II PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: 40 °C
Melting/Freezing Point: -97 °C
Vapor Pressure: 400 at 75 °F
Vapor Density: 2.9
Specific Gravity: 1.33
Solubility in Water: 1.32% at 20 °C
Appearance and Odor: Clear liquid, chloroform like odor.
Percent Volatiles by Volume: N/K

III STABILITY AND REACTIVITY

Stability Indicator: Yes
Materials to Avoid: Strong oxidizing agents, strong caustics, plastic, rubber, nitric acid, water and heat. Chemically active metal, aluminum and magnesium powder, sodium, lithium, and potassium. Liquid methylene chloride will attack some forms of plastic.
Stability Conditions to Avoid: Moisture, heat, open flames, ignition sources, electrical arcs and incompatible materials.
Hazardous Decomposition Products: Hydrochloric acid, carbon monoxide, carbon dioxide, phosgene may be formed.

IV HEATLTH HAZARDS

Acute and Chronic Effects of Exposure: Target organs are central nervous system, liver, and heart. Acute effects: can cause eye irritation, damage. Prolonged skin contact: causes burns. May be absorbed through skin. Inhalation causes narcotic, central nervous system and cardiovascular system EFF ECTS. Ingestion may cause central nervous system depression, vomiting, aspiration hazard. Chronic liver, kidney, central nervous system effects, dermatitis.

Signs and Symptoms of Overexposure: Irritation, nausea, vomiting, headache, dizziness, skin defatting, dermatitis, pain, burns.

Medical Conditions Aggravated by Exposure: Persons with pre-existing skin disorders or eye problems or impaired liver, kidney, cardiovascular or respiratory function may be more susceptible to the effects of the substance.

Route of Entry Indicators: Inhalation: yes, Skin: yes, Ingestion: no
Carcinogenicity Indicators: NTP: yes, IARC: yes, OSHA: no

V FIRST AID, FIRE FIGHTING PROCEDURES, AND SPILL RELEASE PROCEDURES

First Aid:
Eye: Immediately flush with copious amounts of water for at least 15 minutes. Hold eyelids open.
Skin: Immediately wash with soap and copious amounts of water. Wash contaminated clothing before reuse.
Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Ingestion: If conscious, drink plenty of water. Seek immediate medical attention. If vomiting occurs keep head below hips. Do not give anything by mouth to an unconscious person.

Get medical help if symptoms persist.

Fire Fighting Procedures:
Use NIOSH/MSHA approved self-contained breathing apparatus to prevent contact with thermal decomposition products (phosgene and hydrogen chloride gases) and full protective clothing if involved in fire. Firefighters clothing provides only limited protection to the combustible products of this material.
Unusual Fire or Explosion Hazard: Concentrated material can be ignited by a high intensity ignition source such as welders' torches and the like. Vapor may form flammable mixtures in the air. Sealed containers may rupture when heated.
Extinguishing Media: Small fire use water spray, dry chemicals, carbon dioxide or chemical foam.
Flash Point: N/K

Autoignition Temperature: 556 ° C, Lower Limit(s): 12, Upper Limit(s): 23

Spill Release Procedures:

Wear protective gear. Remove open flames. Ventilate area. Absorb spill with vermiculite or other inert material. Place in a container for chemical waste. Wash area with soapy water to remove residue. Collect water rinses in appropriate container.

VI EXPOSURE CONTROLS AND PERSONAL PROTECTION

Respiratory Protection: NIOSH/MSHA approved respirator for chlorinated solvents or organic vapor if TLV is exceeded. Do not use absorbers such as soda lime.

Ventilation: Use general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Protective Gloves: Neoprene.

Eye Protection: Chemical safety goggles/safety glasses.

Other Protective Equipment: Protective clothing to prevent skin exposure. Clothing should be impervious to material. Do not use rubber or PVC clothing. Neoprene apron. Have available water/drench system to flush material from skin.

VII DISPOSAL CONSIDERATIONS

Discharge, treatment, or disposal is subject to federal, state, or local regulations. Can be incinerated. Contract with a licensed chemical disposal agency. Since emptied containers retain product residue, follow label warnings.

Material Safety Data Sheet

I PRODUCT IDENTIFICATION

Ingredient Name: METHYL TERT-BUTYL ETHER
Ingredient CAS Number: 1634-04-4
Ingredient CAS Code: M
OSHA PEL: Not Established
OSHA PEL Code: M
ACGIH TLV: Not Established
ACGIH TLV Code: M
ACGIH STEL: N/P
EPA Reporting Quantity: 1 LBS
DOT Reporting Quantity: 1 LBS
Ozone Depleting Chemical: N

II PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: 55 °C
Melting/Freezing Point: -109 °C
Vapor Pressure: N/K
Vapor Density: N/K
Specific Gravity: 0.74
Solubility in Water: Moderate
Appearance and Odor: Clear, colorless liquid with turpene odor.
Percent Volatiles by Volume: N/K

III STABILITY AND REACTIVITY

Stability Indicator: Yes
Materials to Avoid: Strong oxidizing agents, viton, flourel.
Stability Conditions to Avoid: Sources of ignition and contact with incompatibles.
Hazardous Decomposition Products: Carbon monoxide and other toxic vapors.

IV HEATLTH HAZARDS

Acute and Chronic Effects of Exposure: Acute: contact may cause minor skin and eye irritation, swallowing large amounts may cause mild gastro-intestinal

tract irritation. Chronic: prolonged or repeated inhalation of vapor may cause irritation of respiratory tract and central nervous system effects.

Signs and Symptoms of Overexposure: Inhalation can cause coughing, shortness of breath, dizziness, intoxication. Eye exposure can cause redness, tearing, discomfort. Skin contact can cause a rash, itching. Ingestion can cause nausea and vomiting.

Medical Conditions Aggravated by Exposure: Medical information regarding special health effects is not conclusive.

Route of Entry Indicators: Inhalation: no, Skin: yes, Ingestion: yes.
Carcinogenicity Indicators: NTP: no, IARC: no, OSHA: no.

V FIRST AID, FIRE FIGHTING PROCEDURES, AND SPILL RELEASE PROCEDURES

First Aid:
Eye: Immediately flush with copious amounts of water for at least 15 minutes while holding eyelids open.
Skin: Immediately wash with soap and copious amounts of water. Wash contaminated clothing before reuse.
Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Ingestion: Do not induce vomiting. If conscious give lukewarm water. Get immediate medical attention.

Fire Fighting Procedures:
Use NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing if involved in fire.
Extinguishing Media: Dry chemicals, carbon dioxide, alcohol foam, or water fog (for cooling).
Flash Point: -30C
Unusual Fire or Explosion Hazard: Extremely flammable. Heat may build pressure/rupture closed containers.
Autoignition Temperature: 797 ° F, Lower Limit(s): 2.1, Upper Limit(s): 10.5

Spill Release Procedures:

Eliminate all sources of ignition. Contain spill. Wear proper protective equipment. Isolate and deny entry. Pump large spill to salvage truck or containers. Absorb small spill with inert materials and place in a container for later disposal.

VI EXPOSURE CONTROLS AND PERSONAL PROTECTION

Respiratory Protection: None normally required. Use of NIOSH/MSHA approved respirator in confined space or emergency situations in recommended.

Ventilation: Mechanical exhaust required.

Protective Gloves: PVA or Butyl.

Eye Protection: Safety glasses/chemical splash goggles.

Other Protective Equipment: Eye wash station and safety shower, boots, apron should be worn.

VII DISPOSAL CONSIDERATIONS

Observe all federal, state, and local laws and regulations.

Material Safety Data Sheet

I PRODUCT IDENTIFICATION

Ingredient Name: NAPHTHALENE
Ingredient CAS Number: 91-20-3
Ingredient CAS Code: M
OSHA PEL: 10ppm
OSHA PEL Code: M
ACGIH TLV: 10 ppm
ACGIH TLV Code: M
ACGIH STEL: N/P
EPA Reporting Quantity: 100 LBS
DOT Reporting Quantity: 100 LBS
Ozone Depleting Chemical: N

II PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: 218 °C
Melting/Freezing Point: 80 °C
Vapor Pressure: 0.5 at 20 °C
Vapor Density: 4.42
Specific Gravity: 1.14
Solubility in Water: Negligible.
Appearance and Odor: White crystalline solid, odor of moth balls.
Percent Volatiles by Volume: NA

III STABILITY AND REACTIVITY

Stability Indicator: Yes
Materials to Avoid: Strong oxidizing agents.
Stability Conditions to Avoid: Heat, sparks, sources of ignition, and open flame.
Hazardous Decomposition Products: Carbon dioxide, carbon monoxide.

IV HEATLTH HAZARDS

Acute and Chronic Effects of Exposure: Acute: eye/skin irritation, no identified effects of inhalation, skin absorption may be harmful, ingestion may cause headache, nausea, vomiting, dizziness, gastrointestinal irritation. Chronic: no identified.

Signs and Symptoms of Overexposure: Irritation of eye and skin. Orally consumed may cause headache, nausea, vomiting, dizziness, gastrointestinal irritation.

Medical Conditions Aggravated by Exposure: Unknown.

Route of Entry Indicators: Inhalation: yes, Skin: yes, Ingestion: no
Carcinogenicity Indicators: NTP: no, IARC: no, OSHA: no.

V FIRST AID, FIRE FIGHTING PROCEDURES, AND SPILL RELEASE PROCEDURES

First Aid:
Eye: Flush with water for 15 minutes, holding eyelids open.
Skin: Wash wish soap and water.
Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Ingestion: Do not induce vomiting. Get immediate medical attention.

Get medical attention if symptoms persist.

Fire Fighting Procedures:
Use NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing if involved in fire. Wear full facepiece operated in the positive pressure mode.
Extinguishing Media: Water spray, carbon dioxide, foam/dry chemical. Water spray may be used to keep fire exposed containers cool and flush spills away.
Flash Point: Flash Point Text: -88C
Unusual Fire or Explosion Hazard: Closed containers exposed to heat may explode. Contact with strong oxidizers may cause fire or explosion.
Autoignition Temperature: 979 ° F, Lower Limit(s): 0.9, Upper Limit(s): 5.9

Spill Release Procedures:

Wear suitable protective clothing. Shut off ignition sources. Ventilate area. With clean shovel, carefully place material into clean, dry container and cover. Remove from area. Flush spill area with water.

VI EXPOSURE CONTROLS AND PERSONAL PROTECTION

Respiratory Protection: A chemical cartridge respirator with organic vapor cartridge is recommended at concentrations up to 500 ppm. Above this level use

a NIOSH/MSHA approved respirator.

Ventilation: Mechanical exhaust required.

Protective Gloves: Rubber.

Eye Protection: Safety glasses/Faceshield.

Other Protective Equipment: Safety shower and eye bath. Other equipment as required to minimize exposure from prolonged or repeated contact.

VII DISPOSAL CONSIDERATIONS

Dispose of in accordance with all local, state, and federal regulations.

Material Safety Data Sheet

I PRODUCT IDENTIFICATION

Ingredient Name: PYRENE
Ingredient CAS Number: 129-00-0
OSHA PEL: 8H TWA 0.2 mg/m^3

II PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: 390.0-395.0 °C
Melting/Freezing Point: 151 °C
Vapor Pressure: NA
Vapor Density: NA
Specific Gravity: 1.21 g/cm^3
Solubility in Water: NA
Appearance and Odor: White, fine crystal solid.
Percent Volatiles by Volume: NA

III STABILITY AND REACTIVITY

Stability Indicator: Yes
Materials to Avoid: Strong oxidizing agents.
Stability Conditions to Avoid: Heat, sparks, and open flame.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

IV HEATLTH HAZARDS

Acute and Chronic Effects of Exposure: Readily absorbed through skin. Target organs are blood, liver, and kidneys. Skin contact may cause skin irritation. Eye contact may cause irritation. May be harmful if inhaled. Materials may be irritation to mucous membranes and upper respiratory tract. May be harmful if swallowed.

Signs and Symptoms of Overexposure: Inhalation may cause hepatic, pulmonary, and intragastric pathological changes. Neutrophil, leukocyte, and erythrocyte levels also decrease. Cutaneous application may cause hyperemia, weight loss, and hematopoietic changes and dermatitis. Chronic effects include leukocytosis.

Medical Conditions Aggravated by Exposure: Unknown.

V FIRST AID, FIRE FIGHTING PROCEDURES, AND SPILL RELEASE PROCEDURES

First Aid:
Eye: Immediately flush with copious amounts of water for at least 15 minutes, holding eyelids open.
Skin: Immediately wash with soap and copious amounts of water. Wash contaminated clothing before reuse.
Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Ingestion: If swallowed wash out mouth with water provided the person is conscious. Get medical attention.

Fire Fighting Procedures:
Use NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing if involved in fire.
Extinguishing Media: Water spray, carbon dioxide, dry chemical powder, or appropriate foam.
Flash Point: Flash Point Text: 200 °C
Unusual Fire or Explosion Hazard: Emits toxic fumes under fire conditions.
Autoignition Temperature: NA, Lower Limit(s): NA, Upper Limit(s): NA

Spill Release Procedures:

Exercise appropriate precautions to minimize direct contact with skin or eyes and prevent inhalation of dust. Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

VI EXPOSURE CONTROLS AND PERSONAL PROTECTION

Respiratory Protection: Dusk mask.

Protective Gloves: Protective gloves.

Eye Protection: Chemical safety glasses.

VII DISPOSAL CONSIDERATIONS

Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an after burner and scrubber. Observe all federal, state, and local environmental regulations.

Material Safety Data Sheet

I PRODUCT IDENTIFICATION

Ingredient Name: TOLUENE
Ingredient CAS Number: 108-88-3
Ingredient CAS Code: M
OSHA PEL: 200ppm
OSHA PEL Code: M
ACGIH TLV: 50ppm
ACGIH TLV Code: M
ACGIH STEL: N/P
EPA Reporting Quantity: 1000 LBS
DOT Reporting Quantity: 1000 LBS
Ozone Depleting Chemical: N

II PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: 110.7 °C
Melting/Freezing Point: NA
Vapor Pressure: 36
Vapor Density: 3.1
Specific Gravity: 0.86
Solubility in Water: Negligible.
Appearance and Odor: White paste, organic sulfide odor.
Percent Volatiles by Volume: 14

III STABILITY AND REACTIVITY

Stability Indicator: NP
Materials to Avoid: NP
Stability Conditions to Avoid: NP
Hazardous Decomposition Products: NP

IV HEATLTH HAZARDS

Acute and Chronic Effects of Exposure: NP

Medical Conditions Aggravated by Exposure: NP

Route of Entry Indicators: NP

Carcinogenicity Indicators: NP

V FIRST AID, FIRE FIGHTING PROCEDURES, AND SPILL RELEASE PROCEDURES

First Aid: NP

Fire Fighting Procedures:
Water not recommended.
Extinguishing Media: Carbon dioxide, foam, dry chemical.
Flash Point: Flash Point Text: 66 °F
Unusual Fire or Explosion Hazard: Volatile solvent.
Autoignition Temperature: Lower Limit(s): 1.3, Upper Limit(s): 7

Spill Release Procedures: NP

VI EXPOSURE CONTROLS AND PERSONAL PROTECTION

Respiratory Protection: NP

Ventilation: NP

Protective Gloves: NP

Eye Protection: NP

Other Protective Equipment: NP

VII DISPOSAL CONSIDERATIONS

Observe all federal, state, and local laws and regulations and contact the appropriate agency before disposal.

Material Safety Data Sheet

I PRODUCT IDENTIFICATION

Ingredient Name: XYLENES (m, p, o)
Ingredient CAS Number: 1330-20-7
Ingredient CAS Code: M
OSHA PEL: 100ppm
OSHA PEL Code: M
ACGIH TLV: 100ppm
ACGIH TLV Code: M
ACGIH STEL: N/P
EPA Reporting Quantity: 1000 LBS
DOT Reporting Quantity: 1000 LBS
Ozone Depleting Chemical: N

II PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: 278-288 °F
Melting/Freezing Point: NA
Vapor Pressure: 9.5
Vapor Density: 9.5
Specific Gravity: 0.87
Solubility in Water: Negligible.
Appearance and Odor: Clear and aromatic.
Percent Volatiles by Volume: 100

III STABILITY AND REACTIVITY

Stability Indicator: Yes
Materials to Avoid: Strong oxidizers.
Stability Conditions to Avoid: Heat, sparks, and open flame.
Hazardous Decomposition Products: Thermal decomposition may yield carbon monoxide.

IV HEATLTH HAZARDS

Signs and Symptoms of Overexposure: Severe eye irritation, drying of skin, excessive inhalation causes headache, dizziness and nausea.

Medical Conditions Aggravated by Exposure: Unknown.

Route of Entry Indicators: NP
Carcinogenicity Indicators: NP

V FIRST AID, FIRE FIGHTING PROCEDURES, AND SPILL RELEASE PROCEDURES

First Aid:
Eye: Immediately flush with copious amounts of water for at least 15 minutes.
Skin: Immediately wash with mild soap and copious amounts of water. Apply skin cream.
Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Fire Fighting Procedures:
Use NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing if involved in fire.
Extinguishing Media: Water spray, carbon dioxide, foam, dry chemical
Flash Point: Flash Point Text: 27.8 °C
Unusual Fire or Explosion Hazard: Containers may explode in heat of fire.
Autoignition Temperature: NA, Lower Limit(s): 1.1, Upper Limit(s): 7.0

Spill Release Procedures:

Evacuate unprotected persons. Eliminate ignition sources. Stop leak immediately. Spray with water to cool and divert/contain spill from fire/heat. Provide ventilation. Absorb with commercial absorbent, shovel into metal drums. For a large spill dike with commercial absorbent, pump into covered drums.

VI EXPOSURE CONTROLS AND PERSONAL PROTECTION

Respiratory Protection: NIOSH/MSHA approved respirator.

Ventilation: Local.

Protective Gloves: Rubber.

Eye Protection: Safety glasses.

Other Protective Equipment: Eye bath and safety shower.

VII DISPOSAL CONSIDERATIONS

Keep in covered drums, pending disposal. Handle and dispose in full compliance with all applicable federal, state, and local regulations.

APPENDIX C

DER-10
Technical Guidance for Site Investigation and Remediation,
December 2002
Appendix 1A- New York State Department of Health Generic Community Air Monitoring Plan

APPENDIX 1A

New York State Department of Health
Generic Community Air Monitoring Plan

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

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

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

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. 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.

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

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

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

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

Particulate Monitoring, Response Levels, and Actions

Particulate 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.

- 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.

- 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.

All readings must be recorded and be available for State (DEC and DOH) personnel to review.