



HEALTH AND SAFETY PLAN

Nick's Fish House

**2600 Insulator Drive
Baltimore City, Maryland**

June 14, 2016

Prepared for:

2600 Insulator Drive, LLC

1000 Key Highway East
Baltimore, Maryland 21230

Prepared by:

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GTA Project No: 141887

TABLE OF CONTENTS

1.0	OVERVIEW	3
1.1	Emergency Contacts	3
1.1.1	Project Management/Health and Safety Personnel.....	3
1.1.2	Other Emergency Telephone Numbers.....	3
1.1.3	Primary Hospital (Emergency)	4
1.2	Acknowledgements.....	5
1.2.1	Approvals	5
1.2.2	Field Team Review	5
2.0	INTRODUCTION	6
2.1	Purpose	6
2.2	Limitations	6
2.3	Guidelines	6
3.0	SCOPE AND APPLICABILITY	6
3.1	Site Description	6
3.2	Environmental Background	7
3.3	Scope of Work	7
3.4	HASP Revisions.....	8
4.0	PERSONNEL RESPONSIBILITIES	8
4.1	Project Manager (PM)	8
4.2	Health and Safety Officer (HSO)	8
4.3	Site Personnel	9
4.4	Buddy System.....	9
4.5	Site Communication.....	9
5.0	HAZARD ASSESSMENT	10
5.1	Physical Hazards	10
5.1.1	General Hazards	10
5.1.2	Weather	10
5.1.3	Heat Stress	10
5.1.4	Cold Stress.....	10
5.1.5	Noise	11
5.1.6	Biological Hazards	11
5.2	Chemical Hazards.....	11
5.3	Task Hazard Assessment.....	12
6.0	SAFE WORK PRACTICES	12
6.1	Site Control/Access	12
6.2	Routine Safe Work Practices	12
6.3	Personnel Safety.....	13
6.4	Confined Space Entry	13
6.5	Operation of Heavy Equipment.....	13
6.6	Excavation Operations	13
6.7	Dewatering Activities	14
6.8	Decontamination and Material Handling.....	14
6.9	Air Monitoring.....	15
6.9.1	Real Time Monitoring	15
6.9.2	Action Levels.....	15
6.9.3	Personal Monitoring.....	15
6.10	Medical Surveillance.....	15
7.0	EMERGENCY PROCEDURES	16
7.1	Pre-Emergency Planning	16
7.2	Emergency Plan.....	16
7.3	Evacuation	16
7.4	Emergency Medical Treatment and First Aid.....	16
7.5	Emergency Decontamination	17

7.6	Adverse Weather Conditions.....	17
8.0	PERSONAL PROTECTIVE EQUIPMENT	17
8.1	General Levels of Protection	17
8.2	Site Specific Levels of Protection	18
8.3	Reassessment of Protection Program	18
8.4	Other Safety Equipment.....	19
9.0	TRAINING.....	19
9.1	Site Specific Training.....	19
9.2	Additional Training	19
9.3	On-Site Safety Briefings.....	19
10.0	LOGS, REPORTS, AND RECORDKEEPING	19
10.1	HASP Field Change Request.....	19
10.2	Medical and Training Records	19
10.3	Exposure Records	20
10.4	Accident/Incident Report.....	20
10.5	OSHA Form 300.....	20
10.6	On-Site Health and Safety Field Log Books	20
10.7	Safety Data Sheets	21

APPENDICES

Appendix A	Figure 1 – Site Location Map (<i>1 page, color</i>)
Appendix B	Field Change Request Form (<i>1 page</i>)
Appendix C	Exclusion Zone Entry/Exit Log (<i>1 page</i>)
Appendix D	Decontamination Procedures (<i>1 page</i>)
Appendix E	Training Log (<i>1 page</i>)
Appendix F	Accident/Incident Reports (<i>2 pages</i>)
Appendix G	OSHA Form 300 (<i>12 pages</i>)
Appendix H	Safety Data Sheets (<i>42 pages</i>)
Appendix I	OSHA Poster (<i>1 page</i>)

HEALTH AND SAFETY PLAN

NICK'S FISH HOUSE
BALTIMORE CITY, MARYLAND
JUNE 14, 2016

1.0 OVERVIEW

This Health and Safety Plan (HASP) has been prepared by Geo-Technology Associates, Inc. (GTA) for implementation during soil capping operations, fence post installation, and the management of groundwater during construction activities at 2600 Insulator Drive ("subject property"). Polycyclic aromatic hydrocarbons (PAHs) in soil and metals in both soil and groundwater have been identified at the subject property.

1.1 Emergency Contacts

1.1.1 Project Management/Health and Safety Personnel

Project Manager	Paul Hayden, P.G., L.R.S.	(410) 792-9446 (office) (443) 865-8274 (mobile)
Health and Safety Officer	Michael Whiteman	(410) 792-9446 (office) (443) 377-8307 (mobile)

1.1.2 Other Emergency Telephone Numbers

Police	911
Fire	911
Ambulance	911
Police (Non-Emergency)	(443) 236-2220 option 2
Fire (Non-Emergency)	(410) 396-3083
EPA National Response Center	(800) 424-8802
MD Poison Control Center	(800) 222-1222
MDE Hotline	(866) 633-4686
MD Dept. of Health	(800) 735-2258
Underground Utilities	(800) 257-7777

1.1.3 Primary Hospital (Emergency)

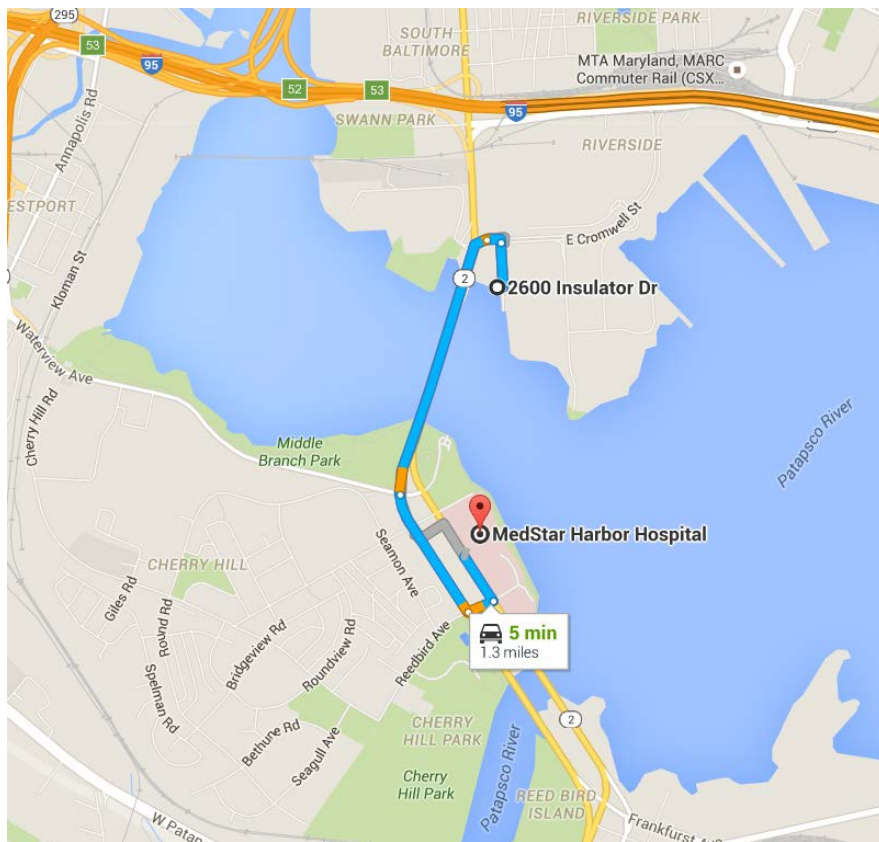
MedStar Harbor Hospital
3001 South Hanover Street
Baltimore, MD 21225

(410) 350-3200

Directions to the Primary Hospital

From: The Site: 2600 Insulator Drive, MD 21230

To: MedStar Harbor Hospital
3001 South Hanover Street
Baltimore, MD 21225



1. Head north on Insulator Drive toward East Cromwell street for 0.1 miles
2. Turn left at the 1st cross street onto West Cromwell Street for 233 feet
3. Turn left onto South Hanover Street for 0.6 miles
4. Continue onto Potee Street for 0.3 miles
5. Turn left onto Reedbird Avenue for 348 feet
6. Turn left onto South Hanover Street for 0.1 miles
7. Hospital will be on the right

(Total: 1.3 miles)

2.0 INTRODUCTION

2.1 Purpose

This HASP details the minimum requirements and standard operating procedures to be implemented by GTA during soil capping operations, fence post installation, and the management of groundwater during construction activities at 2600 Insulator Drive, Baltimore, Maryland.

2.2 Limitations

This HASP is for use by GTA personnel only during the specified operations at 2600 Insulator Drive, Baltimore, Maryland. This HASP may be provided to the Client (2600 Insulator Drive, LLC) and designated contractors for their information and as a framework for preparing other HASPs. The contractors should independently assess the available information and implement appropriate measures to protect the health and safety of their employees and subcontractors. Information and recommendations contained in this plan should not in any way be construed as relieving the contractors or their subcontractors of their responsibilities for site health and safety.

2.3 Guidelines

The HASP has been prepared in general conformance with applicable federal, state, and local regulations, including, but not limited to:

- U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) Section 29 Code of Federal Regulations (CFR) 1910.120, "Hazardous Waste Operations and Emergency Response."
- OSHA 29 CFR 1926, "Safety and Health Regulations for Construction."

Additionally, the following have been used as reference in the development of the HASP:

- National Institute for Occupational Safety and Health/OSHA/U.S. Coast Guard/U.S. Environmental Protection Agency, Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, October 1985.
- U.S. Department of Health and Human Services, June 1997, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health (NIOSH), NIOSH Pocket Guide to Chemical Hazards.
- OSHA, "Permissible Exposure Limits," 29 CFR Part 1910, Subpart Z – Toxic and Hazardous Substances.

3.0 SCOPE AND APPLICABILITY

3.1 Site Description

The subject property is identified at 2600 Insulator Drive, Baltimore, Maryland. The property comprises approximately 2.0 acres of land and contains a restaurant (Nick's Fish House), a marina complex (Baltimore Yacht Basin), a storage building, grassed areas, and associated parking areas. The attached *Figure 1* (Site Location Map) shows the approximate subject property location and boundaries.

GTA understands that the site is likely to remain zoned as commercial/industrial. The facility is serviced by public water and sewer utilities.

3.2 Environmental Background

Historically, the subject property primarily contained vacant land with a “City Wharf” since prior to 1914. By 1927, the site contained three structures, which appeared to be boat maintenance shops, ancillary structures, three piers, and boat storage areas. An additional structure was constructed in 1948 along the eastern property boundary and the shoreline had been dredged and excavated. Between 1966 and 1971, additional fill was placed on the shoreline. Prior to 1972, two structures on the northern portion of the site had been razed and one had been partially razed. In addition, a building that appears to have been used for boat maintenance was constructed on the central portion of the site and likely corresponds to the existing storage building. Between 1972 and 1994, all the structures on the subject property except for the storage building had been razed. In 2002, Nick’s Fish House (restaurant) was constructed on the east-central portion of the site, and in 2004 a covered outdoor patio was constructed adjacently west of the restaurant.

According to previous environmental site assessment (ESA) reports, a suspected underground storage tank (UST) was identified south of the existing storage building. The soil near the suspected UST was analyzed and total petroleum hydrocarbon (TPH) diesel range organics (DRO) were detected in one soil sample above the dated Maryland Department of the Environment (MDE) Residential Cleanup Standard (RCS) but below the dated Non-Residential Cleanup Standard (NRCS). Shallow soil samples were collected as part of a Limited Phase II ESA and of the samples collected, five soil samples exhibited metal concentrations above the dated MDE RCS and NRCS and four of the five samples exhibited elevated SVOCs above the MDE RCS and NRCS. Metal-impacted groundwater was also detected during previous sampling efforts.

An application for the subject property’s acceptance into the MDE Voluntary Cleanup Program (VCP) was submitted to the MDE on May 29, 2015. The subject property was accepted into the VCP by the MDE on December 21, 2015.

Based on previous sampling data, the historic use of the subject property, and to satisfy MDE requirements pursuant to the VCP, GTA performed 11 soil borings and collected 21 soil samples. Several PAHs (benzo(a)anthracene, benzo(a)pyrene, dibenz(a,h)anthracene, and benzo(b)fluoranthene) were detected at several soil boring locations above the current MDE NRCS. Arsenic exceeded the Anticipated Typical Concentration (ATC) and the MDE NRCS in several samples and lead exceeded the MDE NRCS in one soil sample. In addition, three groundwater samples were collected from three of the borings. Several metals (total) were detected above their respective Groundwater Cleanup Standards.

A Response Action Plan dated September 1, 2016, has been submitted to the MDE and is awaiting approval.

3.3 Scope of Work

The objective of this HASP is to provide site-specific procedures to protect health and safety of GTA personnel during proposed future redevelopment activities, where impacted soils and groundwater are present. This HASP addresses health and safety hazards which might be encountered during redevelopment of PAH and metal impacted soil and metal impacted groundwater. This HASP may also be adapted for use in other areas, if necessary.

The activities that this HASP covers include the following field operations:

- Observing the capping operations of metal and PAH-impacted soils;
- Observing the installation of a fence which will isolate impacted from non-impacted soils;
- Observing the management of groundwater during construction activities and
- Observing and documenting activities during redevelopment.

Oversight of general construction by others is not included in the HASP. The overall chemical hazard assessment for this site is low, given the site history, previously detected contaminant concentrations, and the scope of proposed operations. Use of personal protective equipment, along with good personal hygiene practices and proper decontamination procedures, as necessary, will significantly reduce the potential for exposure through dermal contact or ingestion of chemicals at the site.

3.4 HASP Revisions

The health and safety practices, procedures, and personal protective equipment (PPE) requirements established for this project are based on existing information on the chemical and physical hazards known to be present at this site. This HASP, however, is a dynamic document. Its content may change or undergo revision to reflect changes in project scope and site conditions. Any proposed changes must be reviewed by GTA's Health and Safety Officer (HSO), who is identified in *Section 1.1.1*. The Field Change Request Form provided in *Appendix B* may be used to initiate such changes.

4.0 PERSONNEL RESPONSIBILITIES

The responsibilities of GTA's health and safety staff are described in the following sections. GTA personnel serving in these roles are identified in the *Overview* at the beginning of this HASP.

4.1 Project Manager (PM)

GTA's PM has the overall responsibility for the project and the health and safety of GTA personnel. The PM has the authority to suspend field activities if employees are in danger of injury or exposure to harmful agents. The PM's responsibilities include:

- Assure that appropriate health and safety equipment and PPE are available for project personnel;
- Assure that GTA personnel have received the appropriate training and medical examination, if required, before engaging in work activities; and
- Designate a site HSO who will assure compliance with the HASP.

4.2 Health and Safety Officer (HSO)

The primary responsibility of the HSO is to assure the GTA site activities are conducted in accordance with this HASP. The HSO may also assist the PM in the development and implementation of this HASP; review changes to this HASP; and assist in resolving any outstanding safety issues that arise during the conduct of site work. The HSO's responsibilities primarily include:

- Ensure that GTA employees comply with requirements of this HASP;
- Coordinate periodic safety briefings, and notify the Project Manager of any changes in work conditions or tasks which may require changes to the HASP;

- Manage health and safety equipment, including monitoring instruments and PPE, and oversee the decontamination procedures for GTA personnel;
- Evaluate conditions during field activities to determine proper PPE for use by GTA personnel;
- Suspend GTA field activities if conditions warrant, and coordinate with local emergency and health officials for emergency response. Authorization to proceed with work will be issued by the PM after any such action; and
- Delegate, if necessary and appropriate, some of these responsibilities to other on-site qualified site personnel.

4.3 Site Personnel

Personnel will be responsible for the following:

- Becoming familiar with the information, instructions, and emergency response actions contained in this HASP; and
- Complying with rules, regulations, and procedures as set forth in this HASP and any future HASP revisions.

Non-GTA site personnel and contractors should independently assess the available information and implement appropriate measures to protect the health and safety of their employees and subcontractors.

4.4 Buddy System

Based on the site characterization performed to date and the nature of the proposed remediation, use of the buddy system is not anticipated. If necessary, the buddy system may be implemented when conducting field activities. This means that site personnel will work in groups of at least two when wearing PPE or when working in an exclusion zone.

4.5 Site Communication

Site personnel will have access to a working phone.

The following hand signals shall be reviewed during site specific training and shall be understood by personnel prior to commencement of site activities and shall be used, when necessary, during site operations.

TABLE 1 Hand Signal Summary	
Hand Signal	Meaning
Thumbs up	OK, all right, I understand
Thumbs down	No, negative
Hands on top of head	Need assistance
Gripping partner's wrist/place hands on waist	Leave area immediately, no debate
Hand gripping throat	Out of air, can't breathe

5.0 HAZARD ASSESSMENT

5.1 Physical Hazards

5.1.1 General Hazards

A variety of physical hazards may be present during site activities. Rubble, debris, and sloping/uneven terrain at the site can contribute towards slip, trip, and fall hazards. Other primary physical hazards on the site may be those associated with heavy equipment operation, working near excavations, the use of hand and power tools, electrical hazards, and handling and storage of solvents and fuels. These hazards are not unique and are generally familiar to hazardous waste site workers. Safe work practices for these potential hazards are outlined in *Section 6.0*.

5.1.2 Weather

Rain, lightning, wind, and similar weather conditions can create hazardous conditions that may warrant a suspension of GTA's site activities by the PM or HSO. Depending on the prevalent weather conditions, heat or cold stress related illnesses may be of concern to the workers during site activities (see *Sections 5.1.3* and *5.1.4*).

5.1.3 Heat Stress

Heat stress hazards are possible during field activities. Personnel, especially those in impermeable clothing, should be familiar with the signs and symptoms of heat stress, including **heat exhaustion** (dizziness, light-headedness, slurred speech, rapid pulse, confusion, fainting, fatigue, copious perspiration, cool skin that is sometimes pale and clammy, and nausea) and **heat stroke** (hot, dry, flushed skin, delirium, and coma [in some cases]). Heat stroke is a life-threatening event and requires immediate medical attention. Other factors, such as a worker's acclimatization, level of physical fitness, and age, may increase or decrease his or her susceptibility to heat stress. Before assigning a task to an individual worker, these factors should be taken into account to ensure that the task will not endanger the worker's health.

Some preventive measures to avoid heat stress include:

- Frequent resting in cool or shaded areas, and
- Consumption of large quantities of fresh potable water or dilute electrolyte beverages (e.g., Gatorade®).

If heat stress is suspected or observed, the affected person must be moved to a cool or shaded area and given plenty of liquids to consume. If symptoms of heat stroke are observed, call 911 or transport the victim to the hospital immediately.

5.1.4 Cold Stress

Cold stress hazards are most likely to occur at low temperatures or low wind chill factors, with wet, windy conditions also contributing to risks. Cold exposure and hypothermia are possible during field activities. Workers should be familiar with the signs and symptoms of cold stress. Hypothermia is a cold-induced decreasing of the core body temperature that produces shivering, numbness, drowsiness, and muscular weakness. Frostbite is a constriction of blood vessels in the extremities, which limits the supply of warming blood. Symptoms of frostbite are white or

grayish skin, blisters, numbness, mental confusion, failing eyesight, fainting, shock, and cessation of breathing.

5.1.5 Noise

During project activities, use of heavy equipment, running motors etc., may lead to elevated noise levels. Personnel who work near heavy equipment shall wear hearing protection if the 8-hour time-weighted average noise level exceeds 90 decibels. The HSO shall evaluate if noise monitoring is warranted. Hearing protection will be used as directed by the HSO. A general rule of thumb is that hearing protection must be worn if normal speech cannot be understood within an arm's length of the person talking.

5.1.6 Biological Hazards

Biological hazards present at the site may include poisonous plants, insects, and animals. Workers should be familiar with the appearance of poison ivy and should wear impervious clothing, as necessary, to prevent contact with poison ivy. Ticks may be present throughout the site on brush, grass, and weeds. Some ticks carry disease, such as Lyme disease or Rocky Mountain spotted fever. Wear protective clothing or secure pant legs to lower legs or boots, and apply bug repellent to this area. When found, ticks should be removed in accordance with the recommendations of the American Lyme Disease Foundation. Small animals may be present on the site, and contact should be avoided.

5.2 Chemical Hazards

The primary contaminants of concern in soil at the site include the following:

Metals

- Arsenic; and
- Lead.

PAHs

- benzo(a)anthracene;
- benzo(a)pyrene;
- dibenz(a,h)anthracene; and
- benzo(b)fluoranthene).

The primary contaminants of concern in groundwater at the site include the following:

Metals

- Arsenic;
- Beryllium;
- Cadmium;
- Chromium;
- Copper;
- Lead;
- Nickel; and
- Zinc.

Appendix H contains Safety Data Sheets, also known as Material Safety Data Sheets (MSDSs), for these contaminants of potential concern (COPCs).

The Agency of Toxic Substances and Disease Registry (ATSDR) indicates that primary routes of exposure to these COPCs are inhalation, ingestion, and dermal and eye contact. Effects of exposure to these contaminants vary and are multi-symptom, including the dermal, gastrointestinal, hepatic, neurological, respiratory, immunological, cardiovascular, developmental, renal, reproductive, hematological, musculoskeletal, ocular, and dermal systems.

5.3 Task Hazard Assessment

The overall chemical hazard assessment for this site is low, given the site history, previously detected contaminant concentrations, and the scope of proposed redevelopment.

Use of personal protective equipment, along with good personal hygiene practices and proper decontamination procedures, will significantly reduce the potential for exposure through dermal contact or ingestion of chemicals at the site.

Dust monitoring events will provide guidelines as to the presence and levels of such atmospheric hazards and reduce the potential for exposure through inhalation during subsurface invasive activities by the use of appropriate PPE.

6.0 SAFE WORK PRACTICES

6.1 Site Control/Access

Based on the site evaluations performed to date, hazardous substances are not currently proposed to be excavated; therefore, the establishment of specific work zones is not proposed for this project. If an exclusion zone needs to be established, caution tape will be placed around the area, to prevent access by unauthorized personnel. Entry by individual personnel into such exclusion zones is not currently planned as part of this project. If entry into an exclusion zone becomes necessary, this HASP will be modified and the Exclusion Zone Entry/Exit Log in *Appendix C* will be utilized.

6.2 Routine Safe Work Practices

- Ignition sources in the vicinity of potentially flammable material are prohibited. When working in areas where flammable vapors may be present, particular care must be exercised with tools and equipment that may be sources of ignition. Tools and equipment provided must be properly bonded and/or grounded.
- Approved and appropriate safety equipment as specified in *Table 2* shall be worn where required.
- Beards that interfere with respirator fit are not allowed for GTA field personnel within the site boundaries, as all site field personnel may be called upon to use a respirator in some situations, and beards inhibit proper respirator fit.
- No smoking, eating, or drinking is allowed in the contaminated areas. Contaminated tools and hands must be kept away from the face. Do not unnecessarily touch a contaminated surface or allow your clothing, tools, or other equipment to do so.
- Persons with long hair and/or loose fitting clothing that could become tangled in power equipment must take adequate precautions.
- Use protective gloves to avoid the potential for burn injuries from touching hot surfaces.

- Handling materials in drums or other containers, as well as lifting of heavy equipment, can cause strains and sprains from improperly lifting loads, or from carrying loads that are either too large or too heavy.
- When manually moving materials, employees should seek help when a load is so bulky it cannot be properly grasped or lifted, when they cannot see around or over it, or when a load cannot be safely handled.
- Handheld power tools shall be used and maintained in accordance with the manufacturer's specifications, including use of the correct shield, guard, or attachment recommended by the manufacturer.

6.3 Personnel Safety

- Do not climb over or under obstacles.
- Use the buddy system and line-of-sight observation, as necessary.
- Practice contamination prevention on- and off-site.
- Plan activities ahead of time.
- Apply immediate first aid to any and all cuts, scratches, and abrasions.
- Report all accidents, no matter how minor, immediately to the HSO.
- Be alert to your own and others' physical condition.
- Initiate a work/rest regime if ambient temperatures and protective clothing create a potential heat/cold stress situation.
- Do not proceed with work unless adequate light exists and appropriate supervision is present.

6.4 Confined Space Entry

No confined space entry is planned as part of this project.

6.5 Operation of Heavy Equipment

Individuals not directly involved in work operations will be required to maintain a 20-foot distance so as not to interfere with heavy equipment.

6.6 Excavation Operations

This HASP shall provide monitoring and health and safety support in order to ensure the adequacy of protective equipment and safety procedures used by GTA personnel.

During excavation, the following shall apply:

1. Subsurface utilities shall be identified, to the extent possible, prior to the start of excavating, and avoided during the work.
2. Personnel shall not be permitted to stand, work, or travel beneath loads handled by lifting or digging equipment.
3. If mobile equipment is operated around or adjacent to an excavation, a warning system shall be utilized. The warning system may consist of barricades, hand or mechanical signals, or stop logs.
4. Site personnel shall not enter excavations at any time, unless walls are properly sloped or reinforced.

6.7 Dewatering Activities

Based on the groundwater depth and planned excavation depth it is anticipated that groundwater will not be encountered during excavation.

If dewatering should become necessary, the following shall apply:

1. Site personnel shall not enter excavations requiring dewatering at any time.
2. Personnel working in areas of dewatering should utilize appropriate PPE.

6.8 Decontamination and Material Handling

One of the most important aspects of decontamination is the prevention of contamination, when present. This will minimize worker exposure and cross-contamination of materials. Procedures for contamination avoidance include:

Personnel

- Do not walk through areas of obvious or known contamination.
- Do not directly handle or touch contaminated materials.
- Make sure that there are no cuts or tears on PPE.
- Fasten all closures in protective suits, if used.
- Particular care should be taken to protect any skin injuries.
- Stay upwind of airborne contaminants.
- Do not carry cigarettes, cosmetics, gum etc., into contaminated areas.

Sampling/Monitoring

- When required by the HSO, cover instruments with clear plastic, leaving openings for sampling ports.
- Bag sampling containers prior to placement of sample material.

Heavy Equipment

- Care should be taken to limit the amount of contamination that comes in contact with the heavy equipment (backhoe bucket, tires, etc.).
- If contaminated tools are to be placed on non-contaminated equipment for transport to a decontamination area, plastic should be used to prevent cross-contamination.
- Dust control measures may be needed.

If necessary, a personnel decontamination area will be provided where surface contamination and outer protective equipment are removed (see *Appendix D*).

If potentially contaminated materials are encountered, they will be handled in a manner to prevent additional contamination. Discarded materials, waste materials, or other objects shall be handled in such a way as to protect site workers and the public from exposure to site contaminants, and preclude the potential for creating a sanitary hazard. Potentially contaminated materials (e.g., clothing, gloves, etc.) will be bagged or drummed, as necessary, labeled, and segregated for disposal. Uncontaminated materials shall be collected and bagged for appropriate disposal as normal domestic waste. Waste material will be disposed in accordance with applicable regulations and protocols.

6.9 Air Monitoring

The HSO is responsible for air monitoring at the subject property.

6.9.1 Real Time Monitoring

Environmental concerns on the subject property are primarily associated with metal and PAH impacted soils. Therefore, during limited excavation and soil capping activities at the subject property, observations for visible dust emissions will be performed for health and safety purposes. Although it is not anticipated, if necessary, dust monitoring will be performed using real time dust monitoring instrumentation, specifically a handheld Dusttrak DRX. Dust monitoring will be conducted approximately every hour during impacted soil relocation activities.

6.9.2 Action Levels

The OSHA permissible exposure limit (PEL) for Particulates Not Otherwise Regulated (PNOR), is 15 mg/m³, which equates to excessive visible dust and work should be ceased. If visible dust (10 mg/m³) is noted, dust suppression procedures will be implemented until dust levels are reduced to below the action level. If dust levels increase while suppression measures are under way, operations must be shut down and suppression activities continued. When dust concentrations are reduced, operations may resume.

6.9.3 Personal Monitoring

Personal air monitoring is not currently planned as part of this project. If warranted based on site air monitoring results, personal air monitoring shall be conducted using established OSHA/NIOSH protocol. Air samples, including blanks, shall be submitted to an American Industrial Hygiene Association (AIHA) accredited laboratory for sample analysis.

6.10 Medical Surveillance

Contact with contaminated media during the activities outlined in *Section 3.0* is anticipated to be minimal. Therefore, medical surveillance of GTA personnel is not currently planned as part of this project.

Re-evaluation of the need for a medical examination of individual GTA personnel will be conducted by the HSO prior to site entry. Evaluation criteria will include the anticipated duration of activities on the site, the anticipated exposure risks, and the anticipated cumulative annual exposure rates of the individual. If necessary, a medical surveillance examination may be performed in accordance with 29 CFR 1910.120(f) prior to site entry. The medical examination may be provided at some time prior to or after the proposed remedial activities at the site, and may be performed annually and/or upon termination of site work. Additional medical testing may be recommended by the HSO in consultation with the consulting occupational physician, if an overt exposure incident occurs, or if other site conditions warrant further medical surveillance.

7.0 EMERGENCY PROCEDURES

7.1 Pre-Emergency Planning

Pre-emergency planning consists of this emergency response plan, assigning emergency functions to on-site personnel, training of personnel as necessary, and ensuring that emergency procedures and equipment are in place. Emergency telephone numbers, directions, and a route map to the nearest hospital are presented in *Section 1.1*.

7.2 Emergency Plan

This emergency plan will be reviewed by GTA personnel working at the site, prior to the start of work. This emergency plan will be available for use during site work.

Various individual site characteristics will determine preliminary actions taken in the event of a site emergency. The HSO will inform personnel about the nature and duration of work expected on the site, the types of contaminants, and the possible health or safety effects of emergencies involving these contaminants. The HSO shall make necessary arrangements to be prepared for emergencies.

The HSO shall implement the emergency plan whenever conditions at the site warrant such action. The HSO will be responsible for coordination of the evacuation, emergency treatment, and emergency transport of GTA site personnel as necessary and notification of emergency response units and the appropriate management staff.

7.3 Evacuation

In the event of an emergency situation, such as fire, explosion, or significant release of toxic gases, the HSO will initiate evacuation procedures by directly contacting each GTA employee or sounding an alarm, such as an air horn or other appropriate device, for approximately 10 seconds. All personnel will evacuate to a predetermined location. The location shall be upwind of the site, if possible. For efficient and safe site evacuation and assessment of the emergency situation, the HSO will have the authority to contact outside services as needed.

7.4 Emergency Medical Treatment and First Aid

In the event of a safety or health emergency at the site, appropriate emergency measures will immediately be taken. The Project Manager will be immediately informed of any serious injuries. Following decontamination, if required, the injured person will be transported to the nearest medical facility, if necessary. Directions and a map of the route to a nearby hospital are provided in *Section 1.1.3*.

If an employee working in a contaminated area is injured, first-aid procedures should be followed. Depending on the severity of the injury, emergency medical response may be sought. Emergency telephone numbers are provided in *Section 1.1*.

If the injury to a worker is chemical in nature (e.g., overexposure), the following first-aid procedures will be followed.

- Eye Exposure – Wash the eyes immediately at the emergency eyewash station for at least 15 minutes, using large amounts of water and lifting the lower and upper lids occasionally to help

- flush the eye. Do not rub eyes or keep eyes tightly closed. Obtain medical attention immediately.
- Skin Exposure - Use copious amounts of soap and water to wash/rinse the affected area thoroughly, then provide appropriate medical attention. For reddened or blistered skin, consult a physician.
 - Ingestion – Do not induce vomiting!! Call poison control center or seek medical help.
 - Inhalation – Move the person to fresh air. If breathing has stopped, perform artificial respiration. Obtain medical attention as soon as possible.

7.5 Emergency Decontamination

If emergency first aid and/or medical treatment is required, normal decontamination procedures may need to be abbreviated or omitted. The site HSO or designee will accompany contaminated victims to the medical facility to advise on matters involving decontamination, when necessary. The outer garments can be removed if they do not cause delays, interfere with treatment, or aggravate the problem. Respiratory equipment must always be removed. Protective clothing can be cut away. If the outer contaminated garments cannot be safely removed, a plastic barrier between the individual and clean surfaces should be used to help prevent contaminating the inside of ambulances and/or medical personnel. Outer garments are then removed at the medical facility. No attempt will be made to wash or rinse the victim, unless it is known that the individual has been contaminated with an extremely toxic or corrosive material, which could also cause severe injury or loss of life to emergency response personnel. For minor medical problems or injuries, the normal decontamination procedures will be followed. Note that heat stroke requires prompt treatment to prevent irreversible damage or death. Protective clothing must be promptly removed. Less serious forms of heat stress also require prompt attention and removal of protective clothing immediately. Unless the victim is obviously contaminated, decontamination should be omitted or minimized and treatment would begin immediately.

7.6 Adverse Weather Conditions

In the event of adverse weather conditions, the HSO or designee will determine if work can continue without compromising the health and safety of GTA field personnel. Some of the factors to be considered prior to determining if work should continue are:

- Potential for heat/cold stress and related illnesses; and/or
- Treacherous weather-related working conditions (e.g., heavy rain, fog, high winds, lightning, storms, etc.).

Site activities will be limited to daylight hours (unless adequate artificial lighting is provided) and acceptable weather conditions.

8.0 PERSONAL PROTECTIVE EQUIPMENT

The level of protection used by field personnel will be enforced by the HSO. Levels of protection may be upgraded or downgraded at the discretion of the HSO. This decision shall be based on real-time air monitoring, site history data, and prior site experience. Any changes in the level of protection shall be recorded in the health and safety field logbook. Based on the site characterization conducted to date, Level D PPE is anticipated.

8.1 General Levels of Protection

The level of protection selected is based primarily on:

- The type, toxicity, and measured concentration of the chemical substance; and
- The potential or measured exposure to substances in the air, or other direct contact.

The equipment used to protect the body against contact with chemical hazards is divided into four categories (A-D), according to the degree of protection needed. Given the scope of the planned activities at the site, it is expected that Level A and B protection will not be needed. Should ambient conditions reach levels of contamination that would require Level A or B protection, work activities will cease and the site will be vacated until conditions are again suitable for Levels C and D.

8.2 Site Specific Levels of Protection

For activities where the potential for exposure to site contaminants is expected to be low to medium, the level of protection has been designated as Level D. These activities may include site preparation, field screening, and soil removal and capping activities. Activities where there may be low to medium potential for exposure to the hands require Level D, plus nitrile gloves.

TABLE 2 Levels of PPE	
PPE Level	D**
Criteria for selection	Primarily a work uniform providing minimal protection. Not to be worn where respiratory or skin hazards are present.
Respiratory Protection	No respiratory protection
Personal Protective Clothing	<ul style="list-style-type: none"> • Latex and/or Nitrile Gloves** • Boots, steel toe • Hard hat • Safety glasses (as needed) • Hearing protection (as needed)

** Level D may be modified to 'Modified D' by the addition of:

- Tyvek or polycoated Tyvek
- Nitrile gloves
- Boot covers

8.3 Reassessment of Protection Program

The level of protection provided by PPE selection shall be upgraded if conditions change such that there is a possibility of overexposure to the present hazards.

Some indicators of the need for reassessment are:

- Change in job tasks during a work phase;
- Contaminants other than those previously identified are encountered;
- Change in ambient levels of contaminants; and
- Change of work scope, which affects the degree of contact with contaminants.

The HSO has the responsibility for air monitoring and deciding the appropriate level of protection based on air monitoring guidelines presented in *Section 6.8*. The HSO shall be consulted when information is limited or when clarification is required.

8.4 Other Safety Equipment

The following safety and first aid equipment shall be available in the support vehicle/area for GTA field personnel:

- Fire extinguisher, rated at least 1A, 10BC;
- Standard Industrial First Aid Kit, fully stocked;
- Air horn or other alternative means of sounding alarm; and
- Field wash equipment.

9.0 TRAINING

9.1 Site Specific Training

Prior to commencement of field activities, GTA personnel assigned to the project will be provided training that will specifically address the activities, procedures, monitoring, and equipment for the site operations. It will include site and facility layout, hazards, and emergency services at the site, and will highlight the provisions contained within this HASP. This training will also allow field workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and operations for their particular activity.

The site specific training shall also provide information regarding potential health hazards specific to the site contaminants, the likelihood of exposure, and the precautionary measures (including PPE and air and medical monitoring procedures) to be implemented to protect against these hazards.

9.2 Additional Training

Additional training, if required for completion of field tasks during the project, will be identified and provided as the work progresses.

9.3 On-Site Safety Briefings

GTA personnel will be given periodic on-site health and safety briefings by the HSO or designee, as necessary, to assist site personnel in safely conducting their work activities. The briefings will include information on new operations to be conducted, or changes in work practices or the site's environmental conditions. The briefings will also provide a forum to facilitate conformance with health and safety requirements and to identify H&S performance deficiencies noted during daily activities.

10.0 LOGS, REPORTS, AND RECORDKEEPING

10.1 HASP Field Change Request

The HASP Field Change Request form (*Appendix B*) is to be completed for initiating a change to the HASP. Project Manager approval is required. The original will be kept in the project file.

10.2 Medical and Training Records

The HSO must obtain and keep a log of GTA personnel meeting appropriate training and medical qualifications for the site work. The *Training Log* is located in *Appendix E*. A copy of the log will be kept

in the project file. For GTA personnel, GTA's Human Resources Manager or designee will maintain medical records, as necessary, in accordance with 29 CFR 1910.1020.

10.3 Exposure Records

Any personal monitoring results, laboratory reports, calculations, and air sampling data sheets are part of an employee exposure record. These records will be kept in accordance with 29 CFR 1910.1020. For GTA employees, the originals will be sent to GTA's Human Resources Manager or designee.

10.4 Accident/Incident Report

In the event of an accident/incident, as soon as first aid and/or emergency response needs have been met, the following parties are to be contacted:

1. Health and Safety Manager
2. Project Manager

Written documentation for verbal reports is to be submitted within 24 hours by the HSO or designee. The *Accident/Incident Report* found in *Appendix F* is to be used for this purpose. All representatives that are contacted by telephone are to receive a copy of this Report. The originals will be submitted to GTA's Project Manager or designee for recordkeeping. Copies of the forms will be kept in the project file.

For reporting purposes, the term "accident" refers to fatalities, lost time injuries, spill or exposure to hazardous materials, fire, explosion, damage to property, or potential occurrence of the above.

Any information that is released from the health care provider and is not deemed confidential patient information is to be attached to the appropriate form. Any medical information that is released by patient consent is to be filed in the individual's medical records and treated as confidential.

10.5 OSHA Form 300

An OSHA Form 300 (Log of Occupational Injuries and Illnesses) will be kept at the project site. OSHA Form 300 and associated guidance information are contained in *Appendix G*. All recordable injuries or illnesses will be recorded on this form. At the end of the project, the original will be sent to GTA's Human Resources Manager or designee for recordkeeping. The *Accident/Incident Report (Appendix F)* meets the requirements of the OSHA Form 301 (Supplemental Record), which must be maintained with the OSHA Form 300 for all recordable injuries or illnesses.

10.6 On-Site Health and Safety Field Log Books

The HSO or designee will maintain an on-site health and safety log book in which daily site conditions, activities, meetings, personnel, and significant events will be recorded. Calibration records and personnel monitoring results, if available, will also be recorded in field log book. The original log book will be kept in the project file.

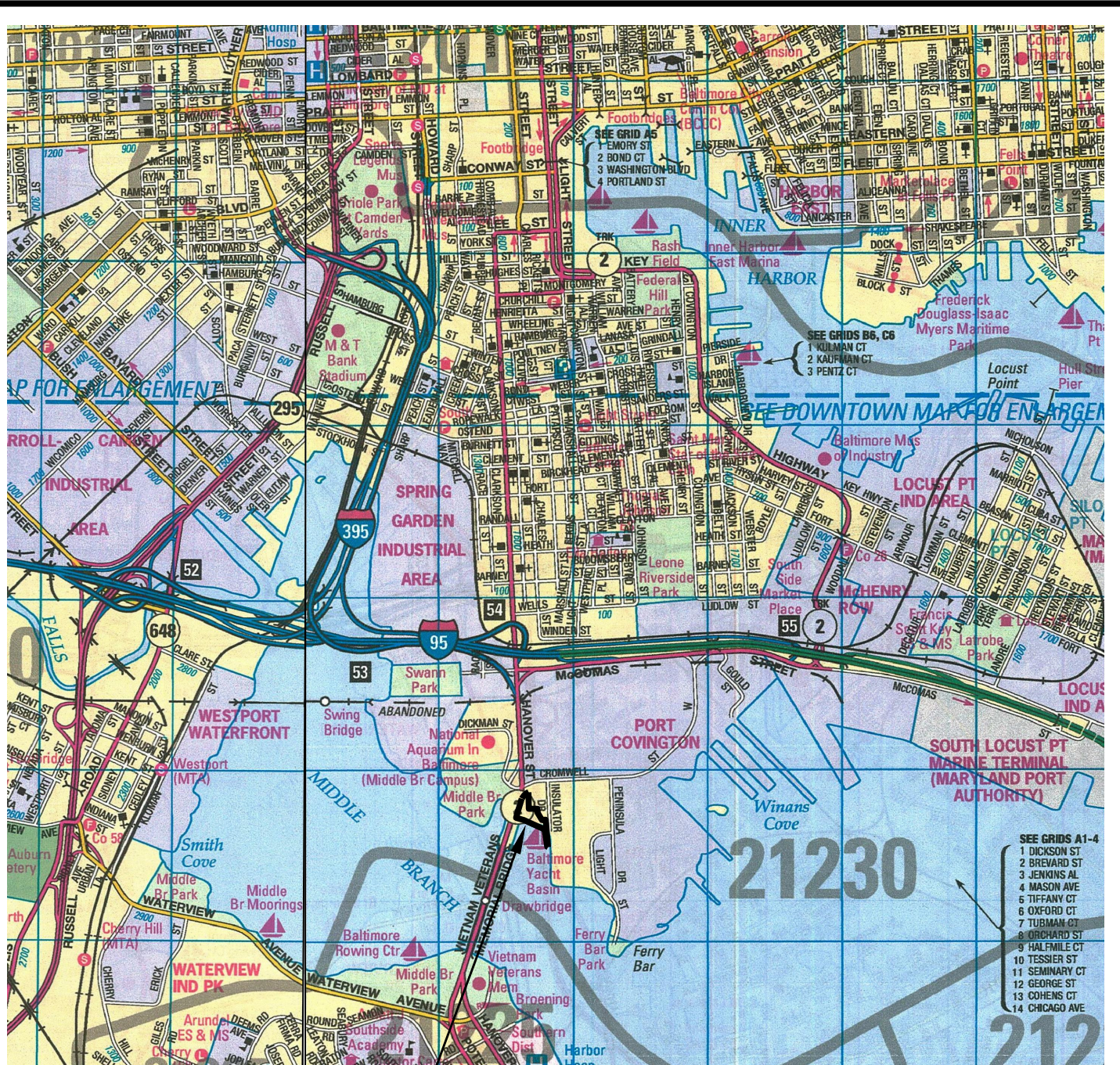
Whenever personnel monitoring is conducted on-site, the monitoring results will be noted in the field log book. These will become part of the exposure records file and will be maintained by the Human Resources Manager or designee.

10.7 Safety Data Sheets

Safety Data Sheets for the COPCs that have been identified at the subject property (in excess of regulatory guidance values) are presented in *Appendix H*. If additional hazardous chemicals are brought to, used, stored, or otherwise identified at the site in conjunction with the RAP, the additional Safety Data Sheets will be incorporated into a modification to this HASP and will be kept on-site.

***** END OF PLAN *****

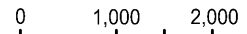
**APPENDIX A
FIGURE**



Approximate Subject Property Boundary

Notes

Map Copyright © ADC The Map People, (800) 829-6277
 Permitted Use Number 21006238



Approximate Scale
 1 inch = 2,000 feet



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NICK'S FISH HOUSE
 BALTIMORE CITY, MARYLAND

SITE LOCATION MAP

APPENDIX B

FIELD CHANGE REQUEST FORM

Health and Safety Plan Field Change Request Form

Site Name: _____

Project No. _____

HASP Date: _____

Section: _____

Page(s): _____

Re: Change to existing HASP

Addition to existing HASP

Other: _____

Anticipated Revision Date: _____

Proposed Change: _____

Reason for Proposed Change:

Disposition of Deficiency

Change in Regulatory or Other Requirements

Operational Experience

Other: _____

Exhibits Attached: No Yes (describe) _____

GTA ESI Approvals: Project Manager: _____ Date: _____

H&S Manager: _____ Date: _____

Distribution After Approval:

On-site copy

Others: _____

Client

Project Files

Prepared By: _____ Date: _____

Title: _____

APPENDIX C

EXCLUSION ZONE ENTRY/EXIT LOG

APPENDIX D

DECONTAMINATION PROCEDURES

Health and Safety Plan

Decontamination Procedures

Personnel and equipment that enter an Exclusion Zone (i.e., personnel, excavators, monitoring equipment, field sample collection equipment, etc.) may require decontamination prior to exit. Decontamination will be supervised by the HSO. The decontamination supplies and equipment will be maintained by the HSO. The decontamination procedure assumes the contaminating substances are particulate matter and soils containing heavy metals. The decontamination procedure will be modified if the type of contaminating substance or its hazard potential is altered.

Personnel Decontamination

Field personnel should wash hands, face, and other exposed skin with soap and water. Shower and shampoo as soon as possible at the end of the work day. Launder non-disposable clothing prior to reuse, separately from other laundry items.

Equipment Decontamination

Equipment and vehicles used in the Exclusion Zone should be decontaminated before being allowed to leave the work area. Bulk soil and debris particles should be physically removed and left in the excavation, or properly containerized for off-site disposal.

Wet-wipe coolers and instruments used on-site prior to leaving the site. Wet-wipe respirator exteriors whenever exiting work areas. Clean respirators using manufacturer-recommended procedures.

Waste Disposal

PPE that cannot be decontaminated (i.e., chemical resistant suits, gloves, boot covers, respirator cartridges, etc.) will be placed in plastic trash bags. If potentially contaminated soils are generated, they will be containerized using 55-gallon drums, roll-off boxes, or similar means, for characterization and proper disposal. If potentially contaminated water is generated, it will be containerized in 55-gallon drums, frac tanks, or similar means, for characterization and proper disposal.

The property owner will be notified for disposal of all wastes. Wastes will be disposed in accordance with local, state, and federal regulations.

APPENDIX E

TRAINING/LOG

APPENDIX F

ACCIDENT/INCIDENT REPORTS

Health and Safety Plan Accident Report

Site Name: _____

Project No. _____

NOTE: This report must be completed by the injured employee or employee's supervisor and submitted to the Project Manager within 24 hours of any accident. Attach additional sheets if necessary. OSHA Form 301 may be used, if preferred.

Date of accident: _____ Time of accident: _____

Exact location where accident occurred (including street, city and state): _____

Name of injured employee: _____

Home address: _____

Home phone: _____ Date of Birth: _____

Age: _____ Sex: M F Date of Hire: _____

Employee's job title: _____

Dept. Regularly Employed: _____

Explain what happened (Include what the employee was doing at the time of the accident and how the accident occurred.): _____

Describe the injury and the specific part of the body affected (e.g., laceration, right hand, third finger, second joint): _____

Object or substance that directly injured employee: _____

Name and address of the physician (if medical attention was administered): _____

Is the employee expected to lose at least one full day of work? _____

Was the employee assigned to restricted duty? _____

Number of days and hours employee usually works per week: _____

List all PPE employee was wearing and all safety devices in use at the time of the accident: _____

Describe the preventive measures taken to avert a recurrence of this type of incident: _____

Date when measures were implemented and by whom: _____

Name of supervisor: _____

Date of this report: _____ Report prepared by: _____

I have read this report, and the contents as to how the accident/loss occurred are accurate to the best of my knowledge.

Signature: _____

Injured Employee

Date: _____

APPENDIX G

OSHA FORM 300

OSHA

Forms for Recording Work-Related Injuries and Illnesses

Dear Employer:

This booklet includes the forms needed for maintaining occupational injury and illness records for 2004. These new forms have changed in several important ways from the 2003 recordkeeping forms.

In the December 17, 2002 Federal Register (67 FR 77165-77170), OSHA announced its decision to add an occupational hearing loss column to OSHA's Form 300, Log of Work-Related Injuries and Illnesses. This forms package contains modified Forms 300 and 300A which incorporate the additional column M(5) Hearing Loss. Employers required to complete the injury and illness forms must begin to use these forms on January 1, 2004.

In response to public suggestions, OSHA also has made several changes to the forms package to make the recordkeeping materials clearer and easier to use:




- On Form 300, we've switched the positions of the day count columns. The days "away from work" column now comes before the days "on job transfer or restriction."
- We've clarified the formulas for calculating incidence rates.
- We've added new recording criteria for occupational hearing loss to the "Overview" section.
- On Form 300, we've made the column heading "Classify the Case" more prominent to make it clear that employers should mark only one selection among the four columns offered.

The Occupational Safety and Health Administration shares with you the goal of preventing injuries and illnesses in our nation's workplaces. Accurate injury and illness records will help us achieve that goal.

*Occupational Safety and Health Administration
U.S. Department of Labor*

What's Inside...

In this package, you'll find everything you need to complete OSHA's *Log* and the *Summary of Work-Related Injuries and Illnesses* for the next several years. On the following pages, you'll find:

- ▼ **An Overview: Recording Work-Related Injuries and Illnesses** — General instructions for filling out the forms in this package and definitions of terms you should use when you classify your cases as injuries or illnesses.
- ▼ **How to Fill Out the Log** — An example to guide you in filling out the *Log* properly.
- ▼ **Log of Work-Related Injuries and Illnesses** — Several pages of the *Log* (but you may make as many copies of the *Log* as you need.) Notice that the *Log* is separate from the *Summary*. 
- ▼ **Summary of Work-Related Injuries and Illnesses** — Removable *Summary* pages for easy posting at the end of the year. Note that you post the *Summary* only, not the *Log*. 
- ▼ **Worksheet to Help You Fill Out the Summary** — A worksheet for figuring the average number of employees who worked for your establishment and the total number of hours worked.
- ▼ **OSHA's 301: Injury and Illness Incident Report** — A copy of the OSHA 301 to provide details about the incident. You may make as many copies as you need or use an equivalent form. 

Take a few minutes to review this package. If you have any questions, **visit us online at www.osha.gov OR call your local OSHA office.** We'll be happy to help you.



An Overview: Recording Work-Related Injuries and Illnesses

The Occupational Safety and Health (OSH) Act of 1970 requires certain employers to prepare and maintain records of work-related injuries and illnesses. Use these definitions when you classify cases on the Log. OSHA's recordkeeping regulation (see 29 CFR Part 1904) provides more information about the definitions below.

The *Log of Work-Related Injuries and Illnesses* (Form 300) is used to classify work-related injuries and illnesses and to note the extent and severity of each case. When an incident occurs, use the *Log* to record specific details about what happened and how it happened. The *Summary* — a separate form (Form 300A) — shows the totals for the year in each category. At the end of the year, post the *Summary* in a visible location so that your employees are aware of the injuries and illnesses occurring in their workplace.

Employers must keep a *Log* for each establishment or site. If you have more than one establishment, you must keep a separate *Log* and *Summary* for each physical location that is expected to be in operation for one year or longer.

Note that your employees have the right to review your injury and illness records. For more information, see 29 Code of Federal Regulations Part 1904.35, *Employee Involvement*.

Cases listed on the *Log of Work-Related Injuries and Illnesses* are not necessarily eligible for workers' compensation or other insurance benefits. Listing a case on the *Log* does not mean that the employer or worker was at fault or that an OSHA standard was violated.

When is an injury or illness considered work-related?

An injury or illness is considered work-related if an event or exposure in the work environment caused or contributed to the condition or significantly aggravated a preexisting condition. Work-relatedness is

presumed for injuries and illnesses resulting from events or exposures occurring in the workplace, unless an exception specifically applies. See 29 CFR Part 1904.5(b)(2) for the exceptions. The work environment includes the establishment and other locations where one or more employees are working or are present as a condition of their employment. See 29 CFR Part 1904.5(b)(1).

Which work-related injuries and illnesses should you record?

Record those work-related injuries and illnesses that result in:

- ▼ death,
- ▼ loss of consciousness,
- ▼ days away from work,
- ▼ restricted work activity or job transfer, or
- ▼ medical treatment beyond first aid.

You must also record work-related injuries and illnesses that are significant (as defined below) or meet any of the additional criteria listed below.

You must record any significant work-related injury or illness that is diagnosed by a physician or other licensed health care professional. You must record any work-related case involving cancer, chronic irreversible disease, a fractured or cracked bone, or a punctured eardrum. See 29 CFR 1904.7.

What are the additional criteria?

You must record the following conditions when they are work-related:

- ▼ any needlestick injury or cut from a sharp object that is contaminated with another person's blood or other potentially infectious material;
- ▼ any case requiring an employee to be medically removed under the requirements of an OSHA health standard;
- ▼ tuberculosis infection as evidenced by a positive skin test or diagnosis by a physician or other licensed health care professional after exposure to a known case of active tuberculosis.
- ▼ an employee's hearing test (audiogram) reveals 1) that the employee has experienced a Standard Threshold Shift (STS) in hearing in one or both ears (averaged at 2000, 3000, and 4000 Hz) and 2) the employee's total hearing level is 25 decibels (dB) or more above audiometric zero (also averaged at 2000, 3000, and 4000 Hz) in the same ear(s) as the STS.

What is medical treatment?

Medical treatment includes managing and caring for a patient for the purpose of combating disease or disorder. The following are not considered medical treatments and are NOT recordable:

- ▼ visits to a doctor or health care professional solely for observation or counseling;

What do you need to do?

1. Within 7 calendar days after you receive information about a case, decide if the case is recordable under the OSHA recordkeeping requirements.
2. Determine whether the incident is a new case or a recurrence of an existing one.
3. Establish whether the case was work-related.
4. If the case is recordable, decide which form you will fill out as the injury and illness incident report.

You may use *OSHA's 301: Injury and Illness Incident Report* or an equivalent form. Some state workers compensation, insurance, or other reports may be acceptable substitutes, as long as they provide the same information as the OSHA 301.

How to work with the Log

1. Identify the employee involved unless it is a privacy concern case as described below.
2. Identify when and where the case occurred.
3. Describe the case, as specifically as you can.
4. Classify the seriousness of the case by recording the **most serious outcome** associated with the case, with column G (Death) being the most serious and column J (Other recordable cases) being the least serious.
5. Identify whether the case is an injury or illness. If the case is an injury, check the injury category. If the case is an illness, check the appropriate illness category.

- ▼ diagnostic procedures, including administering prescription medications that are used solely for diagnostic purposes; and
- ▼ any procedure that can be labeled first aid. (See below for more information about first aid.)

What is first aid?

If the incident required only the following types of treatment, consider it first aid. Do NOT record the case if it involves only:

- ▼ using non-prescription medications at non-prescription strength;
- ▼ administering tetanus immunizations;
- ▼ cleaning, flushing, or soaking wounds on the skin surface;
- ▼ using wound coverings, such as bandages, BandAids™, gauze pads, etc., or using SteriStrips™ or butterfly bandages.
- ▼ using hot or cold therapy;
- ▼ using any totally non-rigid means of support, such as elastic bandages, wraps, non-rigid back belts, etc.;
- ▼ using temporary immobilization devices while transporting an accident victim (splints, slings, neck collars, or back boards).
- ▼ drilling a fingernail or toenail to relieve pressure, or draining fluids from blisters;
- ▼ using eye patches;
- ▼ using simple irrigation or a cotton swab to remove foreign bodies not embedded in or adhered to the eye;
- ▼ using irrigation, tweezers, cotton swab or other simple means to remove splinters or foreign material from areas other than the eye;

- ▼ using finger guards;
- ▼ using massages;
- ▼ drinking fluids to relieve heat stress

How do you decide if the case involved restricted work?

Restricted work activity occurs when, as the result of a work-related injury or illness, an employer or health care professional keeps, or recommends keeping, an employee from doing the routine functions of his or her job or from working the full workday that the employee would have been scheduled to work before the injury or illness occurred.

How do you count the number of days of restricted work activity or the number of days away from work?

Count the number of calendar days the employee was on restricted work activity or was away from work as a result of the recordable injury or illness. Do not count the day on which the injury or illness occurred in this number. Begin counting days from the day after the incident occurs. If a single injury or illness involved both days away from work and days of restricted work activity, enter the total number of days for each. You may stop counting days of restricted work activity or days away from work once the total of either or the combination of both reaches 180 days.

Under what circumstances should you NOT enter the employee's name on the OSHA Form 300?

You must consider the following types of injuries or illnesses to be privacy concern cases:

- ▼ an injury or illness to an intimate body part or to the reproductive system,
- ▼ an injury or illness resulting from a sexual assault,
- ▼ a mental illness,
- ▼ a case of HIV infection, hepatitis, or tuberculosis,
- ▼ a needlestick injury or cut from a sharp object that is contaminated with blood or other potentially infectious material (see 29 CFR Part 1904.8 for definition), and
- ▼ other illnesses, if the employee independently and voluntarily requests that his or her name not be entered on the log.

You must not enter the employee's name on the OSHA 300 Log for these cases. Instead, enter "privacy case" in the space normally used for the employee's name. You must keep a separate, confidential list of the case numbers and employee names for the establishment's privacy concern cases so that you can update the cases and provide information to the government if asked to do so.

If you have a reasonable basis to believe that information describing the privacy concern case may be personally identifiable even though the employee's name has been omitted, you may use discretion in describing the injury or illness on both the OSHA 300 and 301 forms. You must enter enough information to identify the cause of the incident and the general severity of

the injury or illness, but you do not need to include details of an intimate or private nature.

What if the outcome changes after you record the case?

If the outcome or extent of an injury or illness changes after you have recorded the case, simply draw a line through the original entry or, if you wish, delete or white-out the original entry. Then write the new entry where it belongs. Remember, you need to record the most serious outcome for each case.

Classifying injuries

An injury is any wound or damage to the body resulting from an event in the work environment.

Examples: Cut, puncture, laceration, abrasion, fracture, bruise, contusion, chipped tooth, amputation, insect bite, electrocution, or a thermal, chemical, electrical, or radiation burn. Sprain and strain injuries to muscles, joints, and connective tissues are classified as injuries when they result from a slip, trip, fall or other similar accidents.

Classifying illnesses

Skin diseases or disorders

Skin diseases or disorders are illnesses involving the worker's skin that are caused by work exposure to chemicals, plants, or other substances.

Examples: Contact dermatitis, eczema, or rash caused by primary irritants and sensitizers or poisonous plants; oil acne; friction blisters, chrome ulcers; inflammation of the skin.

Respiratory conditions

Respiratory conditions are illnesses associated with breathing hazardous biological agents, chemicals, dust, gases, vapors, or fumes at work.

Examples: Silicosis, asbestosis, pneumonitis, pharyngitis, rhinitis or acute congestion; farmer's lung, beryllium disease, tuberculosis, occupational asthma, reactive airways dysfunction syndrome (RADS), chronic obstructive pulmonary disease (COPD), hypersensitivity pneumonitis, toxic inhalation injury, such as metal fume fever, chronic obstructive bronchitis, and other pneumoconioses.

Poisoning

Poisoning includes disorders evidenced by abnormal concentrations of toxic substances in blood, other tissues, other bodily fluids, or the breath that are caused by the ingestion or absorption of toxic substances into the body.

Examples: Poisoning by lead, mercury,

cadmium, arsenic, or other metals; poisoning by carbon monoxide, hydrogen sulfide, or other gases; poisoning by benzene, benzol, carbon tetrachloride, or other organic solvents; poisoning by insecticide sprays, such as parathion or lead arsenate; poisoning by other chemicals, such as formaldehyde.

Hearing Loss

Noise-induced hearing loss is defined for recordkeeping purposes as a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more in either ear at 2000, 3000 and 4000 hertz, and the employee's total hearing level is 25 decibels (dB) or more above audiometric zero (also averaged at 2000, 3000, and 4000 hertz) in the same ear(s).

All other illnesses

All other occupational illnesses.

Examples: Heatstroke, sunstroke, heat exhaustion, heat stress and other effects of environmental heat; freezing, frostbite, and other effects of exposure to low temperatures; decompression sickness; effects of ionizing radiation (isotopes, x-rays, radium); effects of nonionizing radiation (welding flash, ultra-violet rays, lasers); anthrax; bloodborne pathogenic diseases, such as AIDS, HIV, hepatitis B or hepatitis C; brucellosis; malignant or benign tumors; histoplasmosis; coccidioidomycosis.

When must you post the Summary?

You must post the *Summary* only — not the *Log* — by February 1 of the year following the year covered by the form and keep it posted until April 30 of that year.

How long must you keep the Log and Summary on file?

You must keep the *Log* and *Summary* for 5 years following the year to which they pertain.

Do you have to send these forms to OSHA at the end of the year?

No. You do not have to send the completed forms to OSHA unless specifically asked to do so.

How can we help you?

If you have a question about how to fill out the *Log*,

- visit us online at www.osha.gov** or
- call your local OSHA office.**

Optional

Calculating Injury and Illness Incidence Rates

What is an incidence rate?

An incidence rate is the number of recordable injuries and illnesses occurring among a given number of full-time workers (usually 100 full-time workers) over a given period of time (usually one year). To evaluate your firm's injury and illness experience over time or to compare your firm's experience with that of your industry as a whole, you need to compute your incidence rate. Because a specific number of workers and a specific period of time are involved, these rates can help you identify problems in your workplace and/or progress you may have made in preventing work-related injuries and illnesses.

How do you calculate an incidence rate?

You can compute an occupational injury and illness incidence rate for all recordable cases or for cases that involved days away from work for your firm quickly and easily. The formula requires that you follow instructions in paragraph (a) below for the total recordable cases or those in paragraph (b) for cases that involved days away from work, and for both rates the instructions in paragraph (c).

(a) To find out the total number of recordable injuries and illnesses that occurred during the year, count the number of line entries on your OSHA Form 300, or refer to the OSHA Form 300A and sum the entries for columns (G), (H), (I), and (J).

(b) To find out the number of injuries and illnesses that involved days away from work, count the number of line entries on your OSHA Form 300 that received a check mark in column (H), or refer to the entry for column

(H) on the OSHA Form 300A.

(c) The number of hours all employees actually worked during the year. Refer to OSHA Form 300A and optional worksheet to calculate this number.

You can compute the incidence rate for all recordable cases of injuries and illnesses using the following formula:

Total number of injuries and illnesses × 200,000 ÷ Number of hours worked by all employees = Total recordable case rate

(The 200,000 figure in the formula represents the number of hours 100 employees working 40 hours per week, 50 weeks per year would work, and provides the standard base for calculating incidence rates.)

You can compute the incidence rate for recordable cases involving days away from work, days of restricted work activity or job transfer (DART) using the following formula:

(Number of entries in column H + Number of entries in column I) × 200,000 ÷ Number of hours worked by all employees = DART incidence rate

You can use the same formula to calculate incidence rates for other variables such as cases involving restricted work activity (column (I) on Form 300A), cases involving skin disorders (column (M-2) on Form 300A), etc. Just substitute the appropriate total for these cases, from Form 300A, into the formula in place of the total number of injuries and illnesses.

What can I compare my incidence rate to?

The Bureau of Labor Statistics (BLS) conducts a survey of occupational injuries and illnesses each year and publishes incidence rate data by

various classifications (e.g., by industry, by employer size, etc.). You can obtain these published data at www.bls.gov/iif or by calling a BLS Regional Office.

Worksheet

Total number of injuries and illnesses		Number of hours worked by all employees		Total recordable case rate
<input type="text"/>	X 200,000 ÷	<input type="text"/>	=	<input type="text"/>

Number of entries in Column H + Column I		Number of hours worked by all employees		DART incidence rate
<input type="text"/>	X 200,000 ÷	<input type="text"/>	=	<input type="text"/>



How to Fill Out the Log

The *Log of Work-Related Injuries and Illnesses* is used to classify work-related injuries and illnesses and to note the extent and severity of each case. When an incident occurs, use the *Log* to record specific details about what happened and how it happened.

If your company has more than one establishment or site, you must keep separate records for each physical location that is expected to remain in operation for one year or longer.

We have given you several copies of the *Log* in this package. If you need more than we provided, you may photocopy and use as many as you need.

The *Summary* — a separate form — shows the work-related injury and illness totals for the year in each category. At the end of the year, count the number of incidents in each category and transfer the totals from the *Log* to the *Summary*. Then post the *Summary* in a visible location so that your employees are aware of injuries and illnesses occurring in their workplace.

You don't post the Log. You post only the Summary at the end of the year.

OSHA's Form 300 (Rev. 01/2004) Log of Work-Related Injuries and Illnesses

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

Year 20 
U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

You must record information about every work-related death and about every work-related injury or illness that involves loss of consciousness, restricted work activity or job transfer, days away from work, or medical treatment beyond first aid. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR Part 1904.8 through 1904.12. Feel free to use two lines for a single case if you need to. You must complete an Injury and Illness Incident Report (OSHA Form 301) or equivalent form for each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

Establishment name XYZ Company
City Anywhere State MA

Identify the person			Describe the case			Classify the case CHECK ONLY ONE box for each case based on the most serious outcome for that case:				Enter the number of days the injured or ill worker was:		Check the "Injury" column or choose one type of illness:						
(A) Case no.	(B) Employee's name	(C) Job title <small>(e.g. Welder)</small>	(D) Date of injury or onset of illness	(E) Where the event occurred <small>(e.g. Loading dock north end)</small>	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill <small>(e.g. Second degree burns on right forearm from acetylene torch)</small>	Remained at Work				Away from work (K)	On job transfer or restriction (L)	(M)						
						Death (G)	Days away from work (H)	Job transfer or restriction (I)	Other recordable cases (J)	Days	Days	Injury (1)	Skin disorders (2)	Respiratory conditions (3)	Hoarseness (4)	Hearing loss (5)	All other illnesses (6)	
1	Mark Bagin	Welder	5 / 25 <small>month/day</small>	basement	fracture, left arm and left leg, fell from ladder	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12	15	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Shana Alexander	Foundry man	7 / 2 <small>month/day</small>	pouring deck	poisoning from lead fumes	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Sam Sauder	Electrician	8 / 5 <small>month/day</small>	2nd floor storeroom	broken left foot, fell over box	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7	30	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Ralph Boccella	Laborer	9 / 17 <small>month/day</small>	packaging dept	Back strain lifting boxes	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Jarrod Daniels	Machine opr.	10 / 23 <small>month/day</small>	production floor	dust in eye	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Be as specific as possible. You can use two lines if you need more room.

Revise the log if the injury or illness progresses and the outcome is more serious than you originally recorded for the case. Cross out, erase, or white-out the original entry.

Choose ONLY ONE of these categories. Classify the case by recording the most serious outcome of the case, with column G (Death) being the most serious and column J (Other recordable cases) being the least serious.

Note whether the case involves an injury or an illness.



Log of Work-Related Injuries and Illnesses

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

Form approved OMB no. 1218-0176

You must record information about every work-related death and about every work-related injury or illness that involves loss of consciousness, restricted work activity or job transfer, days away from work, or medical treatment beyond first aid. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR Part 1904.8 through 1904.12. Feel free to use two lines for a single case if you need to. You must complete an Injury and Illness Incident Report (OSHA Form 301) or equivalent form for each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

Establishment name _____

City _____ State _____

Identify the person			Describe the case			Classify the case				Enter the number of days the injured or ill worker was:		Check the "Injury" column or choose one type of illness:					
(A) Case no.	(B) Employee's name	(C) Job title <i>(e.g., Welder)</i>	(D) Date of injury or onset of illness	(E) Where the event occurred <i>(e.g., Loading dock north end)</i>	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill <i>(e.g., Second degree burns on right forearm from acetylene torch)</i>	CHECK ONLY ONE box for each case based on the most serious outcome for that case:				Away from work	On job transfer or restriction	(M)					
						Death	Days away from work	Job transfer or restriction	Other recordable cases	(K)	(L)	Injury	Skin disorder	Respiratory condition	Poisoning	Hearing loss	All other illnesses
						(G)	(H)	(I)	(J)	_____ days	_____ days	(1)	(2)	(3)	(4)	(5)	(6)
_____	_____	_____	_____/_____/_____ month/day	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____ days	_____ days	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Summary of Work-Related Injuries and Illnesses



All establishments covered by Part 1904 must complete this Summary page, even if no work-related injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete and accurate before completing this summary.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the Log. If you had no cases, write "0."

Employees, former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR Part 1904.35, in OSHA's recordkeeping rule, for further details on the access provisions for these forms.

Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
_____	_____	_____	_____
(G)	(H)	(I)	(J)

Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
_____	_____
(K)	(L)

Injury and Illness Types

Total number of . . . (M)	
(1) Injuries _____	(4) Poisonings _____
(2) Skin disorders _____	(5) Hearing loss _____
(3) Respiratory conditions _____	(6) All other illnesses _____

Post this Summary page from February 1 to April 30 of the year following the year covered by the form.

Public reporting burden for this collection of information is estimated to average 58 minutes per response, including time to review the instructions, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any other aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistical Analysis, Room N-3644, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.

Establishment information

Your establishment name _____

Street _____

City _____ State _____ ZIP _____

Industry description (e.g., *Manufacture of motor truck trailers*)

Standard Industrial Classification (SIC), if known (e.g., 3715)

OR

North American Industrial Classification (NAICS), if known (e.g., 336212)

Employment information (If you don't have these figures, see the Worksheet on the back of this page to estimate.)

Annual average number of employees _____

Total hours worked by all employees last year _____

Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

Company executive _____ Title _____

() - / /
Phone Date

Optional

Worksheet to Help You Fill Out the Summary

At the end of the year, OSHA requires you to enter the average number of employees and the total hours worked by your employees on the summary. If you don't have these figures, you can use the information on this page to estimate the numbers you will need to enter on the Summary page at the end of the year.

How to figure the average number of employees who worked for your establishment during the year:

- 1 Add** the total number of employees your establishment paid in all pay periods during the year. Include all employees: full-time, part-time, temporary, seasonal, salaried, and hourly.

The number of employees paid in all pay periods = **1** _____
- 2 Count** the number of pay periods your establishment had during the year. Be sure to include any pay periods when you had no employees.

The number of pay periods during the year = **2** _____
- 3 Divide** the number of employees by the number of pay periods.

$\frac{\mathbf{1}}{\mathbf{2}}$ _____ = **3** _____
- 4 Round the answer** to the next highest whole number. Write the rounded number in the blank marked *Annual average number of employees*.

The number rounded = **4** _____

For example, Acme Construction figured its average employment this way:

For pay period...	Acme paid this number of employees...		
1	10	Number of employees paid =	1
2	0		
3	15	Number of pay periods =	2
4	30		
5	40	$\frac{830}{26} =$	3
▼	▼	31.92	
24	20	31.92 rounds to	4
25	15		
26	+10	32 is the annual average number of employees	
	830		

How to figure the total hours worked by all employees:

Include hours worked by salaried, hourly, part-time and seasonal workers, as well as hours worked by other workers subject to day to day supervision by your establishment (e.g., temporary help services workers).

Do not include vacation, sick leave, holidays, or any other non-work time, even if employees were paid for it. If your establishment keeps records of only the hours paid or if you have employees who are not paid by the hour, please estimate the hours that the employees actually worked.

If this number isn't available, you can use this optional worksheet to estimate it.

Optional Worksheet

- _____ **Find** the number of full-time employees in your establishment for the year.
- X** _____ **Multiply** by the number of work hours for a full-time employee in a year.
- _____ This is the number of full-time hours worked.
- +** _____ **Add** the number of any overtime hours as well as the hours worked by other employees (part-time, temporary, seasonal)
- _____ **Round** the answer to the next highest whole number. Write the rounded number in the blank marked *Total hours worked by all employees last year*.

OSHA's Form 301

Injury and Illness Incident Report

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.



U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

This *Injury and Illness Incident Report* is one of the first forms you must fill out when a recordable work-related injury or illness has occurred. Together with the *Log of Work-Related Injuries and Illnesses* and the accompanying *Summary*, these forms help the employer and OSHA develop a picture of the extent and severity of work-related incidents.

Within 7 calendar days after you receive information that a recordable work-related injury or illness has occurred, you must fill out this form or an equivalent. Some state workers' compensation, insurance, or other reports may be acceptable substitutes. To be considered an equivalent form, any substitute must contain all the information asked for on this form.

According to Public Law 91-596 and 29 CFR 1904, OSHA's recordkeeping rule, you must keep this form on file for 5 years following the year to which it pertains.

If you need additional copies of this form, you may photocopy and use as many as you need.

Completed by _____

Title _____

Phone (____) _____ -- _____ Date ____/____/____

Information about the employee

1) Full name _____

2) Street _____

City _____ State _____ ZIP _____

3) Date of birth ____/____/____

4) Date hired ____/____/____

5) Male

Female

Information about the physician or other health care professional

6) Name of physician or other health care professional _____

7) If treatment was given away from the worksite, where was it given?

Facility _____

Street _____

City _____ State _____ ZIP _____

8) Was employee treated in an emergency room?

Yes

No

9) Was employee hospitalized overnight as an in-patient?

Yes

No

Information about the case

10) Case number from the Log _____ (Transfer the case number from the Log after you record the case.)

11) Date of injury or illness ____/____/____

12) Time employee began work _____ AM / PM

13) Time of event _____ AM / PM Check if time cannot be determined

14) **What was the employee doing just before the incident occurred?** Describe the activity, as well as the tools, equipment, or material the employee was using. Be specific. *Examples:* "climbing a ladder while carrying roofing materials"; "spraying chlorine from hand sprayer"; "daily computer key-entry."

15) **What happened?** Tell us how the injury occurred. *Examples:* "When ladder slipped on wet floor, worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time."

16) **What was the injury or illness?** Tell us the part of the body that was affected and how it was affected; be more specific than "hurt," "pain," or "sore." *Examples:* "strained back"; "chemical burn, hand"; "carpal tunnel syndrome."

17) **What object or substance directly harmed the employee?** *Examples:* "concrete floor"; "chlorine"; "radial arm saw." *If this question does not apply to the incident, leave it blank.*

18) **If the employee died, when did death occur?** Date of death ____/____/____

If You Need Help...

If you need help deciding whether a case is recordable, or if you have questions about the information in this package, feel free to contact us. We'll gladly answer any questions you have.

▼ Visit us online at www.osha.gov

▼ Call your OSHA Regional office and ask for the recordkeeping coordinator

or

▼ Call your State Plan office

Federal Jurisdiction

Region 1 - 617 / 565-9860
Connecticut; Massachusetts; Maine; New Hampshire; Rhode Island

Region 2 - 212 / 337-2378
New York; New Jersey

Region 3 - 215 / 861-4900
DC; Delaware; Pennsylvania; West Virginia

Region 4 - 404 / 562-2300
Alabama; Florida; Georgia; Mississippi

Region 5 - 312 / 353-2220
Illinois; Ohio; Wisconsin

Region 6 - 214 / 767-4731
Arkansas; Louisiana; Oklahoma; Texas

Region 7 - 816 / 426-5861
Kansas; Missouri; Nebraska

Region 8 - 303 / 844-1600
Colorado; Montana; North Dakota; South Dakota

Region 9 - 415 / 975-4310

Region 10 - 206 / 553-5930
Idaho

State Plan States

Alaska - 907 / 269-4957

Arizona - 602 / 542-5795

California - 415 / 703-5100

*Connecticut - 860 / 566-4380

Hawaii - 808 / 586-9100

Indiana - 317 / 232-2688

Iowa - 515 / 281-3661

Kentucky - 502 / 564-3070

Maryland - 410 / 767-2371

Michigan - 517 / 322-1848

Minnesota - 651 / 284-5050

Nevada - 702 / 486-9020

*New Jersey - 609 / 984-1389

New Mexico - 505 / 827-4230

*New York - 518 / 457-2574

North Carolina - 919 / 807-2875

Oregon - 503 / 378-3272

Puerto Rico - 787 / 754-2172

South Carolina - 803 / 734-9669

Tennessee - 615 / 741-2793

Utah - 801 / 530-6901

Vermont - 802 / 828-2765

Virginia - 804 / 786-6613

Virgin Islands - 340 / 772-1315

Washington - 360 / 902-5601

Wyoming - 307 / 777-7786

*Public Sector only



Have questions?

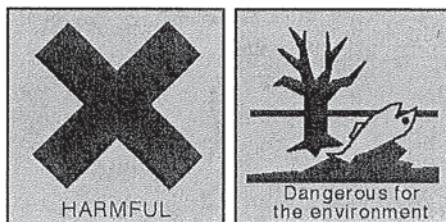
If you need help in filling out the *Log* or *Summary*, or if you have questions about whether a case is recordable, contact us. We'll be happy to help you. You can:

- ▼ Visit us online at: **www.osha.gov**
- ▼ Call your regional or state plan office. You'll find the phone number listed inside this cover.

APPENDIX H

SAFETY DATA SHEETS

Safety data for dibenz(a,h)anthracene



Glossary of terms on this data sheet.

The information on this web page is provided to help you to work safely, but it is intended to be an overview of hazards, not a replacement for a full Material Safety Data Sheet (MSDS). MSDS forms can be downloaded from the web sites of many chemical suppliers.

General

Synonyms: 1,2:5,6-benzanthracene, 1,2:5,6-dibenzanthracene, dibenzo(a,h)anthracene, DBA, 1,2,5,6-DBA

Use: a common pollutant in smoke and used oils

Molecular formula: $C_{22}H_{14}$

CAS No: 53-70-3

EINECS No: 200-181-8

Annex I Index. No: 601-041-00-2

Physical data

Appearance: white to light yellow crystalline solid

Melting point: 266 - 267 C

Boiling point: 524 C

Vapour density:

Vapour pressure:

Density ($g\ cm^{-3}$): 1.28

Flash point:

Explosion limits:

Autoignition temperature:

Water solubility:

Stability

Stable. Combustible. Incompatible with strong oxidizing agents.

Toxicology

Harmful if swallowed or inhaled. Experimental carcinogen, tumorigen and neoplastigen. IARC probable human carcinogen.

Toxicity data

(The meaning of any toxicological abbreviations which appear in this section is given [here.](#))

IVN-MUS LDLO 10 mg kg⁻¹

Risk phrases

(The meaning of any risk phrases which appear in this section is given [here.](#))

R45 R50 R53.

Environmental information

Harmful in the environment - may cause long-term damage.

Transport information

(The meaning of any UN hazard codes which appear in this section is given [here.](#))

Non-hazardous for air, sea and road freight.

Personal protection

Safety glasses, gloves, good ventilation. Handle as a possible carcinogen.

Safety phrases

(The meaning of any safety phrases which appear in this section is given [here.](#))

S45 S53 S60 S61.

[Return to [Physical & Theoretical Chemistry Lab. Safety home page.](#)]

This information was last updated on October 8, 2006. We have tried to make it as accurate and useful as possible, but can take no responsibility for its use, misuse, or accuracy. We have not verified this information, and cannot guarantee that it is up-to-date. Note also that the information on the PTCL Safety web site, where this page was hosted, has been copied onto many other sites, often without permission. If you have any doubts about the veracity of the information that you are viewing, or have any queries, please check the URL that your web browser displays for this page. If the URL begins "http://msds.chem.ox.ac.uk/" the page is maintained by the Safety Officer in Physical Chemistry at Oxford University. If not, this page is a copy made by some other person and we have no responsibility for it.

APG**Analytical Products Group, Inc.**2730 Washington Blvd., Belpre, OH 45714
740-423-4200 800-272-4442 Fax 740-423-5588**Material Safety Data Sheet**

Date prepared on: 6/14/01

Last revised on: 1/20/08

Page 1

Section I: Product Identification

CATALOG NUMBER: 5380, 5382	PRODUCT NAME: Benzo(a)pyrene
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Section II - Hazardous Ingredients/Identity Information

Chemical Name	CAS Reg. No.	OSHA PEL (TWA)	% Composition*
Acetone	67-64-1	750ppm	>99%
Benzo(A) Pyrene	50-32-8	0.2Mg/M3	<0.1%
A table of the compound possible in this polynuclear aromatic hydrocarbon analytical standard is attached. Data included in the table are formulas, CAS numbers, oral Id50 values for rats and PEL/TWA values if available. .			

Section III - Physical/Chemical Characteristics of Hazardous Ingredients

BOILING POINT: 56 C (132 F) @ 760 mm Hg		SPECIFIC GRAVITY: 0.79 (water=1)	
VAPOR PRESSURE: 181 (20 C)	SOLUBILITY IN WATER: Complete	APPEARANCE/ODOR: Clear, colorless liquid, sweet odor (acetone).	

Section IV - Fire and Explosion Hazard Data

FLASH POINT (Method used): -18 C (-2 F)	AUTO IGNITION TEMPERATURE: 464 C (869 F)	FLAMMABLE LIMITS	LEL 2.5%	UEL 13%
EXTINGUISHING MEDIA: Use alcohol foam, dry chemical or carbon dioxide (water may be ineffective). Use extinguisher media appropriate for surrounding fire.				
SPECIAL FIRE FIGHTING PROCEDURES: Firefighters should wear proper protective equipment and self-contained breathing apparatus with full face piece operated in positive pressure mode. Move containers from fire area if it can be done without risk. Use water to keep fire exposed containers cool.				
UNUSUAL FIRE AND EXPLOSION HAZARDS: Vapors may flow along surfaces to distant ignition sources and flash back. Closed containers exposed to heat may explode. Contact with strong oxidizers may cause a fire.				

Section V - Reactivity Data

STABILITY:	Unstable <input type="checkbox"/>	Stable <input checked="" type="checkbox"/>	Conditions to Avoid: Heat, flame, other sources of ignition.
INCOMPATIBILITY (Materials to avoid): Strong oxidizing agents, strong bases, halogen acids and halogen compounds, caustics, amines and ammonia, chlorine and chlorine compounds, strong acids esp. sulfuric and nitric.			
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, carbon dioxide, toxic fumes of chlorine.			
HAZARDOUS POLYMERIZATION:	May Occur <input type="checkbox"/>	Will Not Occur <input checked="" type="checkbox"/>	Conditions to Avoid: None Known

Section VI - Health Hazard Data

ROUTES OF ENTRY	Inhalation? YES	Skin? YES	Ingestion? YES
HEALTH HAZARDS (Acute and Chronic): ACUTE: Irritation of the nose and throat. CHRONIC: Kidney and liver damage.			
COMPONENTS LISTED AS CARCINOGENS OR POTENTIAL CARCINOGENS: Total of PAH is less than 1%. Some are on the IARC list.			
SIGNS AND SYMPTOMS OF EXPOSURE: Irritation of skin, eyes, nose and throat. Headache, dizziness, vomiting, nausea, central nervous system depression, low			

blood pressure and respiratory failure. Prolonged contact may cause dermatitis.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Skin and eye disorders, chronic respiratory disease.

EMERGENCY AND FIRST AID PROCEDURES: Seek medical assistance for treatment, observation and support if necessary. EYE CONTACT: Flush with water, seek medical attention. SKIN CONTACT: Wash with soap and water, use protective creams. INHALATION: Remove to fresh air, if not breathing give artificial respiration. If breathing is difficult give oxygen and obtain medical assistance. INGESTION: Obtain medical assistance if swallowed. If conscious give large amounts of water and induce vomiting.

Section VII - Precautions for Safe Handling and Use

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Diluted standard can be absorbed with sand or other non-combustible absorbent material and placed into a container for later disposal. Sample solutions should be absorbed with charcoal or other organic absorbent and incinerated. Flush area with water.

WASTE DISPOSAL METHOD: Dispose in accordance with all applicable federal, state and local regulations.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep container tightly closed. Store in a cool, dry, well ventilated flammable liquid storage area. Isolate from incompatible materials.

OTHER PRECAUTIONS* Do not heat or evaporate analytical standards to dryness.

Section VIII - Control Measures

RESPIRATORY PROTECTION (Please specify): Respiratory protection required if airborne concentrations exceeds PEL (750 ppm). At concentrations up to 5000 ppm a chemical cartridge respirator with organic vapor cartridge is recommended. Above this level, a self-contained breathing apparatus is recommended. (20,000 is immediately dangerous to life or health).

VENTILATION: Local exhaust

PROTECTIVE GLOVES: Butyl, neoprene, latex, or rubber gloves.

EYE PROTECTION: Safety glasses or goggles.

OTHER PROTECTIVE EQUIPMENT: Impervious Clothing.

EMERGENCY WASH FACILITIES: Maintain eye wash and quick drench showers in work area.

The information stated in this Material Safety Data Sheet (MSDS) is believed to be correct on the date of publication and must not be considered all conclusive. The information has been obtained only by a search of available literature and is only a guide for handling the chemicals. Persons not specifically and properly trained should not handle this chemical or its container. This MSDS is provided without any warranty expressed or implied, including merchantability or fitness for any particular purpose.

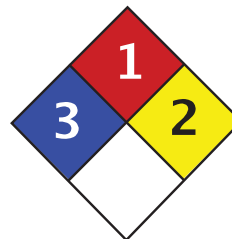
This product is furnished for laboratory use ONLY! Our standards may not be used as drugs, cosmetics, agricultural or pesticidal products, food additives or as house hold chemicals.

* Various Government agencies (i.e., Department of Transportation, Occupational Safety and Health Administration, Environmental Protection Agency, and others) may have specific regulations concerning the transportation, handling, storage or use of this product which may not be contained herein. The customer or user of this product should be familiar with these regulations.

Chemical Name	Common Name	Percentage	CAS#	Formula	PEL(Units)	ILV(Units)	LD50 Value	Conditions	Footnote
Acetone	Acetone	>98.0	67.-64-1	CH3COC	750ppm	750ppm	5800	Mg/Kg Oral Rat	2
Benzo (A) Pyrene	Benzo (A) Pyrene	<0.1	50-32-8	C20H12	0.2 Mg/M3	ALARA	Not Available		1

HAZARDOUS COMPONENTS OF POLYNUCLEAR AROMATIC HYDROCARBONS S

1. Classified by IARC as a Class 2A Carcinogen
2. Subject to the reporting requirements of SARA Title III, Section 313



Health	3
Fire	1
Reactivity	2
Personal Protection	E

Material Safety Data Sheet Arsenic MSDS

Section 1: Chemical Product and Company Identification

Product Name: Arsenic

Catalog Codes: SLA1006

CAS#: 7440-38-2

RTECS: CG0525000

TSCA: TSCA 8(b) inventory: Arsenic

CI#: Not applicable.

Synonym:

Chemical Name: Arsenic

Chemical Formula: As

Contact Information:

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

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

Order Online: ScienceLab.com

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

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

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

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Arsenic	7440-38-2	100

Toxicological Data on Ingredients: Arsenic: ORAL (LD50): Acute: 763 mg/kg [Rat]. 145 mg/kg [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:

Very hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant), of eye contact (irritant).

Potential Chronic Health Effects:

CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH.

MUTAGENIC EFFECTS: Not available.

TERATOGENIC EFFECTS: Not available.

DEVELOPMENTAL TOXICITY: Not available.

The substance is toxic to kidneys, lungs, the nervous system, mucous membranes.

Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

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

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:

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

Serious Inhalation:

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

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

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances: Flammable in presence of open flames and sparks, of heat, of oxidizing materials.

Explosion Hazards in Presence of Various Substances:

Risks of explosion of the product in presence of mechanical impact: Not available.

Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:

SMALL FIRE: Use DRY chemical powder.

LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards:

Material in powder form, capable of creating a dust explosion. When heated to decomposition it emits highly toxic fumes.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:

Use a shovel to put the material into a convenient waste disposal container. Be careful that the product is not

present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:

Keep locked up.. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, acids, moisture.

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

Section 8: Exposure Controls/Personal Protection

Engineering Controls:

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

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

Personal Protection in Case of a Large Spill:

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

Exposure Limits:

TWA: 0.01 from ACGIH (TLV) [United States] [1995]
Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

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

Odor: Not available.

Taste: Not available.

Molecular Weight: 74.92 g/mole

Color: Silvery.

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

Boiling Point: Not available.

Melting Point: Sublimation temperature: 615°C (1139°F)

Critical Temperature: Not available.

Specific Gravity: 5.72 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water, hot water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

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

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals: Acute oral toxicity (LD50): 145 mg/kg [Mouse].

Chronic Effects on Humans:

CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH.

Causes damage to the following organs: kidneys, lungs, the nervous system, mucous membranes.

Other Toxic Effects on Humans:

Very hazardous in case of ingestion, of inhalation.

Slightly hazardous in case of skin contact (irritant).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are as toxic as the original product.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Arsenic UNNA: UN1558 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Arsenic

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Arsenic

Pennsylvania RTK: Arsenic

Massachusetts RTK: Arsenic

TSCA 8(b) inventory: Arsenic

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):

CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).

CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):

R22- Harmful if swallowed.

R45- May cause cancer.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 1

Reactivity: 2

Personal Protection: E

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

Health: 3

Flammability: 1

Reactivity: 2

Specific hazard:

Protective Equipment:

Gloves.

Lab coat.

Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.

Safety glasses.

Section 16: Other Information**References:**

-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987.

-Liste des produits purs tératogènes, mutagènes, cancérogènes. Répertoire toxicologique de la Commission de la Santé et de la Sécurité du Travail du Québec.

-Material safety data sheet emitted by: la Commission de la Santé et de la Sécurité du Travail du Québec.

-SAX, N.I. Dangerous Properties of Industrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984.

-The Sigma-Aldrich Library of Chemical Safety Data, Edition II.

-Guide de la loi et du règlement sur le transport des marchandises dangereuses au Canada. Centre de conformité international Ltée. 1986.

Other Special Considerations: Not available.

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Last Updated: 10/09/2005 04:16 PM

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MATERIAL SAFETY DATA SHEET

EM SCIENCE

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Manufacturer.....:

EM SCIENCE
A Division of EM Industries
P.O. Box 70
480 Democrat Road
Gibbstown, N.J. 08027

Preparation Date.: 10/25/96

Information Phone Number.: 856-423-6300

Hours: Mon. to Fri. 8:30-5

Chemtrec Emergency Number: 800-424-9300

Hours: 24 hrs a day

Catalog Number(s):

BX0207

Product Name:

1,2-Benzanthracene

Synonyms:

Benzo (A) Anthracene

Chemical Family:

Aromatic Hydrocarbon

Formula:

$C_{18}H_{12}$

Molecular Weight.:

228.29

2. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS #	Appr %
1,2-Benzanthracene	56-55-3	100%

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

SUSPECT CANCER HAZARD. MAY CAUSE CANCER.

HARMFUL IF INHALED, SWALLOWED OR ABSORBED THROUGH SKIN.

IRRITATING TO SKIN, EYES AND MUCOUS MEMBRANES.

MAY CAUSE DAMAGE TO KIDNEY, URETER, BLADDER.

WARNING: This product contains a chemical(s) known to the State of California to cause cancer.

Appearance:

Light yellow powder

POTENTIAL HEALTH EFFECTS (ACUTE AND CHRONIC)

Symptoms of Exposure:

Harmful if inhaled, swallowed, or absorbed through the skin. Irritating on contact with skin, eyes or mucous membranes. May cause damage to kidney, ureter, bladder. Chronic exposure may cause alteration of genetic material.

Medical Cond. Aggravated by Exposure:

Urinary conditions

Routes of Entry:

Inhalation, ingestion or skin contact.

Carcinogenicity:

Suspected human carcinogenic substance. Suspect Cancer Hazard.

WARNING: This product contains a chemical(s) known to the State of California to cause cancer.

4. FIRST AID MEASURES

Emergency First Aid:

GET MEDICAL ASSISTANCE FOR ALL CASES OF OVEREXPOSURE.

Skin: Immediately flush thoroughly with large amounts of water.

Eyes: Immediately flush thoroughly with water for at least 15 minutes.

Inhalation: Remove to fresh air; give artificial respiration if breathing has stopped.

Ingestion: If conscious, drink water and induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person.

Remove contaminated clothing and wash before reuse.

5. FIRE FIGHTING MEASURES

Flash Point (F): Noncombustible
Flammable Limits LEL (%): N/A
Flammable Limits UEL (%): N/A
Extinguishing Media:
Foam, Carbon dioxide, Water spray

Fire Fighting Procedures:
Wear self-contained breathing apparatus and protective clothing.

Fire & Explosion Hazards:
Thermal decomposition produces highly toxic fumes.

6. ACCIDENTAL RELEASE MEASURES

Spill Response:
Evacuate the area of all unnecessary personnel. Wear suitable protective equipment listed under Exposure / Personal Protection. Eliminate any ignition sources until the area is determined to be free from explosion or fire hazards. Contain the release and eliminate its source, if this can be done without risk. Take up and containerize for proper disposal as described under Disposal. Comply with Federal, State, and local regulations on reporting releases. Refer to Regulatory Information for reportable quantity and other regulatory data.

7. HANDLING AND STORAGE

Handling & Storage:
Keep container tightly closed. Store in a cool, dry, well-ventilated area. Do not breathe vapor or dust. Do not get in eyes, on skin, or on clothing.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT:

Ventilation, Respiratory Protection, Protective Clothing, Eye Protection:

Respiratory Protection: If workplace exposure limit(s) of product or any component is exceeded (see TLV/PEL), a NIOSH/MSHA approved air supplied respirator is advised in absence of proper environmental control. OSHA regulations also permit other NIOSH/MSHA respirators (negative pressure type) under specified conditions (see your safety equipment supplier). Engineering and/or administrative controls should be implemented to reduce exposure. Material must be handled or transferred in an approved fume hood or with equivalent ventilation. Protective gloves must be worn to prevent skin contact (Viton or equivalent) Safety glasses with side shields must be worn at all times. Impervious protective clothing should be worn to prevent skin contact.

Work/Hygenic Practices:

Wash thoroughly after handling. Do not take internally. Eye wash and safety equipment should be readily available.

EXPOSURE GUIDELINES

OSHA - PEL:

Component	TWA		STEL		CL		Skin
	PPM	MG/M3	PPM	MG/M3	PPM	MG/M3	

1,2-Benzanthracene

ACGIH - TLV:

Component	TWA		STEL		CL		Skin
	PPM	MG/M3	PPM	MG/M3	PPM	MG/M3	

1,2-Benzanthracene

If there are no exposure limit numbers listed in the Exposure Guidelines chart, this indicates that no OSHA or ACGIH exposure limits have been established.

9. PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point (C 760 mmHg) : 435C Sublimes

Melting Point (C) : 160C

Specific Gravity (H₂O = 1) : N/A

Vapor Pressure (mm Hg) : N/A

Percent Volatile by vol (%) : N/A

Vapor Density (Air = 1) : N/A

Evaporation Rate (BuAc = 1) : N/A

Solubility in Water (%) : Insoluble

Appearance :

Light yellow powder

10. STABILITY AND REACTIVITY

Stability: Yes

Hazardous Polymerization:

Does not occur

Hazardous Decomposition:

CO_x

Conditions to Avoid:

None indicated

Materials To Avoid:

- Water
- Acids
- Bases
- Corrosives
- Oxidizers
- Other:

11. TOXICOLOGICAL INFORMATION

Toxicity Data

ivn-mus LDLo: 10 mg/kg

Toxicological Findings:

Tests on laboratory animals indicate material may produce adverse mutagenic effects and cause tumors.

Cited in Registry of Toxic Effects of Chemical Substances (RTECS)

12. DISPOSAL CONSIDERATIONS

EPA Waste Numbers: U018

Treatment:

Specified Technology - Incineration to a level below TCA (Total Constituent Analyses) levels. Contact your local permitted waste disposal company (TSD) for permissible treatment site.

ALWAYS CONTACT A PERMITTED WASTE DISPOSER (TSD) TO ASSURE COMPLIANCE WITH ALL CURRENT LOCAL, STATE AND FEDERAL REGULATIONS.

13. TRANSPORT INFORMATION

DOT Proper Shipping Name:

Environmentally Hazardous Substance, Solid, n.o.s. (1,2-Benzanthracene)

DOT ID Number :

UN3077

14. REGULATORY INFORMATION

TSCA Statement:

The CAS number of this product is listed on the TSCA Inventory.

Component	SARA EHS (302)	SARA EHS TPQ (lbs)	CERCLA RQ (lbs)
-----------	----------------------	--------------------------	-----------------------

1,2-Benzanthracene

10

Component	OSHA Floor List	SARA 313	DeMinimis for SARA 313 (%)
-----------	--------------------	-------------	----------------------------------

1,2-Benzanthracene

Y

Y

0.1

If there is no information listed on the regulatory information chart, this indicates that the chemical is not covered by the specific regulation listed.

15. OTHER INFORMATION

Comments:

None

NFPA Hazard Ratings:

Health : 3
 Flammability : 0
 Reactivity : 0
 Special Hazards :

Revision History: 1/1/84 7/18/87 1/24/91 3/1/91
 11/19/93 3/10/95

| = Revised Section

N/A = Not Available

N/E = None Established

The statements contained herein are offered for informational purposes only and are based upon technical data that EM Science believes to be accurate. It is intended for use only by persons having the necessary technical

SAFETY DATA SHEET

Version 5.6
Revision Date 05/24/2016
Print Date 05/28/2016

1. PRODUCT AND COMPANY IDENTIFICATION**1.1 Product identifiers**

Product name : Benzo[*b*]fluoranthene

Product Number : 275336
Brand : Aldrich
Index-No. : 601-034-00-4

CAS-No. : 205-99-2

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

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION**2.1 Classification of the substance or mixture****GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

Carcinogenicity (Category 1B), H350
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

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

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word : Danger

Hazard statement(s)

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

Precautionary statement(s)

P201 : Obtain special instructions before use.
P202 : Do not handle until all safety precautions have been read and understood.
P273 : Avoid release to the environment.
P281 : Use personal protective equipment as required.
P308 + P313 : IF exposed or concerned: Get medical advice/ attention.
P391 : Collect spillage.

P405
P501

Store locked up.
Dispose of contents/ container to an approved waste disposal plant.

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

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms : 3,4-Benzofluoranthene
Benz[e]acephenanthrylene
2,3-Benzfluoranthene
3,4-Benz[e]acephenanthrylene
Benzo[b]fluoranthene
Benzo[e]fluoranthene
NSC 89265

Formula : C₂₀H₁₂
Molecular weight : 252.31 g/mol
CAS-No. : 205-99-2
EC-No. : 205-911-9
Index-No. : 601-034-00-4

Hazardous components

Component	Classification	Concentration
Benz[e]acephenanthrylene		
	Carc. 1B; Aquatic Acute 1; Aquatic Chronic 1; H350, H410	<= 100 %

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

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

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

If inhaled

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

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Flush eyes with water as a precaution.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

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

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

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

5.2 Special hazards arising from the substance or mixture

No data available

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

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

- 6.1 Personal precautions, protective equipment and emergency procedures**
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.
- 6.2 Environmental precautions**
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.
- 6.3 Methods and materials for containment and cleaning up**
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.
- 6.4 Reference to other sections**
For disposal see section 13.

7. HANDLING AND STORAGE

- 7.1 Precautions for safe handling**
Avoid formation of dust and aerosols. Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.
- 7.2 Conditions for safe storage, including any incompatibilities**
Keep container tightly closed in a dry and well-ventilated place.
Storage class (TRGS 510): Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects
- 7.3 Specific end use(s)**
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Appropriate engineering controls

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

Personal protective equipment

Eye/face protection

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min
Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

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

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

- | | |
|---|---|
| a) Appearance | Form: solid |
| b) Odour | No data available |
| c) Odour Threshold | No data available |
| d) pH | No data available |
| e) Melting point/freezing point | Melting point/range: 163 - 165 °C (325 - 329 °F) - lit. |
| f) Initial boiling point and boiling range | No data available |
| g) Flash point | No data available |
| h) Evaporation rate | No data available |
| i) Flammability (solid, gas) | No data available |
| j) Upper/lower flammability or explosive limits | No data available |
| k) Vapour pressure | No data available |
| l) Vapour density | No data available |
| m) Relative density | No data available |
| n) Water solubility | No data available |
| o) Partition coefficient: n-octanol/water | No data available |
| p) Auto-ignition temperature | No data available |
| q) Decomposition | No data available |

temperature

- r) Viscosity No data available
- s) Explosive properties No data available
- t) Oxidizing properties No data available

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

Strong oxidizing agents

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides

Other decomposition products - No data available

In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

TDL_o Oral - Mouse - 7.57 mg/kg

Remarks: Liver:Changes in liver weight. Endocrine:Changes in thymus weight.

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

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

Possible human carcinogen

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Benz[e]acephenanthrylene)

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Benz[e]acephenanthrylene)

NTP: Reasonably anticipated to be a human carcinogen (Benz[e]acephenanthrylene)
NTP: Reasonably anticipated to be a human carcinogen (Benz[e]acephenanthrylene)
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: Not available

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

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

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to daphnia and other aquatic invertebrates Immobilization EC50 - Daphnia magna (Water flea) - > 1.024 mg/l - 24 h

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

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

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

Not dangerous goods

IMDG

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

IATA

UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Benz[e]acephenanthrylene)

Further information

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

15. REGULATORY INFORMATION

SARA 302 Components

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

SARA 313 Components

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

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-03-01

SARA 311/312 Hazards

Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-03-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-03-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-03-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer.

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-09-28

WARNING! This product contains a chemical known to the State of California to cause cancer.

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-09-28

16. OTHER INFORMATION

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

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
H350	May cause cancer.

H400 Very toxic to aquatic life.
H410 Very toxic to aquatic life with long lasting effects.

HMIS Rating

Health hazard: 1
Chronic Health Hazard: *
Flammability: 0
Physical Hazard 0

NFPA Rating

Health hazard: 2
Fire Hazard: 0
Reactivity Hazard: 0

Further information

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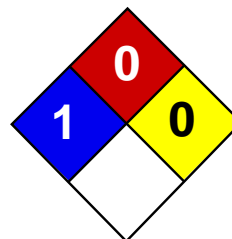
Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.6

Revision Date: 05/24/2016

Print Date: 05/28/2016



Health	1
Fire	0
Reactivity	0
Personal Protection	E

Material Safety Data Sheet

Lead MSDS

Section 1: Chemical Product and Company Identification

Product Name: Lead

Catalog Codes: SLL1291, SLL1669, SLL1081, SLL1459, SLL1834

CAS#: 7439-92-1

RTECS: OF7525000

TSCA: TSCA 8(b) inventory: Lead

CI#: Not available.

Synonym: Lead Metal, granular; Lead Metal, foil; Lead Metal, sheet; Lead Metal, shot

Chemical Name: Lead

Chemical Formula: Pb

Contact Information:

Sciencelab.com, Inc.

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:

1-800-424-9300

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

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

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Lead	7439-92-1	100

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

Section 3: Hazards Identification

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

Potential Chronic Health Effects:

Slightly hazardous in case of skin contact (permeator). **CARCINOGENIC EFFECTS:** Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC. **MUTAGENIC EFFECTS:** Not available. **TERATOGENIC EFFECTS:** Not available. **DEVELOPMENTAL TOXICITY:** Not available. The substance may be toxic to blood, kidneys, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

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

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:

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

Serious Inhalation: Not available.

Ingestion:

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

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

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

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

Explosion Hazards in Presence of Various Substances:

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:

SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: When heated to decomposition it emits highly toxic fumes of lead.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:

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

Large Spill:

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

Section 7: Handling and Storage

Precautions:

Keep locked up.. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable

protective clothing. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

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

Section 8: Exposure Controls/Personal Protection

Engineering Controls:

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

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

Personal Protection in Case of a Large Spill:

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

Exposure Limits:

TWA: 0.05 (mg/m³) from ACGIH (TLV) [United States] TWA: 0.05 (mg/m³) from OSHA (PEL) [United States] TWA: 0.03 (mg/m³) from NIOSH [United States] TWA: 0.05 (mg/m³) [Canada] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

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

Odor: Not available.

Taste: Not available.

Molecular Weight: 207.21 g/mole

Color: Bluish-white. Silvery. Gray

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

Boiling Point: 1740°C (3164°F)

Melting Point: 327.43°C (621.4°F)

Critical Temperature: Not available.

Specific Gravity: 11.3 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, excess heat

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:

Can react vigorously with oxidizing materials. Incompatible with sodium carbide, chlorine trifluoride, trioxane + hydrogen peroxide, ammonium nitrate, sodium azide, disodium acetylide, sodium acetylide, hot concentrated nitric acid, hot concentrated hydrochloric acid, hot concentrated sulfuric acid, zirconium.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Inhalation. Ingestion.

Toxicity to Animals:

LD50: Not available. LC50: Not available.

Chronic Effects on Humans:

CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC. May cause damage to the following organs: blood, kidneys, central nervous system (CNS).

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

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans:

Acute Potential: Skin: Lead metal granules or dust: May cause skin irritation by mechanical action. Lead metal foil, shot or sheets: Not likely to cause skin irritation Eyes: Lead metal granules or dust: Can irritate eyes by mechanical action. Lead metal foil, shot or sheets: No hazard. Will not cause eye irritation. Inhalation: In an industrial setting, exposure to lead mainly occurs from inhalation of dust or fumes. Lead dust or fumes: Can irritate the upper respiratory tract (nose, throat) as well as the bronchi and lungs by mechanical action. Lead dust can be absorbed through the respiratory system. However, inhaled lead does not accumulate in the lungs. All of an inhaled dose is eventually absorbed or transferred to the gastrointestinal tract. Inhalation effects of exposure to fumes or dust of inorganic lead may not develop quickly. Symptoms may include metallic taste, chest pain, decreased physical fitness, fatigue, sleep disturbance, headache, irritability, reduces memory, mood and personality changes, aching bones and muscles, constipation, abdominal pains, decreasing appetite. Inhalation of large amounts may lead to ataxia, delirium, convulsions/seizures, coma, and death. Lead metal foil, shot, or sheets: Not an inhalation hazard unless metal is heated. If metal is heated, fumes will be released. Inhalation of these fumes may cause "fume metal fever", which is characterized by flu-like symptoms. Symptoms may include metallic taste, fever, nausea, vomiting, chills, cough, weakness, chest pain, generalized muscle pain/aches, and increased white blood cell count. Ingestion: Lead metal granules or dust: The symptoms of lead poisoning include abdominal pain or cramps (lead colic), spasms, nausea, vomiting, headache, muscle weakness, hallucinations, distorted perceptions, "lead line" on the gums, metallic taste, loss of appetite, insomnia, dizziness and other symptoms similar to that of inhalation. Acute poisoning may result in high lead levels in the blood and urine, shock, coma and death in extreme cases. Lead metal foil, shot or sheets: Not an ingestion hazard for usual industrial handling.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations**Waste Disposal:**

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

Section 14: Transport Information

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

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information**Federal and State Regulations:**

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Lead California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (female) which would require a warning under the statute: Lead California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (male) which would require a warning under the statute: Lead California prop. 65 (no significant risk level): Lead: 0.0005 mg/day (value) California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Lead California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Lead Connecticut hazardous material survey.: Lead Illinois toxic substances disclosure to employee act: Lead Illinois chemical safety act: Lead New York release reporting list: Lead Rhode Island RTK hazardous substances: Lead Pennsylvania RTK: Lead

Other Regulations:

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

Other Classifications:

WHMIS (Canada): CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):

R20/22- Harmful by inhalation and if swallowed. R33- Danger of cumulative effects. R61- May cause harm to the unborn child. R62- Possible risk of impaired fertility. S36/37- Wear suitable protective clothing and gloves. S44- If you feel unwell, seek medical advice (show the label when possible). S53- Avoid exposure - obtain special instructions before use.

HMIS (U.S.A.):

Health Hazard: 1

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

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

Health: 1

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:

Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:21 PM

Last Updated: 06/09/2012 12:00 PM

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.

APG**Analytical Products Group, Inc.**2730 Washington Blvd., Belpre, OH 45714
740-423-4200 800-272-4442 Fax 740-423-5588**Material Safety Data Sheet**

Date prepared on: 6/14/01

Last revised on: 1/20/08

Page 1

Section I: Product Identification

CATALOG NUMBER: 5380, 5382	PRODUCT NAME: Benzo(a)pyrene
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Section II - Hazardous Ingredients/Identity Information

Chemical Name	CAS Reg. No.	OSHA PEL (TWA)	% Composition*
Acetone	67-64-1	750ppm	>99%
Benzo(A) Pyrene	50-32-8	0.2Mg/M3	<0.1%
A table of the compound possible in this polynuclear aromatic hydrocarbon analytical standard is attached. Data included in the table are formulas, CAS numbers, oral Id50 values for rats and PEL/TWA values if available. .			

Section III - Physical/Chemical Characteristics of Hazardous Ingredients

BOILING POINT: 56 C (132 F) @ 760 mm Hg		SPECIFIC GRAVITY: 0.79 (water=1)	
VAPOR PRESSURE: 181 (20 C)	SOLUBILITY IN WATER: Complete	APPEARANCE/ODOR: Clear, colorless liquid, sweet odor (acetone).	

Section IV - Fire and Explosion Hazard Data

FLASH POINT (Method used): -18 C (-2 F)	AUTO IGNITION TEMPERATURE: 464 C (869 F)	FLAMMABLE LIMITS	LEL 2.5%	UEL 13%
EXTINGUISHING MEDIA: Use alcohol foam, dry chemical or carbon dioxide (water may be ineffective). Use extinguisher media appropriate for surrounding fire.				
SPECIAL FIRE FIGHTING PROCEDURES: Firefighters should wear proper protective equipment and self-contained breathing apparatus with full face piece operated in positive pressure mode. Move containers from fire area if it can be done without risk. Use water to keep fire exposed containers cool.				
UNUSUAL FIRE AND EXPLOSION HAZARDS: Vapors may flow along surfaces to distant ignition sources and flash back. Closed containers exposed to heat may explode. Contact with strong oxidizers may cause a fire.				

Section V - Reactivity Data

STABILITY:	Unstable <input type="checkbox"/>	Stable <input checked="" type="checkbox"/>	Conditions to Avoid: Heat, flame, other sources of ignition.
INCOMPATIBILITY (Materials to avoid): Strong oxidizing agents, strong bases, halogen acids and halogen compounds, caustics, amines and ammonia, chlorine and chlorine compounds, strong acids esp. sulfuric and nitric.			
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, carbon dioxide, toxic fumes of chlorine.			
HAZARDOUS POLYMERIZATION:	May Occur <input type="checkbox"/>	Will Not Occur <input checked="" type="checkbox"/>	Conditions to Avoid: None Known

Section VI - Health Hazard Data

ROUTES OF ENTRY	Inhalation? YES	Skin? YES	Ingestion? YES
HEALTH HAZARDS (Acute and Chronic): ACUTE: Irritation of the nose and throat. CHRONIC: Kidney and liver damage.			
COMPONENTS LISTED AS CARCINOGENS OR POTENTIAL CARCINOGENS: Total of PAH is less than 1%. Some are on the IARC list.			
SIGNS AND SYMPTOMS OF EXPOSURE: Irritation of skin, eyes, nose and throat. Headache, dizziness, vomiting, nausea, central nervous system depression, low			

blood pressure and respiratory failure. Prolonged contact may cause dermatitis.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Skin and eye disorders, chronic respiratory disease.

EMERGENCY AND FIRST AID PROCEDURES: Seek medical assistance for treatment, observation and support if necessary. EYE CONTACT: Flush with water, seek medical attention. SKIN CONTACT: Wash with soap and water, use protective creams. INHALATION: Remove to fresh air, if not breathing give artificial respiration. If breathing is difficult give oxygen and obtain medical assistance. INGESTION: Obtain medical assistance if swallowed. If conscious give large amounts of water and induce vomiting.

Section VII - Precautions for Safe Handling and Use

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Diluted standard can be absorbed with sand or other non-combustible absorbent material and placed into a container for later disposal. Sample solutions should be absorbed with charcoal or other organic absorbent and incinerated. Flush area with water.

WASTE DISPOSAL METHOD: Dispose in accordance with all applicable federal, state and local regulations.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep container tightly closed. Store in a cool, dry, well ventilated flammable liquid storage area. Isolate from incompatible materials.

OTHER PRECAUTIONS* Do not heat or evaporate analytical standards to dryness.

Section VIII - Control Measures

RESPIRATORY PROTECTION (Please specify): Respiratory protection required if airborne concentrations exceeds PEL (750 ppm). At concentrations up to 5000 ppm a chemical cartridge respirator with organic vapor cartridge is recommended. Above this level, a self-contained breathing apparatus is recommended. (20,000 is immediately dangerous to life or health).

VENTILATION: Local exhaust

PROTECTIVE GLOVES: Butyl, neoprene, latex, or rubber gloves.

EYE PROTECTION: Safety glasses or goggles.

OTHER PROTECTIVE EQUIPMENT: Impervious Clothing.

EMERGENCY WASH FACILITIES: Maintain eye wash and quick drench showers in work area.

The information stated in this Material Safety Data Sheet (MSDS) is believed to be correct on the date of publication and must not be considered all conclusive. The information has been obtained only by a search of available literature and is only a guide for handling the chemicals. Persons not specifically and properly trained should not handle this chemical or its container. This MSDS is provided without any warranty expressed or implied, including merchantability or fitness for any particular purpose.

This product is furnished for laboratory use ONLY! Our standards may not be used as drugs, cosmetics, agricultural or pesticidal products, food additives or as house hold chemicals.

* Various Government agencies (i.e., Department of Transportation, Occupational Safety and Health Administration, Environmental Protection Agency, and others) may have specific regulations concerning the transportation, handling, storage or use of this product which may not be contained herein. The customer or user of this product should be familiar with these regulations.

Chemical Name	Common Name	Percentage	CAS#	Formula	PEL(Units)	ILV(Units)	LD50 Value	Conditions	Footnote
Acetone	Acetone	>98.0	67-64-1	CH3COC	750ppm	750ppm	5800	Mg/Kg Oral Rat	2
Benzo (A) Pyrene	Benzo (A) Pyrene	<0.1	50-32-8	C20H12	0.2 Mg/M3	ALARA	Not Available		1

HAZARDOUS COMPONENTS OF POLYNUCLEAR AROMATIC HYDROCARBONS S

1. Classified by IARC as a Class 2A Carcinogen
2. Subject to the reporting requirements of SARA Title III, Section 313

SAFETY DATA SHEET

Version 5.6
Revision Date 05/24/2016
Print Date 05/28/2016

1. PRODUCT AND COMPANY IDENTIFICATION**1.1 Product identifiers**

Product name : Benzo[*b*]fluoranthene

Product Number : 275336
Brand : Aldrich
Index-No. : 601-034-00-4

CAS-No. : 205-99-2

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

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION**2.1 Classification of the substance or mixture****GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

Carcinogenicity (Category 1B), H350
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

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

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word : Danger

Hazard statement(s)

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

Precautionary statement(s)

P201 : Obtain special instructions before use.
P202 : Do not handle until all safety precautions have been read and understood.
P273 : Avoid release to the environment.
P281 : Use personal protective equipment as required.
P308 + P313 : IF exposed or concerned: Get medical advice/ attention.
P391 : Collect spillage.

P405
P501

Store locked up.
Dispose of contents/ container to an approved waste disposal plant.

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

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms : 3,4-Benzofluoranthene
Benz[e]acephenanthrylene
2,3-Benzfluoranthene
3,4-Benz[e]acephenanthrylene
Benzo[b]fluoranthene
Benzo[e]fluoranthene
NSC 89265

Formula : C₂₀H₁₂
Molecular weight : 252.31 g/mol
CAS-No. : 205-99-2
EC-No. : 205-911-9
Index-No. : 601-034-00-4

Hazardous components

Component	Classification	Concentration
Benz[e]acephenanthrylene		
	Carc. 1B; Aquatic Acute 1; Aquatic Chronic 1; H350, H410	<= 100 %

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

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

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

If inhaled

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

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Flush eyes with water as a precaution.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

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

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

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

5.2 Special hazards arising from the substance or mixture

No data available

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

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

- 6.1 Personal precautions, protective equipment and emergency procedures**
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.
- 6.2 Environmental precautions**
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.
- 6.3 Methods and materials for containment and cleaning up**
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.
- 6.4 Reference to other sections**
For disposal see section 13.

7. HANDLING AND STORAGE

- 7.1 Precautions for safe handling**
Avoid formation of dust and aerosols. Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.
- 7.2 Conditions for safe storage, including any incompatibilities**
Keep container tightly closed in a dry and well-ventilated place.
Storage class (TRGS 510): Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects
- 7.3 Specific end use(s)**
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

- 8.1 Control parameters**
Components with workplace control parameters
Contains no substances with occupational exposure limit values.
- 8.2 Exposure controls**
Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.
- Personal protective equipment**
- Eye/face protection**
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).
- Skin protection**
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.
- Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm

Break through time: 480 min
Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

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

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

- | | |
|---|---|
| a) Appearance | Form: solid |
| b) Odour | No data available |
| c) Odour Threshold | No data available |
| d) pH | No data available |
| e) Melting point/freezing point | Melting point/range: 163 - 165 °C (325 - 329 °F) - lit. |
| f) Initial boiling point and boiling range | No data available |
| g) Flash point | No data available |
| h) Evaporation rate | No data available |
| i) Flammability (solid, gas) | No data available |
| j) Upper/lower flammability or explosive limits | No data available |
| k) Vapour pressure | No data available |
| l) Vapour density | No data available |
| m) Relative density | No data available |
| n) Water solubility | No data available |
| o) Partition coefficient: n-octanol/water | No data available |
| p) Auto-ignition temperature | No data available |
| q) Decomposition | No data available |

temperature

- r) Viscosity No data available
- s) Explosive properties No data available
- t) Oxidizing properties No data available

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

Strong oxidizing agents

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides

Other decomposition products - No data available

In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

TDL_o Oral - Mouse - 7.57 mg/kg

Remarks: Liver:Changes in liver weight. Endocrine:Changes in thymus weight.

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

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

Possible human carcinogen

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Benz[e]acephenanthrylene)

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Benz[e]acephenanthrylene)

NTP: Reasonably anticipated to be a human carcinogen (Benz[e]acephenanthrylene)
NTP: Reasonably anticipated to be a human carcinogen (Benz[e]acephenanthrylene)
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: Not available

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

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

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to daphnia and other aquatic invertebrates Immobilization EC50 - Daphnia magna (Water flea) - > 1.024 mg/l - 24 h

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

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

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

Not dangerous goods

IMDG

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

IATA

UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Benz[e]acephenanthrylene)

Further information

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

15. REGULATORY INFORMATION

SARA 302 Components

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

SARA 313 Components

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

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-03-01

SARA 311/312 Hazards

Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-03-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-03-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-03-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer.

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-09-28

WARNING! This product contains a chemical known to the State of California to cause cancer.

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-09-28

16. OTHER INFORMATION

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

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
H350	May cause cancer.

H400 Very toxic to aquatic life.
H410 Very toxic to aquatic life with long lasting effects.

HMIS Rating

Health hazard: 1
Chronic Health Hazard: *
Flammability: 0
Physical Hazard 0

NFPA Rating

Health hazard: 2
Fire Hazard: 0
Reactivity Hazard: 0

Further information

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Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.6

Revision Date: 05/24/2016

Print Date: 05/28/2016

APPENDIX I

OSHA POSTER

Job Safety and Health It's the law!

OSHA
Occupational Safety
and Health Administration
U.S. Department of Labor

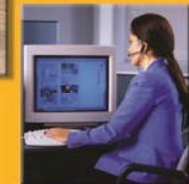
EMPLOYEES:

- You have the right to notify your employer or OSHA about workplace hazards. You may ask OSHA to keep your name confidential.
- You have the right to request an OSHA inspection if you believe that there are unsafe and unhealthful conditions in your workplace. You or your representative may participate in that inspection.
- You can file a complaint with OSHA within 30 days of retaliation or discrimination by your employer for making safety and health complaints or for exercising your rights under the *OSH Act*.
- You have the right to see OSHA citations issued to your employer. Your employer must post the citations at or near the place of the alleged violations.
- Your employer must correct workplace hazards by the date indicated on the citation and must certify that these hazards have been reduced or eliminated.
- You have the right to copies of your medical records and records of your exposures to toxic and harmful substances or conditions.
- Your employer must post this notice in your workplace.
- You must comply with all occupational safety and health standards issued under the *OSH Act* that apply to your own actions and conduct on the job.

EMPLOYERS:

- You must furnish your employees a place of employment free from recognized hazards.
- You must comply with the occupational safety and health standards issued under the *OSH Act*.

This free poster available from OSHA –
The Best Resource for Safety and Health



Free assistance in identifying and correcting hazards or complying with standards is available to employers, without citation or penalty, through OSHA-supported consultation programs in each state.

1-800-321-OSHA
www.osha.gov

OSHA 3165-12-06R