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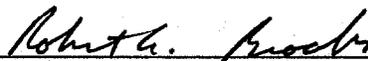
**HEALTH AND SAFETY PLAN  
FOR  
REMEDICATION OF GROUNDWATER CONTAMINATION  
CAMP ALLEN LANDFILL  
NAVAL STATION NORFOLK  
NORFOLK, VIRGINIA**

Prepared for:

DEPARTMENT OF THE NAVY  
Contract No. N62470-93-D-3032  
Delivery Order 0008

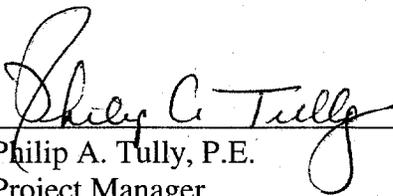
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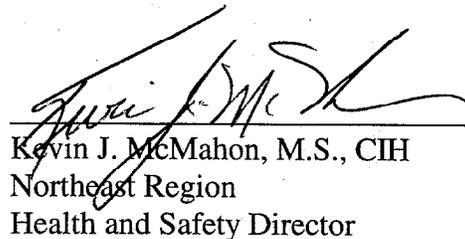


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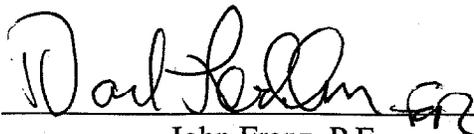
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**OHM Remediation  
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A Subsidiary of OHM Corporation

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OHM Project 15856HS\_WTP

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## ***1.0 INTRODUCTION***

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This Health and Safety Plan (HASP) has been developed for United States Navy, LANTDIV, Delivery Order entitled, Soil and Groundwater Remediation, Camp Allen Landfill, Areas A and B, Norfolk Naval Station, located in Norfolk, Virginia. The Delivery Order will be executed per the requirements stated in the Final Statement of Work (SOW) for Service Delivery Order per Contract No. N62470-93-D-3032, Delivery Order 0008, in cooperation with the Navy. This Delivery Order will also be executed in accordance with Naval Facilities Engineering Command (NAVFAC).

This HASP documents the policies and procedures which protect workers and the public from potential hazards posed by work at this site and is a key component in the *OHM Safety Improvement Process*. OHM considers safety the highest priority during work at a site containing potentially hazardous materials and has established a goal of **zero incidents** for all projects. All projects will be conducted in a manner which minimizes the probability of injury, accident, or incident occurrence. This HASP is a key element in the proper planning of project work which is necessary to assure the goal of **zero incidents** is achieved. The HASP Acknowledgment (Appendix A) will be signed by all who actively participate at this project.

Although the plan focuses on the specific work activities planned for this site, it must remain flexible because of the nature of this work. Conditions may change and unforeseen situations may arise that require deviations from the original plan. This flexibility allows modification by the OHM supervisors and health and safety officials with approval from the project CIH.

### **1.1 SITE HISTORY**

Area A of the Camp Allen Landfill, shown on Figure 1, is a 45-acre site that was used for the disposal of wastes from the early 1940s until 1974. During this time, significant quantities of municipal, solid, and hazardous wastes were disposed including the following: general refuse, demolition debris, sludges from metal plating processes, parts cleaning and paint stripping wastes, over-age chemicals, various chlorinated organic solvents, acids, caustics, paints and paint thinners, pesticides, and asbestos. It is estimated, from approximated waste generation rates, that about 40,000 pounds of metals plating sludge, 60,000 pounds of parts cleaning sludges, and 400,000 pounds of paint stripping residue were disposed at Area A. Additionally, ash from the incineration of solid wastes, as well as fly and bottom ash from the power plant, were landfilled.

In the mid-1940s, an incinerator was constructed in the southern portion of the Camp Allen area to burn combustible wastes. This incinerator operated until the mid-1960s. Materials too bulky for the incinerator were burned in Area A of the Camp Allen Landfill.

Area B (the eastern portion of the Camp Allen Landfill), as shown on Figure 1, received waste residues and debris from a salvage yard fire. In general, salvage yard activities have included storage and management of waste oils and chemicals, over-age chemicals, and scrap industrial/commercial equipment. The Camp Allen Salvage Yard, which closed April 30, 1995, is located between Camp Allen Landfill Areas A and B.

At present, most of Areas A and B is soil covered and revegetated to minimize surface erosion. Area A incorporates the Navy Brig facility and a heliport built over a portion of the landfill during the mid-1970s. The area is surrounded by drainage ditches, which convey surface water runoff to Willoughby Bay. These drainage ditches are remnants of Bousch Creek, the main channel of which was completely filled and replaced by a network of ditches and channels during the development of Norfolk Naval Base. Additionally,

a residential area (Glenwood Park) is located to the west of the site. The Camp Allen Elementary School and the Capehard Housing Area border Area B to the south.

As of May 1997, the water treatment portion of the project will commence. This plan specifically covers operations associated with the water treatment operations.

**1.2 SCOPE OF WORK**

The principle task to be conducted is the operation and maintenance of the water treatment plant.

These activities have been analyzed for potential hazards for which hazard control measures are provided in Section 3.4 Activity Hazard Analysis.



**FIGURE 1.1  
SITE MAP**

## **2.0 KEY PERSONNEL AND MANAGEMENT**

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The Project Manager (PM), Plant Operator (PO), Certified Industrial Hygienist (CIH), Health and Safety Manager (HSM) and Site Safety Officer (SSO) are responsible for formulating and enforcing health and safety requirements, and implementing the HASP. Reporting relationships are shown in Figure 2.1

### **2.1 PROJECT MANAGER (PM)**

The PM has the overall responsibility for the project and to assure that the goals of the construction remedial action are attained in a manner consistent with the HASP requirements. The PM will coordinate with the PO and the SSO to assure that the remedial action goals are completed in a manner consistent with the HASP. The PM will conduct a monthly health and safety audit of the project using the Management Safety Improvement Report Form. Specific Key Requirement Areas (KRAs) for safety performance include:

- Implement Site Specific Safety Awareness/ Recognition program
- Conduct site audit of project (Management Safety Improvement Report)
- Investigate and report findings for any OSHA recordable cases; assure corrective actions are taken

### **2.2 PLANT OPERATOR (PO)**

The PO is responsible for field implementation of the HASP. The PO will be the main contact in any on-site emergency situation and will insure off-site emergency agencies have been contacted prior to the start of work. The PO will act as the SSO when the assigned SSO is not on the project site. The assigned SSO will make periodic visits to the project to determine compliance with this HASP. The PO will conduct periodic inspections (at least weekly) of the work site to confirm compliance with all health and safety requirements. The Project Safety Improvement Checklist shall be used to document inspections (see appendix . The PO is also responsible for coordinating remedial actions for all deficiencies and for enforcing the OHM "Cardinal Safety Rules." Specific KRAs for safety performance include:

- Complete Site-Specific Job Safety Analyses for all principle tasks
- Implement Site Specific Safety Awareness/ Recognition program
- Conduct weekly safety inspections of the job site
- Correct all deficiencies as noted on Management Safety Improvement Reports and safety department audits, within recommended time frames
- Investigate and report findings for OSHA recordable cases; assure corrective actions are taken

### **2.3 SITE SAFETY OFFICER (SSO)**

The SSO has responsibility for administering the HASP relative to site activities, and will be in the field periodically while site activities are in progress. The SSO's primary operational responsibilities include personal and environmental monitoring, coordination of job safety analyses, selection and care of personal protective equipment, assignment of protection levels and review of work permits. The SSO will monitor all field activities involved with safety and is authorized to stop work when an imminent health or safety risk exists. The SSO is responsible for informing all on-site personnel of essential safety requirements and facilitating the daily safety meetings. Specific KRAs for SSO performance include:

- Monitor workers for signs of stress, such as cold exposure, heat stress, and fatigue
- Reevaluate site conditions on an on-going basis. Coordinate protective measures including engineering controls, work practices and personal protective equipment



- Assist the PO in the preparation, presentation and documentation of daily safety meetings
- Conduct and prepare reports of daily safety inspections of work processes, site conditions, equipment conditions and submit to PO. Discuss any necessary corrective actions with the PO and review new procedures
- Initiate revisions of the HASP as necessary for new tasks or modifications of existing operations and submit to the Program CIH for approval
- Perform air monitoring as required
- Assist the PM and in accident investigations
- Prepare permits for special operations, e.g., hot work, confined spaces, line breaking, etc.
- Maintain site safety records
- Conduct weekly inspections of all fire extinguishers, supplied air respirators, first-aid kits, and eye washes/emergency showers
- Inform subcontractors of the elements of the HASP/contractor pre-job checklist
- Coordinate the preparation of Site Specific Job Safety Analyses with the PO, team leader, and work crew
- Coordinate the Site Specific Safety and Health Awareness and Recognition Program (SHARP) with Project Manager and Supervisor

#### **2.4 HEALTH AND SAFETY MANAGER (HSM)**

The HSM is responsible for staffing health and safety personnel and monitoring projects for compliance with regulatory and OHM health and safety policies and procedures. This position reports to the Region Health and Safety Director and may visit the site periodically to ensure compliance with this HASP.

#### **2.5 PROGRAM CERTIFIED INDUSTRIAL HYGIENIST (CIH)**

The Program CIH is responsible for reviewing the HASP and ensures that the HASP is complete and accurate. The Program CIH provides technical and administrative support for the LANTDIV Health and Safety Program. If necessary, the CIH can modify specific aspects of the HASP to adjust for on-site changes that affect safety. The CIH will coordinate with the HSM and SSO on necessary modifications to the HASP and will be available for consultation when required. The CIH may make periodic site visits to determine compliance. The CIH reports to the Regional Vice President/General Manager.

#### **2.6 EMPLOYEE SAFETY RESPONSIBILITY**

Each employee is responsible for personal safety as well as the safety of others in the area and is expected to participate fully in the Safety Improvement Process, particularly the Safer Observation Program. The employee will use all equipment provided in a safe and responsible manner as directed by the SS. All OHM personnel will follow the policies set forth in the OHM Health and Safety Procedures Manual, with particular emphasis on the OHM "Cardinal Safety Rules." Employees that knowingly disregard safety policies/procedures may be subject to disciplinary actions.

**2.7 KEY SAFETY PERSONNEL**

The following individuals share responsibility for health and safety at the site:

Project Manager	Phil Tully, P.E. 609-588-6345 (office) 609-869-8954 (pager)
ROICC/NTR	Mark Linn 804-464-7713 (office)
Plant Operator	Dave Bouchard TBD (site phone) 508-545-0359 (pager)
Site Safety Officer	Dave Bouchard 508-545-0359 (pager)
Program Manager for LANTDIV	John P. Franz, P.E. 609-588-6477 (office)
Deputy Program Manager for LANTDIV	Dave Leadenham 609-588-6370 (office)
Health and Safety Manager	Robert A. Brooks, CSP 609-588-6423 (office) 800-818-2185 (pager)
Northeast Region Health and Safety Director/Program CIH	Kevin McMahon, M.S., CIH 609-588-6375 (office) 609-421-7523 (pager)
Vice President, Health and Safety	Fred Halvorsen, Ph.D., PE, CIH 800-231-7031

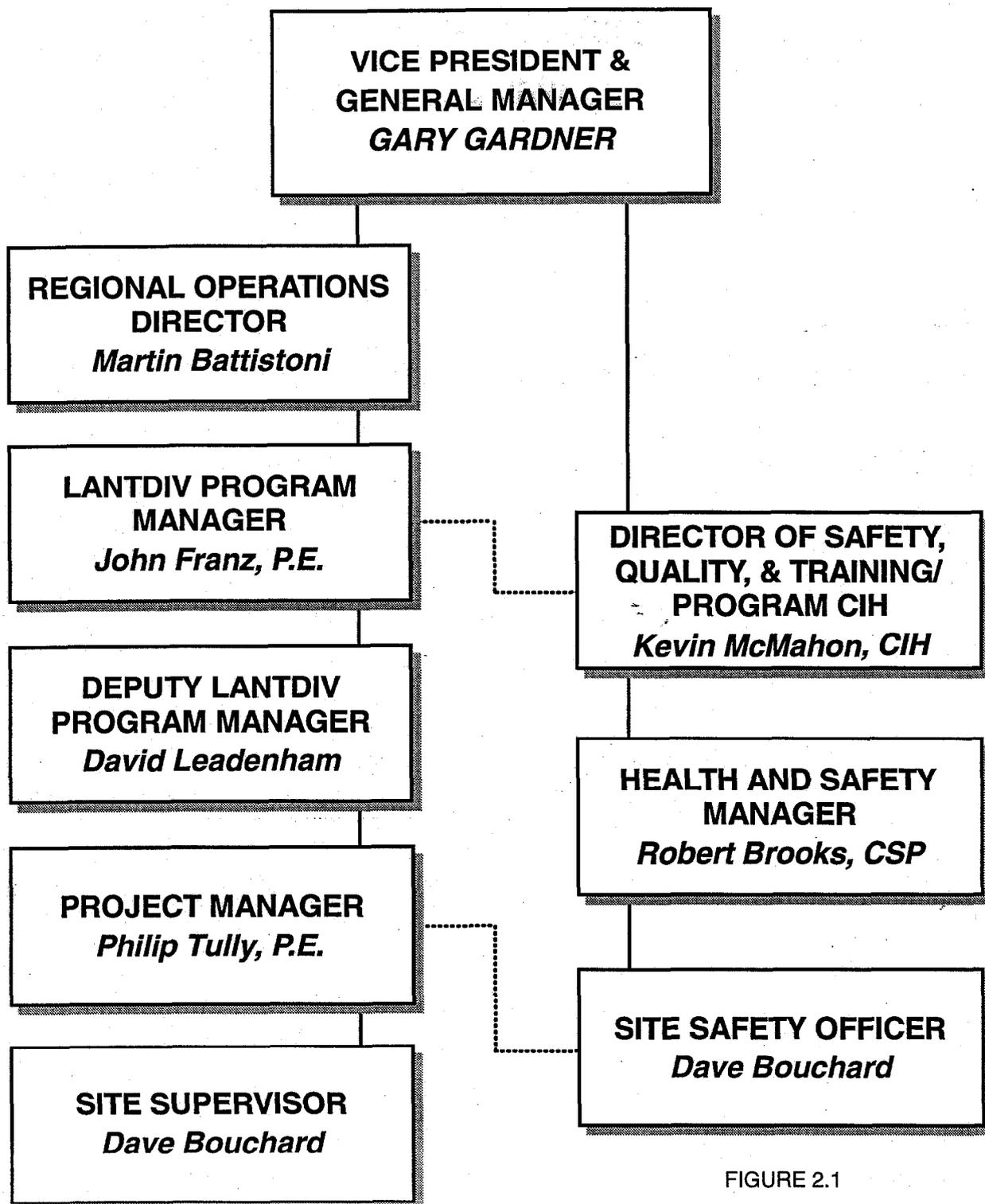


FIGURE 2.1

**HEALTH & SAFETY ORGANIZATION**

Remedial Action  
 Remediation of Groundwater Contamination  
 Water Treatment Plant Operations  
 Camp Allen Landfill  
 Naval Station Norfolk  
 Norfolk, Virginia  
 Delivery Order 0008  
 OHM Project 15856

Prepared for

DEPARTMENT OF THE NAVY  
 ATLANTIC DIVISION  
 NAVAL FACILITIES ENGINEERING COMMAND  
 NORFOLK, VIRGINIA

### 3.0 JOB HAZARD ANALYSIS

This section outlines the potential chemical and physical hazards which workers may be exposed to during work on this project. Table 3.1 lists significant contaminant identified at the site. An MSDS list is included in Appendix C.

#### 3.1 CHEMICAL HAZARDS

The chemical hazards listed below have been developed from previous studies of soil and groundwater for Areas A&B at Camp Allen. They include heavy metals, which are primarily a hazard through ingestion and inhalation; volatile organic compounds (VOCs) which, are primarily a hazard through inhalation and skin contact; and corrosive materials which will be utilized in the water treatment process that are mainly a hazard through skin contact and inhalation. The water treatment plant is a closed system; the primary chemicals of concern during normal plant operations, with the exception of vessel clean out operations, will be Sodium Hydroxide, and Sulfuric Acid.

CHEMICAL HAZARDS			
CHEMICAL	EXPOSURE ROUTES	PEL/TLV	HEALTH HAZARDS/ PHYSICAL HAZARDS
Arsenic	Skin, eye, inhalation, ingestion	0.1 mg/m <sup>3</sup>	A powerful allergen, arsenic will cause burning swelling, and redness in the eyes, nose, throat, and skin; a human carcinogen; Long term exposure can cause liver, kidney, and blood damage
			A fire hazard in the form of dust or contact with oxidizers
Barium	Inhalation, ingestion	0.5 mg/m <sup>3</sup>	Insoluble salts are skin, eye, and respiratory irritants; a nuisance dust; water soluble compounds are highly toxic by ingestion; abdominal pain, vomiting, diarrhea, convulsions, muscular spasms, internal hemorrhage
			Insoluble compounds are largely non-reactive; thermal decomposition can release toxic gases
Benzene	Skin, eye, inhalation, ingestion	1 PPM	Irritation of eyes, nose, throat, giddiness, headache, nausea, staggered walking; fatigue, lack of appetite, dermatitis, anemia; a carcinogen
			Flammable; reacts with strong oxidizers, acids
Cadmium	Inhalation, ingestion	0.05 mg/m <sup>3</sup>	A probable carcinogen; skin, eye, respiratory irritation; mild flu and fever symptoms (metal fume fever); pneumonitis, pulmonary edema
			Reacts violently with ammonium nitrate; finely divided cadmium metal can become pyrophoric; avoid heat, flame, causes cadmium fume formation
Chlordane (pesticide)	Skin, eye, inhalation, ingestion	0.5 mg/m <sup>3</sup>	Tremors, convulsions, excitement, loss of coordination (ataxia), gastritis, respiratory collapse; a suspected carcinogen
			Decomposition of chlordane produces chlorine fumes



CHEMICAL HAZARDS			
CHEMICAL	EXPOSURE ROUTES	PEL/TLV	HEALTH HAZARDS/ PHYSICAL HAZARDS
Chromium	Inhalation, ingestion	0.5 mg/m <sup>3</sup>	Scarring of lung tissue; a carcinogen
			Reacts with strong oxidizers, alkalis
1,2-Dichloroethene	Skin, eye, inhalation, ingestion	793 mg/m <sup>3</sup>	Irritation from skin contact; headache, nausea, vomiting, dizziness, and central nervous system depression; Long term exposure can effect the kidneys and liver
			Flammable liquid, keep away from sources of ignition. Will liberate toxic phosgene gas and hydrogen chloride when heated; Avoid contact with strong oxidizers and bases, aluminum, ammonia, and nitric acid
Ethyl Benzene	Skin, eye, inhalation, ingestion	100 ppm	Irritation of eyes, nose, throat; headache, dermatitis, dizziness, sleepiness
			Reacts with strong oxidizers, flammable
Lead	Inhalation, ingestion	0.05 mg/m <sup>3</sup>	Weakness, insomnia; loss of appetite, loss of weight, abdominal pain; anemia; tremors; weakness of wrists/ankles; kidney damage; low blood pressure
Petroleum Distillates	Skin, eye, inhalation, ingestion	100 ppm	Mucous membrane irritant; headache, dizziness, euphoria, unconsciousness; a CNS depressant; pulmonary edema from aspiration
			Reacts violently with oxidizers and oxidizing acids; emits toxic smoke and gas during combustion
Polychlorinated Biphenyls	Skin, eye, inhalation, ingestion	0.5 mg/m <sup>3</sup>	Irritation of eyes, skin; acne-form dermatitis; potential carcinogen; liver damage
			Reacts with strong oxidizers
Sodium Hydroxide	Skin, Eye, Inhalation	2 mg/m <sup>3</sup>	Product is destructive to skin and eye tissue contacted and causes severe burns. Inhalation of dust, mist or spray may cause damage to the upper respiratory tract and lung tissue proper which can produce chemical pneumonia. Chronic local effects may cause dermatitis.
			Avoid direct contact with water. <b>AVOID CONTACT WITH STRONG ACIDS</b>
Sulfuric Acid 70-100%	Skin, Eye, Inhalation	1 mg/m <sup>3</sup>	Exposure to mists may cause irritation of the nose and throat. Skin contact may cause skin corrosion, burns, or ulcers. Eye contact may cause blindness.
			Do not mix with water.. Contact with metals can cause the formation of flammable hydrogen gas.
Toluene	Skin, eye, inhalation, ingestion	50 ppm	Fatigue, weakness, confusion, euphoria, dizziness, headache, dilated pupils, insomnia, numbness/tingling in hands, feet, dermatitis
			Reacts with strong oxidizers; flammable

<b>CHEMICAL HAZARDS</b>			
<b>CHEMICAL</b>	<b>EXPOSURE ROUTES</b>	<b>PEL/TLV</b>	<b>HEALTH HAZARDS/ PHYSICAL HAZARDS</b>
Trichloro-ethylene	Skin, eye, inhalation, ingestion	50 ppm	A skin and eye irritant; defatting of the skin; headache, nausea, dizziness, intoxication; CNS depression
			A dangerous fire hazard, will emit toxic phosgene gas when heated
Vinyl Chloride	Skin, eye, inhalation, ingestion	1 ppm	A severe fire and explosion hazard; reacts with copper, aluminum, and hydroquinone; forms toxic decomposition products when involved with fires or heat; HCl, carbon monoxide, and phosgene
Xylene	Skin, eye, inhalation, ingestion	100 ppm	Dizziness, excitement, drowsiness, incoherent, staggering walking; eye, nose, throat irritation; nausea, vomiting, dermatitis
			Flammable; reacts with strong oxidizers
Zinc	Inhalation, ingestion	10.0 mg/m <sup>3</sup>	A skin, eye, and respiratory irritant; a nuisance dust; health effects primarily from fume inhalation, metal fume fever; chromates of zinc are human carcinogens
			Zinc salts are incompatible with reactive cyanides and sulfides;

The following general symptoms may indicate exposure to a hazardous material. Personnel will be removed from the work site and provided proper medical attention immediately if the following symptoms occur:

- Dizziness or stupor
- Nausea, headaches, or cramps
- Irritation of the eyes, nose, or throat
- Euphoria
- Chest pains and coughing
- Rashes or burns

### 3.2 PHYSICAL HAZARDS

To minimize physical hazards, OHM has developed standard safety protocols which will be followed at all times. Failure to follow safety protocols will result in expulsion of an employee from the site and appropriate disciplinary actions.

The SS and SSO will observe the general work practices of each crew member and equipment operator, and enforce safe procedures to minimize physical hazards. Hard hats, safety glasses, and steel-toe safety boots are required in all areas of the site. Site-specific hazards and all necessary precautions will be discussed at the daily safety meetings. The Health and Safety Procedures Manual for LANTDIV will be maintained at the project site as a reference document.

The following physical hazards may be associated with project tasks:

- Work from elevated platforms
- Confined space



- Electrical hazards
- Heavy equipment
- Slip, trip, fall hazards

**3.3 ENVIRONMENTAL HAZARDS**

Environmental factors such as weather, wild animals, insects, and irritant plants pose a hazard when performing outdoor work. The SSO and SS will take all necessary measures to alleviate these hazards should they arise.

**3.3.1 Heat Stress**

The combination of warm ambient temperature and protective clothing result in the potential for heat stress. Heat stress disorders include:

- Heat rash
- Heat cramps
- Heat exhaustion
- Heat stroke

Heat stress prevention is outlined in procedure No. 22 of the OHM Corp. LANTDIV Health and Safety Procedures manual. This information will be reviewed during safety meetings. Workers will be encouraged to increase consumption of water and electrolyte-containing beverages eg. Gatorade.

It is recommended that workers break approximately every 2 hours for 10 to 15 minute rest periods when temperatures rise above 72.5 degrees F. and protective clothing is worn. In addition, workers are encouraged to take rests whenever they feel any adverse effects that may be heat-related. The frequency of breaks may need to be increased upon worker recommendation to the SSO and SS. Heat stress can be prevented by assuring an adequate work/rest schedule; guidelines are printed below.

AMBIENT TEMPERATURE	NO CHEMICAL PROTECTIVE CLOTHING (LEVEL D PPE)	CHEMICAL PROTECTIVE CLOTHING (D+/C/B/A)
90° F or above	After 45 minutes of work	After 15 minutes of work
87.5 F-90 F	After 60 minutes of work	After 30 minutes of work
82.5-87.5 F	After 90 minutes of work	After 60 minutes of work
77.5-82.5 F	After 120 minutes of work	After 90 minutes of work
72.5-77.5 F	After 150 minutes of work	After 120 minutes of work

The work/rest schedule can be calculated based on heat stress monitoring results. Monitoring consists of taking the radial pulse of a worker for 30 seconds immediately after exiting the work area. The frequency of monitoring is provided herein.

If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by 1/3 and keep the rest period the same. If the heart rate still exceeds 110 beats per minute at the next rest period, increase the following rest period by 1/3. The initial rest period should be at least 10 minutes.

Monitoring for heat stress will begin when the ambient temperature reaches or exceeds 70 degrees Fahrenheit when wearing chemical protective clothing, or 80 degrees Fahrenheit for site activities performed



with no chemical protective clothing (Level D). Monitoring will include pulse rate, weight loss, oral temperature and signs and symptoms of heat stress. See Procedure 22 LANTDIV Health and Safety Procedures Manual.

### **3.3.4 Noise**

Hearing protection is required for workers operating or working with water treatment equipment, where the noise level is greater than 85 dbA (TWA) as well as personnel working around heavy equipment. The SSO will determine the need for and appropriate testing procedures, i.e., sound level meter and/or dosimeter for noise measurement.

## **3.4 TASK-SPECIFIC ACTIVITY HAZARD ANALYSES**

This section of the Site-Specific HASP provides a breakdown of the hazards and control measures for each principal task. These Job Safety Analyses are general in nature and must be made project specific by the Site Supervisor prior to each task. The Job Safety Analyses will be field checked by the supervisor on an ongoing basis and revised as necessary. All revisions will be communicated to the work crew.

3.4.1 JOB SAFETY ANALYSIS FOR WATER TREATMENT OPERATIONS				
AIR MONITORING: "ACTION LEVELS"				
Task Breakdown	Potential Hazards	Hazard Control Measures	Personal Protective Equipment	Air Monitoring Devices
System Operation	Inhalation & Contact with Hazardous Substances	<ul style="list-style-type: none"> <li>• Provide workers proper skin, eye, respiratory &amp; splash protection based on the exposure hazards present (See Section 5.0 HASP)</li> <li>• Review hazardous properties of site contaminants with workers before treatment operations begin</li> </ul>	Hard hat, Safety glasses, steel-toe shoes; splash shields, goggles and Tyvek coveralls for chemical handling (See Section 5.0 HASP)	PID
	Electrical Shock	<ul style="list-style-type: none"> <li>• De-energize or shut off utility lines at their source before work begins</li> <li>• Use double insulated or properly grounded electric power-operated tools</li> <li>• Maintain tools in a safe condition</li> <li>• Provide an equipment-grounding conductor program or employ ground-fault circuit interrupters</li> <li>• Use qualified electricians to hook up electrical circuits</li> <li>• Inspect all extension cords daily for structural integrity, ground continuity, and damaged insulation</li> <li>• Cover or elevate electric wire or flexible cord passing through work areas to protect from damage</li> <li>• Keep all plugs and receptacles out of water</li> <li>• Use approved water-proof, weather-proof type if exposure to moisture is likely</li> <li>• Inspect all electrical power circuits prior to commencing work</li> <li>• Follow Lockout-Tagout procedures in accordance with OHM Health and Safety Procedures (see Appendix F)</li> </ul>		

3.4.1 JOB SAFETY ANALYSIS FOR WATER TREATMENT OPERATIONS				
AIR MONITORING: "ACTION LEVELS"				
Task Breakdown	Potential Hazards	Hazard Control Measures	Personal Protective Equipment	Air Monitoring Devices
	Caught In/ Between Moving Parts	<ul style="list-style-type: none"> <li>Identify and understand parts of equipment which may cause crushing, pinching, rotating or similar motions</li> <li>Assure guards are in place to protect from these parts of equipment during operation</li> <li>Provide and use proper work gloves when the possibility of pinching, or other injury may be caused by moving/ handling large or heavy objects</li> <li>Maintain all equipment in a safe condition</li> <li>Keep all guards in place during use</li> <li>De-energize and lock-out machinery before maintenance or service</li> </ul>		
System Operation (Continued)	Pressurized Vessels, Hoses, Lines	<ul style="list-style-type: none"> <li>Prepare written operating instructions for water treatment system</li> <li>Train all water treatment operators in conducting site operations</li> <li>Assign qualified engineer to design water treatment system</li> <li>Prepare process flow diagram and P and I D</li> <li>All changes to equipment and procedures approved by qualified engineer</li> <li>All water treatment system components shall be designed according to applicable codes</li> <li>Maintain equipment according to manufacturer's recommendations</li> <li>Wire quick connections, temporary lines closed before operating</li> </ul>	Hard hat, face shield and goggles	

3.4.1 JOB SAFETY ANALYSIS FOR WATER TREATMENT OPERATIONS				
AIR MONITORING: "ACTION LEVELS"				
Task Breakdown	Potential Hazards	Hazard Control Measures	Personal Protective Equipment	Air Monitoring Devices
System Operation (Continued)	Fires	<ul style="list-style-type: none"> <li>Eliminate sources of ignition from the work area</li> <li>Prohibit smoking</li> <li>Provide ABC (or equivalent) fire extinguishers for all work and flammable storage areas, fuel powered generators and compressors</li> <li>Store flammable liquids in well ventilated areas</li> <li>Prohibit storage, transfer of flammable liquids in plastic containers</li> <li>Post "NO SMOKING" signs</li> <li>Store combustible materials away from flammables</li> <li>Store all compressed gas cylinders upright, secure, caps in place when not in use</li> <li>Separate Flammables and Oxidizers by 20 feet minimum</li> </ul>		
	Slips, Trips, Falls	<ul style="list-style-type: none"> <li>Clear walkways, work areas of equipment, ground debris, tools, and other materials</li> <li>Mark, identify, or barricade other obstructions</li> <li>Clean up spills immediately</li> </ul>		
	High Ambient Temperature	<ul style="list-style-type: none"> <li>Monitor for heat stress in accordance with OHM Health &amp; Safety Procedures # 22</li> <li>Provide fluids to prevent worker dehydration</li> </ul>	Seasonal Clothing	
Treatment Chemical Handling	Inhalation & Contact with Hazardous Substances <ul style="list-style-type: none"> <li>Sodium Hydroxide</li> <li>Sulfuric Acid</li> </ul>	<ul style="list-style-type: none"> <li>Provide workers proper skin, eye, respiratory &amp; splash protection based on the exposure hazards present (See Section 5.0 HASP)</li> <li>Review water treatment chemical MSDSs with workers before treatment operations begin</li> </ul>	Hard hat with splash shield, chemical goggles, PVC gloves, polyethylene-coated Tyvek coveralls	
	Handling Heavy Objects	<ul style="list-style-type: none"> <li>Observe proper lifting techniques</li> <li>Obey sensible lifting limits (60 lb. maximum per person manual lifting)</li> <li>Use mechanical lifting equipment (hand cart, truck) to move large awkward loads</li> </ul>		



3.4.1 JOB SAFETY ANALYSIS FOR WATER TREATMENT OPERATIONS				
AIR MONITORING: "ACTION LEVELS"				
Task Breakdown	Potential Hazards	Hazard Control Measures	Personal Protective Equipment	Air Monitoring Devices
Treatment Chemical Handling (Continued)	Fires	<ul style="list-style-type: none"> <li>Eliminate sources of ignition from the work area</li> <li>Prohibit smoking in work areas</li> <li>Provide ABC (or equivalent) fire extinguishers in all work and flammable storage areas, fuel powered generators and compressors</li> <li>Store flammable liquids in well ventilated areas</li> <li>Prohibit storage, transfer of flammable liquids in plastic containers</li> <li>Post "NO SMOKING" signs</li> <li>Store combustible materials away from flammables</li> <li>Store all compressed gas cylinders upright, caps in place when not in use</li> <li>Separate Flammables and Oxidizers by 20 feet minimum</li> </ul>		
	Caught In/ Between Moving Parts	<ul style="list-style-type: none"> <li>Identify and understand parts of equipment which may cause crushing, pinching, rotating or similar motions</li> <li>Assure guards are in place to protect from these parts of equipment during operation</li> <li>Provide and use proper work gloves when the possibility of crush, pinch, or other injury may be caused by moving/stationary edges or objects</li> <li>Maintain all equipment in a safe condition</li> <li>Keep all guards in place during use</li> <li>De-energize and lock-out machinery before maintenance or service</li> </ul>		
	Sharp Objects	<ul style="list-style-type: none"> <li>Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects</li> <li>Maintain all hand and power tools in a safe condition</li> <li>Keep guards in place during use</li> </ul>	Leather gloves, re-enforced palms	

3.4.2 JOB SAFETY ANALYSIS FOR TANK, CELL, SEPARATOR CLEANING				
AIR MONITORING: "ACTION LEVELS"				
Task Breakdown	Potential Hazards	Hazard Control Measures	Personal Protective Equipment	Air Monitoring Devices
Tank, Cell, Separator Cleaning	Fire/ Explosion	<ul style="list-style-type: none"> <li>Eliminate sources of ignition from the work area</li> <li>Prohibit smoking</li> <li>Provide ABC (or equivalent) fire extinguishers in all work, flammable storage areas and with fuel powered generators and compressors</li> <li>Store flammable liquids in well ventilated areas</li> <li>Prohibit storage, transfer of flammable liquids in plastic containers</li> <li>Post "NO SMOKING" signs</li> <li>Store combustible materials away from flammables</li> <li>Store all compressed gas cylinders upright, caps in place when not in use</li> <li>Separate Flammables and Oxidizers by 20 feet minimum</li> </ul>		
	Flammable, Toxic, Oxygen deficient Atmospheres	<ul style="list-style-type: none"> <li>Test vessel atmosphere for flammable/toxic vapors, and oxygen deficiency</li> <li>Obtain Confined Space Entry Permit signed by Plant Operation Officer (see Appendix G)</li> <li>De-energize, lock-out and tag all energized equipment</li> <li>Provide written rescue plan</li> <li>Review hazardous properties of site contaminants with entrants and safety observer</li> <li>Review emergency procedures before work commences</li> <li>Provide safety observer outside vessel</li> <li>Wear proper level of PPE for the type of atmospheric contaminants</li> <li>Use body harness, safety belt with tripod winch for possible rescue</li> </ul>	Level of Protection depends on air monitoring results; see Section 7.0 for action levels	LEL/O <sub>2</sub> , PID
	Inhalation and Contact with Hazardous Substances (see Section 3.0, Chemical Hazards)	<ul style="list-style-type: none"> <li>Provide workers proper skin, eye and respiratory protection based on the exposure hazards present</li> <li>Review hazardous properties of site contaminants with workers before operations begin</li> </ul>	Level of Protection depends on air monitoring results; see Section 7.0 for action levels	

3.4.2 JOB SAFETY ANALYSIS FOR TANK, CELL, SEPARATOR CLEANING				
AIR MONITORING: "ACTION LEVELS"				
Task Breakdown	Potential Hazards	Hazard Control Measures	Personal Protective Equipment	Air Monitoring Devices
Tank, Cell, Separator Cleaning (Continued)	Sharp Objects	<ul style="list-style-type: none"> <li>Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects</li> <li>Maintain all hand and power tools in a safe condition</li> <li>Keep guards in place during use</li> </ul>	Leather gloves, re-enforced palms	
	High Ambient Temperature	<ul style="list-style-type: none"> <li>Monitor for Heat stress in accordance with Section 3.0 of this HASP</li> <li>Provide fluids to prevent worker dehydration</li> </ul>		

### **3.5 ACCIDENT PREVENTION**

This Site Specific Health and Safety Plan has been developed with accident prevention as the primary goal. Details are discussed throughout this SSHSP. This section will outline the Accident Prevention Plan established for this project.

#### **3.5.1 Administrative Responsibilities**

The Project Manager is ultimately responsible for the safety and health of site personnel. The PM is to provide the materials and maintenance of equipment necessary to enhance and maintain safe site and work conditions.

The PO has the responsibility and the authority to control the day to day remediation activities in the field with respect to safety. The PO reports directly to the Project Manager. The PO monitors employees for signs of heat stress, excessive fatigue, and obvious outward signs of chemical exposure. In addition, the PO ensures that equipment brought to the site is in proper working condition and inspected regularly. These responsibilities will be shared by the Site Foremen.

The Site Safety Officer reports to the Project Manager and the District Health and Safety Manager and is responsible to point out unsafe conditions that may pose a hazard to personnel or the public. The SSO is required to conduct regular safety inspections. Accident investigation will be performed by the SSO, and the PO, or both.

#### **3.5.2 Phase Safety Plans (Job Safety Analyses)**

Site-Specific Phase Safety Plans (Job Safety Analyses) will be developed for each contract activity and operation occurring in each major phase of work. The Phase Safety Plan for a specific task will be developed utilizing the job safety analyses presented in Section 3.4. The following areas will be addressed:

- Identify activity being performed; Sequence of work
- Hazards to be controlled in each activity
- Hazard control measures

The analysis will be discussed with all site personnel performing the task and will be documented in a site log. Prior to work on site, all site personnel will undergo a safety and health orientation including discussion of the HASP and site conditions. Prior to each shift, a daily safety meeting will be held discussing the previous day's and the current days' health and safety issues.

#### **3.5.3 Subcontractors**

All subcontractor employees are subject to the same training and medical surveillance requirements as OHM personnel depending on job activity. All subcontractor personnel will be required to sign in daily and be required to attend a daily meeting discussing operations and safety issues. All subcontractors involved in construction/remedial activities will be required to submit a Subcontractor Safety Prequalification Questionnaire prior to the award of a contract. Subcontractors will submit Job Safety analyses for their work activities to the OHM PM. The subcontractor reports directly to the OHM Project Manager. All incidents involving subcontractor employees shall be reported to the OHM Project Manager and a copy of the subcontractor's injury/illness report shall be submitted to the OHM PM within 24 hours.



#### **3.5.4 Local Requirements**

OHM will comply with any applicable local requirements such as noise control and traffic rules at the site. Traffic control will be developed as is needed for specific tasks.

#### **3.5.5 Housekeeping**

The project site will be kept in a neat and orderly fashion to prevent common injuries due to slips, trips, and falls, accumulation of trash to keep insects away, and to maintain a professional work site. Personnel shall not leave a work area in a disorderly condition. The PO is responsible for housekeeping.

#### **3.5.6 Emergency and Contingency Plan**

OHM has developed an emergency contingency plan provided in section 8.0 of this HASP.

#### **3.5.7 Safety Inspections**

The Plant Operator will perform regular safety inspections. A report, including results of the inspection and any corrective actions taken, will be kept in the project files. A copy will be provided to the client representative. Identified safety deficiencies and corrective measures will also be recorded in the "Contractors QC Report."

## **4.0 WORK AND SUPPORT AREAS**

To prevent migration of contamination caused through tracking by personnel or equipment, work areas and personal protective equipment will be clearly specified prior to beginning operations. OHM has designated work areas or zones as suggested by the NIOSH/OSHA/USCG/EPA'S document, titled "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities." Each work area will be divided into three zones as follows:

- An Exclusion or "hot" Zone (EZ)
- A Contamination Reduction Zone (CRZ)
- A Support Zone (SZ)

### **4.1 EXCLUSION ZONE**

The EZ is the area suspected of contamination and presents the greatest potential for worker exposure. Personnel entering the area must wear the mandated level of protection for that area. In certain instances, different levels of protection will be required depending on the tasks and monitoring performed within that zone. The EZ for this project will be the interior of the water treatment containment tanks, filters, cells, and separators.

### **4.2 CONTAMINATION REDUCTION ZONE**

The CRZ or transition zone will be established between the EZ and SZ. In this area, personnel will begin the sequential decontamination process required to exit the EZ. To prevent off-site migration of contamination and for personnel accountability, all personnel will enter and exit the EZ through the CRZ. The CRZ for this project will be the access/egress routes to/from the EZ and the personal decontamination..

### **4.3 SUPPORT ZONE**

The SZ serves as a clean, control area. Operational support facilities are located within the SZ. Normal work clothing and support equipment are appropriate in this zone. Contaminated equipment, or clothing will not be allowed in the SZ. The support facilities should be located upwind of site activities. There will be a clearly marked controlled access point from the SZ into the CRZ and EZ that is monitored closely by the SSO and the SS to ensure proper safety protocols are followed. The SZ will be the office areas and all other locations within the water treatment facility that would not come into contact with treated water or recovered product

### **4.4 SITE CONTROL LOG**

A log of all personnel visiting, entering or working on the site shall be maintained in the main office trailer location. The log will record the date, name, company or agency, and time entering or exiting the site.

No visitor will be allowed in the EZ without showing proof of training and medical certification, per 29 CFR 1910.120(e), (f). Visitors will supply their own boots and respiratory equipment, if required. Visitors will attend a site orientation given by the PO/SSO and sign the HASP.



**4.5 GENERAL**

The following items are requirements to protect the health and safety of workers and will be discussed in the safety briefing prior to initiating work on the site:

- Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand to mouth transfer and ingestion of contamination is prohibited in the EZ and CRZs.
- Hands and face must be washed upon leaving the EZ and before eating, drinking, chewing gum or tobacco and smoking or other activities which may result in ingestion of contamination.
- A buddy system will be used. Hand signals will be established to maintain communication.
- During site operations, each worker will consider himself as a safety backup to his partner. Off-site personnel provide emergency assistance. All personnel will be aware of dangerous situations that may develop.
- Visual contact will be maintained between buddies on site when performing hazardous duties.
- No personnel will be admitted to the site without the proper safety equipment, training, and medical surveillance certification.
- All personnel must comply with established safety procedures. Any staff member who does not comply with safety policy, as established by the SSO or the SS, will be immediately dismissed from the site.
- Proper decontamination procedures must be followed before leaving the site.
- All employees and visitors must sign in and out of the site.

## **5.0 PROTECTIVE EQUIPMENT**

This section addresses the various levels of personal protective equipment (PPE) which are or may be required at this job site. OHM personnel are trained in the use of all PPE utilized.

### **5.1 ANTICIPATED PROTECTION LEVELS**

<b>TASK</b>	<b>PROTECTION LEVEL</b>	<b>COMMENTS/MODIFICATIONS</b>
Water Treatment Operations	Level D/D+	Tyvek coveralls, latex gloves, splash shield and goggles (chemical treatment handling) or safety glasses, latex boots (in wet areas); fall harness and life line if greater than 4 feet above the ground; hearing protection >85 dBA
Maintenance, Tank Cleaning	Level C/B	Polyethylene-coated Tyvek coveralls, nitrile or latex gloves, latex or neoprene boots; upgrade to level B for confined space entry or if air monitoring action levels are exceeded
CRZ Workers	Level D/D+	Tyvek coveralls, latex gloves, splash shield and goggles (chemical treatment handling) or safety glasses, latex boots (in wet areas); fall harness and life line if greater than 4 feet above the ground; hearing protection >85 dBA
SZ Workers	Level D	

### **5.2 PROTECTION LEVEL DESCRIPTIONS**

This section lists the minimum requirements for each protection level. Modification to these requirements will be noted above.

#### **5.2.1 Level D**

Level D consists of the following:

- Safety glasses with side shields
- Hard hat
- Steel-toed work boots
- Work clothing as prescribed by weather

#### **5.2.2 Modified Level D**

Modified Level D consists of the following:

- Safety glasses with side shields
- Hard hat
- Steel-toed work boots
- Nitrile, neoprene, latex or PVC overboots
- Outer nitrile, neoprene, or PVC gloves over latex sample gloves
- Face shield (when projectiles or splashes pose a hazard)
- Tyvek coverall [Polyethylene-coated Tyveks required when workers have a potential to be exposed to contaminated liquids or sludges.]



### 5.2.3 Level C

Level C consists of the following:

- Full-face, air-purifying respirator with appropriate cartridges
- Hooded Tyvek Coveralls [Polyethylene-coated Tyveks required when workers have a potential to be exposed to contaminated liquids or sludges].
- Hard hat
- Steel-toed work boots
- Nitrile, neoprene, latex or PVC overboots
- Nitrile, neoprene, or PVC gloves over latex sample gloves
- Face shield (when projectiles or splashes pose a hazard)

### 5.2.4 Level B

Level B protection consists of the items required for Level C protection with the exception that an air-supplied respirator is used in place of the air-purifying respirator.

## 5.3 SUPPLIED-AIR RESPIRATORS

If air monitoring shows that Level B protection is needed, OHM personnel will wear Survivair 9881-02 Hippack Airline respirators with 5-minute egress bottles. Personnel requiring Level "B" protection and high mobility will wear Survivair Mark 2 SCBA units.

## 5.4 BREATHING-AIR QUALITY

Code of Federal Regulations 29 CFR 1910.134 states breathing air will meet the requirement of the specification for Grade D breathing air as described in the ANSI/CGA Specification G-7.1-1989. OHM requires a certificate of analysis from vendors of breathing air in order to show that the air meets this standard. Breathing air will be obtained in cylinders exclusively and will be stationed in the exclusion zone (EZ).

## 5.5 AIR-PURIFYING RESPIRATORS

A NIOSH approved full face respirator with appropriate air purifying cartridges will be used for level C work.

## 5.6 RESPIRATOR CARTRIDGES

The crew members working in Level C will wear respirators equipped with air-purifying cartridges approved for the following contaminants.

- Organic vapors <1,000 ppm
- Chlorine gas <10 ppm
- Hydrogen chloride <50 ppm
- Sulfur dioxide <50 ppm
- Dusts, fumes and mists with a TWA <0.05 mg/m<sup>3</sup>
- Asbestos-containing dusts and mists
- Radionuclides

**5.7 CARTRIDGE CHANGES**

All cartridges will be changed a minimum of once daily, or more frequently if personnel begin to experience increased inhalation resistance or breakthrough of a chemical warning property.

**5.8 INSPECTION AND CLEANING**

Respirators are checked periodically by a qualified individual and inspected before each use by the wearer. All respirators and associated equipment will be decontaminated and hygienically cleaned after each use.

**5.9 FIT TESTING**

Annual respirator fit tests are required of all personnel wearing negative-pressure respirators. The test will use isoamyl acetate or irritant smoke. The fit test must be for the style and size of the respirator to be used.

**5.10 FACIAL HAIR**

No personnel who have facial hair which interferes with the respirator's sealing surface will be permitted to wear a respirator and will not be permitted to work in areas requiring respirator use.

**5.11 CORRECTIVE LENSES**

Normal eyeglasses cannot be worn under full-face respirators because the temple bars interfere with the respirator's sealing surfaces. For workers requiring corrective lenses, special spectacles designed for use with respirators will be provided.

**5.12 CONTACT LENSES**

Contact lenses will not be worn with any type of respirator.

**5.13 MEDICAL CERTIFICATION**

Only workers who have been certified by a physician as being physically capable of respirator usage will be issued a respirator. Personnel unable to pass a respiratory fit test or without medical clearance for respirator use will not be permitted to enter or work in areas on site that require respiratory protection. Employees receive a written physicians opinion that they are fit for general hazardous waste operations as per 29 CFR 1910.120(f)(7).

**5.14 SITE SPECIFIC PERSONAL PROTECTIVE EQUIPMENT (PPE) PROGRAM**

The primary objective of the PPE program is to ensure employee protection and to prevent employee exposure to site contaminants during site operations. Engineering controls are not feasible for many tasks and, therefore, require the use of PPE.

The PO will be responsible for implementing all aspects of the PPE program. This includes donning and doffing, temperature related stress monitoring, inspection, and decontamination (see Section 6.0). PPE selection is identified in Table 5.1 for each specified task. The PO in consultation with the SSO, if assigned, Health and Safety Manager, project CIH and the ROICC will direct changes in PPE based on changing conditions. The site specific HASP will serve as written certification that the workplace was evaluated

concerning PPE requirements. OHM Corporation's comprehensive PPE Program is described in Appendix D.

#### **5.14.1 Site-Specific Respiratory Protection Program**

The primary objective of respiratory protection is to prevent employee exposure to atmospheric contamination. When engineering measures to control contamination are not feasible, or while they are being implemented, personal respiratory protective devices will be used.

The criteria for determining respirator need have been evaluated based on the site contaminants; expected levels of protection are outlined in Section 5.1. Air monitoring will be conducted to confirm that respiratory protection levels are adequate (Section 7.0). All respirator users are OSHA trained in proper respirator use and maintenance. The PO and SSO will observe workers during respirator use for signs of stress. The PO, CIH, HSM, and SSO will also evaluate this HASP periodically to determine its continued effectiveness with regard to respiratory protection. All persons assigned to use respirators will have medical clearance to do so.

## **6.0 DECONTAMINATION PROCEDURES**

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This section describes the procedures necessary to ensure that both personnel and equipment are free from contamination when they leave the work site.

### **6.1 PERSONNEL DECONTAMINATION**

Decontamination procedures will ensure that material which workers may have contacted in the EZ does not result in personal exposure and is not spread to clean areas of the site. This sequence describes the general decontamination procedure for Level D+, Level C and Level B, SCBA. The specific stages will vary depending on the site, the task, the protection level, etc.

#### **Level D+ Decontamination**

1. Go to end of EZ
2. Remove and discard latex booties
3. Remove outer gloves and discard
4. Remove outer sample gloves and discard
5. Cross into CRZ (dirty side of respirator wash area)
6. Remove suit (regular tyvek)
7. Remove inner sample gloves and discard
8. Wash face and hands

#### **Level C Decontamination**

1. Go to end of EZ
2.
  - a. Wash outer boots (Tingley or Robars) and stage to let dry; or
  - b. Remove and discard latex booties
3. Remove outer gloves and discard
4. Remove outer suit (Saranex/polycoated/regular tyvek)
5. Remove outer sample gloves and discard
6. Cross into CRZ (dirty side of respirator wash area)
7. Remove inner suit and discard, (if applicable)
8. Remove and wash respirator (4 stages)
  - a. Soap and water solution
  - b. First rinse
  - c. Disinfect respirator (1 cap full of bleach to 1 gallon of water)
  - d. Final rinse
9. Hang respirator to dry
10. Remove inner sample gloves and discard
11. Wash face and hands

#### **Level B Decontamination (SCBA)**

1. Move to edge of EZ
2. Bottle change only
  - a. Wash boots and gloves
  - b. Move to edge of EZ and CRZ
  - c. Remove face mask airline from regulator assembly

- d. Allow assistant to change bottle and reconnect face mask airline
- e. Return to EZ
3.
  - a. Wash outer boots and stage to let dry (Tingley or Robars only); or
  - b. Remove and discard latex booties
4. Remove and discard outer gloves
5. Disconnect from SCBA bottle and stage SCBA (NOTE: SCBA mask remains on)
6. Remove outer suit (Saranex/polycoated/regular tyvek)
7. Remove outer sample gloves and discard
8. Cross into CRZ
9. Remove inner suit (if applicable)
10. Move to respirator wash area and wash SCBA facepiece and hose line
  - a. Soap and water solution
  - b. First rinse
  - c. Disinfect respirator (1 cap full of bleach to 1 gallon of water)
  - d. Final rinse
11. Hang mask to dry
12. Remove inner sample gloves and discard
13. Wash face and hands

#### **6.1.1 Suspected Contamination**

Any employee suspected of sustaining skin contact with chemical materials will first use the emergency shower. Following a thorough drenching, the worker will proceed to the decontamination facility. Here the worker will remove clothing, shower, don clean clothing, and immediately be taken to the first-aid station. Medical attention will be provided as determined by the degree of injury.

#### **6.1.2 Personal Hygiene**

Before any eating, smoking, or drinking, personnel will wash hands, arms, neck and face.

#### **6.2 EQUIPMENT DECONTAMINATION**

All contaminated parts and equipment will be decontaminated before leaving the site. Decontamination procedures will vary depending upon the contaminant involved, but may include sweeping, wiping, scraping, hosing, or steaming the exterior of the equipment. Personnel performing this task will wear the proper PPE as prescribed by the SSO.

#### **6.3 DISPOSAL**

All decontamination liquids and disposable clothing will be treated as contaminated waste unless determined otherwise by accepted testing methods. Wastes will be disposed of according to state and federal regulations.

## 7.0 AIR MONITORING

Air monitoring will only be conducted during times when intrusive maintenance (entry and cleanout of vessels, cells or separators) is being performed. An LEL/O<sub>2</sub> and a PID will be on site during these activities conducted by OHM personnel. Work activities will follow the action levels outlined in the table below.

Air monitoring will be conducted in order to determine airborne contamination levels. This ensures that respiratory protection is adequate to protect personnel against the chemicals that are encountered. The following air monitoring efforts will be used at this site. Additional air monitoring may be conducted at the discretion of the SSO.

The following chart describes the air monitoring required and appropriate action levels.

Monitoring Device	Action Level	Action
LEL/O <sub>2</sub>	>10% LEL <20.8% O <sub>2</sub>	Evacuate area, ventilate, upgrade to Level B if necessary, continue to monitor
PID	1-5 ppm unknowns 5-500 ppm unknowns >500 ppm unknowns	Level C Level B Level A

### 7.1 LOWER EXPLOSIVE LIMIT/OXYGEN (LEL/O<sub>2</sub>) METER

Prior to entering a confined-space area or hot work involving welding, cutting, or other high heat-producing operations where flammable or combustible vapors may be present, LEL/O<sub>2</sub> measurements will be taken.

#### 7.1.1 Type and Operational Aspects

- MSA Combustible Gas/Oxygen Meter Model 260
  - Principle of Operation
    - Oxygen detector uses an electrochemical sensor; produces a minute electric current proportional to the oxygen content.
    - Combustible gas indicators use a combustion chamber containing a filament that ignites flammable vapors; filament is heated or coated with a catalyst (platinum) to facilitate combustion.
    - Filament is part of a balanced resistor circuit; combustion in the chamber causes the filament temperature to increase; results in increased filament resistance.
    - Change in the filament's resistance causes an imbalance in the circuit proportional to the percent of the lower explosive limit (% LEL).
    - Concentrations greater than the LEL and lower than the upper explosive limit (UEL) will read 100% LEL; combustible atmosphere present.

- Concentrations greater than the UEL will read above 100% LEL then return to zero. (NOTE: Some devices have catchment mechanisms which will cause the needle to remain at 100% until the meter is reset.) This type of response indicates the gas mixture is too rich to burn and is not combustible. The danger is that the addition of air to the gas mixture could bring it into the flammable range (less than the UEL).
- Oxygen meter set at the factory to alarm at 19.5% (oxygen deficient atmosphere) combustible gas meter set by the user to alarm at 10% LEL.

### **7.1.2 Calibration Methods/Frequencies**

Before the calibration of the combustible gas indicator can be checked, the Model 260 must be in operating condition. The Model 260 combustible gas indicator is normally calibrated on pentane as being representative of the flammability characteristics of most commonly encountered combustible gases. The meter scale is calibrated from zero to 100% LEL, which corresponds in actual volume concentrations of 0 to approximately 14% pentane in air. A booklet of response curves is supplied with the Model 260. These curves may be used to interpret meter readings when sampling combustible gases other than pentane.

It is recommended that calibration be checked before and after using each time. The SSO will record and log such calibration information into an air monitoring notebook. The O<sub>2</sub> meter is calibrated by adjusting the O<sub>2</sub> control knob to 20.8% while the meter is operated in a fresh air atmosphere.

### **7.1.3 Preventative Maintenance**

The primary maintenance of the Model 260 is the rechargeable 2.4 volt nickel cadmium battery. Recommended charging time is 16 hours. It may be left on charge for longer periods without damaging the battery. The battery sometimes will not supply full power capacity after repeated partial use between charging. Therefore, it is recommended that the battery be exercised at least once a month by running for eight to 10 hours and recharged. If the instrument has not been used for 30 days, the battery should be charged prior to use.

## **7.2 PHOTOIONIZATION DETECTOR (PID)**

A PID will be used to monitor total ionizable organic content of the ambient air. A PID will prove useful as a direct reading instrument to aid in determining if respiratory protection needs to be upgraded and to define the EZ. (Note: PID readings do not always indicate the actual air concentration of a compound. Consult the manual, HNU, or the CIH for clarification.)

The SSO will take measurements before operations begin in an area to determine the amount of organic compounds naturally occurring in the air. This is referred to as a background level.

Levels of volatile organic compounds will be measured in the air at active work sites once every hour and at the support zone once every hour when levels are detected above background in the exclusion zone. If levels exceed background at any time in the support zone, work in the exclusion zone will cease and corrective actions will be taken, e.g., cover soil with polyethylene sheeting. Work will not resume until levels reach background in the support zone.

### **7.2.1 Type and Operational Aspects**

- PID Model PI 101
  - Principle of Operation
    - Ionization potential (IP) - The energy required to remove the outermost electron from a molecule; measured in electron volts (eV); characteristic property of a specific chemical.
    - Photoionization - Using ultraviolet (UV) light to remove the outermost electron from a molecule.
    - Energy of UV light (10.2, 9.5, 11.7 eV) must be equal to or greater than the IP to photoionize the molecule.
    - Fan or pump is used to draw air into the detector where the contaminants are exposed to a UV light source (lamp).
    - Ions are collected on a charged plate and produce a current directly proportional to the number of ionized molecules; current is amplified and displayed on the meter.

### **7.2.2 Calibration Method/Frequencies**

The PID Model PI 101 is designed for trace gas analysis in ambient air and is calibrated at HNU with certified standards of benzene, vinyl chloride, and isobutylene. Other optional calibrations are available (e.g., ammonia, ethylene oxide, H<sub>2</sub>S, etc.).

OHM will use a PID with a 10.2 eV lamp. This lamp has been determined to be most responsive to the contaminants on site. Optional probes containing lamps of 9.5 and 11.7 eV are interchangeable in use within individual read-out assemblies for different applications.

The approximate span settings for the probe that would give different readings of the amounts of trace gas of a particular species in a sample are based upon the relative photoionization sensitivities of various gases twice daily (beginning and end of shift).

It is recommended that calibration be checked twice each day (beginning and end of shift). The SSO will record and log such calibration information into an air monitoring notebook.

### **7.2.3 Preventative Maintenance**

Maintenance of the PID Model PI 101 consists of cleaning the lamp and ion chamber, and replacement of the lamp or other component parts or sub-assemblies.

## **7.3 AIR MONITORING LOG**

The SSO will ensure that all air-monitoring data is logged into a monitoring notebook. Data will include instrument used, wind direction, work process, etc. The Regional and Corporate OHM CIH will periodically review this data.



**7.4 CALIBRATION REQUIREMENTS**

The PID, LEL/O<sub>2</sub> meter and sampling pumps required with fixed-media air sampling will be calibrated daily before and after use. A separate log will be kept detailing date, time, span gas, or other standard, and name of person performing the calibration.

**7.5 AIR MONITORING RESULTS**

Air monitoring results will be posted for personnel inspection, and will be discussed during morning safety meetings.

## 8.0 EMERGENCY RESPONSE

### 8.1 PRE-EMERGENCY PLANNING

Prior to engaging in construction/remediation activities at the site, OHM will plan for possible emergency situations and have available adequate supplies and manpower to respond. In addition site personnel will receive training during the site orientation concerning proper emergency response procedures.

The following situations would warrant implementation of the Emergency Response and Contingency Plan (ERCP):

<p>Fire/Explosion</p>	<ul style="list-style-type: none"> <li>• The potential for human injury exists.</li> <li>• Toxic fumes or vapors are released.</li> <li>• The fire could spread on site or off site and possibly ignite other flammable materials or cause heat-induced explosions.</li> <li>• The use of water and/or chemical fire suppressants could result in contaminated run-off.</li> <li>• An imminent danger of explosion exists.</li> </ul>
<p>Spill or Release of Hazardous Materials</p> <ul style="list-style-type: none"> <li>• Sodium Hydroxide</li> <li>• Sulfuric Acid</li> </ul>	<ul style="list-style-type: none"> <li>• The spill could result in the release of flammable liquids or vapors, thus causing a fire or gas explosion hazard.</li> <li>• The spill could cause the release of toxic liquids or fumes in sufficient quantities or in a manner that is hazardous to or could endanger human health.</li> </ul>
<p>Natural Disaster</p>	<ul style="list-style-type: none"> <li>• A rain storm exceeds the flash flood level.</li> <li>• The facility is in a projected tornado path or a tornado has damaged facility property.</li> <li>• Severe wind gusts are forecasted or have occurred and have caused damage to the facility.</li> </ul>
<p>Medical Emergency</p>	<ul style="list-style-type: none"> <li>• Overexposure to hazardous materials.</li> <li>• Trauma injuries (broken bones, severe lacerations/bleeding, burns).</li> <li>• Eye/skin contact with hazardous materials.</li> <li>• Loss of consciousness.</li> <li>• Heat stress (Heat stroke).</li> <li>• Cold stress (Hypothermia).</li> <li>• Heart attack.</li> <li>• Respiratory failure.</li> <li>• Allergic reaction.</li> </ul>

The following measures will be taken to assure the availability of adequate equipment and manpower resources:

- Sufficient equipment and materials will be kept on site and dedicated for emergencies only. The inventory will be replenished after each use.
- On-site emergency responders will be current in regards to training and medical surveillance programs. Copies of all applicable certificates will be kept on file for on-site personnel required to respond.

- It will be the responsibility of the emergency coordinator to brief the on-site response team on anticipated hazards at the site. The emergency coordinator shall also be responsible for anticipating and requesting equipment that will be needed for response activities.
- Emergency response activities will be coordinated with the Local Emergency Planning Committee (LEPC) in compliance with SARA Title III requirements.

Communications will be established prior to commencement of any activities at the remediation site. Communication will be established so that all responders on site have availability to all pertinent information to allow them to conduct their activities in a safe and healthful manner. The primary communication device will be two-way radios. Air horns may be used to alert personnel of emergency conditions. A telephone will be located at the command post to summon assistance in an emergency.

Primary communication with local responders in the event of an emergency will be accomplished using commercial telephone lines.

**8.2 EMERGENCY RECOGNITION AND PREVENTION**

Because unrecognized hazards may result in emergency incidents, it will be the responsibility of the Plant Operator (PO) and Site Safety Officer (SSO), through daily site inspections and employee feedback (Safety Observation Program, daily safety meetings, and activity hazard analyses to recognize and identify all hazards that are found at the site. These may include:

Chemical Hazards	<ul style="list-style-type: none"> <li>• Materials at the site</li> <li>• Materials brought to the site</li> </ul>
Physical Hazards	<ul style="list-style-type: none"> <li>• Fire/explosion</li> <li>• Slip/trip/fall</li> <li>• Electrocutation</li> <li>• Confined space</li> <li>• IDLH atmospheres</li> <li>• Excessive noise</li> </ul>
Mechanical Hazards	<ul style="list-style-type: none"> <li>• Heavy equipment</li> <li>• Stored energy system</li> <li>• Pinch points</li> <li>• Electrical equipment</li> <li>• Vehicle traffic</li> </ul>
Environmental Hazards	<ul style="list-style-type: none"> <li>• Electrical Storms</li> <li>• High winds</li> <li>• Heavy Rain/Snow</li> <li>• Temperature Extremes (Heat/Cold Stress)</li> <li>• Poisonous Plants/Animals</li> </ul>

Once a hazard has been recognized, the PO and/or the SSO will take immediate action to prevent the hazard from becoming an emergency. This may be accomplished by the following:

- Daily safety meeting
- Task-specific training prior to commencement of activity
- Lock-out/tag-out
- Personal Protective Equipment (PPE) selection/use

- Written and approved permits for hot work, confined space
- Trenching/shoring procedure
- Air monitoring
- Following all OHM standard operating procedures
- Practice drills for fire, medical emergency, and hazardous substances spills

**TABLE 8.1  
EMERGENCY TELEPHONE NUMBERS**

<u>Local Agencies</u>	
Fire Department	757-444-3333
Police	757-444-3333
Ambulance	757-444-3333
<i>Hospital: DePaul Medical Center</i>	757-889-5000
<i>Directions: From site follow Helmick St to Hampton Blvd; turn Right onto Hampton Blvd. to Taussig Blvd, turn right onto Taussig Blvd, road becomes Rt 564; take Gramby St Exit; right onto Gramby St; Hospital on Gramby St Rt side</i>	
Portsmouth Naval Hospital	757-398-5000
Regional Poison Control Center	800-552-6337
<u>State Agencies</u>	
Virginia Pollution Response	804-367-0080
<u>Federal Agencies</u>	
EPA Region Branch Response Center, Phila., PA	800-438-2474
Agency for Toxic Substances and Disease Registry	404-639-0615 (24 HR)
<u>Navy ROICC</u>	
Lt. Price-Thurlow	757-444-9554
COMNAVBASE Duty Desk	757-444-7097 or 7098 (Release of Hazardous Materials)
U.S. Coast Guard	804-484-8192
National Response Center	800-424-8802
<u>OHM Personnel</u>	
Project Manager - Phil Tully	609-588-6348
Director, Health and Safety - Kevin McMahon	609-588-6375
District Health & Safety Manger - Bob Brooks	609-588-6423
OHM Corporation (24 hour)	800-537-9540
Additional Phone #'s in Section 2 this HASP	

### 8.3 PERSONNEL ROLES, LINES OF AUTHORITY, AND COMMUNICATIONS

This section of the ERCP describes the various roles, responsibilities, and communication procedures that will be followed by personnel involved in emergency responses.

The primary emergency coordinator for this site is the plant operator. In the event an emergency occurs and the emergency coordinator is not on site, the Site Safety Officer or the highest ranking employee

on site will serve as the emergency coordinator until he arrives. The emergency coordinator will determine the nature of the emergency and take appropriate action as defined by this ERCP.

The emergency coordinator will implement the ERCP immediately as required. The decision to implement the plan will depend upon whether the actual incident threatens human health or the environment. Immediately after being notified of an emergency incident, the emergency coordinator or his designee will evaluate the situation to determine the appropriate action.

### **8.3.1 Responsibilities and Duties**

This section describes the responsibilities and duties assigned to the emergency coordinator.

It is recognized that the structure of the "Incident Command System" will change as additional response organizations are added. OHM will follow procedures as directed by the fire department, LEPC, State and Federal Agencies as required. OHM will defer to the local Fire Department chief to assume the role of Incident Commander upon arriving on site. Additional on-site personnel may be added to the Site Emergency Response Team as required to respond effectively.

### **8.3.2 On-site Emergency Coordinator Duties**

The on-site emergency coordinator is responsible for implementing and directing the emergency procedures. All emergency personnel and their communications will be coordinated through the emergency coordinator. Specific duties are as follows:

- Identify the source and character of the incident, type and quantity of any release. Assess possible hazards to human health or the environment that may result directly from the problem or its control.
- Discontinue operations in the vicinity of the incident if necessary to ensure that fires, explosions, or spills do not recur or spread to other parts of the site. While operations are dormant, monitor for leaks, pressure build-up, gas generation, or ruptures in valves, pipes, or other equipment, where appropriate.
- Notify local Emergency Response Teams if their help is necessary to control the incident. Table 8.1 provides telephone numbers for emergency assistance.
- Direct on-site personnel to control the incident until, if necessary, outside help arrives.
- Ensure that the building or area where the incident occurred and the surrounding area are evacuated and shut off possible ignition sources, if appropriate. The Emergency Response Team is responsible for directing site personnel such that they avoid the area of the incident and leave emergency control procedures unobstructed.
- If fire or explosion is involved, notify facility Fire Department.
- Notify LANTDIV ROICC
- Notify OHM Project Manager
- Have protected personnel, in appropriate PPE, on standby for rescue.

If the incident may threaten human health or the environment outside of the site, the emergency coordinator should immediately determine whether evacuation of area outside of the site may be necessary and, if so, notify the Police Department and the Office of Emergency Management.

When required, notify the National Response Center. The following information should be provided to the National Response Center:

- Name and telephone number
- Name and address of facility
- Time and type of incident
- Name and quantity of materials involved, if known
- Extent of injuries
- Possible hazards to human health or the environment outside of the facility.

The emergency telephone number for the National Response Center is 800-424-8802.

If hazardous waste has been released or produced through control of the incident, ensure that:

- Waste is collected and contained.
- Containers of waste are removed or isolated from the immediate site of the emergency.
- Treatment or storage of the recovered waste, contaminated soil or surface water, or any other material that results from the incident or its control is provided.
- Ensure that no waste that is incompatible with released material is treated or stored in the facility until cleanup procedures are completed.
- Ensure that all emergency equipment used is decontaminated, recharged, and fit for its intended use before operations are resumed.
- The Navy will notify any local, state, or federal office of any spills that occur on the Base and submit the necessary reports.

#### **8.4 SAFE DISTANCES AND PLACES OF REFUGE**

The emergency coordinator for all activities will be the PO. No single recommendation can be made for evacuation or safe distances because of the wide variety of emergencies which could occur. Safe distances can only be determined at the time of an emergency based on a combination of site and incident-specific criteria. However, the following measures are established to serve as general guidelines.

In the event of minor hazardous materials releases (small spills of low toxicity), workers in the affected area will report initially to the main office location. Small spills or leaks (generally less than 55 gallons) will require initial evacuation of at least 50 feet in all directions to allow for cleanup and to prevent exposure. After initial assessment of the extent of the release and potential hazards, the emergency coordinator or his designee will determine the specific boundaries for evacuation. Appropriate steps such as caution tape, rope, traffic cones, barricades, or personal monitors will be used to secure the boundaries.

In the event of a major hazardous material release (large spills of high toxicity/greater than 55 gallons), workers will be evacuated from the building/site. Workers will assemble at the entrance to the site for a head count by their foremen and to await further instruction.

If an incident may threaten the health or safety of the surrounding community, the public will be informed and, if necessary, evacuated from the area. The emergency coordinator, or his designee will inform the proper agencies in the event that this is necessary. Telephone numbers are listed in Table 8.1.

Places of refuge will be established prior to the commencement of activities. These areas must be identified for the following incidents:

- Chemical release
- Fire/explosion
- Power loss
- Medical emergency

In general, evacuation will be made to the main building office area, unless the emergency coordinator determines otherwise. It is the responsibility of the emergency coordinator to determine when it is necessary to evacuate personnel to off-site locations.

In the event of an emergency evacuation, all the employees will gather at the entrance to the water treatment building until a head count establishes that all are present and accounted for. No one is to leave the site without notifying the emergency coordinator.

## **8.5 EVACUATION ROUTES AND PROCEDURES**

All emergencies require prompt and deliberate action. In the event of an emergency, it will be necessary to follow an established set of procedures. Such established procedures will be followed as closely as possible. However, in specific emergency situations, the emergency coordinator may deviate from the procedures to provide a more effective plan for bringing the situation under control. The emergency coordinator is responsible for determining which situations require site evacuation.

### **8.5.1 Evacuation Signals and Routes**

Two-way radio communication and an air horn will be used to notify employees of the necessity to evacuate an area or building involved in a release/spill of a hazardous material. Each crew supervisor will have a two way radio. A base station will be installed in the OHM office trailer to monitor for emergencies. Total site evacuation will be initiated only by the emergency coordinator, however, in his absence, decision to preserve the health and safety of employees will take precedence. Evacuation routes will be posted in each outside work area. Signs inside buildings will be posted on walls or other structural element of a building. Periodic drills will be conducted to familiarize each employee with the proper routes and procedures.

### **8.5.2 Evacuation Procedures**

In the event evacuation is necessary, the following actions will be taken:

- The emergency signal will be activated.
- No further entry of visitors, contractors, or trucks will be permitted. Vehicle traffic within the site will cease in order to allow safe exit of personnel and movement of emergency equipment.
- Shut off all machinery if safe to do so.
- ALL on-site personnel, visitors, and contractors in the support zone will assemble at the entrance to the site for a head count and await further instruction from the emergency coordinator.

- ALL persons in the exclusion zone and contamination reduction zone will be accounted for by their immediate crew leaders (e.g., foreman). Leaders will determine the safest exits for employees and will also choose an alternate exit if the first choice is inaccessible.
- During exit, the crew leader should try to keep the group together. Immediately upon exit, the crew leader will account for all employees in his crew.
- Upon completion of the head count, the crew leader will provide the information to the emergency coordinator.
- Contract personnel and visitors will also be accounted for.
- The names of emergency response team members involved will be reported to the emergency spill control coordinator.
- A final tally of persons will be made by the emergency coordinator or designee. No attempt to find persons not accounted for will involve endangering lives of OHM or other employees by re-entry into emergency areas.
- In all questions of accountability, immediate crew leaders will be held responsible for those persons reporting to them. Visitors will be the responsibility of those employees they are seeing. Contractors and truck drivers are the responsibility of the Site Supervisor. The security guard will aid in accounting for visitors, contractors, and truckers by reference to sign-in sheets available from the guard shack.
- Personnel will be assigned by the emergency coordinator to be available at the main gate to direct and brief emergency responders.
- Re-entry into the site will be made only after clearance is given by the emergency coordinator. At his direction, a signal or other notification will be given for re-entry into the facility.
- Drills will be held periodically to practice all of these procedures and will be treated with the same seriousness as an actual emergency.

## **8.6 EMERGENCY SPILL RESPONSE PROCEDURES AND EQUIPMENT**

In the event of an emergency involving a hazardous material spill or release, the following general procedures will be used for rapid and safe response and control of the situation. Emergency contacts found in Table 8.1 provide a quick reference guide to follow in the event of a major spill.

### **8.6.1 Notification Procedures**

If an employee discovers a chemical spill or process upset resulting in a vapor or material release, he or she will immediately notify the on-site emergency coordinator.

On-site Emergency Coordinator will obtain information pertaining to the following:

- The material spilled or released.
- Location of the release or spillage of hazardous material.
- An estimate of quantity released and the rate at which it is being released.
- The direction in which the spill, vapor or smoke release is heading.

- Any injuries involved.
- Fire and/or explosion or possibility of these events.
- The area and materials involved and the intensity of the fire or explosion.

This information will help the on-site emergency coordinator to assess the magnitude and potential seriousness of the spill or release.

### **8.6.2 Procedure for Containing/Collecting Spills**

The initial response to any spill or discharge will be to protect human health and safety, and then the environment. Identification, containment, treatment, and disposal assessment will be the secondary response.

If for some reason a chemical spill is not contained within a dike or sump area, an area of isolation will be established around the spill. The size of the area will generally depend on the size of the spill and the materials involved. If the spill is large (greater than 55 gallons) and involves a tank or a pipeline rupture, an initial isolation of at least 100 ft. in all directions will be used. Small spills (less than or equal to 55 gallons) or leaks from a tank or pipe will require evacuation of at least 50 ft. in all directions to allow cleanup and repair and to prevent exposure. When any spill occurs, only those persons involved in overseeing or performing emergency operations will be allowed within the designated hazard area. If possible the area will be roped or otherwise blocked off.

If the spill results in the formation of a toxic vapor cloud (by reaction with surrounding materials or by outbreak of fire) and its release (due to high vapor pressures under ambient conditions), further evacuation will be enforced. In general an area at least 500 feet wide and 1,000 feet long will be evacuated downwind if volatile materials are spilled. (Consult the DOT Emergency Response Guide for isolation distances for listed hazardous materials.)

If an incident may threaten the health or safety of the surrounding community, the public will be informed and possibly evacuated from the area. The on-site emergency coordinator will inform the proper agencies in the event this is necessary. (Refer to Table 8.1)

As called for in regulations developed under the Comprehensive Environmental Response Compensation Liability Act of 1980 (Superfund), OHM's practice is to report a spill of a pound or more of any hazardous material for which a reportable quantity has not been established and which is listed under the Solid Waste Disposal Act, Clean Air Act, Clean Water Act, or TSCA. OHM also follows the same practice for any substances not listed in the Acts noted above but which can be classified as a hazardous waste under RCRA.

Clean up personnel will take the following measures:

- Make sure all unnecessary persons are removed from the hazard area.
- Put on protective clothing and equipment.
- If a flammable material is involved, remove all ignition sources, and use spark and explosion proof equipment for recovery of material.
- Remove all surrounding materials that could be especially reactive with materials in the waste. Determine the major components in the waste at the time of the spill.
- If wastes reach a storm sewer, try to dam the outfall by using sand, earth, sandbags, etc. If this is done, pump this material out into a temporary holding tank or drums as soon as possible.

- Place all small quantities of recovered liquid wastes (55 gallons or less) and contaminated soil into drums for incineration or removal to an approved disposal site.
- Spray the spill area with foam, if available, if volatile emissions may occur.
- Apply appropriate spill control media (e.g. clay, sand, lime, etc.) to absorb discharged liquids.
- For large spills, establish diking around leading edge of spill using booms, sand, clay or other appropriate material. If possible, use diaphragm pump to transfer discharged liquid to drums or holding tank.

### 8.6.3 Emergency Response Equipment

The following equipment will be staged in the support zone and throughout the water treatment building, as needed, to provide for safety and first aid during emergency responses.

- ABC-type fire extinguisher
- First-aid kit, industrial size
- Eyewash/safety showers
- Emergency signal horn

In addition to the equipment listed above, OHM maintains direct reading instrumentation that may be used in emergency situations to assess the degree of environmental hazard. This equipment will only be used by the Site Safety Officer or other specially trained personnel. This equipment will be stored, charged and ready for immediate use in evaluating hazardous chemical concentrations. The equipment will be located at the OHM office trailer.

EQUIPMENT NAME	APPLICATION
Portable H-NU Photoionization Meter	Measures selected inorganic and organic chemical concentrations
MSA Oxygen and Combustible Gas Meter	Measures oxygen and combustible gas levels

### 8.6.4 Personal Protective Equipment

All designated site emergency response personnel will have respirators available for use with cartridge selection determined by the Site Safety Officer based on the results of direct reading instruments. Emergency response personnel will also be provided with protective clothing as warranted by the nature of the hazardous material and as directed by the Site Safety Officer.

### 8.6.5 Emergency Spill Response Clean-Up Materials and Equipment

A sufficient supply of appropriate emergency response clean-up and personal protective equipment will be inventoried and inspected, visually, on a weekly basis.

The materials listed below will be kept on site for spill control, based on the types of hazardous materials present on site. The majority of this material will be located in the support zone and will be placed in wall mounted spill kits located in the active work areas.

The following equipment will be kept on site and dedicated for spill cleanup:

- Plastic shovels for recovering corrosive materials.
- Sausage-shaped absorbent booms for diking liquid spills, drains, or sewers.
- Sorbent sheets (diapers) and pillows for absorbing liquid spills.
- 85-gallon open-top plastic drums for containerization of waste materials.

\*NOTE: All contaminated absorbent materials, and other materials resulting from the clean-up of spilled or discharged substances shall be properly stored, labeled, and disposed of off-site.

## 8.7 EMERGENCY CONTINGENCY PLAN

This section of the ERCP details the contingency measures OHM will take to prepare for and respond to fires, explosions, spills and releases of hazardous materials, hazardous weather, and medical emergencies.

### 8.7.1 Medical Emergency Contingency Measures

The procedures listed below will be used to respond to medical emergencies. The SSO will contact the local hospital and inform them of the site hazards and potential emergency situations. A minimum of two First-Aid/CPR trained personnel will be maintained on site.

#### 8.7.1.1 Response

The nearest workers will immediately assist a person who shows signs of medical distress or who is involved in an accident. The work crew supervisor will be summoned.

The work crew supervisor will immediately make radio contact with the on-site emergency coordinator to alert him of a medical emergency situation. The supervisor will advise the following information:

- Location of the victim at the work site
- Nature of the emergency
- Whether the victim is conscious
- Specific conditions contributing to the emergency, if known

The Emergency Coordinator will notify the Site Safety Officer. The following actions will then be taken depending on the severity of the incident:

- Life-Threatening Incident--If an apparent life-threatening condition exists, the crew supervisor will inform the emergency coordinator by radio, and the local Emergency Response Services (EMS) will be immediately called. An on-site person will be appointed who will meet the EMS and have him/her quickly taken to the victim. Any injury within the EZ will be evacuated by OHM personnel to a clean area for treatment by (EMS) personnel. No one will be able to enter the EZ without showing proof of training, medical surveillance and site orientation.
- Non Life-Threatening Incident--If it is determined that no threat to life is present, the Site Safety Officer will direct the injured person through decontamination procedures (see below) appropriate to the nature of the illness or accident. Appropriate first aid or medical attention will then be administered.

\*NOTE: The area surrounding an accident site must not be disturbed until the scene has been cleared by the Site Safety Officer.

Any personnel requiring emergency medical attention will be evacuated from exclusion and contamination reduction zones if doing so would not endanger the life of the injured person or otherwise aggravate the injury. Personnel will not enter the area to attempt a rescue if their own lives would be threatened. The decision whether or not to decontaminate a victim prior to evacuation is based on the type and severity of the illness or injury and the nature of the contaminant. For some emergency victims, immediate decontamination may be an essential part of life-saving first aid. For others, decontamination may aggravate the injury or delay life-saving first aid. Decontamination will be performed if it does not interfere with essential treatment.

If decontamination can be performed, observe the following procedures:

- Wash external clothing and cut it away.

If decontamination cannot be performed, observe the following procedures:

- Wrap the victim in blankets or plastic to reduce contamination of other personnel.
- Alert emergency and off-site medical personnel to potential contamination, instruct them about specific decontamination procedures.
- Send site personnel familiar with the incident and chemical safety information, e.g. MSDS, with the affected person.

All injuries, no matter how small, will be reported to the SSO or the Site Supervisor. An accident/injury/illness report will be completely and properly filled out and submitted to the Regional Health and Safety Director/Project CIH, in accordance with OHM's reporting procedures.

A list of emergency telephone numbers is given in Table 8.1.

### 8.7.1.2 Notification

The following personnel/agencies will be notified in the event of a medical emergency:

- Local Fire Department or EMS
- On-site Emergency Coordinator
- Workers in the affected areas
- Client Representative

### 8.7.2 **Fire Contingency Measures**

OHM personnel and subcontractors are not trained professional firefighters. Therefore, if there is any doubt that a fire can be quickly contained and extinguished, personnel will notify the emergency coordinator by radio and vacate the structure or area. The emergency coordinator will immediately notify the local Fire Department.

The following procedures will be used to prevent the possibility of fires and resulting injuries:

- Sources of ignition will be kept away from where flammable materials are handled or stored.
- The air will be monitored for explosivity before and during hot work and periodically where flammable materials are present. Hot work permits will be required for all such work.

- "No smoking" signs will be conspicuously posted in areas where flammable materials are present.
- Fire extinguishers will be placed in all areas where a fire hazard may exist.
- Before workers begin operations in an area the foreman will give instruction on egress procedures and assembly points. Egress routes will be posted in work areas and exit points clearly marked.

#### 8.7.2.1 Response

The following procedures will be used in the event of a fire:

- Anyone who sees a fire will notify their supervisor who will then contact the Emergency Coordinator by radio. The emergency coordinator will activate the emergency air horns and contact the local Fire Department.
- When the emergency siren sounds, workers will disconnect electrical equipment in use (if possible) and proceed to the nearest fire exit.
- Work crews will be comprised of pairs of workers (buddy system) who join each other immediately after hearing the fire alarm and remain together throughout the emergency. Workers will assemble at a predetermined rally point for a head count.
- When a small fire has been extinguished by a worker, the emergency coordinator will be notified.

#### 8.7.3 **Hazardous Weather Contingency Measures**

Operations will not be started or continued when the following hazardous weather conditions are present:

- Lightning
- Heavy Rains/Snow
- High Winds

##### 8.7.3.1 Response

- Excavation/soil stock piles will be covered with plastic liner.
- All equipment will be shut down and secured to prevent damage.
- Personnel will be moved to safe refuge, initially crew trailers. The emergency coordinator will determine when it is necessary to evacuate personnel to off-site locations and will coordinate efforts with fire, police and other agencies.

##### 8.7.3.2 Notification

The emergency coordinator will be responsible for assessing hazardous weather conditions and notifying personnel of specific contingency measures. Notifications will include:

- OHM employees and subcontractors
- Client Representative
- Local Civil Defense Organization

## 8.7.4 Spill/Release Contingency Measures

In the event of release or spill of a hazardous material the following measures will be taken:

### 8.7.4.1 Response

Any person observing a spill or release will act to remove and/or protect injured/contaminated persons from any life-threatening situation. First aid and/or decontamination procedures will be implemented as appropriate.

First aid will be administered to injured/contaminated personnel. Unsuspecting persons/vehicles will be warned of the hazard. All personnel will act to prevent any unsuspecting persons from coming in contact with spilled materials by alerting other nearby persons. Attempt to stop the spill at the source, if possible. Without taking unnecessary risks, personnel will attempt to stop the spill at the source. This may involve activities such as uprighting a drum, closing a valve or temporarily sealing a hole with a plug.

Utilizing radio communications, the emergency coordinator will be notified of the spill/release, including information on material spilled, quantity, personnel injuries and immediate life threatening hazards. Air monitoring will be implemented by the emergency coordinator and SSO to determine the potential impact on the surrounding community. Notification procedures will be followed to inform on-site personnel and off-site agencies. The emergency coordinator will make a rapid assessment of the spill/release and direct confinement, containment and control measures. Depending upon the nature of the spill, measures may include:

- Construction of a temporary containment berm utilizing on-site clay absorbent earth
- Digging a sump, installing a polyethylene liner and
- Diverting the spill material into the sump placing drums under the leak to collect the spilling material before it flows over the ground
- Transferring the material from its original container to another container

The emergency coordinator will notify the LANTDIV ROICC, NTR, COMNAVBASE Duty Desk, and Activity POC of the spill and steps taken to institute clean-up. Emergency response personnel will clean-up all spills following the spill clean-up plan developed by the emergency coordinator. Supplies necessary to clean up a spill will be immediately available on-site. Such items may include, but are not limited to:

- Shovel, rake
- Clay absorbent
- Polyethylene liner
- Personal safety equipment
- Steel drums
- Pumps and miscellaneous hand tools

The major supply of material and equipment will be located in the Support Zone. Smaller supplies will be kept at active work locations. The emergency coordinator will inspect the spill site to determine that the spill has been cleaned up to the satisfaction of the ROICC, NTR, COMNAVBASE Duty Desk, and Activity POC. If necessary, soil, water or air samples may be taken and analyzed to demonstrate the effectiveness of the spill clean-up effort. The emergency coordinator will determine the cause of the spill and determine remedial steps to ensure that recurrence is prevented. The emergency coordinator will review the cause with the ROICC, NTR, COMNAVBASE Duty Desk, and Activity POC and obtain his concurrence with the remedial action plan.

## **9.0 TRAINING REQUIREMENTS**

---

As a requirement for work at this site, in any hazardous waste work area, all field personnel will be required to take a 40-hour training class. This training must cover the requirements in 29 CFR 1910.120: personal protective equipment, toxicological effects of various chemicals, hazard communication, bloodborne pathogens, handling of unknown tanks and drums, confined-space entry procedures, electrical safety, etc. In addition, all personnel must receive annual 8-hour refresher training and three day on-site training under a trained, experienced supervisor. Supervisory personnel shall have received an additional 8-hour training in handling hazardous waste operations.

All personnel entering the exclusion zone will be trained in the provisions of this site safety plan and be required to sign the Site Safety Plan Acknowledgment in Appendix A.

Site-specific training for the Water Treatment Plant Operations, Camp Allen, Norfolk, Virginia, which will include potential site contaminants, Hazard Communication as per 29 CFR 1910.1200, site physical and environmental hazards, emergency response and evacuation procedures, and emergency telephone numbers will be held at the site location by the PO and SSO before any site work activities begin.

Outlines of the orientation for OHM / OHM sub-contract personnel and visitors are presented below:

### **9.1 SITE ORIENTATION**

#### **OHM/Subcontractors**

- a. HASP sign off
- b. Sign in/out procedures
- c. Site background
- d. Chain of command
- e. Rules and regulations
- f. Hours of work
- g. Absences
- h. Equipment
- i. Emergency Information
  - Emergency signal
  - Gathering point
  - Responsibilities/roles
  - Emergency phone numbers
- j. Contaminants and Material Safety Data Sheets (MSDS) [Hazard Communication Program]
- k. JSAs (Phase Safety Plans)
- l. Forms, site-specific

#### **Visitor Orientation**

- a. Sign in/out procedures
- b. Observation platform safety
- c. Review of Site map
- d. Work Zones in progress
- e. Hazard Communication
- f. Emergency plan/signals
- g. Training/medical requirements
- h. Zones/areas open to visitors

## 10.0 MEDICAL SURVEILLANCE PROGRAM

All OHM personnel participate in a medical and health monitoring program. This program is initiated when the employee starts work with a complete physical and medical history and is continued on a regular basis. A listing of OHM's worker medical profile is shown below. This program was developed in conjunction with a consultant toxicologist and OHM's occupational health physician. Other medical consultants are retained when additional expertise is required.

The medical surveillance program meets the requirements of the OSHA Standard 29 CFR 1910.120

(f).

TABLE 10.1 WORKER MEDICAL PROFILE		
Item	Initial	Annual
Medical History	X	X
Work History	X	X
Visual Acuity and Tonometry	X	X
Pulmonary Function Tests	X	X
Physical Examination	X	X
Audiometry Tests	X	X
Chest X-Ray	X	X
Complete Blood Counts	X	X
Blood Chem. (SSAC-23 or equivalent)	X	X
Urinalysis	X	X
Dermatology Examination	X	X
Electrocardiogram/Stress Test	X	X (based on age)

Specific Tests (as required): (PCB blood or fat, urine mercury, urine arsenic, urine phenol, urine halomethanes, blood cyanide, cholinesterase-pseudo-cholinesterase, nerve conduction velocity tests, blood lead, urine lead.)

### 10.1 EXAMINATION SCHEDULE

Employees are examined initially upon start of employment, annually thereafter, and may be examined upon termination of employment. Unscheduled medical examinations are conducted:

- At employee request after known or suspected exposure to toxic or hazardous materials
- At the discretion of the client, the CIH, SSO, or OHM occupational physician after known or suspected exposure to toxic or hazardous materials
- At the discretion of the OHM occupational physician



All nonscheduled medical examinations will include, as a minimum, all items specified above for periodic surveillance examination, with the exception of the chest X-ray, which will be conducted at the discretion of the occupational physician performing the examination.

**APPENDIX A**

**HEALTH AND SAFETY PLAN CERTIFICATION**

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**APPENDIX B**  
**OHM HAZARD COMMUNICATION PROGRAM**

# **APPENDIX B**

## **OHM HAZARD COMMUNICATION PROGRAM**

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### **1. OBJECTIVE**

A Site Specific Hazard Communication (Employee Right-To-Know) Program will be instituted at the Camp Allen Water Treatment Plant site.

### **2. PURPOSE**

The purpose of Hazard Communication (Employee Right-to-Know) is to ensure that the hazards of all chemicals located at field project sites, shops, and facilities are transmitted (communicated), according to 29 CFR 1910.1200 and 29 CFR 1926.59 to all OHM personnel and OHM subcontractors.

### **3. GENERAL REQUIREMENTS**

3.1 It is the responsibility of site supervisors, shop supervisors, and facilities managers to ensure that the Hazard Communication Program for the area under their supervision is updated as necessary.

3.2 Container Labeling — OHM personnel will ensure that all drums and containers are labeled according to contents. These drums and containers will include those from manufacturers and those produced by on site operations. All incoming and outgoing labels shall be checked for identity, hazard warning, and name and address of responsible party.

3.3 Material Safety Data Sheets (MSDSs) — There will be an MSDS located on site for each hazardous chemical known to exist or which is being used on site. All MSDSs will be located in the site health and safety plan which can be found in the office trailer. MSDS's for products in use may be stored in a separate binder.

3.4 Employee Information and Site Specific Training — Training employees on chemical hazards is accomplished through an ongoing corporate and regional training program. Additionally, chemical hazards will be communicated to employees through daily safety meetings held at the project and by an initial site orientation program.

3.5 OHM employees will be instructed on the following:

- Chemicals and their hazards in the work area
- How to prevent exposure to these hazardous chemicals
- What the company has done to prevent workers' exposure to these chemicals
- Procedures to follow if they are exposed to these chemicals
- How to read and interpret labels and MSDSs for hazardous substances
- Emergency spill procedures
- Proper storage and labeling

3.6 Before any new hazardous chemical is introduced on site, each employee will be given information in the same manner as during the initial safety class. The site supervisor will be responsible for seeing that the MSDS on the new chemical is available. During the mandatory morning safety briefing, information on each new chemical will be presented.

Should any new chemical be brought on site, the appropriate MSDSs will be added and reviewed with the employees.

1. **GENERAL**

The following written Hazard Communication Program has been established for OHM Remediation Services Corp. (OHM). The purpose of this program is to transmit information to the workers about the chemical hazards in the work place using various media. The transmittal of information will be accomplished by means of a comprehensive Hazard Communication Program, which will include container labeling and other forms of warning, material safety data sheets (MSDSs), and employee training in accordance with 29 CFR 1910.1200 and 29 CFR 1926.59.

Upon mobilization at the job site the Hazard Communication Program will be reviewed with all employees. Upon reading the Hazard Communication Program employees will be asked to sign the "Worker Hazard Communication Acknowledgment Form". The Hazard Communication Program will also be reviewed with new employees and visitors as they arrive on site. These persons will also be asked to sign the acknowledgment form. The Hazard Communication Program shall be available for review by anyone on site any time during normal work hours. OHM will accomplish the hazard communication requirements through formal safety training, departmental safety meetings, and job-site safety meetings.

The Health and Safety Department shall update the Hazard Communication Program when personnel responsibilities change, a new non-routine task is introduced, or an extremely hazardous material needs particular attention. This new program will then be distributed throughout the company.

2. **RESPONSIBILITIES**

Overall responsibility for compliance with the Site Specific Hazard Communication Program rests with the site supervisor. A brief outline of responsibilities for those persons directly involved with the program will follow. These responsibilities are not all inclusive, but are designed to give guidance in initial and long-term program development. Since each area is different, these responsibilities may vary.

This program is intended to cover those employees who are directly involved with the handling of hazardous chemicals or supervision of activities that involve the use of hazardous chemicals.

2.1 **Health and Safety Department Responsibilities**

- Review operations with site supervisors to determine what tasks require hazard communication training.
- Advise supervisory people as to which materials may need to be considered hazardous initially and eventually to ensure that hazard task determination is being done according to the written policy.
- Follow up through safety meetings and safety audits to ensure that supervisors are carrying out prescribed company policy.
- Notify supervisors immediately of any operating changes affecting the hazardous chemicals being used.

2.2 **Training Department Responsibilities**

- Ensure that up-to-date records are maintained on training of all employees required to handle hazardous chemicals. The supervisor should keep copies of these records and should also send copies of the initial training to the corporate training secretary for the training file.
- Educate personnel upon initial 40-hour OSHA training to the requirements of the Hazard Communication Standard.

### **2.3 Site Supervisors' Responsibilities**

- Identify jobs requiring the use of hazardous chemicals and develop a list of those jobs and chemicals.
- Provide the training required by the Hazard Communication Standard and document training of employees in the safe handling of hazardous chemicals.
- Ensure inspection of engineering controls and personal protective equipment before each use. The health and safety department shall help determine a suitable inspection plan for each application as needed.
- Make daily surveys of the work area to ensure that safe practices are being followed. Advise employees of and document unsafe work practices on the first occasion and consider further unsafe work practices as disciplinary violations. Use documentation as topics of safety meetings.
- Ensure required labeling practices are being followed. Labels should be affixed to the container when it arrives. If the contents are transferred to another container, then all label information (manufacturer, manufacturer's telephone number, product name, target organ(s) and product number) must also be affixed to the new container, so that all containers of the material, regardless of size, are labeled. Contact the health and safety department for proper labels.
- Enforce all applicable safety and health standards through periodic documented audits.
- Before ordering a material, determine if a MSDS exists on file. Request a MSDS from the manufacturer for all new products.

### **2.4 Employee Responsibilities**

- Read and understand entire Site Specific Hazard Communication Program.
- Obey established safety rules and regulations.
- Use all safety procedures and personal protective equipment as required by company procedures.
- Notify supervisor of the following:
  - Any symptoms or unusual effects that may be related to the use of hazardous chemicals.
  - Any missing, incomplete, or unreadable labels on containers.
  - Missing, damaged, or malfunctioning safety equipment.
- Use approved labels on containers; do not remove labels (labels are available from the health and safety department).
- Use only approved containers for hazardous chemicals. (Is chemical and container compatible and appropriate?)
- Know where emergency equipment and first-aid supplies are located.
- Know location of MSDSs. These will be located in the break/decon area and the job-site office trailer.
- Know what you are expected to do in case of an emergency. Before the commencement of any task, emergency considerations shall be made.

## 2.5 Shipping/Receiving Personnel Responsibilities

- The Project Accountant (PA) or other persons assigned by the site supervisor shall ensure MSDSs are received with initial shipment of a hazardous chemical; if not, contact purchasing to request the appropriate MSDS and also call the health and safety department to determine if there is a MSDS available until the requested MSDS arrives.
- Ensure labels with required information are affixed to all containers.
- Store hazardous materials in designated locations.
- Use proper personal protective equipment when handling hazardous chemicals.
- Report damaged containers or spills to the site supervisor and the site safety officer immediately.

## 3. HAZARD DETERMINATION

OHM will rely on MSDSs from chemical suppliers and manufacturers to meet hazard determination requirements. Other relevant data from laboratory analyses, chemical reference materials, and chemical manufacturers' written evaluation procedures will be utilized when warranted. No other method shall be used to determine a chemicals' hazards unless approved by the health and safety department.

## 4. LABELING

The site supervisor will be responsible for seeing that all containers arriving at OHM job sites are properly and clearly labeled. Site supervisors shall also check all labels for chemical identity and appropriate hazard warnings. If the hazardous chemical is regulated by OSHA in a substance specific health standard (29 CFR 1910), the site supervisor shall ensure that the labels or other forms of warning used are in accordance with the requirements of that standard. Any container that is not labeled shall be immediately labeled after initial discovery with the required information.

The site supervisor or Team Leader shall be responsible for seeing that all portable containers used in their work area are properly labeled with chemical identity and hazard warning. (Refer to MSDS for required labeling information.)

The site supervisor or Team Leader shall also ensure that labels on hazardous chemical containers are not removed or defaced unless the container is immediately marked with the required information and that all labels are legible in English and prominently displayed on the container or readily available in the work area throughout each shift.

If any container is found and the contents cannot be identified, the site supervisor shall be contacted immediately. When proper identification is made, a label shall be affixed to the container immediately. If it is discovered that no MSDS is available, the manufacturer and the health and safety department shall be contacted to assist in locating the proper MSDS. If there is no means of identifying the material in the container, the container shall be taken out of service, away from all personnel until it can be tested by the health and safety department or laboratory personnel. The site supervisor shall communicate their findings or awareness of such containers to all personnel working in the area and to the district health and safety manager.

## 5. MATERIAL SAFETY DATA SHEETS (MSDS)

The site supervisor at the job site will be responsible for maintaining a current MSDS relevant to the hazardous chemicals used on their job sites. The health and safety department will be responsible for compiling the initial MSDS file for the job site and aiding all job sites with the completion and maintenance of their respective MSDS files.

All MSDSs shall be readily available for review by all employees during each work shift. Each job site will designate a clearly marked "Employee Right-to-Know" station where employees can immediately obtain a MSDS and the required information in an emergency. MSDSs shall also be made available, upon request, to designated OHM representatives, other employer's employees, and to any OSHA inspector in accordance with the requirements of 29 CFR 1910.1200(e).

Although manufacturers are required to provide employers with MSDSs on an initial chemical shipment, OHM purchasing agents (and site supervisors purchasing their own material) shall request MSDSs and updates to MSDSs on all purchase orders. Site supervisors that are without proper MSDSs shall be responsible for requesting this information from chemical manufacturers. The site supervisor shall maintain a file of follow-up letters for all hazardous chemical shipments they receive without MSDSs.

## **6. EMPLOYEE INFORMATION AND TRAINING**

It is the responsibility of the supervisor in charge of each employee to ensure that the employee is properly trained. Training employees on chemical hazards and chemical handling is accomplished at the time of initial employment at OHM, whenever a new chemical (or physical) hazard is introduced into the work area, and through ongoing formal and informal training programs. Additionally, chemical hazards are communicated to employees through weekly and morning, job-site safety meetings, which shall be documented according to topic, major points discussed, and names of those attending (attendance is mandatory). Records of all formal training conducted at OHM are coordinated and maintained by the Training Department secretary.

At a minimum, OHM will inform employees on the following:

- The requirements of 29 CFR 1910.1200--Hazard Communication--Evaluating the potential hazards of chemicals and communicating information concerning hazards and appropriate protective measures to employees. OHM shall accomplish employee training in several different ways including, but not limited, to 40-hour OSHA Hazardous Waste Worker Training (29 CFR 1910.120), shop safety meetings, job-site safety meetings, Health and Safety Department safety meetings, and formal and informal training about specific chemical hazards.
- The location and availability of the written Hazard Communication Program, list of hazardous chemicals, and MSDSs will be periodically posted on the employee bulletin boards providing the location of the above material.
- Any operations in their work area where hazardous chemicals are present.
- How to work safely with chemicals present in the workplace and minimize potential exposure.

Employee training shall include the following:

- Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (monitoring instruments, visual appearance or odor, and acute and chronic health effects).
- The physical, chemical, and health hazards of the chemicals in the work area.
- The methods of preventing exposure to hazardous chemicals including the measures OHM has taken to protect the employees.
- Procedures to follow if OHM employees are exposed to hazardous chemicals (location of the nearest phone, emergency eyewash, and shower will be included). These discussions shall include proper operating procedures for all emergency equipment.

- The details of the OHM written Hazard Communication Program, including an explanation of the labeling system and the MSDSs, and how employees can obtain and use the appropriate hazard information.
- Procedures for workers involved in non-routine tasks.

Each site supervisor shall ensure that the above training is emphasized to OHM employees. The health and safety department will ensure that each job site is properly informing and training all employees through group meetings and individual discussions. Whenever a new hazardous chemical is placed into use, the site supervisor shall inform the employees of the hazards said chemical may pose. The site supervisor shall also be responsible for obtaining and making available a MSDS for the new chemical.

## **7. HAZARDOUS NON-ROUTINE TASKS**

Occasionally, employees at OHM are required to perform tasks which are considered to be non-routine. All tasks OHM considers non-routine shall be carefully discussed among the supervisor and those performing the task. This safety briefing shall include all possible hazards an employee may encounter while completing the task, including:

- Hazard recognition
- Chemicals involved and their hazardous properties
- Physical hazards
- Methods of avoiding hazards (monitoring instruments, proper personal protective equipment, etc.)

The following is a list of some of the non-routine tasks which may occur at OHM job sites. These tasks are all covered in detail in various OHM standard operating Procedures.

- 7.1 Confined Space Entry
- 7.2 Excavation, Trenching, and Shoring
- 7.3 Decontamination of Equipment
- 7.4 Laboratory Spills
- 7.5 High-Pressure Washer (Laser) Operation
- 7.6 Line Entry Procedure
- 7.7 Hot Work

## **8. INFORMING CONTRACTORS**

It shall be the responsibility of the OHM site supervisor/SSO to provide subcontractors with the following information:

- Hazardous chemicals to which they may be exposed while performing a task including the following:
  - Chemical properties
  - Physical properties
  - Acute/Chronic health effects
- Location of "Employee Right-to Know" station which includes the following:
  - MSDS for work area
  - Hazard Communication Program
  - Other relevant safety material such as Project Health and Safety Plan (HASP)
- Precautionary measures to be taken to protect employees from chemical and physical hazards.
- Location of nearest emergency equipment (fire extinguisher, eyewash, shower, phone, first-aid kit, etc.)
- Procedures to follow in the event of employee exposure.

- Steps OHM has taken to reduce the risk of exposure to physical and chemical hazards including the following:
  - Safety meetings
  - Hazard Communication Program
  - Proper storage and labeling of hazardous chemicals
  - Health and safety department shop audits
- The methods used to label all hazardous chemicals.
- Emergency evacuation signals and evacuation rally locations.

The health and safety department shall offer assistance in providing the above information to subcontractors working at OHM job sites. On initial visit by a subcontractor to OHM job sites, a "Contractor Right-to-Know" release form shall be completed. This form will state that the above information has been communicated to the perspective contractor.

Conversely, the site supervisor shall obtain the above information from subcontractors for hazardous materials they have brought to our projects.

**8.1 Contractor Right-to-Know Acknowledgment**

By signing this sheet, the signee is stating that an OHM employee or representative has briefed said signee on the essentials of OHM's Hazard Communication Program, including hazardous chemical(s) to which one may be exposed, location of program and MSDS, precautionary measures taken to protect contractors from chemical and physical hazards, location of nearest emergency equipment, procedures to follow in the event of employer's employee chemical exposure, and method used to label all hazardous chemicals.

Name	Date	Company
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

**9. LIST OF HAZARDOUS CHEMICALS**

The following is a list of hazardous chemicals used on this OHM job site. Further information on each hazardous chemical listed below can be found in the MSDS which are included in the site specific health and safety plan.

- Typical OHM Job-Site Hazardous Chemical Inventory List

<u>Available On Site</u>	<u>Chemicals</u>
_____	Acetone
_____	Acetylene
_____	Activated Charcoal, Powder
_____	Alum (Aluminum Sulfate)



- \_\_\_\_\_ Anti-fog Bausch & Lomb
- \_\_\_\_\_ Argon/Methan (95%/5%)
- \_\_\_\_\_ Brake Fluid
- \_\_\_\_\_ Calcium Hydroxide (Hydrated Lime)
- \_\_\_\_\_ Calibration Check Gas
- \_\_\_\_\_ Carbon
- \_\_\_\_\_ Caustic Soda (Sodium Hydroxide)
- \_\_\_\_\_ Citrikleen
- \_\_\_\_\_ Coal Fly Ash
- \_\_\_\_\_ Compressed Air
- \_\_\_\_\_ Diatomaceous Earth
- \_\_\_\_\_ Diesel Fuel
- \_\_\_\_\_ Dry Ice (Solid Carbon Dioxide)
- \_\_\_\_\_ Ethylene Glycol
- \_\_\_\_\_ Ferric Chloride
- \_\_\_\_\_ Freon
- \_\_\_\_\_ Gear Grease - Delta
- \_\_\_\_\_ Helium
- \_\_\_\_\_ Hexane
- \_\_\_\_\_ Hydraulic Fluid
- \_\_\_\_\_ Hydrochloric Acid
- \_\_\_\_\_ Hydrogen
- \_\_\_\_\_ Isobutylene
- \_\_\_\_\_ Kiln Dust
- \_\_\_\_\_ Methanol
- \_\_\_\_\_ Nitrogen
- \_\_\_\_\_ Nitrous Oxide
- \_\_\_\_\_ Oxygen
- \_\_\_\_\_ Penetone
- \_\_\_\_\_ Pentane
- \_\_\_\_\_ Polymers (Flocculants)
- \_\_\_\_\_ Premium Unleaded Gasoline
- \_\_\_\_\_ PVC Solvent Cleaner
- \_\_\_\_\_ PVC Cement
- \_\_\_\_\_ Regular Leaded Gasoline
- \_\_\_\_\_ Starting Fluid
- \_\_\_\_\_ Stoddard Solvent
- \_\_\_\_\_ Sulfuric Acid
- \_\_\_\_\_ 10W-40 Motor Oil - Shell
- \_\_\_\_\_ Tube Grease - Kendall
- \_\_\_\_\_ TU Type 555 Thread Sealing Compound
- \_\_\_\_\_ 2-Cycle Oil - Wolf's Head

- Site-Specific Hazardous Chemical Inventory

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***APPENDIX C***  
***MATERIAL SAFETY DATA SHEETS***

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**PRILLAMAN**

Chemical Corporation

P. O. Box 1606  
Suffolk, VACharlotte, NC  
Suffolk, VA  
Fayetteville, NC  
Richmond, VA  
Martinsville, VA  
Kinston, NCProduct Safety  
Data Sheet**GENERAL INFORMATION**

TRADE NAME (COMMON NAME OR SYNONYM) Caustic Soda 20%, 25%, 50% Rayon Grade		C.A.S. NO. 1310-73-2	
CHEMICAL NAME SODIUM HYDROXIDE, SODA LYE, LYE			
FORMULA NaOH		MOLECULAR WEIGHT	
ADDRESS (No., STREET, CITY, STATE, AND ZIP CODE) PRILLAMAN CHEMICAL P. O. Box 1606 Suffolk, Virginia 23439-1606			
CONTACT David W. Dussia - Technical Manager	PHONE NUMBER (804) 539-7401	ISSUED DATE March 2, 1990	REVISED DATE August 13, 1996

**FIRST AID MEASURES**

**Eyes:** Object is to immediately flush out material and get medical attention. Flush eyes with large amounts of water for at least 15 minutes, forcibly holding eyelids apart to ensure complete irrigation. Washing eyes within several seconds is essential to achieve maximum effectiveness. Get medical attention immediately.

**Skin:** Immediately remove contaminated clothing and footwear under a safety shower. Flush affected areas with large amounts of water for at least 15 minutes. Wash contaminated clothing before reuse and discard footwear which cannot be decontaminated. Get immediate medical attention.

**Inhalation:** Remove victim to fresh air. If breathing is difficult, administer oxygen. If breathing ceases, give mouth-to-mouth resuscitation. Get medical attention.

**Ingestion:** DO NOT INDUCE VOMITING. Give large amounts of water or milk, if permissible. If vomiting occurs spontaneously, keep airway clear. Never give anything by mouth to an unconscious person. Get medical attention immediately.

**HAZARDS INFORMATION**

## HEALTH

INHALATION Airborne concentrations of dust, mist, or spray of this product may cause damage to the upper respiratory tract and lung tissue proper which could produce chemical pneumonia, depending upon severity of exposure.	
INGESTION This product, if swallowed can cause severe burns and complete tissue perforation of mucous membranes of the mouth, throat, esophagus, and stomach. LD50: 140-340 mg/kg (rat).	
SKIN This product is destructive to tissue contacted and produces severe burns. A latent period may exist between exposure and sense of irritation LD50: 1350 mg/mg (rabbit).	
EYES This product is destructive to eye tissue upon contact. Will cause severe burns that result in damage to the eyes and even blindness.	
PERMISSIBLE CONCENTRATION: (SEE SECTION J) AIR No Data	
UNUSUAL CHRONIC TOXICITY The chronic local effect may consist of multiple areas of superficial destruction of the skin or primary irritant dermatitis.	

## FIRE AND EXPLOSION

FLASH POINT PEN CUP <input type="checkbox"/> CLOSED CUP	N/A	AUTO IGNITION TEMPERATURE Non Combustible	FLAMMABLE LIMITS IN AIR (% BY VOL.) N/A
UNUSUAL FIRE AND EXPLOSION HAZARDS See section G for reactivity data.			

## PRECAUTIONS/PROCEDURES

### FIRE EXTINGUISHING AGENTS RECOMMENDED

This product is non-combustible. Water spray, foam, carbon dioxide, or dry chemical may be used where this product is stored.

### EXTINGUISHER AGENTS TO AVOID

Avoid direct contact with water, as this can cause a violent exothermic reaction.

### SPECIAL FIRE FIGHTING PRECAUTIONS

Wear full protective clothing. Avoid direct contact of this product with water as this can cause a violent exothermic reaction.

### VENTILATION

No special requirements under normal use. Use local exhaust ventilation where dust, mist, or spray may be generated. NOTE: Where carbon monoxide or other reaction products may be generated, special ventilation may be required.

### NORMAL HANDLING

Do not get into eyes, on skin or clothing. Avoid breathing dust, mist or spray. Do not take internally. Use with adequate ventilation or employ respiratory protection, when exposure to dust, mist or spray is possible. When handling, wear gloves.

### STORAGE

Keep container closed. Product can react violently with water, acids, and other substances. Product is corrosive to tin, aluminum, zinc, and alloys containing these metals and will react violently with these metals in powder form.

### SPILL AND LEAK

Leaks should be stopped. Spills should be contained and cleaned up immediately. Spills should be removed using a vacuum truck. Neutralize remaining traces of material with any dilute inorganic acid such as hydrochloric, sulfuric, nitric, or phosphoric acid. The spill area should then be flushed with water followed by a liberal covering of sodium bicarbonate. All clean up material should be removed and placed in appropriate containers labeled and stored in a safe place to await disposal.

### SPECIAL PRECAUTIONS/PROCEDURES/LABEL INSTRUCTIONS

**CORROSIVE MATERIAL:** Caustic soda may react violently with acids and water.  
**DANGER!** Causes severe burns to skin, eyes, and mucous membranes. Contact with eyes can cause permanent eye damage.

## PERSONAL PROTECTIVE EQUIPMENT

### RESPIRATORY PROTECTION

None required under normal use. Use NIOSH/MSHA approved respirators where dust, mist or spray may be generated.

### EYES AND FACE

Wear chemical safety goggles plus full face shield to protect against splashing.

### HANDS, ARMS, AND BODY

Chemical resistant gloves should be worn. Gloves can be decontaminated by washing with mild soap and water. Natural and butyl rubber have been suggested.

### OTHER CLOTHING AND EQUIPMENT

Impervious protective clothing and chemically resistant safety shoes should be worn to minimize contact. Wash contaminated clothing with soap and water before reuse. Showers and eyewash facilities should be accessible.

## PHYSICAL DATA

MATERIAL IS (AT NORMAL CONDITIONS): Liquid	APPEARANCE AND ODOR Clear water white to pale yellow with no odor.	
BOILING POINT 20%/230F, 25%/234F, 50%/293F MELTING POINT 20%/ -18F, 25%/12F, 50%/54F	SPECIFIC GRAVITY (H <sub>2</sub> O = 1) @ 60°F 20%, 1.223 25%, 1.283 50%, 1.53	VAPOR DENSITY (AIR = 1) N/A
SOLUBILITY IN WATER (% by Weight) Completely soluble 100%	pH 7.5% solution has a pH of 14.0	VAPOR PRESSURE 20% & 25% 95mmHg @60F 50% 134mmHg @ 60F
EVAPORATION RATE □(Butyl Acetate = 1) □(Ether = 1) N/A	% VOLATILES BY VOLUME (At 20°C) 20% 25% 50% less than 80% 75% 50%	

## REACTIVITY DATA

STABILITY Stable	CONDITIONS TO AVOID None
COMPATIBILITY Avoid direct contact with water. Product may be added slowly to water or acids with dilution and agitation to avoid a violent exothermic reaction. When handling this product, avoid contact with aluminum, tin, zinc, and alloys containing these metals. DO NOT mix with strong acids. Avoid contact with leather and wool.	
HAZARDOUS DECOMPOSITION PRODUCTS None known.	
HAZARDOUS POLYMERIZATION Will not occur.	CONDITIONS TO AVOID N/A.

## HAZARDOUS INGREDIENTS (Mixtures Only)

MATERIAL OR COMPONENT/C.A.S.	WT. %	HAZARD DATA (SEE SECTION J)
Sodium Hydroxide 1310-73-2	20%	
	25%	
	50%	
Water 7732-18-5	80%	
	75%	
	50%	

## ENVIRONMENTAL

DEGRADABILITY/AQUATIC TOXICITY This product has not been tested for environmental effects.		
OCTANOL/WATER PARTITION COEFFICIENT N/A		
EPA HAZARDOUS SUBSTANCE? YES X NO	IF SO, REPORTABLE QUANTITY: 1000 lbs.	40 CFR 118 - 117
WASTE DISPOSAL METHODS (DISPOSER MUST COMPLY WITH FEDERAL, STATE AND LOCAL DISPOSAL OR DISCHARGE LAWS) The materials resulting from clean-up operations may be hazardous wastes, and therefore subject to specific regulations. Package, store, transport, and dispose of all clean-up materials and any contaminated equipment in accordance with all applicable federal, state and local health and environmental regulations. Shipments of waste materials may be subject to manifesting requirements per applicable regulations.		
RCRA STATUS OF UNUSED MATERIAL: Unknown		40 CFR 261.22

## REFERENCES

PERMISSIBLE CONCENTRATION REFERENCES PEL: 2mg/m3 Ceiling TLV: 2mg/m3 Ceiling
REGULATORY STANDARDS All components of this product that are required to be on the TSCA Inventory are listed on the inventory. Not listed as a Carcinogen-IARC, NTP, OSHA
D.O.T. CLASSIFICATION Sodium Hydroxide Solution, 8, UN1824, PGII
49 CFR 172.101

## ADDITIONAL INFORMATION

	NFPA	HMIS
HEALTH	3	3
FLAMMABILITY	0	0
REACTIVITY	1	1

THE DATA PRESENTED HEREIN ARE BELIEVED TO BE ACCURATE BUT ARE IN NO WAY GUARANTEED. PRILLAMAN CHEMICAL CORPORATION ASSUMES NO LIABILITY IN CONNECTION WITH ANY USE FOR THE PRODUCTS DISCUSSED AND IT MAKES NO WARRANTY, EXPRESS OR IMPLIED, IN THAT RESPECT, NOR CAN IT BE ASSUMED THAT ALL SAFETY MEASURES ARE INDICATED HEREIN OR THAT OTHER OR ADDITIONAL MEASURES MAY BE REQUIRED. THE USER, THEREFORE, MUST ASSUME FULL RESPONSIBILITY, BOTH AS TO PERSONS AND AS TO PROPERTY, FOR THE USE OF THESE MATERIALS INCLUDING ANY USE WHICH MIGHT BE COVERED BY PATENT.

5-56



DISTRIBUTED BY  
PRILLAMAN CHEMICAL CORP.  
SUFFOLK, VA 23434  
804-539-7401



DuPont Chemicals

4950CR

Revised 19-OCT-1996

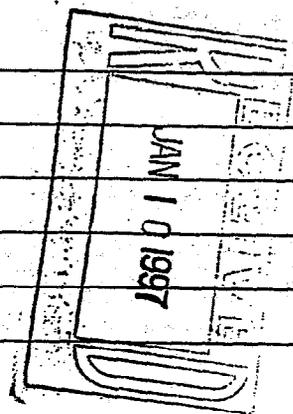
Printed 6-JAN-1997

# Sulfuric Acid, 77 to 100%

## CHEMICAL PRODUCT/COMPANY IDENTIFICATION

### Material Identification

Corporate MSDS Number	DU000051
CAS Number	7664-93-9
Formula	H2SO4
Molecular Weight	98.08
CAS Name	SULFURIC ACID
Grade	77 to 100% TECHNICAL



### Tradenames and Synonyms

CC0036

### Company Identification

MANUFACTURER/DISTRIBUTOR  
DuPont  
1007 Market Street  
Wilmington, DE 19898

### PHONE NUMBERS

Product Information	1-800-441-7515
Transport Emergency	CHEMTREC: 1-800-424-9300
Medical Emergency	1-800-441-3637

## COMPOSITION/INFORMATION ON INGREDIENTS

### Components

Material	CAS Number	%
SULFURIC ACID	7664-93-9	
60 DEG TECHNICAL		77.7
66 DEG TECHNICAL		93.2

(Continued)

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**COMPOSITION/INFORMATION ON INGREDIENTS**(Continued)

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1.835 ELECTROLYTE		93.2
98% TECHNICAL		98
99% TECHNICAL		.99
100% TECHNICAL		100
<hr/>		
WATER	7732-18-5	0-22

---

**HAZARDS IDENTIFICATION****Potential Health Effects****INHALATION**

Exposure to mists may cause: Irritation of the nose and throat with sneezing, sore throat or runny nose. Non-specific effects such as headache, nausea and weakness. Gross overexposure may cause: Irritation of nose, throat, and lungs with cough, difficulty breathing or shortness of breath. Pulmonary edema (body fluid in the lungs) with cough, wheezing, abnormal lung sounds, possibly progressing to severe shortness of breath and bluish discoloration of the skin; symptoms may be delayed. Repeated and/or prolonged exposure to mists may cause: Corrosion of teeth.

---

**SKIN CONTACT**

Contact with liquid may cause: Skin corrosion, burns or ulcers. Contact with a 1 % solution may cause-- Slight irritation with itching, redness or swelling. Repeated and/or prolonged exposure to mists may cause: Irritation with itching, burning, redness, swelling or rash.

---

**EYE CONTACT**

Contact with liquid may cause: Eye corrosion or ulceration - blindness may result. Repeated and/or prolonged exposure to mists may cause: Eye irritation with tearing, pain or blurred vision.

---

**INGESTION**

Immediate effects of overexposure may include: Burns of the mouth, throat, esophagus and stomach, with severe pain, bleeding, vomiting, diarrhea and collapse of blood pressure - damage may appear days after exposure.

---

**ADDITIONAL HEALTH EFFECTS**

The International Agency for Research on Cancer (IARC) classified "strong inorganic acid mists containing sulfuric acid" as a Category 1 carcinogen, a substance that is "carcinogenic to humans". This classification is for strong inorganic acid mists only and does not apply to sulfuric acid or sulfuric acid solutions. The basis for the IARC classification rests on several

(Continued)

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## HAZARDS IDENTIFICATION(Continued)

epidemiology studies which have several deficiencies. These studies did not account for exposure to other substances, some known to be animal or potential human carcinogens, social influences (smoking, etc.) and included small numbers of subjects. Based on the overall weight of evidence from all human and chronic animal studies, no definitive causal relationship between sulfuric acid mist exposure and respiratory tract tumors has been shown.

Increased susceptibility to the effects of this material may be observed in persons with pre-existing disease of the: lungs.

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### Carcinogenicity Information

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

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## FIRST AID MEASURES

### First Aid

#### INHALATION

If inhaled, immediately remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Please note: Symptoms may be delayed; prompt medical attention may be required. Call a physician.

#### SKIN CONTACT

In case of contact, immediately flush skin with plenty of water for at least 15 minutes, while removing contaminated clothing and shoes. Call a physician. Wash contaminated clothing before reuse.

While the patient is being transported to a medical facility, continue the application of cold, wet compresses. If medical treatment must be delayed, repeat the flushing with cold water or soak the affected area with cold water to help remove the last traces of sulfuric acid. Creams or ointments should not be applied before or during the washing phase of treatment.

#### EYE CONTACT

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

#### INGESTION

If swallowed, do not induce vomiting. Give large quantity of water. Call a physician immediately. Never give anything by mouth to an unconscious person.

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### Notes to Physicians

Continued washing of the affected area with cold or iced water will be helpful in removing the last traces of sulfuric acid. Creams or ointments should not be applied before or during the washing phase of the treatment.

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## **FIRE FIGHTING MEASURES**

### **Flammable Properties**

Will not burn.

### **Fire and Explosion Hazards:**

Reacts with most metals, especially when dilute, to give flammable, potentially explosive hydrogen gas. Follow appropriate National Fire Protection Association (NFPA) codes.

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### **Extinguishing Media**

Use media appropriate for surrounding material.

Use water spray to cool containers exposed to fire; do not get water inside containers.

---

### **Fire Fighting Instructions**

Evacuate personnel to a safe area. Keep personnel removed and upwind of fire. Generates heat upon addition of water, with possible spattering. Wear full protective clothing. Runoff from fire control may cause pollution. Neutralize run-off with lime, soda ash, etc., to prevent corrosion of metals and formation of hydrogen gas. Wear self-contained breathing apparatus if fumes or mists are present.

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## **ACCIDENTAL RELEASE MEASURES**

### **Safeguards (Personnel)**

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

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### **Accidental Release Measures**

Stop flow if possible. Review "Fire and Explosion Hazards" and "Safety Precautions" before proceeding with clean up. Use appropriate protective equipment during clean up. Soak up small spills with dry sand, clay or diatomaceous earth. Dike large spills, and cautiously dilute and neutralize with lime or soda ash, and transfer to waste water treatment system. Prevent liquid from entering sewers, waterways, or low areas.

If this product is spilled and not recovered, or is recovered as a waste for treatment or disposal, the Reportable Quantity is 1,000 lbs. (based on the sulfuric acid content of the solution spilled). Comply with Federal, State, and local regulations on reporting releases.

DuPont Emergency Exposure Limits (EEL) are established to facilitate site or plant emergency evacuation and specify airborne concentrations of brief durations which should not result in permanent adverse health effects or interfere with escape. EEL's are expressed as airborne concentration

(Continued)

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## ACCIDENTAL RELEASE MEASURES (Continued)

multiplied by time (CxT) for up to a maximum of 60 minutes and as a ceiling airborne concentration. These limits are used in conjunction with engineering controls/monitoring and as an aid in planning for episodic releases and spills. For more information on the applicability of EEL's, contact DuPont.

The DuPont Emergency Exposure Limit (EEL) for Sulfuric Acid is 10 mg/m<sup>3</sup> for 15 to 60 minutes and 20 mg/m<sup>3</sup> for up to 15 minutes with a not-to-exceed ceiling of 20 mg/m<sup>3</sup>.

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## HANDLING AND STORAGE

### Handling (Personnel)

Do not get in eyes, on skin, or on clothing. Avoid breathing vapors or mist. Wash thoroughly after handling.

Keep containers closed. Do not add water to contents while in container because of violent reaction.

---

### Storage

Keep out of sun and away from heat, sparks, and flame. Keep container tightly closed and (drum) closure up to prevent leakage. Loosen closure carefully. Relieve internal pressure when received and at least weekly thereafter. Do not use pressure to empty. Be sure closure is securely fastened before moving container. Do not wash out container or use it for other purposes; replace closure after each withdrawal and return it with empty container.

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## EXPOSURE CONTROLS/PERSONAL PROTECTION

### Engineering Controls

Good general ventilation should be provided to keep vapor and mist concentrations below the exposure limits.

---

### Personal Protective Equipment

Have available and wear as appropriate for exposure conditions when handling containers or operating equipment containing sulfuric acid: chemical splash goggles; full-length face shield/chemical splash goggles combination; acid-proof gauntlet gloves, apron, and boots; long sleeve wool, acrylic, or polyester clothing; acid proof suit and hood; and appropriate NIOSH/MSHA respiratory protection. In case of emergency or where there is a strong possibility of considerable exposure, wear a complete acid suit with hood, boots, and gloves. If acid vapor or mist are present and exposure limits may be exceeded, wear appropriate NIOSH/MSHA respiratory protection.

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(Continued)

## EXPOSURE CONTROLS/PERSONAL PROTECTION(Continued)

### # Exposure Guidelines

#### Exposure Limits

Sulfuric Acid, 77 to 100%

PEL (OSHA)

TLV (ACGIH)

1 mg/m<sup>3</sup>, 8 Hr. TWA

1 mg/m<sup>3</sup>, 8 Hr. TWA, A2

STEL 3 mg/m<sup>3</sup>, A2

A2 (Sulfuric acid contained in strong inorganic acid mists)

AEL \* (DuPont)

1 mg/m<sup>3</sup>, 8 & 12 Hr. TWA

3 mg/m<sup>3</sup>, 15 minute TWA

\* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

## PHYSICAL AND CHEMICAL PROPERTIES

### Physical Data

Boiling Point

193-327 C (379-621 F) @ 760 mm Hg

Vapor Pressure

<0.3 mm Hg @ 25 C (77 F)

<0.6 mm Hg @ 38 C (100 F)

Vapor Density

3.4

Melting Point

-35 to 11 C (-31 to 52 F)

Evaporation Rate

<1 (Butyl Acetate=1.0)

Solubility in Water

100 WT%

pH

<1

Form

Odorless.

Color

Oily; clear to turbid liquid

Colorless to light gray

GRADE	BOILING PT.		MELTING PT.		SPECIFIC GRAVITY
	DEG C	DEG F	DEG C	DEG F	
60 DEG TECHNICAL	193	380	-12	10	1.706
66 DEG TECHNICAL	279	535	-35	-31	1.835
1.835 ELECTROLYTE	279	535	-35	-31	1.835
98% TECHNICAL	327	621	-2	29	1.844
99% TECHNICAL	310	590	4	40	1.842
100% TECHNICAL	274	526	11	51	1.839

(Continued)

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## STABILITY AND REACTIVITY

### Chemical Stability

Stable, but reacts violently with water and organic materials with evolution of heat.

### Incompatibility with Other Materials

Vigorous reactions with water; alkaline solutions; metals, metal powder; carbides; chlorates; fuminates; nitrates; picrates; strong oxidizing, reducing, or combustible organic materials. Hazardous gases are evolved on contact with chemicals such as cyanides, sulfides, and carbides.

### Decomposition

Releases sulfur dioxide at extremely high temperatures.

### Polymerization

Polymerization will not occur.

---

## TOXICOLOGICAL INFORMATION

### Animal Data

#### EYE:

Animal testing indicates this material is corrosive to the eye, when tested undiluted. Animal testing indicates this material is a moderate eye irritant, when tested as 10 % solution.

#### SKIN:

The concentrated compound is corrosive. Animal testing indicates this material is a slight skin irritant, when tested as 10 % solution.

#### INGESTION:

LD50, rat: 2,140 mg/kg.

#### INHALATION:

8 hour, LC50, guinea pigs: 30 mg/m<sup>3</sup>.  
Single and repeated exposure caused: Irritation of the respiratory tract. Corrosion of the respiratory tract. Lung damage. Labored breathing. Altered respiratory rate. Pulmonary edema. Repeated exposure caused: Altered red blood cell count.

#### CARCINOGENIC, DEVELOPMENTAL, REPRODUCTIVE, MUTAGENIC EFFECTS:

No adequate animal data are available to define the carcinogenic potential of this material. Limited studies do not suggest effects. In animal testing this material has not caused developmental toxicity. No animal data are available to define the following effects of this material: reproductive toxicity. This material has not produced genetic damage in bacterial cultures. It has not been tested for genetic toxicity in mammalian cell cultures or in animals.

(Continued)

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## ECOLOGICAL INFORMATION

### Ecotoxicological Information

#### AQUATIC TOXICITY:

Slightly to moderately toxic.

96 hour LC50 - Bluegill sunfish: 10.5 ppm.

48 hour TLm - Flounder: 100-300 ppm

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## DISPOSAL CONSIDERATIONS

### Waste Disposal

Cleaned-up material may be an RCRA Hazardous Waste on disposal due to the corrosivity characteristic. Do not flush to surface water or sanitary sewer system. Comply with Federal, State, and local regulations. If approved, neutralize and transfer to waste treatment system.

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## TRANSPORTATION INFORMATION

### Shipping Information

DOT/IMO

Proper Shipping Name           SULFURIC ACID

Hazard Class                   8

UN No.                         1830

DOT/IMO Label               CORROSIVE

Packing Group               II

Reportable Quantity       1000 lb (454 kg)

Shipping Containers

Tank Cars.

Tank Trucks.

Barge.

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## REGULATORY INFORMATION

### U.S. Federal Regulations

TSCA Inventory Status       Reported/Included.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute           : Yes

Chronic        : Yes

Fire           : No

Reactivity    : Yes

Pressure      : No

### HAZARDOUS CHEMICAL LISTS

SARA Extremely Hazardous Substance: Yes

CERCLA Hazardous Substance        : Yes

SARA Toxic Chemical                 : Yes

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(Continued)

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## OTHER INFORMATION

### NFPA, NPCA-HMIS

NFPA Rating	
Health	3
Flammability	0
Reactivity	2

Water Reactive.

### NPCA-HMIS Rating

Health	3
Flammability	0
Reactivity	2

Personal Protection rating to be supplied by user depending on use conditions.

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### Additional Information

For further information, see DuPont Sulfuric Acid "Storage and Handling Bulletin".

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The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsibility for MSDS : DuPont Chemicals  
Address : Engineering & Product Safety  
> : P.O. Box 80709, Chestnut Run  
> : Wilmington, DE 19880-0709  
Telephone : (302) 999-4946

# Indicates updated section.

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End of MSDS

***APPENDIX D***  
***SITE-SPECIFIC PERSONAL PROTECTIVE EQUIPMENT***  
***(PPE) PROGRAM***

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OHM Remediation  
Services Corp.

# HEALTH & SAFETY PROCEDURES

## PERSONAL PROTECTIVE EQUIPMENT PROGRAM

PROCEDURE NUMBER 4-1

Page 1 of 10

LAST REVISED 5/96

APPROVED BY: DLM/FHH

### 1.0 OBJECTIVE

OHM Remediation Services Corp. (OHM) personnel will be protected for chemical, physical, and environmental hazards by the appropriate personal protective equipment (PPE) when engineering and administrative controls are not effective in controlling job hazards.

### 2.0 PURPOSE

The purpose of this procedure is to address the elements of the PPE program. This PPE program conforms to the requirements found in 29 CFR 1910.120 (g) Engineering controls, work practices, and personal protective equipment for employee protection; 29 CFR 1910 Subpart I - Personal Protective Equipment - .132 General Requirements, .133 Eye and Face Protection, .135 Head Protection, .136 Foot Protection, .138 Hand Protection; and 29 CFR 1910.1200 Hazard Communication.

### 3.0 RESPONSIBILITY AND AUTHORITY

The responsibility and authority for the selection, use, and maintenance of personal protective equipment is shared between management, supervisory, health and safety, and employee personnel.

3.1 Management. Management has the responsibility to provide PPE appropriate for the hazards associated with expected work tasks.

3.2 Supervisors. Supervisors have the responsibility to conduct hazard assessments and to ensure personnel utilize PPE in compliance with this SOP. Supervisors may request assistance from or designate authority to health and safety personnel for hazard assessment, selection, inspection, and decontamination of PPE. The supervisor must use PPE specified by the regional health and safety director or designee or as specified in the health and safety plan (HASP). The use of PPE by employees is the supervisor's responsibility.

3.3 Health and Safety Personnel. Health and safety personnel have the responsibility to assist supervisors in the ongoing hazard assessment, selection, inspection, and decontamination of PPE. In the event of conflict, health and safety personnel have the authority to implement the necessary measures.

3.4 Employees. Employees have the responsibility to use, inspect, and decontaminate PPE as directed by supervisors.

#### 4.0 PROGRAM ELEMENTS

Program elements define the regulatory requirements of a PPE program.

- 4.1 Hazard Assessment. All tasks undertaken by OHM personnel will be assessed for chemical, physical, and environmental hazards present or likely to be present which necessitate the use of PPE to ensure adequate protection. This assessment shall take place prior to commencement of work.
- 4.2 Hazard Reassessment. The level of protection or type of personal protective equipment shall be increased when additional information on site conditions indicates that increased protection is necessary to reduce employee exposures below permissible exposure limits, published exposure levels for hazardous substances and health hazards; or other physical and environmental hazards.
- 4.3 PPE Selection. The regional health and safety director or designee will initially select the level and types of PPE that will protect the affected employee from the hazards identified in the initial hazard assessment.

On a periodic basis, the corporate director of health and safety, will establish specifications for commonly used PPE and review submissions for blanket order PPE suppliers. PPE items should be procured only from these approved vendors. A list of specifications and approved vendors is available through corporate or regional health and safety department or corporate or regional purchasing department.

- 4.4 Written Certification. The site specific health and safety plan (HASP) will serve as the written certification that identifies the workplace was evaluated. The HASP shall be dated. The signature line shall designate the person certifying that the evaluation has been performed.
- 4.5 Communication of Selection. Employees will be informed of the PPE selection decisions through reading or verbally reviewing the HASP, attending pre-project safety briefings, job safety analysis (JSA) review, or attending safety meetings.
- 4.6 PPE Use and Fit. The supervisor will be responsible for the proper use and fit of PPE by workers under their direction and will monitor the effectiveness of these items. Health and safety personnel will advise and assist the supervisor in these areas.
- 4.7 Work Mission Duration. The supervisor will be responsible for the establishment of the duration of specific work missions. The duration will be determined by the complexity of the assignment, PPE involved, physical factors, temperature,

humidity, weather conditions, elevation of work, and acclimation of the worker to the demands of the task assigned. The supervisor will consider the recommendations of the health and safety personnel.

A sufficient amount of rest breaks will be allowed in order to avoid overexertion or thermal stress by the employees while maintaining productive work practices. Further guidance is offered in OHM SOP 3-4, Heat Stress Prevention and SOP 3-5, Cold Stress Prevention.

4.8 **PPE Maintenance and Storage.** Each employee is responsible for the proper maintenance and storage of the standard issue equipment (e.g., hard hat, full-face piece air purifying respirator, safety glasses). The supervisor will assure that proper maintenance is carried out.

4.9 **PPE Decontamination.** Each employee is responsible for daily cleaning and decontamination of reusable PPE such as outer gloves, outer boots, reusable chemically resistant clothing, and standard issue PPE such as hard hats and respirators.

OHM will provide an area for decontamination operations, necessary cleaning agents, cleaning tools, such as brushes and wash basins, and a method to dispose of materials generated during decontamination activities.

OHM will attempt to reduce decontamination requirements through the use of disposable protective clothing and gloves as feasible.

4.10 **PPE Training.** All employees will receive training in the proper use of PPE prior to wearing the equipment in a work situation. This training will be administered upon commencement of employment during HAZWOPER training. PPE refresher training will be reviewed annually during the HAZWOPER refresher training. Project specific training will be provided as required.

4.11 **PPE Donning and Doffing Procedures.** All employees will receive training upon commencement of employment and during annual refresher training concerning the donning and doffing of PPE. Periodic training will be provided as required.

4.12 **PPE Inspection.** Each employee shall inspect PPE for defects and proper function prior to each use. Defective or damaged PPE shall not be used. Any PPE found to be defective or have missing parts will be replaced prior to use.

4.13 **PPE In Use Monitoring.** The supervisor is responsible for monitoring the effectiveness of selected PPE. If at any time level of PPE is to be downgraded, it is mandatory that the change be approved by the regional health and safety director or designee.

- 4.14 Evaluation of PPE Program. Health and safety personnel will compile data on PPE in the field to determine that the PPE performs to OHM needs. Periodically, this information should be reviewed cognizant by a health and safety professional during site audits or weekly supervisors inspections to ensure that PPE is providing the necessary level of protection, quality, and is appropriate for the work performed.
- If at any time the failure of PPE causes injury to an employee or fails to perform as expected, the supervisor will take the unit or item out of service and investigate the incident. The incident shall be immediately reported to the regional health and safety director. If after scrutiny, the unit or item is determined to have a manufacturing defect, all identical units will be removed from use until corrective actions are taken.
- 4.15 Limitations During Temperature Extremes. Extreme temperatures exert stress on personnel and may alter the performance characteristics of PPE. During periods of extreme temperature, work assignments will be adjusted to protect the employee from overexertion or exposure. The supervisor will evaluate if temperature extremes are effecting performance characteristics of PPE and report these findings to the regional health and safety director.
- 4.16 Unserviceable PPE. Any PPE which is no longer functioning properly or is no longer serviceable shall be removed from use and either repaired or destroyed.

### SAFETY EQUIPMENT POLICY

OHM will provide, maintain, and replace personal protective equipment as detailed below.

Standard Issue Safety Equipment. Standard issue safety equipment will be provided at no cost to field employees. These items consist of:

- Hard hat
- Safety glasses with clear and shaded lenses
- Full-face respirator with nose cup
- Regional approved OHM designed shirts

Company Provided Equipment. OHM will provide, at no cost to the employee the following items on a task specific or project specific basis:

- Chemical protective equipment such as gloves, boots, and clothing
- Specialty glasses or goggles

- Face shields
- Flame resistant clothing
- Hearing protection
- Fall protection

5.3 **Employee Provided Equipment.** The employee shall provide the following equipment:

- ANSI approved steel toed and shank boots/shoes (Note: Further guidance is provided in Section 9, Safety Footwear)
- Outerwear for cold weather

5.4 **Equipment Replacement.** OHM will replace worn-out or work-damaged equipment detailed in Sections 5.1 and 5.2. OHM reserves the right to charge employees for the replacement cost of equipment which is lost or damaged through neglect or abuse.

5.5 **Additional PPE.** The regional health and safety director or the supervisor may require additional company provided PPE on a task specific basis.

## 6.0 **WORK CLOTHES**

OHM employees, subcontractors, and visitors will observe the requirements for proper work clothing when on OHM project sites, facilities, and shops.

6.1 **Pants.** Long pants are required at all times. These pants must be in good repair.

6.2 **Shirts.** Shirts will be worn on the job. Shirts will be buttoned up the front and at the cuff unless rolled up. Shirt tails must be kept in the trousers. Sleeveless shirts are prohibited at all work locations. Supervisory personnel are expected to wear a shirt with a collar. T-shirts are permitted for personnel who wear protective clothing most of the day.

6.3 **Clothing.** Loose or ragged clothing will not be worn.

6.4 **Modifications.** Regional health and safety director may modify work clothing requirements on a project specific basis.

6.5 **Contaminated Clothing.** Clothing (including shoes) saturated with petroleum products or chemicals will be removed immediately to prevent irritation and

possible dermal exposure.

- 6.6 **Jewelry.** Rings and other jewelry (except watches) must be removed when working in areas where they could catch on moving objects, sharp protrusions, come in contact with electrical circuits or chemical agents, or compromise PPE (i.e. rings capable of cutting gloves). Additionally, the supervisor may deem other types of jewelry inappropriate for the work task.
- 6.7 **Hair Length.** Hair long enough to constitute a hazard while working around moving machinery or rotating tools and equipment must be secured by a net or tied back. Hair styles must not interfere with the ability to properly wear safety headgear, safety spectacles, and respiratory protection.

## 7.0 EYE/FACE PROTECTION

All OHM employees, subcontractors, and visitors shall wear eye and face protection meeting the requirements of ANSI document Z87.1 - 1989 titled "Practice of Occupational and Educational Eye and Face Protection" during the tasks posing exposure to eye or face injury.

- 7.1 **Requirements.** To protect the face and eyes against injuries from flying objects, splashing liquids, and harmful rays, safety spectacles with side shields, goggles, face shields, cutting goggles, and welding helmets will be used as appropriate. The supervisor will be responsible to identify the need for eye/face protection and specify the eye/face protection required for each operation. A selection guide is attached in Table 1.
- 7.2 **Safety Spectacles.** Safety spectacles with side shields are protective devices intended to shield the wearer's eyes from a variety of hazards. While they are primary protectors and may be used alone, they may also be used in conjunction with other protective devices such as goggles and face shields.
- 7.3 **Goggles.** Goggles are protective devices intended to fit the face immediately surrounding the eyes in order to shield the eyes from a variety of hazards. While they are primary protectors and may be used alone, they also may be used in conjunction with other protectors.
- 7.4 **Face Shields.** Face shields are protective devices intended to shield the wearer's face, or portions thereof, in addition to the eyes, from certain hazards. Face shields are secondary protectors and shall not be used in place of safety glasses, tight fitting goggles, or other primary protective devices.

- 7.5 **Cutting Goggles.** Cutting goggles are protective devices designed to protect the eyes from radiation and impact. Goggles are primary protectors and in some situations must be supplemented with face shields. See Table 2 for selection guidelines.
- 7.6 **Welding Helmets.** Welding helmets are protective devices intended to shield the eyes and face from optical radiation and impact. Welding helmets are secondary protectors and shall be used only in conjunction with primary protectors such as safety spectacles or goggles. See Table 3 for selection guidelines.
- 7.7 **Prescription Spectacles.** For personnel that wear prescription spectacles, OHM provides prescription safety spectacles with side shields. It is mandatory that prescription safety spectacles not be altered by the employee and be worn at all times when safety spectacles are required. Refer to SOP 4-4, Prescription Safety Glasses.
- 7.8 **Contact Lenses.** Contact lenses are not permitted to be worn where accidental eye contact with chemical agents or physical materials is possible. OHM provides prescription spectacles and other protective devices for use in these situations.
- 7.9 **Shaded Lenses.** Shaded lenses are not to be worn indoors or under low light conditions.
- 7.10 **Modifications.** Eye/face protection may not be altered or modified in any manner. For example, removing side shields on safety glasses.

## 8.0 **SAFETY HEADGEAR**

All OHM employees, subcontractors, and visitors shall wear safety headgear meeting the requirements of ANSI document Z89.1-1986 titled "Protective Headwear for Industrial Workers - Requirements" when exposed to overhead hazards.

- 8.1 **Requirement.** Safety headgear shall be worn by all personnel while engaged in work where there is a hazard of falling objects, low overhead restrictions, and other overhead hazards exist. Safety headgear may also be required to be worn by contractual requirements.
- 8.2 **Use.** Safety headgear must be worn as prescribed by the manufacturer in the bill front position unless the headgear was approved to be worn in another position.
- 8.3 **Modifications.** Safety headgear shall not be painted, drilled or modified in any manner. Use of safety related headgear stickers are permitted.
- 8.4 **Life Expectancy.** No maximum mandatory service life is specified by regulation for safety headgear. However, a hard hat should be removed from service if

chemical corrosion, cracks, deformities, worn suspension, or discoloration is noted with the unit.

## **9.0 SAFETY FOOTWEAR**

All OHM employees, subcontractors, and visitors that enter OHM project sites and are exposed to foot hazards shall wear footwear meeting the ANSI document Z41 - 1991 titled "Protective Footwear" during operations posing foot injury.

- 9.1 **Project Sites.** Steel toe leather work boots shall be worn on all OHM project sites. High top or low top sneakers, western style boots with a riding heel, or other footwear even though ANSI approved are not appropriate for the activities encountered at hazardous waste and emergency response sites and shall not be worn. The HASP will address additional safety footwear requirements for a particular project.
- 9.2 **OHM Facilities and Shops.** Personnel working at OHM shops and facilities have the option of wearing other types of ANSI approved safety work shoes and boots provided they are appropriate for the tasks being performed. The supervisor of the work area is responsible to decide what type footwear is appropriate.

## **10.0 HAND PROTECTION/GLOVES**

OHM employees, subcontractors, and visitors will don appropriate gloves when engaged in any operation that presents a hazard to the hands.

- 10.1 **Use.** Appropriate work gloves shall be available for hand protection against heat and flame, cold, chemicals, petroleum products, corrosive materials, moisture, mechanical abrasion, electricity, and sharp and rough surfaces.
- 10.2 **Selection.** Glove selection of the appropriate hand protection shall be based on an evaluation of the performance characteristic of the hand protection relative to the task(s) to be performed, chemical concentration and properties, physical conditions present, duration of use, and the hazards and potential hazards identified. The type of work gloves used must be approved by the regional health and safety director or designee as specified in the HASP for the particular task.
- 10.3 **Electrical.** When working on high voltage (480 volts and above) electrical equipment, electrically tested high voltage gloves will be worn. Leather protection will be worn over these gloves. (NOTE: Only authorized personnel are permitted to work on high voltage electrical equipment).

## 11.0 PROTECTIVE CLOTHING

OHM employees, subcontractors, and visitors will don appropriate protective clothing when engaged in any operation that presents a hazard to the body.

- 11.1 **Use.** Appropriate clothing shall be available for body protection against heat and flame, cold, chemicals, petroleum products, corrosive materials, moisture, mechanical abrasion, electricity, and sharp and rough surfaces.
- 11.2 **Selection.** Clothing selection of the appropriate body protection shall be based on an evaluation of the performance characteristic of the body protection relative to the task(s) to be performed, chemical concentration and properties, physical conditions present, duration of use, and the hazards and potential hazards identified. The type of protective clothing used must be approved by the regional health and safety director or designee and specified in the HASP for the particular task.

## 12.0 TOTALLY-ENCAPSULATING CHEMICAL PROTECTIVE SUITS

Totally-encapsulating chemical protective suits (Level A) shall be used in conditions where skin absorption of a hazardous substance may result in a substantial possibility of immediate death, immediate serious illness or injury, or impair the ability to escape.

- 12.1 **Use.** OHM will only use Level A protection when all other reasonable efforts of controlling employee exposure through engineering or administrative means are not possible.
- 12.2 **Authorization.** Level A protection may only be used after authorization of the regional health and safety director has been granted.
- 12.3 **Health and Safety Personnel.** An appropriately experienced health and safety employee must be assigned to the project site where Level A is to be used. They must evaluate that the following items are ready:
- Communications
  - Decontamination
  - Emergency rescue procedures and personnel
  - Emergency medical attention
- 12.4 **Training.** Site-specific training will be provided on donning use, doffing, decontamination, and emergency procedures for all employees required to use level A protective suits.

12.5 Decontamination and Disposal. OHM will discard and properly dispose of any Level A suit which has come in contact with chemical contaminants or sustained physical damage at least at the end of the project.

### 13.0 LOANING PERSONAL PROTECTIVE EQUIPMENT

OHM personnel should not loan OHM personal protective equipment to any client, subcontractor, or visitor personnel. If there are urgent circumstances, such as an emergency response where the equipment cannot be obtained elsewhere and chemical exposure is possible, OHM personnel can loan personal protective equipment such as respirators, protective clothing and other safety equipment to client personnel or personnel from other organizations. However because of the potential liability involved, approval of senior OHM management is required as well as the requirement that a representative of the company and the individual using the equipment execute an OHM Indemnification and Release Agreement. A copy of this agreement is attached as Appendix A.

13.1 Execution of Indemnification and Release Agreement. In general, the following will be required BEFORE the personal protective equipment may be loaned:

- The OHM Regional Vice President (or designee) must specifically authorize the loaning of personal protective equipment on the particular project.
- An authorized representative of the company whose personnel will use the equipment must sign the Indemnification and Release Agreement.
- The individual who will use the equipment must also sign the Indemnification and Release Agreement attesting to the fact that the individual is either experienced in the use of the equipment or has been given instruction on the safe use of the equipment and is medically qualified to wear the equipment.
- An OHM representative must also sign the form as a witness to the above.

13.2 Contractual Requirement. An indemnification and release agreement is not required if providing personal protective equipment to clients or regulatory personnel is a contractual requirement.

13.3 Exemptions. Hard hats, safety glasses, hearing protection, and protective clothing provided for cleanliness is exempted for the indemnification requirement. Instruction should be provided to the individual prior to wearing.



**APPENDIX A**  
**OHM REMEDIATION SERVICES CORP.**  
**INDEMNIFICATION AND RELEASE AGREEMENT**  
**FOR PERSONAL PROTECTION CLOTHING**

FOR AND IN CONSIDERATION OF the use by the undersigned of property belonging to OHM Remediation Services Corp. (hereinafter referred to as "OHM") and which may include full-face mask respirators, self-contained breathing apparatus, and other equipment and supplies, and other good and valuable consideration, the undersigned, for himself and his successors, and assigns, does hereby release and discharge OHM, its officers, employees, agents, and subcontractors from any and all claims, actions, demands, damages, costs, loss of services, expenses, compensation, third-party actions, or suits, including attorneys fees, arising and resulting from the aforementioned use of property, equipment, or supplies belonging to OHM.

In addition, the undersigned, on behalf of his employer, principal, himself, and his successors, and assigns, agrees to release, save, and hold harmless, protect, indemnify, and defend OHM, and its officers, employees, agents, and subcontractors against any and all claims, actions, and expenses as above described, whether for bodily injury, property damage or destruction, or both, arising or resulting in any way from the use by the undersigned of property of OHM and agrees to save, hold harmless, protect, indemnify, and defend OHM against any such claims, actions, or expenses, referenced above, that might be brought against OHM by any third persons or the heirs, successors, executors or assigns of the undersigned.

The undersigned acknowledges by signing that he has carefully read this Agreement, understands the contents thereof, and has freely and voluntarily signed the same.

EXECUTED on \_\_\_\_\_, 19\_\_.

1. OHM Regional Vice President (or designee) authorizing use of equipment:  
\_\_\_\_\_

2. CLIENT OR SUBCONTRACTOR REPRESENTATIVE AUTHORIZING EQUIPMENT USE:

I authorize the individual(s) in 3. below to use OHM provided personal protective equipment

Company Name \_\_\_\_\_

Sign Name \_\_\_\_\_

Print Name \_\_\_\_\_

Title \_\_\_\_\_

3. INDIVIDUAL USING EQUIPMENT: I certify that I am familiar with the equipment and medically qualified to wear the equipment

Company Name \_\_\_\_\_

Sign Name \_\_\_\_\_

Print Name \_\_\_\_\_

NOTE: A continuation sheet can be used if more than one individual is to be certified to use equipment

4. OHM Representative Acknowledging Signatures:

Sign Name \_\_\_\_\_



**OHM Remediation  
Services Corp.**  
A Subsidiary of OHM Corporation

**TABLE 1  
FACE PROTECTION SELECTION GUIDELINES**

<b>Hazard</b>	<b>Protection</b>
Flying fragments, objects, large chips, particles, sand, and dirt from chipping, grinding, work, riveting, and sanding	Safety spectacles or goggles Supplement with face machining, masonry shield for severe exposure
Chemical splash from corrosive and chemical handling, pressure washing operations	Chemical Splash Goggles Supplement with face shield for severe exposure
Nuisance dust from woodworking, buffing, and general dusty conditions	Safety spectacles or goggles
Hot sparks from grinding operations	Safety spectacles or goggles Supplement with face shield for severe exposure
Molten metal from torch cutting operations	Shaded cutting goggles (see Table 3) and face shield
Welding operations	Safety spectacles and shaded welding hood (see Tables 2)

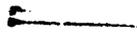


TABLE 2

GUIDE FOR CUTTING SHADE NUMBERS

<u>Operation</u>	<u>Plate Thickness</u>	<u>Minimum Protective Shade</u>
Gas Welding		
Light	Under 1/8	4 or 5
Medium	1/8 to 1/2	5 or 6
Heavy	over 1/2	6 or 8
Oxygen Cutting		
Light	Under 1	3 or 4
Medium	1 to 6	4 or 5
Heavy	Over 6	5 or 6

**TABLE 3**

**GUIDE FOR WELDING SHADE NUMBERS**

<u>Operation</u>	<u>Electrode Size</u>		<u>Minimum Protective Shade</u>	<u>Suggested* Shade No. (Comfort)</u>
	<u>1/32 inch</u>	<u>Arc Current (A)</u>		
Shielding metal arc welding	Less than 3	Less than 60	7	---
	3-5	60-160	8	10
	5-8	160-250	10	12
	More than 8	250-550	11	14
Gas metal arc welding and flux cored arc welding		Less than 60	7	---
		60-160	10	11
		160-250	10	12
		250-500	10	14
Air carbon Air cutting	(Light)	150-500	10	14
	(Heavy)	Less than 500 500-1000	10 11	12 14
Plasma arc welding		Less than 20	6	6 to 8
		20-100	8	10
		100-400	10	12
		400-800	11	14
Plasma arc cutting	(Light)	Less than 300	8	9
	(Medium)	300-400	9	12
	(Heavy)	400-800	10	14
Torch brazing		---	---	3 or 4
Torch soldering		---	---	2
Carbon arc welding		---	---	14

\*As a rule of thumb, start with a shade that is too dark to see the weld zone. Then go to a lighter shade which gives sufficient view of the weld zone without going below the minimum. In oxyfuel gas welding or cutting where the torch produces a high yellow light, it is desirable to use a filter lens that absorbs the yellow or sodium line in the visible light of the (spectrum) operation.

***APPENDIX E***  
***SITE INSPECTION REPORTS***

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**OHM Remediation Services Corporation  
Supervisor Site Safety Inspection Checklist**

Project Name: \_\_\_\_\_  
 Project Number: \_\_\_\_\_  
 Project Location: \_\_\_\_\_  
 Site Supervisor: \_\_\_\_\_  
 Auditor's Name: \_\_\_\_\_

MEDICAL AND FIRST AID

YES      NO      N/A

- |   |       |       |       |
|---|-------|-------|-------|
| 1. Are First Aid Kits accessible and identified?        | _____ | _____ | _____ |
| 2. Are emergency eye wash and safety showers available? | _____ | _____ | _____ |
| 3. Are First Aid Kits inspected weekly?                 | _____ | _____ | _____ |

PERSONAL PROTECTIVE EQUIPMENT

- |  |       |       |       |
|--|-------|-------|-------|
| 1. Have levels of personnel protection been established?                                   | _____ | _____ | _____ |
| 2. Do all employees know their level of protection?  | _____ | _____ | _____ |
| 3. Are respirators decontaminated, inspected, and stored according to standard procedures? | _____ | _____ | _____ |
| 4. Have employees been fit-tested?   | _____ | _____ | _____ |
| 5. Is defective personal protective equipment tagged?                                      | _____ | _____ | _____ |
| 6. Does compressed breathing air meet CGA Grade "D" minimum?                               | _____ | _____ | _____ |
| 7. Are there sufficient quantities of safety equipment and repair parts?                   | _____ | _____ | _____ |
| 8. Does Level D protection consist of safety glasses, hard hats, and steel toe boots?      | _____ | _____ | _____ |

FIRE PREVENTION

- |   |       |       |       |
|---|-------|-------|-------|
| 1. Is smoking prohibited in flammable storage areas?                    | _____ | _____ | _____ |
| 2. Are fire lanes established and maintained?                           | _____ | _____ | _____ |
| 3. Are flammable dispensing systems grounded and bonded?                | _____ | _____ | _____ |
| 4. Are approved safety cans available for storage of flammable liquids? | _____ | _____ | _____ |
| 5. Has the local fire department been contacted?                        | _____ | _____ | _____ |
| 6. Are fire extinguishers available near refueling areas?               | _____ | _____ | _____ |

AIR MONITORING

- |   |       |       |       |
|---|-------|-------|-------|
| 1. Is air monitoring being conducted as required by the site safety plan? | _____ | _____ | _____ |
| 2. Are air monitoring instruments calibrated daily?                       | _____ | _____ | _____ |
| 3. Is the air monitoring logbooks up to date?                             | _____ | _____ | _____ |
| 4. Are user manuals available?  | _____ | _____ | _____ |
| 5. Are instruments clean and charged?                                     | _____ | _____ | _____ |

WELDING AND CUTTING (29 CFR 1926 Subpart J)

YES NO N/A

- 1. Are fire extinguishers present at welding and cutting operations?
- 2. Are confined spaces, such as, tanks, pipelines, and trenches, tested prior to cutting and welding operations?
- 3. Are Hot Work Permits available?
- 4. Are proper helmets, goggles, aprons, and gloves available for welding and cutting operations?
- 5. Are welding machines properly grounded?
- 6. Are oxygen and fuel gas cylinders stored a minimum of 20 feet apart?
- 7. Are only trained personnel permitted to operate welding and cutting equipment?

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

HAND AND POWER TOOLS (29 CFR 1926 Subpart I)

- 1. Are defective hand and power tools tagged and taken out of service?
- 2. Is eye protection available and used when operating power tools?
- 3. Are guards and safety devices in place on power tools?
- 4. Are power tools inspected before each use?
- 5. Are non-sparking tools available?

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

MOTOR VEHICLES

- 1. Are vehicles inspected daily?
- 2. Are personnel licensed for the equipment they operate?
- 3. Are unsafe vehicles tagged and reported to supervision?
- 4. Are vehicles shut down before fueling?
- 5. When backing vehicles, are spotters provided?
- 6. Is safety equipment on vehicles?
- 7. Are loads secure on vehicles?
- 8. Are vehicle occupants using safety belts if provided?

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

EMERGENCY PLANS

- 1. Are emergency telephone numbers posted?
- 2. Have emergency escape routes been designated?
- 3. Are employees familiar with the emergency signal?
- 4. Has the emergency route to the hospital been established and posted?

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

MATERIALS HANDLING

- 1. Are materials stacked and stored as to prevent sliding or collapsing?
- 2. Are flammables and combustibles stored in non-smoking areas?
- 3. Is machinery braced when personnel are performing maintenance?
- 4. Are tripping hazards labeled?
- 5. Are semi-trailers chocked?
- 6. Are fixed jacks used under semi-trailers?
- 7. Are riders prohibited on materials handling equipment?
- 8. Are cranes inspected as prescribed and logged?
- 9. Are OSHA approved manlifts provided for the lifting of personnel?
- 10. Are personnel in manlifts wearing approved fall protection devices?

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

FIRE PROTECTION

- 1. Has a fire alarm been established?
- 2. Do employees know the location and use of all fire extinguishers?
- 3. Are fire extinguisher locations marked?

_____	_____	_____
_____	_____	_____
_____	_____	_____

**FIRE PROTECTION** (Continued)

YES NO N/A

- 4. Are combustible materials segregated from open flames? \_\_\_\_\_
- 5. Have fire extinguishers been professionally inspected during the last year? \_\_\_\_\_
- 6. Are fire extinguishers visually inspected monthly? \_\_\_\_\_

**ELECTRICAL** (29 CFR 1926-Subpart K)

- 1. Is electrical equipment and wiring properly guarded? \_\_\_\_\_
- 2. Are electrical lines, extension cords, and cables guarded and maintained in good conditions? \_\_\_\_\_
- 3. Are extension cords kept out of wet areas? \_\_\_\_\_
- 4. Is damaged electrical equipment tagged and taken out of service? \_\_\_\_\_
- 5. Have underground electrical lines been identified by proper authorities? \_\_\_\_\_
- 6. Has positive lock-out system been established by a certified project electrician? \_\_\_\_\_
- 7. Are GFCI's being used as needed? \_\_\_\_\_
- 8. Are extension cords being inspected daily for ground continuity and structural integrity? (i.e., group pin in place, no unapproved splices) \_\_\_\_\_
- 9. Are warning signs exhibited on high voltage equipment (250V or greater)? \_\_\_\_\_
- 10. Is extension cord inspection documented? \_\_\_\_\_

**CRANES AND RIGGING** (29 CFR 1926.550)

- 1. Are cranes inspected daily? \_\_\_\_\_
- 2. Are crane swing areas barricaded or demarked? \_\_\_\_\_
- 3. Is all rigging equipment tagged with an identification number and rated capacity? \_\_\_\_\_
- 4. Is rigging equipment inspection documented? \_\_\_\_\_
- 5. Are slings, chains, and rigging inspected before each use? \_\_\_\_\_
- 6. Are damaged slings, chains, and rigging tagged and taken out of service? \_\_\_\_\_
- 7. Are slings padded or protected from sharp corners? \_\_\_\_\_
- 8. Do employees keep clear of suspended loads? \_\_\_\_\_
- 9. Are employees in the lift area wearing hard hats? \_\_\_\_\_

**COMPRESSED GAS CYLINDERS**

- 1. Are breathing air cylinders charged only to prescribed pressures? \_\_\_\_\_
- 2. Are like cylinders segregated in well ventilated areas? \_\_\_\_\_
- 3. Is smoking prohibited in cylinder storage areas? \_\_\_\_\_
- 4. Are cylinders stored secure and upright? \_\_\_\_\_
- 5. Are cylinders protected from snow, rain, etc.? \_\_\_\_\_
- 6. Are cylinder caps in place before cylinders are moved? \_\_\_\_\_
- 7. Are fuel gas and oxygen cylinders stored a minimum of 20 feet apart? \_\_\_\_\_
- 8. Are propane cylinders stored and used outside the structure? \_\_\_\_\_

**SCAFFOLDING** (29 CFR 1926.451)

- 1. Is scaffolding placed on a flat, firm surface? \_\_\_\_\_
- 2. Are scaffold planks free of mud, ice, grease, etc.? \_\_\_\_\_
- 3. Is scaffolding inspected before each use? \_\_\_\_\_
- 4. Are defective scaffold parts taken out of service? \_\_\_\_\_
- 5. Does mobile scaffold height exceed 4 times the width or base dimension? \_\_\_\_\_
- 6. Does scaffold planking overlap a minimum of 12 inches? \_\_\_\_\_
- 7. Does scaffold planking extend over end supports between 6 to 18 inches? \_\_\_\_\_
- 8. Are employees restricted from working on scaffolds during storms and high winds? \_\_\_\_\_
- 9. Are all pins in place and wheels locked? \_\_\_\_\_
- 10. Is perimeter guarding (top rail, mid rail, and toe board) present? \_\_\_\_\_

WALKING AND WORKING SURFACES

YES NO N/A

- 1. Are ladders a Type I or industrial? \_\_\_\_\_
- 2. Are accessways, stairways, ramps, and ladders clean of ice, mud, snow, or debris? \_\_\_\_\_
- 3. Are ladders being used in a safe manner? \_\_\_\_\_
- 4. Are ladders kept out of passageways, doors, or driveways? \_\_\_\_\_
- 5. Are broken or damaged ladders tagged and taken out of service? \_\_\_\_\_
- 6. Are metal ladders prohibited in electrical service? \_\_\_\_\_
- 7. Are stairways and floor openings guarded? \_\_\_\_\_
- 8. Are safety feet installed on straight and extension ladders? \_\_\_\_\_
- 9. Is general housekeeping up to OHM standards? \_\_\_\_\_
- 10. Are ladders tied off? \_\_\_\_\_

SITE SAFETY PLAN

- 1. Is a site safety plan available on site or accessible to all employees? \_\_\_\_\_
- 2. Does the safety plan accurately reflect site conditions and tasks? \_\_\_\_\_
- 3. Have potential hazards been described to employees on site? \_\_\_\_\_
- 4. Is there a designated safety official on site? \_\_\_\_\_
- 5. Have all employees signed the acknowledgment form? \_\_\_\_\_

SITE POSTERS

- 1. Are the following documents posted in a prominent and accessible area?
  - A. Minimum Wage \_\_\_\_\_
  - B. OSHA Health and Safety \_\_\_\_\_
  - C. Equal Employment Opportunity \_\_\_\_\_

SITE CONTROL

- 1. Are work zones clearly defined? \_\_\_\_\_
- 2. Are support trailers located to minimize exposure from a potential release? \_\_\_\_\_
- 3. Are support trailers accessible for approach by emergency vehicles? \_\_\_\_\_
- 4. Is the site properly secured during and after work hours? \_\_\_\_\_

HEAVY EQUIPMENT (29 CFR 1926 Subpart O)

- 1. Is heavy equipment inspected as prescribed by the manufacturer? \_\_\_\_\_
- 2. Is defective heavy equipment tagged and taken out of service? \_\_\_\_\_
- 3. Are project roads and structures inspected for load capacities and proper clearances? \_\_\_\_\_
- 4. Is heavy equipment shut down for fueling and maintenance? \_\_\_\_\_
- 5. Are back-up alarms installed and working on equipment? \_\_\_\_\_
- 6. Are designated operators only operating equipment? \_\_\_\_\_
- 7. Are riders prohibited on heavy equipment? \_\_\_\_\_
- 8. Are guards and safety appliances in place and used? \_\_\_\_\_

EXCAVATION (29 CFR 1926 Subpart P)

- 1. Has a "competent person" been designated to supervise this excavation activity? \_\_\_\_\_
- 2. Have utility companies been advised of excavation activities? \_\_\_\_\_
- 3. Prior to opening excavations, are utilities located and marked? \_\_\_\_\_
- 4. Has a professional engineer evaluated all excavations greater than 20 feet deep? \_\_\_\_\_
- 5. Is there rescue equipment on-site and accessible to excavation? \_\_\_\_\_
- 6. Is excavated material placed a minimum of 24 inches from the excavations? \_\_\_\_\_
- 7. Are the sides of excavations sloped or shored to prevent caving in on employees? \_\_\_\_\_

EXCAVATION (29 CFR 1926 Subpart P - Continued)

YES NO N/A

- 8. Has excavation greater than 4-feet deep been monitored for hazardous atmospheres (i.e. LEL/O2 deficiency)?
- 9. Are ladders used in excavations over 4-feet deep?
- 10. Are ladders present every 25 feet?
- 11. Are barriers, i.e. guardrails or fences placed around excavations near pedestrian or vehicle thoroughfares?
- 12. Is excavation inspected daily by competent persons and documented?

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

CONFINED SPACES (Proposed Regulation 29 CFR 1910.146)

- 1. Have employees been trained in the hazards of confined spaces?
- 2. Are confined space permits available on project site?
- 3. Is the contractors confined space safety procedure on the project?
- 4. Has a rescue plan been established?

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

PERSONNEL DECONTAMINATION

- 1. Are decontamination stations set up on site?
- 2. Are waste receptacles available for contaminated clothing?
- 3. Are steps taken to contain liquids used for decontamination?
- 4. Have decontamination steps and procedures been covered by the site supervisor or safety official?
- 5. Is all personal protective equipment and respiratory equipment being cleaned on a daily basis?

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

EQUIPMENT DECONTAMINATION

- 1. Has equipment decontamination been established?
- 2. Is contamination wash water properly contained and disposed of?
- 3. Are all pieces of equipment inspected for proper decontamination before leaving the site?
- 4. Is all equipment being cleaned on a daily basis?

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

HAZARD COMMUNICATION (29 CFR 1926.59)

- 1. Is there a written program on-site?
- 2. Is there a MSDS FOR EACH HAZARDOUS CHEMICAL present on-site?
- 3. Are all containers properly labeled, as to content, hazard?
- 4. Have employees been trained on chemical hazards?
- 5. Are employee's trained on chemical hazards while doing non-routine tasks?
- 6. Do employees (including subcontractors) know and understand the acute and chemical effects of exposure from the chemicals on-site?
- 7. Have all subcontractors signed the Haz-Comm acknowledgment form?

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Signature

Date

Site Supervisor: \_\_\_\_\_

Project Manager: \_\_\_\_\_

Auditor: \_\_\_\_\_

**APPENDIX F**  
**LOCK OUT/TAG OUT**

---



# HEALTH & SAFETY PROCEDURES

## ELECTRICAL SAFETY

PROCEDURE NUMBER 2-5

Page 1 of 4

LAST REVISED 7/96

APPROVED BY: JFK/FHH

### 1.0 OBJECTIVE

OHM Remediation Services Corp. (OHM) personnel performing work on electrical systems and equipment will control electrical hazards by following standards set by OSHA.

### 2.0 PURPOSE

This procedure specifies the requirements for electrical equipment and methods and is an overview of the requirements of 29 CFR 1910, Subpart S-Electrical. If work is to be performed on any electrical circuit, Lockout/Tagout/Try may be required. Refer to the Lockout/Tagout/Try procedure.

### 3.0 GENERAL REQUIREMENTS

- 3.1 Only approved electricians will be permitted to work on electrical equipment or permanent electrical wiring.
- 3.2 Use proper clearance and grounding procedures. All electrical circuits and equipment shall be de-energized and Lockout/Tagout/Try accomplished before maintenance or repair work is started.
- 3.3 Single-phase electric hand tools and other single-phase portable electrical equipment must be approved by a recognized testing agency, and all exposed non-current-carrying metal parts must be grounded, or be double insulated.
- 3.4 Before each use, portable electrical appliances are to be examined for obvious deficiencies in the appliance, cord, and plug. If any deficiency is noted, the appliance is not to be used.

### 4.0 PORTABLE ELECTRICAL EQUIPMENT

- 4.1 Double insulated portable industrial type electric tools meeting the requirements of the Underwriters Laboratory are authorized for use (ground wire not required). Where such a system is employed, the equipment must be distinctly marked.
- 4.2 All portable electrical appliances and equipment where the non-current carrying metal parts are exposed to contact by personnel shall be grounded by continuous

conductor of adequate capacity from the device to a grounded receptacle. The site safety officer shall resolve any question which arises as to whether or not a particular appliance should be grounded.

4.3 Grounding of receptacles shall be accomplished in one of two ways:

- A built-in ground wire of green color may be attached to the ground pole of the receptacle.
- The conduit system, if installed in an approved manner, may be relied upon for grounding of a receptacle serving single phase appliances with ratings up to 230 volts.

4.4 All single-phase 15 and 20 ampere receptacle outlets operating at 120 and 240 volts which are not a part of the permanent wiring of the building or structure must have GFCI for personnel protection. The GFCI should be located at the power source so that all extension cords and tools are protected by the GFCI. In situations where GFCI protection is not practical for 240 volt equipment, the supervisor must follow the procedures for assuring grounding conductors on all equipment.

The outlet box for portable extension cords for outdoor use shall be of weatherproof type maintained in good condition.

## 5.0 ELECTRICAL GUARDING

5.1 Suitable access and working space shall be provided and maintained about all electric equipment to permit ready and safe operation and maintenance of such equipment.

5.2 The dimension of the working space in the direction of access to energized parts in switchboards, control panels, fused switches, circuit breakers, panel boards, motor controllers, and similar equipment which require examination, adjustment, servicing, or maintenance while energized, shall not be less than 36" in depth (30" for installations built prior to 1981) and the side being 30" or the width of the equipment, whichever is greater.

5.3 The working space shall not be used for storage purposes. The "keep clear" area may be identified with suitable floor markings and/or posting of signs or decals on the equipment.

5.4 Energized parts of electrical equipment operating at 50 volts or more shall be guarded against accidental contact by the use of approved cabinets or enclosures.

- 5.5 Entrance to rooms and other guarded location containing exposed energized parts shall be marked with a conspicuous warning sign forbidding unqualified persons to enter. Doors shall be kept locked.
- 5.6 Temporary covers, warning signs, and/or barricades are to be used when it is necessary to remove covers of electrical panels during construction, major refurbishment, or for the purpose of providing temporary power to an area.
- 5.7 All openings in boxes, enclosures, or fittings shall be effectively guarded or closed to afford protection substantially equivalent to that of the wall of the box, enclosure, or fitting.
- 5.8 All electrical components over 230 volts shall have signs stating "High Voltage" 240 volts (or whatever voltage is present).

#### **6.0 EXTENSION CORD REQUIREMENTS**

- 6.1 Extension cords are designed for and will be used for **TEMPORARY USE ONLY!** All other electrical connections will be made permanent by proper construction methods.
- 6.2 Extension cords are to be kept clean, dry, free of kinks, and protected from oil, hot or sharp surfaces, and chemicals. Extension cords used on construction and hazardous waste sites shall be Ground Fault Circuit Interrupter (GFCI) protected. All extension cords shall be free from damage and are not to be placed across aisles, through doors, through holes in a wall, or in areas where the cord may be damaged or become a tripping hazard. Extension cords must not be placed in walkways, or on stairs or steps where the cords may pose a tripping hazard.
- 6.3 If a cord is damaged through use or abuse, it must be de-energized, destroyed, and discarded. OHM will not repair extension cords.
- 6.4 Cords shall be protected against contact with oil, hot surfaces and chemicals.
- 6.5 Cords must not be hung over nails or other sharp edges or placed where vehicles may run over them.

#### **7.0 ELECTRICAL FUSE REQUIREMENTS**

- 7.1 Circuits must be de-energized by Lockout/Tagout/Try procedures before attempting to replace fuses.

7.2 Bridging of fuses or circumventing the normal operation of circuit breakers is prohibited.

7.3 Blown fuses shall not be replaced with fuses having a higher amperage or voltage rating. Fuses should be replaced in kind to maintain proper circuit protection.

7.4 Use a fuse puller to remove fuses.

#### 8.0 ASSURED ELECTRICAL GROUNDING STATEMENT

In limited circumstances, and only with the approval of the Regional Health and Safety Director will Assured Equipment Grounding be used at OHM projects or facilities. If implemented, all requirements of the OSHA regulations will be required.

#### 9.0 TEMPORARY LIGHTING

Exposed bulbs on temporary lights shall be guarded to prevent accidental contact, except where bulbs are deeply recessed in the reflector. Temporary lights shall not be suspended by their electric cords unless designed for this use. Explosion-proof bulb covers shall be used when contact with flammable vapors or gases is possible and shall meet Class 1, Division 1 requirements.



OHM Remediation  
Services Corp.

# HEALTH & SAFETY PROCEDURES

LOCKOUT/TAGOUT/TRY

PROCEDURE NUMBER 6-4

Page 1 of 4

LAST REVISED 6/96

APPROVED BY: JFK/FHH

## 1.0 OBJECTIVE

This procedure shall be used by OHM Remediation Services Corp. (OHM) personnel to ensure that the machine or equipment being worked on is isolated from all potential hazardous energy sources, and locked out or tagged out before an employee performs any servicing or maintenance activity where that unexpected energization, start-up or release of energy could cause an injury. Energy sources can be electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

## 2.0 PURPOSE

This procedure establishes the minimum safety requirements to ensure the proper deactivation of movable, electrically energized, pressurized equipment and systems, and systems containing hazardous materials prior to repairing, cleaning, oiling, adjusting, or similar work. This procedure complies with the requirements in the OSHA standard 29 CFR 1910.147--The Control of Hazardous Energy and 29 CFR 1910.333 Selection and Use of Work Practices.

## 3.0 REQUIREMENTS

This procedure applies to all equipment that receives energy from electrical power, hydraulic fluid under pressure, compressed air, steam, energy stored in springs, potential energy from suspended parts, or any other source that may cause unexpected movement when it is necessary to perform work on that system. It also applies to similar functions performed on systems containing hazardous materials. Every OHM project which has equipment requiring maintenance must implement a lockout/tagout try program.

## 4.0 DEFINITIONS

- 4.1 Lockout. The placement of a lockout device on an energy isolating device, in accordance with this procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed. The lockout device can be key operated or a combination device.
- 4.2 Tagout. The placement of a tagout device on an energy isolating device, in accordance with this procedure, to indicate that the energy isolating device and the

equipment being controlled may not be operated until the tagout device is removed by the authorized person who originally placed the tagout device in position.

- 4.3 Authorized Employee. A person who locks or implements a tagout system procedure on machines or equipment to perform the servicing or maintenance on that machine or equipment.
- 4.4 Affected Employee. An employee whose job requires him to operate equipment which is locked out or whose job places him near a piece of equipment which is locked out.

## 5.0 PROGRAM ELEMENTS

Prior to initiating any repairs, modifications and/or adjustments to operating equipment, these steps will be followed.

- 5.1 Notification. The immediate supervisor with jurisdiction over the equipment and all affected employees will be notified that the energy sources are to be deactivated.
- 5.2 Identify Energy Sources. All sources of power that must be locked out, blocked or released will be identified by the immediate supervisor and the employee who will work on the equipment.
- 5.3 Lockout Energy Sources. In order to ensure that the equipment cannot be re-energized while maintenance activities are performed, the employee will lockout or blank out all potential energy sources. (The employees will either be assigned individually keyed padlocks or the project will have a supply of individually keyed padlocks for employee use.) If more than one employee is assigned to work on the equipment, a multi-lockout hasp will be used so that all employees working on the equipment can apply their locks and ensure their safety.
- 5.4 Tag Energy Sources. A tagout device will be affixed to all components or systems de-energized to indicate that lockout has been performed.
- 5.5 Try Energy Sources. Prior to performing any work activities, the employee will operate the start and stop controls on the equipment to ensure that the equipment has been properly deactivated. After the test, the equipment must be in neutral or off.
- 5.6 Remove Locks and Tags After Completing Work. After the servicing and/or maintenance is complete and the equipment is ready for normal operations, check the area around the machine or equipment. After all tools have been removed from the machine or equipment, guards have been reinstalled, remove all lockout or

tagout devices. Operate the energy isolating devices to restore energy to the machine or equipment.

## 6.0 SPECIAL CONDITIONS

- 6.1 Testing Equipment While Locked Out/Tagged Out. During certain operations it may be necessary to energize the equipment for a short period of time. Employees in the immediate area will be notified and directed to stay clear of the equipment. If the operation is to be deactivated again, the employee should repeat steps 5.3 to 5.5 of this procedure before work resumes.
- 6.2 Long Term Equipment Lockout. In some instances work will carry over to another shift. The maintenance supervisor shall affix his lock to the equipment to ensure that it is not energized during the transition. During subsequent shift operations, each employee will ensure that steps 5.2 to 5.5 are complete before work resumes on the equipment.
- 6.3 Prohibition on Removing Locks/Tags. If the work is completed and a lock remains on the equipment, it shall not be removed until the employee responsible for the lock is found or the supervisor of the employee investigates and ascertains that the equipment is safe to operate. Unauthorized removal of a lock will subject the violator to disciplinary action up to dismissal.

## 7.0 CORD AND PLUG EXCEPTIONS TO LOCKOUT/TAGOUT/TRY

There is no requirement to perform lockout/tagout/try on electrical installations where the unexpected energization of the equipment can be controlled by unplugging the cord from the energy source. The unplugged cord must remain under the exclusive control of the person performing the repair or maintenance.

## 8.0 TRAINING

Initial and annual training will be provided affected employees to ensure that the purpose and function of the energy control program are understood and that the knowledge and skills required for the safe application, usage, and removal of the energy controls are acquired by employees. The training shall include the following areas.

- 8.1 Authorized Employee. Each authorized employee shall receive training in the recognition of applicable energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation.

- 8.2 Affected Employee. Each affected employee shall be instructed in the purpose and use of the energy control procedure.
- 8.3 Other Employees. All other employees whose work operations are or may be in an area where energy control procedures may be utilized, shall be instructed about the procedure, and about the prohibition relating to attempts to restart or reenergize machines or equipment which are locked out.
- 8.4 Tag Usage. When tags are used, employees shall be informed that these are only warning devices and do not completely secure an energy source as would a lock. Tags are not to be removed without authorization of the authorized person.
- 8.5 Initial and Refresher Training. Initial training will be performed in the 40-hour HAZWOPER course. Site specific training will be provided during the initial startup of a site's operational process requiring this energy control procedure. Retraining will occur whenever a new or revised control method and procedure is introduced. Periodically, this program will be reviewed in the 8-hour HAZWOPER refresher training and during site safety meetings.

## 9.0 PERIODIC INSPECTION

Corporate health and safety will conduct an annual audit of the energy control program to ensure that the requirements of these procedures are being followed.

***APPENDIX G***  
***CONFINED SPACE ENTRY***

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OHM Remediation  
Services Corp.

# HEALTH & SAFETY PROCEDURES

## CONFINED SPACE ENTRY

PROCEDURE NUMBER 6-1

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LAST REVISED 7/96

APPROVED BY: DJS/FHH

### 1.0 OBJECTIVE

Confined spaces may pose special hazards such as toxic, flammable, or asphyxiating atmospheres, or engulfment. To minimize the hazards presented by confined space entries, OHM Remediation Services Corp. (OHM) shall enforce this procedure as a means of protecting the health and safety of workers while entering, working in, and exiting confined spaces, and providing for compliance with the OSHA permit required confined space standard, 29 CFR 1910.146.

### 2.0 PURPOSE

The purpose of this program is to establish confined space entry procedures and practices which protect all OHM employees, and subcontractor employees performing entries under OHM supervision.

### 3.0 APPLICABILITY

This confined space entry program applies to all OHM personnel and subcontractor personnel at OHM supervised project sites, and at OHM facilities. When client confined space requirements may differ from the OHM confined space entry requirements, the more stringent requirement shall be met.

The confined space entry program requirements include identification of confined space personnel including entry supervisor, entrant, attendant, rescue team, and rescue service; training and rescue drills; a permit system for hazard identification and control; a site specific rescue plan; safety equipment and PPE; labeling and posting of confined spaces; and safe work practices and procedures including atmospheric testing and monitoring.

### 4.0 DEFINITIONS

**Attendant** - is the individual stationed outside the confined space who monitors the authorized entrants and who performs all attendant's duties assigned in the permit space program.

**Authorized entrant** - is an employee who is authorized by the employer to enter a permit space.

**Confined space - is a space that:**

1. In large enough and so configured that an employee can bodily enter and perform assigned work; and
2. Has limited or restricted means for entry or exit; and
3. Is not designed for continuous human occupancy.

**Non-Permit Required Confined Space -** A non-permit required confined space is any confined space that does not contain, or have the potential to contain, atmospheric hazards or any other hazard capable of causing death or serious physical harm to personnel. OHM considers all confined space entry to be a permit required entry.

**Entry -** is the action taken by a person to pass through the opening into a permit required confined space. Entry includes ensuing work activities in that space, and is considered to have occurred as soon as any part of the entrant's body breaks the plane of the opening into the space.

**Entry supervisor -** is the person responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required.

**Hazardous atmosphere -** is an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, injury or acute illness from one or more of the following causes:

1. Flammable gas, vapor, or mist in excess of 10 percent of the lower explosive limit (LEL).
2. Airborne combustible dust at a concentration that meets or exceeds the LEL.
3. Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent.
4. Atmospheric concentration of any substance which could result in employee exposure in excess of the permissible exposure limit (PEL).
5. Any other atmospheric condition that is immediately dangerous to life or health (IDLH).

**Permit required confined space - (permit space)** is a confined space that has one or more of the following characteristics:

1. Contains or has the potential to contain a hazardous atmosphere
2. Contains a material that has the potential for engulfing an entrant
3. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a small cross-section; or
4. Contains any other recognized serious safety or health hazard.

**Permit system** - is the administrative procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.

**Rescue service** - is the personnel designated to rescue employees from permit spaces.

**Retrieval system** - is the equipment (including a retrieval line, chest or full-body harness, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.

## 5.0 RESPONSIBILITIES

### **Entry Supervisors:**

1. Evaluate their work sites to determine if any operations involve permit required confined spaces.
2. Inform employees who may enter confined spaces, of the existence and location of, and the danger posed by the permit spaces, by posting danger signs or other equally effective means.
3. Inform subcontractors of the requirements for permit required confined space program.
4. Reevaluate permit spaces when there are changes in conditions.
5. Identify the hazards that may be faced during entry.
6. Attend confined space training.
7. Assure all employees involved with confined space operations are trained and proficient.
8. Verify that the appropriate entries have been made on the permit, and that all safe operating procedures and equipment have been specified and in place prior to signing the permit and allowing entry to begin.

9. Verify that rescue services are available and that the means for summoning are operable.
10. Remove unauthorized personnel from the area where permit entry is being made.
11. Determine that entry operations remain consistent with the terms of the entry permit and that acceptable entry conditions are maintained.

**Authorized entrants:**

1. Attend site specific confined space training and rescue drills.
2. Know the hazards that may be present during entry.
3. Properly use equipment required to safely enter the confined space including equipment for testing and monitoring, ventilation, respiratory protection, communication, PPE, lighting, etc.
4. Communicate with the attendant periodically.
5. Alert the attendant whenever a hazardous condition arises.
6. Exit from the space as quickly and safely as possible whenever an order to evacuate is given by the attendant or the entry supervisor; when the entrant recognizes any warning sign or symptom of exposure to a potentially dangerous situation, or when the entrant detects a prohibited condition, or when an evacuation alarm is given.

**Attendants:**

1. Attend site specific confined space training and rescue drills.
2. Know the hazards that may be present, and the symptoms of overexposure to the chemical and physical hazards faced by the entrants.
3. Be alert to the possible exposure symptoms exhibited by the entrants.
4. Maintain an accurate count of authorized entrants in the permit space and ensure that the permit accurately identifies who is in the permit space.
5. Remain outside the permit space during entry operations until relieved by another attendant.
6. Communicate with entrants to monitor their status.

7. Monitor activities inside and outside the space to determine that it is safe for the entrants to remain in the space, or to evacuate the space in case a hazardous condition arises.
8. Summon rescue and emergency services as necessary.
9. Keep unauthorized personnel from approaching a permit space.
10. Perform non-entry rescue as required.
11. Perform entry rescues only if trained and equipped for rescue operations, and only after being relieved by a qualified attendant.
12. Perform no other duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants.

**Rescue Services:** (non-entry rescue/outside rescue services shall be used whenever feasible)

1. Know hazards of confined space.
2. Attend confined space training which includes training on hazard recognition, use of rescue equipment, rescue drill prior to entry into confined space with different configuration.
3. Attend first aid/CPR training. At least one member of the team must be current in first aid/CPR certification.
4. Conduct a rescue drill every twelve months.

**6.0 PROCEDURE**

- 6.1 **Permitting.** An MSDS for the last contents of the confined space must be reviewed prior to issuance of the permit. A permit will be issued for each permit required confined space entry. The permit duration is limited to one shift; a new permit must be issued daily for any ongoing confined space work. The permit requirements must be met by a qualified person; the entry supervisor will ensure that the permit requirements have been met, and sign off on the permit as the Entry Supervisor. The OHM confined space entry permit is attached.
- 6.2 **Written Rescue Procedure.** Prior to any confined space work, a site specific written rescue plan will be developed that address the minimum requirements of pre-entry planning, equipment, rescue services on-site and off-site, permits and signs. A generic site safety rescue plan is attached.

**6.2.1 Rescue Requirements**

- Rescue equipment must be in-place before the first entrant enters the confined space.
- A trained stand-by person (attendant) will be assigned to each confined space with required emergency equipment including a fully charged SCBA or airline and egress unit.
- The attendant is to keep life lines clear, to maintain contact with all workers within the confined space and to summon help if needed.
- The attendant may not leave his post until he is properly relieved by rescue assistance.
- The attendant may attempt non-entry rescue via lifeline while waiting for rescue assistance.

**7.0 PERMIT SYSTEM**

All confined space entry permits will address the following:

- Location
- Duration
- Hazard identification
- Hazard control, e.g. lockout/tagout
- PPE and special requirements
- Air monitoring requirements and documentation of results
- Personal monitoring
- Training required
- Entrants
- Attendant personnel
- Rescue personnel
- Communication procedures
- Emergency/rescue procedures
- Confined space classification
- Posting of notification

**8.0 TRAINING**

OHM will train personnel involved in confined space entry and confined space rescue on the hazards associated with confined space work. Training will be provided to each affected employee before performing confined space activities, when there is a change in assigned duties, and when there is any change in safe work procedures. New employees will receive confined space training when they come on site, and prior to performing

confined space work. The training will include an assessment of the proficiency of confined space personnel with the training content. The training will, as a minimum, include the following topics:

- Hazard recognition
- Hazard control
- Emergency entry and exit
- Respirator use
- First Aid/CPR
- Lock-out procedures
- Safety equipment
- Rescue drills for each new entry configuration (at least annually)
- Permit systems
- Work practices
- Communications and requirements

**9.0 TESTING AND MONITORING**

**9.1 Initial Monitoring.** Entry into a confined space is prohibited until initial testing of the atmosphere for oxygen content, flammability, and toxic gas concentration is conducted from the outside. Initial monitoring gives critical information concerning oxygen level, flammability, and toxicity hazards. In general, OHM personnel will not enter confined spaces if there is 10% LEL, any oxygen deficiency or excess, or any indication of toxic vapors. If a confined space entry is made where any flammable vapors, any oxygen deficiency or excess, or any indication of toxics are present, that entry must be specifically approved by the Regional Health and Safety Director or his designee.

**9.2 Flammability Monitoring.** Initial monitoring for flammables shall be conducted from outside the space. Any work producing open flames or sparks (hot work) is prohibited on or in any confined space where monitoring indicates that there are flammable compounds in excess of 10 percent of the Lower Explosive Limit (LEL). The monitoring device will be intrinsically safe for flammable atmosphere or explosion proof. If hot work must be performed in a confined space, a hot work permit must first be completed. Cutting gas cylinders and welding machines will not be taken into confined space. OHM personnel will not enter any confined space until flammable vapor concentrations are below 10 percent LEL. If there is any detection of flammable vapors the Regional Health and Safety Director must approve the entry.

**9.3 Oxygen Requirement.** Initial monitoring for oxygen shall be conducted from outside the space. The oxygen concentration for entry must not be lower than 19.5, and not higher than 23.5 percent for confined space entry without supplied air respirators. If elevated (here defined as greater than 22 percent) oxygen levels are detected, the confined space must be ventilated prior to any "hot work". Any

oxygen reading above or below 20.5 percent will be reported to the Regional Health and Safety Director or designee before further entry is attempted. No entry will be allowed when the oxygen concentration is less than 19.5 percent which constitutes an oxygen deficient condition without the approval of the Regional Health and Safety Director.

- 9.4 **Toxic Atmospheres.** Initial monitoring for toxics shall be conducted from outside the space. Personnel will be provided with, and will be required to properly use protective clothing and respiratory protective equipment when contaminants in the atmosphere reach or exceed the PEL. The personal protective equipment selected will reduce the potential for exposure to acceptable levels.

No IDLH atmospheres will be entered without regional health and safety approval. The site specific health and safety plan must be reviewed to determine action levels and PEP appropriate for the toxic atmosphere.

- 9.5 All monitoring equipment will be calibrated before each use and those calibration documented in the equipment records. The calibration record will be kept for a minimum of one year from the date of the measurement.

**10.0 LABELING AND POSTING**

- 10.1 Permit must be posted at the confined space.
- 10.2 Any signs warning of dangers in the work area will be in English and the predominant language of any non-English reading workers.
- 10.3 All entrances to confined spaces will have appropriate signs posted. The signs should include the following if applicable:

DANGER  
 Confined Space Entry  
 Entry by Permit Only

The following statements shall be added where necessary:

Respirator Required for Entry  
 Lifeline Required for Entry  
 Hot Work Permitted  
 or  
 No Hot Work

- 10.4 Emergency numbers will be conspicuously posted near the work area or at the telephone nearest the work area.

**11.0 SAFETY EQUIPMENT AND PPE**

The site safety officer or entry supervisor will determine and list on the confined space permit the necessary safety equipment and PPE. The entry supervisor will ensure that the safety equipment is properly used and is maintained in the proper working condition. These items may include, but are not limited to:

- Eye/face protection
- Head protection
- Foot protection
- Protective clothing
- Hearing protection
- Respiratory protection
- Safety bells/alarms
- Harnesses
- Lifelines
- Wrist Harnesses
- Tripods and winches
- Life jackets
- Fall nets
- Barricades
- Retrieval systems

Retrieval systems must meet the following requirements:

- All retrieval system must meet OSHA requirements
- Each authorized entrant shall use a chest or full-body harness with a retrieval line attached at the center of the entrant's back. The other end of the retrieval line must be attached to a mechanical device or fixed point outside the permit space.
- A mechanical retrieval device must be available for vertical entries more than five feet deep.

**12.0 WORK PRACTICES**

The following work practices must be followed during any confined space entry:

- 12.1 Purge and Ventilation.** During purge and ventilation procedure, blower controls will be at a safe distance from the confined space. Initial testing is to be conducted prior to purge/ventilation to determine what precautions are necessary. If a flammable atmosphere exists, all electrical equipment must be intrinsically safe or explosion proof. Ventilation equipment must be bonded and grounded. Continuous ventilation will be required when welding or painting in a confined space, or where a toxic atmosphere may form from desorption from walls, or

evaporation of chemicals. Ventilation systems must not prevent egress from the area or interfere with communications.

- 12.2 **Isolation/Lock-out/Tag-out.** Each confined space will have isolation procedures specifically developed. The confined space must be completely isolated from all systems by physical disconnect, block and bleed, or blanking and tagging. Electrical system must be de-energized and locked-out. All systems should be checked for stored energy before any entry into confined space is attempted.
- 12.3 **Cleaning.** Cleaning procedures will be reviewed and approved by the qualified person. Initial cleaning will be conducted from outside the tank whenever possible to minimize exposures to employees. Cleaning must be accomplished by flushing with water or chemical cleaners. At times the use of a "Butterworth" cleaning head may be required. In any case, gross contamination must be removed before entry is performed.
- 12.4 **Communications.** Communications between attendant and entrant(s) must be maintained for the duration of the entry. Maintaining visual contact is the preferred method of communications. A positive means of communication such as voice communication or use of radios is required when line of sight is not feasible. The communication system must be established and agreed upon prior to entry into the confined space; hand signals, if used, must be standardized.

Subcontractor and client personnel must be notified of any work they are doing in the area which can impact the work performed in confined space.

**13.0 EQUIPMENT AND TOOLS**

All equipment that is used in confined space will be inspected and as a minimum, will meet the following requirements:

- Hand tools will be kept clean and in proper working condition.
- Electric tools, equipment, and low voltage lighting will be intrinsically safe or explosion proof for flammable atmosphere and be equipped with ground fault interrupters (GFCI).
- Extension cords will be industrial quality, 3 wire and 12 gauge as a minimum.
- Cylinders of compressed gas will never be taken into a confined space, with the exception of SCBA tanks or life saving equipment.
- Ladder and scaffolding will meet or exceed OSHA requirements in 29 CFR 1910.25-28.

**14.0 PROGRAM REVIEW**

- The confined space entry program shall be reviewed at least annually. The program shall be revised as necessary to ensure the safety of personnel performing permit required confined space entries.
- Regional Health and Safety Director or designee shall receive a copy of each confined space permit for review.

**PERMIT REQUIRED CONFINED SPACE ENTRY  
RESCUE PLAN**

PROJECT: \_\_\_\_\_ NO: \_\_\_\_\_

In the event of an emergency requiring the rescue of one or more employees engaged in a confined space entry, the procedures outlined in this plan will be followed for \_\_\_\_\_  
(Identification of confined space)

**1.0 PRE-ENTRY PLANNING**

The following planning will be conducted before confined space entry.

1.1 **Equipment**. The following equipment will be used for rescue of employee(s) engaged in the confined space work:

\_\_\_\_\_ Retrieval System  
\_\_\_\_\_ Lifeline(s)  
\_\_\_\_\_ Harness(es)  
\_\_\_\_\_ Protective Clothing/Equipment  
Specify: \_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_ Communication Equipment  
Specify: \_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_ Other Rescue Equipment  
Specify: \_\_\_\_\_  
\_\_\_\_\_

All rescue equipment will be inspected and determined to be fit for use by the supervisor prior to entry into the confined space.

1.2 **Rescue Services (on-site)**. The following on-site personnel have been trained in rescue procedures and will respond to confined space entry rescues:

\_\_\_\_\_  
\_\_\_\_\_

- 1.3 Rescue Services (off-site). In the event of a confined space entry rescue the following off-site rescue services will be notified:

Fire Department: \_\_\_\_\_  
Police Department: \_\_\_\_\_  
Ambulance: \_\_\_\_\_

- 1.4 Confined Space Entry Permit/Signs. A completed confined space entry permit must be signed by the site supervisor or site safety office before beginning confined space entry work. All entrances to confined spaces will identify the space as follows:

DANGER  
CONFINED SPACE ENTRY  
ENTRY BY PERMIT ONLY

## 2.0 RESCUE PROCEDURES

The following procedures will be followed for confined space entry rescues.

- 2.1 Attendant. A trained stand-by person (attendant) will be assigned to each confined space with a fully charged SCBA or Airline/Egress unit. The stand-by is to keep lifelines clear, to maintain contact with all workers within the confined space, and to summon help if needed. The stand-by must never enter the confined space unless relieved by rescue assistance. The stand-by may attempt a non-entry rescue by lifeline while waiting for rescue assistance.
- 2.2 Rescue Equipment. The equipment required to rescue a victim (Section 1.1) must be in place before the first person enters the confined space. A mechanical device will be in place to retrieve personnel from vertical type permit spaces more than five feet deep.
- 2.3 Evacuations. The attendant will monitor activities inside and outside the confined space to determine if it is safe to remain in the space and shall order the entrants to evacuate the space under any of the following conditions:
- If the attendant detects a prohibited condition, e.g. unacceptable levels of toxic gases, oxygen, or combustible gases (see Site Safety and Health Plan).
  - If the attendant detects a situation outside the space that could endanger the entrants.
  - If the attendant cannot fulfill his duties.
  - If the attendant detects the behavioral effects of hazardous exposure in the entrants.
- 2.4 Rescue Procedures. If the confined space entry attendant determines that rescue of entrants is necessary, the following procedures will be followed.
- 2.4.1 All work activities in and around the confined space will be shut-down.

- 2.4.2 The confined space attendant will notify the site supervisor by radio or other means of communication that a rescue response is necessary.
- 2.4.3 The site supervisor will notify the off-site rescue services (Section 1.3) to respond to the site.
- 2.4.4 The attendant will first attempt to rescue the entrants by use of the retrieval system.
- 2.4.5 If retrieval by the attendant from outside the confined space is unsuccessful, the attendant must wait for back-up assistance before entering the confined space to attempt rescue.
- 2.4.6 The site supervisor or attendant will notify the on-site rescue services by radios or other means of communication that a rescue response is necessary.
- 2.4.7 The attendant will brief all on-site/off-site rescue services of the current conditions and hazards before rescue is attempted. Air monitoring data (LEL/O<sub>2</sub>, Toxic Gases) will be updated.
- 2.4.8 No attempt will be made to proceed with rescue if for any reason this would jeopardize the safety of any rescue personnel or exacerbate the problem. All hazards will be abated (e.g., ventilation of space to remove flammable levels of gases) before rescue is attempted.
- 2.4.9 When all hazards to rescue personnel have been controlled and the necessary rescue equipment is available, proceed with the rescue.
- 2.4.10 If an injured entrant is exposed to a hazardous substance, a material safety data sheet will be made available to the medical facility treating the exposed entrant.

### 3.0 TRAINING

All employees authorized to perform rescue services will receive the following training:

- Each member of the rescue service will be trained to use properly the personal protective equipment and rescue equipment.
- Each member of the rescue service will be trained to perform the assigned rescue duties and know the hazards that may be faced during entry/rescue.
- Each member of the rescue service will practice making permit space rescues before actual rescue attempts.
- Each member of the rescue service will be trained in First Aid and CPR. At least one currently certified member shall be available on-site.

4.0 RESCUE PLAN CERTIFICATION

All rescue personnel shall review this plan and document their understanding of its contents by signature.

NAME	SIGNATURE	DATE
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

5.0 PLAN APPROVAL

This plan has been completed and approved by the following personnel.

Completed by: \_\_\_\_\_ Title: \_\_\_\_\_

Approved by: \_\_\_\_\_ Title: \_\_\_\_\_

Date: \_\_\_\_\_

## CONFINED SPACE ENTRY PERMIT

Project No. \_\_\_\_\_

Permit No. \_\_\_\_\_

Good on this Date Only: \_\_\_\_\_

From: \_\_\_\_\_ a.m./ p.m.

To: \_\_\_\_\_ a.m./ p.m.

Location: \_\_\_\_\_

Purpose of Entry: \_\_\_\_\_

Workers Authorized to Enter	Attendants	Rescue Personnel
_____	_____	_____
_____	_____	_____

**EMPLOYEE PRE-ENTRY BRIEFING**

Pre-Entry Briefing Conducted by Entry Supervisor: \_\_\_\_\_  
(Name)

\_\_\_\_\_ (Date)

**CONFINED SPACE PREPARATION**

- |  |               |             |             |
|--|---------------|-------------|-------------|
| 1. Is Illumination Adequate?   | YES _____     | NO _____    |             |
| 2. Must Electrical Devices be Intrinsically Safe or Explosion Proof? | YES _____     | NO _____    |             |
| 3. Are Non-Sparking Tools Required?                                  | YES _____     | NO _____    |             |
| 4. Are GFCI's In Use?  | YES _____     | NO _____    |             |
| 5. Have All Power Cords and Tools Been Visually Inspected?           | YES _____     | NO _____    | N/A _____   |
| 6. Fire Extinguisher Available at Entrance.                          | YES _____     | NO _____    | TYPE _____  |
| 7. Eye Wash/Safety Shower Available.                                 | YES _____     | NO _____    | N/A _____   |
| 8. Is Rescue SCBA Available?   | YES _____     | NO _____    | N/A _____   |
| 9. Work Area Isolated with Signs/Barriers?                           | YES _____     | NO _____    | N/A _____   |
| 10. All Energy Sources Locked/Tagged Out?                            | YES _____     | NO _____    | N/A _____   |
| 11. All Input Lines Capped/Blinded?                                  | YES _____     | NO _____    | N/A _____   |
| 12. Vessel Contents Drained/Flushed/Neutralized?                     | YES _____     | NO _____    | N/A _____   |
| 13. Vessel Cleaned/Purged?   | YES _____     | NO _____    | N/A _____   |
| 14. Ventilation Provided 30 Minutes Before Entry?                    | YES _____     | NO _____    | N/A _____   |
| 15. Communication Requirements                                       | VISUAL _____  | VOICE _____ | RADIO _____ |
| 16. Level of Respiratory Protection.                                 | B _____       | C _____     | D _____     |
| 17. Type of Chemical Protective Clothing Required.                   | TYVEK _____   | SARAN _____ | ACID _____  |
| 18. Type of Glove Material Required.                                 | NITRILE _____ | PVC _____   | ACID _____  |

**PRE-ENTRY ATMOSPHERIC TESTING**

TIMES & READINGS:	Time: _____ LEL: _____ % Oxygen: _____ % Toxic: _____ ppm of (TLV= _____)	Time: _____ LEL: _____ % Oxygen: _____ % Toxic: _____ ppm of (TLV= _____)	Time: _____ LEL: _____ % Oxygen: _____ % Toxic: _____ ppm of (TLV= _____)	Time: _____ LEL: _____ % Oxygen: _____ % Toxic: _____ ppm of (TLV= _____)	Time: _____ LEL: _____ % Oxygen: _____ % Toxic: _____ ppm of (TLV= _____)
-------------------	---	---	---	---	---

CONTINUOUS MONITORING REQUIRED: YES \_\_\_\_\_ NO \_\_\_\_\_ NOTE: Acceptable: LEL<10%, Oxygen-20.9%

SPECIAL PRECAUTIONS: \_\_\_\_\_

**EMERGENCY/RESCUE PROCEDURES**

- |   |           |                 |
|---|-----------|-----------------|
| 1. Is a Site Specific Rescue Plan Required?                   | YES _____ | NO _____        |
| 2. Are Personnel Trained for Confined Space Rescue Available? | YES _____ | NO _____        |
| 3. If NO, Has an Outside Agency Been Notified?                | YES _____ | NO _____        |
| 4. Outside Rescue Agency Name: _____                          |           | Phone No. _____ |

**ENTRY/EGRESS REQUIREMENTS**

- |   |           |          |
|---|-----------|----------|
| 1. Are Ladders Required for Entry?                  | YES _____ | NO _____ |
| 2. Are Vertical Extraction/Rescue Devices Required? | YES _____ | NO _____ |
| 3. Is Fall Protection Required?                     | YES _____ | NO _____ |

**OTHER POTENTIAL HAZARDS**

- |                      |           |          |               |
|----------------------|-----------|----------|---------------|
| 1. Noise             | YES _____ | NO _____ | CONTROL _____ |
| 2. Heat Stress       | YES _____ | NO _____ | CONTROL _____ |
| 3. Cold Stress       | YES _____ | NO _____ | CONTROL _____ |
| 4. Biological Agents | YES _____ | NO _____ | CONTROL _____ |

**SUBCONTRACTOR NOTIFICATION**

Contractor Notified of: Permit Conditions \_\_\_\_\_ Potential Hazards \_\_\_\_\_ N/A \_\_\_\_\_

**PERMIT AUTHORIZATION**

I certify that I have inspected the work area for safety and reviewed all safety precautions recorded on this permit.

Entry Supervisor Authorization (Signature): \_\_\_\_\_ Employee # \_\_\_\_\_

Distribution: Original to: Project file Copy to: Regional Health and Safety Director for review

***APPENDIX H***  
***PORTABLE FIRE EXTINGUISHERS***

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# HEALTH & SAFETY PROCEDURES

## PORTABLE FIRE EXTINGUISHERS

PROCEDURE NUMBER 4-3

Page 1 of 4

LAST REVISED 7/96

APPROVED BY: DLM/FHH

### 1.0 OBJECTIVE

OHM Remediation Services Corp. (OHM) will provide portable fire extinguishers of the appropriate type, size, and quantity as recommended by the National Fire Protection Association and/or OSHA for incipient stage fire fighting by trained employees.

### 2.0 PURPOSE

This procedure describes requirements for the selected maintenance, use, and inspection of portable fire extinguishers.

### 3.0 POLICY

OHM employees will only engage in incipient stage fire fighting on fires considered within the ability of the employee and capacity of fire extinguisher. In all other cases, evacuation is the preferred action.

### 4.0 REGULATORY REQUIREMENTS

This procedure complies with the guidelines in 29 CFR 1910.157 and 1926.150. In the event of a conflict between these standards, the more stringent will prevail.

### 5.0 GENERAL REQUIREMENTS

The following items detail general requirements for portable fire extinguishers:

- 5.1 Mounting. All fire extinguishers in offices and in shops (for shop use) are to be mounted and identified on walls or upright structure.
- 5.2 Surrounding Area. The 36-inch area surrounding the mounted fire extinguishers is to be kept free of obstructions.
- 5.3 Inventory. An inventory of all fire extinguishers is to be maintained by each office or shop. A checklist follows this procedure in Attachment A.
- 5.4 In Service. All fire extinguishers will be maintained in a fully charged and operable condition and kept in their assigned places, except during use.

5.5 Deficient Fire Extinguishers. Any fire extinguisher not meeting inspection criteria shall be removed from service and tagged out of service until the deficiencies are corrected.

## 6.0 SELECTION AND DISTRIBUTION

Fire extinguishers are selected and distributed based upon the types of fires expected, type of building, and amount and type of material in storage.

6.1 Fire Extinguisher Classification. Fire extinguishers are divided into four classes based upon the type of material they can extinguish.

- Class A - Wood, paper, trash having glowing embers
- Class B - Flammable liquids, gasoline, oil paints, grease, etc.
- Class C - Electrical equipment
- Class D - Combustible metals

6.2 Numerical Designation. The number which precedes the fire extinguisher classification indicates relative extinguishing effectiveness of that unit.

6.3 Flammable or Combustible Liquid Storage Areas. A fire extinguisher not less than 10 B shall be provided within 50 feet of wherever more than 5 gallons of flammable or combustible liquids are stored.

6.4 Vehicles and Forklifts. A fire extinguisher not less than 2.5 ABC shall be mounted in each company owned vehicle and forklift.

6.5 Heavy Equipment. A fire extinguisher not less than 5 BC shall be mounted in each piece of company owned heavy equipment.

6.6 Buildings. Buildings shall be protected on the following basis:

- A fire extinguisher rated at not less than 2 A shall be provided for each 3,000 square feet of protected building.
- Portable fire extinguishers for type A fires should be distributed so that travel distance for employees is 75 feet or less.
- Portable fire extinguishers for type B fires should be distributed so that travel distance for employees is 50 feet or less.

- Portable fire extinguishers for type C fires should be distributed so that travel distance for employees is 50 feet or less.
- Portable fire extinguishers for type D fires should be distributed so that travel distance for employees is 75 feet or less.

## 7.0 INSPECTION, MAINTENANCE, AND TESTING

The following sections details inspection, maintenance, and testing procedures.

- 7.1 Monthly and Annual Inspections. All extinguishers are to be inspected monthly by facility personnel. An annual inspection will be conducted by an approved third party who is trained in fire extinguisher maintenance. Records of all inspections will be maintained at the facility or in the project file.

Dry chemical extinguishers will be emptied and inspected by a competent technician every six years. These extinguishers will be hydrostatically tested every twelve years. Some states have more stringent requirements.

- 7.2 Annual Inspection Tags. All fire extinguishers used in outside service or on project sites will have hard (plastic, metal, or laminated) annual inspection tags.

- 7.3 Monthly Inspection Procedure. Monthly inspection of a portable fire extinguisher shall include:

- Pin and seal in place
- Pressure gauge indicates acceptable pressure (if present)
- Extinguisher hose or bell in good condition and free from obstruction
- Annual inspection tag attached and indicates inspection within the past 12 months.

## 8.0 TRAINING

Employees required to use portable fire extinguishers will be trained. The following items describe these points.

- 8.1 Training Subjects. Employees who may use fire extinguishers for incipient stage fire fighting will be provided training which reviews the following subjects:

- Fire tetrahedron
- Fire classes
- Fire evaluation

- Capacity, range, and use of fire extinguishers
- Evacuation procedures
- Reporting requirements

- 8.2 Field Employees. OHM will familiarize employees with the general principals of fire extinguisher use during 40-hour HAZWOPER training.
- 8.3 Office and Shop Employees. Personnel who work in OHM offices and shops and may be required to use fire extinguishers will be provided training periodically to ensure that they are familiar with the correct techniques and procedures.
- 8.4 Additional Training. If employees are expected to respond to greater than incipient stage fires, additional training will be provided. Training requirements will be detailed in the health and safety plan.

**APPENDIX A**

**PORTABLE FIRE EXTINGUISHER CHECKLIST**

Office/Shop Location \_\_\_\_\_

**INVENTORY**

Serial No.	Location	Serial No.	Location
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

**Inspection Points**

1. Fire extinguisher is in assigned location
2. Access is not obstructed
3. Fire extinguisher is fully charged
4. Lock-pin in place
5. Test tag attached and current

**INSPECTIONS COMPLETED**

<u>Month</u>	<u>Initials</u>	<u>Month</u>	<u>Initials</u>
January	_____	July	_____
February	_____	August	_____
March	_____	September	_____
April	_____	October	_____
May	_____	November	_____
June	_____	December	_____

***APPENDIX I***

***SAFETY SHOWERS & EYEWASH STATIONS***

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OHM Remediation  
Services Corp.

## HEALTH & SAFETY PROCEDURES

### SAFETY SHOWERS AND EYEWASH STATIONS

PROCEDURE NUMBER 3-6

Page 1 of 3

LAST REVISED 5/96

APPROVED BY: JFK/FHH

#### 1.0 OBJECTIVE

OHM Remediation Services Corp. (OHM) shall provide suitable facilities for quick drenching or flushing of the eyes and body within the work area for immediate emergency use where the eyes or body of any person may be exposed to injurious corrosive materials.

#### 2.0 PURPOSE

This procedure describes the types and locations of safety showers and eyewash stations and addresses the requirements found in 29 CFR 1910.151(c) and the American National Standards ANSI Z358.1-1990 for emergency eyewash and shower equipment. All projects will have a means to flush the eyes, face, and body as appropriate for the chemicals which will be handled by OHM employees.

#### 3.0 REQUIREMENTS

3.1 Eyewash Stations. Eyewash stations shall be located throughout company facilities and job sites for emergency first aid in case of exposure to injurious corrosive material to the eyes and skin. The general requirement for emergency eyewash stations are as follows:

- Stations must be capable of flushing both eyes simultaneously.
- Freeze protection must be provided when possibility of freezing conditions exist.
- There can be no sharp projections in operating area of unit.
- Nozzles on eyewash stations must be protected from airborne contaminants by covers or caps.
- Self-contained eyewash stations shall be constructed of materials that will not corrode in the presence of flushing fluid.
- Eyewash stations must be capable of delivering not less than 0.4 gpm for 15 minutes.

- Once activated, the opening mechanism must have "stay open" feature allowing both hands free to open eyelids.
- Activating valves on eyewash stations must be capable of being turned on in 1 second or less.
- The valve activator shall be large enough to be easily located and operated by user.

**Installation Requirements:**

- Unit must be positioned so that water nozzles are 33-45 inches from the floor and 6 or more inches from the wall.
- Supply line for plumbed units shall provide an uninterrupted supply of potable water at a minimum of 30 lbs. per square inch of pressure.
- Eyewash units shall be in an accessible location, located no further than 100 feet from the hazard. Where strong caustics or acids are present, the distance should be 10 feet or less.
- The location of the eyewash station should be marked with a highly visible sign in a well lit area and must be kept clear of debris and other material at all times.

**NOTE:** Personal eyewash bottles must not be substituted for ANSI approved eyewash stations. In limited cases, personal eyewash bottles may be stocked at project sites in addition to approved eyewash stations.

**3.2 Drench Showers.** Drench showers shall be located throughout company facilities and at project sites for emergency use in case of exposure to injurious corrosive material to the face, head and/or body. The general requirement for drench showers is as follows:

- The height of the drench shower had should be at least 82 inches and not more than 96 inches from standing level.
- The water spray pattern should be a minimum of a 20 inch diameter, 60 inches from standing level.
- The center of the water spray should be 16 inches from any obstruction.

- The drench shower should deliver a continuous adequate supply of water to drench an employee in the event of a splash or spill.
- The control valve should stay on once activated, and should be able to be activated from "off" to "on" in one second.
- Drench showers should be located a maximum of 10 seconds or 100 feet from the hazard. In situations where strong caustics or acids are present, the distance should be 10 feet or less.
- The drench shower should be identified with a sign and should be located in a well lit, highly visible area.

3.3 **Inspection.** To simplify the maintenance and record-keeping, an individual at the project site or department should be assigned the task of checking all eyewash devices on a weekly schedule and records of those inspections be kept on the device. The flushing solution should also be checked and replaced per the manufacturer's instructions. Trash or debris should be removed from any eyewash basins at this time.

3.4 **Maintenance.** Each plumbed emergency eyewash device should be activated weekly to test the equipment and flush plumbed lines of any bacterial or sediment build-up. For self-contained eyewash units, follow the manufacturer's instructions. ANSI Standards recommend that all emergency eyewash devices be checked on a weekly basis in order to ensure proper working conditions as well as adequate levels of flushing solution.