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WORK PLAN FOR
REMOVAL OF MERCURY CONTAMINATED SOIL
NAVAL SURFACE WARFARE CENTER
INDIAN HEAD, MARYLAND

Prepared for:

U.S. NAVY
Contract N62470-93-D-3032
Delivery Order 0010

Prepared by:

OHM Corporation
Eastern Region

A handwritten signature in cursive script, reading "Kenneth Kukkonen", written over a horizontal line.

Kenneth Kukkonen, P.E.
Project Manager

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George E. Krauter, P.E.
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May 2, 1994
OHM Project 15831

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May 2, 1994

Commander
Department of the Navy
Atlantic Division
Naval Facilities Engineering Command
Attn: Contracts Branch Code 02143 Ms. Brenda Smith
6500 Hampton Boulevard
Building A (South East Wing) 3rd Floor
Norfolk, Virginia 23508

Dear Ms. Smith:

On behalf of OHM Remediation Services Corp. (OHM), enclosed please find the Work Plan for Delivery Order 0010, Removal of Mercury Contaminated Soil, Naval Surface Warfare Center, Indian Head, Maryland.

If you have any questions regarding this Work Plan, please call me at 609-588-6477.

Sincerely,

George E. Krauter
Program Manager

GEK:jeo

pc: Jerry Haste, LANTDIV
Kenneth Kukkonen, OHM
Alan Williams, OHM
OHM Project 15831

SECTION 1.0 INTRODUCTION

OHM Remediation Services Corp. (OHM) has been retained by the Department of the Navy, Atlantic Division under Delivery Order 0010 to remove mercury contaminated soil and sediment from an intermittent drainage channel located at the Naval Surface Warfare Center (NSWC), Indian Head, Maryland.

To accomplish the removal of the contaminated soil, OHM will construct erosion and sediment control measures as specified in Appendix A. Erosion and sediment control measures include the installation of a stream diversion system, tributary pumping system, dike construction, silt fencing, and rock construction entrances. Site preparation tasks will be required including the construction of an access road into the site, and tree clearing and grubbing.

The mercury contaminated soil from the stream channel will be excavated and hauled to the placement site at Magazine No. 606. Post-excavation sampling of the stream channel will be performed to evaluate the effectiveness of the contamination removal.

Following excavation and post-excavating sampling, the stream channel and adjacent areas will be reconstructed. Restoration includes regrading, revegetation and the removal of the water diversion and erosion and sediment control devices.

1.1 PROJECT ORGANIZATION

The scope of work for this project, as specified in the contract specifications prepared by Halliburton NUS Environmental Corporation, included the following major tasks:

Section 2.0 - Scope of Work: OHM's understanding of the Scope of Work.

Section 3.0 - Technical Proposal: OHM's proposed implementation of remedial measures and construction activities.

Section 4.0 - Project Schedule: OHM's proposed production schedule.

Appendix A - Erosion and Sediment Control Plan

Appendix B - Health and Safety Plan

Appendix C - Quality Control Plan

SECTION 2.0 SCOPE OF WORK

OHM has prepared this work plan based on the information provided in the Request for Proposal and Specifications for the removal of contaminated soil at the Naval Surface Warfare Center, Indian Head, Maryland, prepared by Halliburton NUS Environmental Corporation.

The contract specifications require the submittal of an Environmental Protection Plan, Quality Control (QC) Plan, and a Sampling and Analysis Plan. Pertinent parameters of the Environmental Protection Plan have been addressed in this Work Plan. The QC Plan is attached as Appendix C, which includes the submittal register; however, the Testing laboratory Qualifications and Sampling Analysis Plan have been omitted due to limited sampling and analysis activity within OHM's scope of work.

The following details the scope of work OHM is prepared to perform that will complete the removal of contaminated soil and restoration of the site.

- Perform site set-up, notify applicable regulatory agencies of work to be performed.
- Install water diversion and erosion and sediment control devices, this includes the major stream and tributaries diversion system, dike construction, silt fencing, and rock construction entrances. Following construction, an inspection and approval will be required from the Maryland Department of Environmental at 410-631-3510.
- Site preparation including construction of an access road into the site and tree clearing and grubbing.
- Excavation of the mercury contaminated soil.
- Transportation of the excavated material to the placement site.
- Post-excavation sampling to evaluate removal effectiveness will be by others.
- Reconstruct and restore stream channel and adjacent areas.
- Revegetate disturbed areas.
- Remove water diversion and erosion and sediment control devices.

SECTION 3.0 TECHNICAL APPROACH

The overall technical approach prepared by OHM, and detailed in this section, is designed in accordance with the submitted specifications. OHM believes our technical approach will ensure that this project will be completed in a safe, efficient, and cost effective manner. A site-specific health and safety plan (Appendix B) has been prepared to ensure all tasks are completed in a safe manner.

3.1 PRE-PROJECT PLANNING AND CONSTRUCTION MEETING

After notice to proceed, OHM will attend a pre-construction meeting with the contracting officer and other involved parties. The meeting will be held on site, and will cover site logistics including support area, materials storage, tree removal, erosion control, and access issues related to the removal of the mercury contaminated sediment and soil. The schedule will be reviewed and a hard date for mobilization will be established.

Submittals, plans, and pre-performance approvals required by the specifications, critical to the success of the project, will be discussed, and milestone dates will be established.

Photographs of the work area will be taken to document the existing conditions prior to the initiation of any work. These photos will later be used for comparison to help restore the site.

Prior to and during mobilization of major field equipment, OHM will prepare the site to ensure the efficiency and effectiveness of the project for the contaminated soil remediation, and to ensure the project's full compliance with regulatory requirements. OHM will provide the Navy, or their site engineer, with all required submittals, including a site specific health and safety plan, work plan, all OSHA training certificates for our employees, and any other required information.

3.2 MOBILIZATION AND SITE PREPARATION

OHM will mobilize equipment, personnel, and materials for this project from our Glen Allen, Virginia, Windsor, New Jersey, Buffalo, New York, and Hopkinton, Massachusetts offices. All OHM employees and their subcontractors are 40-hour OSHA trained in accordance with 29 CFR 1910.120. OHM will use a combination of owned or rented equipment for this project. OHM will obtain commitments on all key equipment and supplies in order for the project to progress smoothly.

3.2.1 Mobilization and Site Set-up

Once on site, OHM will install the appropriate shower and wash facilities, and a decon (change) room and office trailer at the approved location. An equipment decontamination facility will be established at the edge of the exclusion zone, most probably between the access corridor and the southern edge of the excavation area. Sanitary facilities will be supplied by portable toilets at the support area and immediately outside the exclusion zone. OHM will install temporary electrical power and telephone service to the office trailer and decontamination facilities. Potable water for trailers will be supplied in water coolers.

3.2.2 Site Access

OHM intends to access the site from the contractor route shown on the specification drawings. An access road will be constructed between the existing road and the drainage channel work area. The access road (approximately 210 feet long) will be constructed by placing crushed stone over a geosynthetic fabric. The access

road will be competent for heavy machinery and truck traffic, and will comply with the erosion and sediment control plan (Appendix A).

If the soil and sediment in the drainage ditch is too soft to drive machinery or vehicles over, swamp mats will be placed along the length of the ditch. Swamp mats are large wooden timbers lashed together so the machinery and trucks can drive on top of them without sinking in the mud. If conditions warrant so, the swamp mats may be used for clearing and grubbing operations as well as excavation and hauling.

3.2.3 Tree Clearing and Grubbing

Prior to excavation of the contaminated soil and sediment from the drainage ditch, the work area will be selectively cleared of trees, shrubs, and other obstacles to excavation activities.

Tree clearing shall consist of the felling, trimming, and cutting of trees into sections and the satisfactory disposal of the trees and other vegetation designated for removal, including downed timber, snags, brush, and rubbish occurring within the areas to be cleared.

Trees will be cut at up to three feet above ground to facilitate stump removal as part of grubbing task.

Trees to be removed will be marked by the Contracting Officer and OHM site supervisor prior to construction activities. If any additional trees are required to be removed, the Contractor shall notify the Contracting Officer before removal.

Chainsaws and/or heavy equipment will be used to remove the trees.

Roots larger than 3 inches in diameter, matted roots, and designated stumps from the areas on which grading activities are to be performed will be removed and disposed of.

Soil will first be physically removed from stumps and roots, then the stumps and roots will be pressure-washed to remove any possible residual contamination. The soil and washwater will be handled together with the contaminated soil and sediment to be excavated. Grubbing will be performed to a depth not less than 18 inches in the work area.

Felled trees and uncontaminated portions of tree trunks and branches with diameters 4 inches and greater and minimum lengths of 8 feet shall be considered merchantable timber. Merchantable timber shall be cut into 8- to 10-foot lengths and stockpiled onsite in the area identified on the drawings as directed by the Contracting Officer. The stockpiled merchantable timber shall remain the property of the Government.

Branches, trunks, and limbs smaller than 4 inches in diameter will be mulched and disposed of on site. Logs with diameters of 4 inches and greater but less than 8 feet in length shall be placed on the sides of the realigned vegetated stream channel.

Tree stumps and logs will be placed off to the side of the realigned vegetated stream channel upon completion of construction.

3.2.4 Water Control Plan

Except as provided below and in accordance with the Stream Diversion Plan shown on the Drawings, OHM will not interrupt or interfere with the natural flow of the stream through the work site without the prior written approval of the Contracting Officer. The primary stream diversion system shall be able to pass a minimum base flow



of 100 gallons per minute (gpm) around the construction site (from Manhole A) without flooding the NSWC facilities. A tributary stream diversion system shall be able to pass a minimum base flow of 50 gpm. A contingency plan including the use of backup pumps and electricity generators shall be ready for implementation if necessary. OHM shall also control all drainage and flows from tributaries and springs in the vicinity of the work area. For the purpose of stream diversions, OHM will use the suggested method as shown on the contract drawings or a variation of this method as long as it is approved by the Contracting Officer and conforms to all state regulations. This includes directing the flow to a nearby stream via temporary pumps, pipes, or flumes.

OHM will furnish the materials needed for the temporary diversion of the stream and site dewatering including pumps, pipes, cofferdams, channels, flumes, drains, outlet structures, pump discharge devices and sumps.

OHM will construct and maintain all temporary diversion devices necessary for diversions and care of the stream during construction. OHM will provide a pump with a minimum capacity of 100 gpm in Manhole A for the primary stream diversion and a minimum of 50 gpm for the tributary stream diversion. Flows will be discharged in the stream downgradient of the construction site in a manner to assure sediments and erosion are controlled. Bypass pumping operations will not be manned 24 hours/day, seven days/week. The installation will be checked at night and on weekends during precipitation events. In case of a problem, other OHM personnel will be called in to effect repairs.

OHM will pressure wash all sediment from the 36-inch reinforced concrete pipe between Manhole A and the Upper Section of Stream and dispose as contaminated sediment/soil in the soil cover of Magazine No. 606 as indicated on the drawings.

OHM will dewater the site as necessary, so that the contaminated sediments/soils can be excavated, landfilled, and placed as a solid material. OHM will dewater excavated contaminated sediments/soils as necessary before placement in the soil cover of Magazine No. 606. Dewatering of sediments/soils will be accomplished by temporarily stockpiling the material in roll-off containers staged near the excavation area. The water will be collected via an underdrain in the roll-off containers where it will be pumped off. The water will be deposited upstream of the sedimentation basin.

3.2.5 Erosion and Sediment Control Plan

OHM will control soil erosion and sediments as specified in the Erosion and Sediment Control Plan (Appendix A). This plan will be implemented throughout all phases of this project.

3.3 SOIL AND SEDIMENT REMOVAL AND DISPOSAL

As designed in the contract specification, OHM intends to excavate approximately 500 cubic yards of contaminated sediment/soil from the drainage ditch area. The contaminated sediment/soil will be hauled to and placed in the earthen berm surrounding Magazine No. 606. Products and definitions mentioned in the section shall remain as defined in the contract specifications.

3.3.1 Contaminated Sediment and Soil Removal

Working from the north to south ends of the stream channel, OHM will excavate contaminated sediment/soil to the contours, elevations and dimensions indicated in the contract specifications and drawings. OHM will perform the following excavator subtasks:

- Reuse non-contaminated, excavated materials that meet the specified requirements for the material type required at the intended location.

- Keep excavations free from water.
- Excavate soil disturbed or weakened by Contractor's operations, soil softened or made unsuitable for subsequent construction due to exposure to weather.
- Refill over-excavated areas with fill material.
- Compact over-excavated areas at Site 8 to 85 percent of ASTM D 698 maximum density and at Magazine No. 606 to 95 percent of ASTM D 698 maximum density.

Contaminated sediment/soil shall be excavated from the Upper Section of the Stream as indicated on the drawings. Contaminated sediment/soil will be removed from the Upper Section of Stream, hauled and placed in the soil cover of Magazine No. 606.

After removal of contaminated sediment/soil, the Navy will conduct verification sampling and analysis indicating the removal action is complete. OHM will regrade the area as shown on the drawings.

3.3.2 Magazine No. 606 - Contaminated Sediment/Soil Placement

The soil cover at Magazine No. 606 will be excavated to the grades shown on the drawings in order to properly place the contaminated sediment/soil. The soil cover removed from the berm at Magazine No. 606 will be used for fill in the stream channel, providing the soil meets the required specifications.

Contaminated sediment/soil excavated shall be placed in the soil cover of Magazine No. 606 in six-inch compacted lifts. Areas not accessible to rollers or compactors will be compacted with mechanical hand tampers.

OHM will provide contaminated sediment/soil indicator tape. The tape will be buried between contaminated sediment/soil and low permeability soil to warn people who may start to excavate the area in the future.

Low permeability soil will be placed over the soil cover of Magazine No. 606 in six-inch compacted lifts.

Compaction is expressed as a percentage of maximum density. In-place density of existing subgrade will be determined; if required density exists, no compaction of existing subgrade will be required.

Subgrades including contaminated sediment/soil will be compacted to 95 percent of ASTM D 698. Low permeability soil will be compacted to a minimum of 95 percent of ASTM D 698 and to a permeability less than 1×10^{-5} centimeters per second by EPA SW-846.

Soil cover at Magazine No. 606 shall be graded as directed by the contracting officer.

3.4 SITE RESTORATION

OHM will complete this remediation project by filling, backfilling, regrading, and revegetating the disturbed areas.

3.4.1 Filling and Backfilling

Excavated areas will be filled and backfilled to contours, elevations, and dimensions indicated. Each lift will be compacted before placing the overlaying lift.

OHM will place fill in eight-inch lifts, and compact areas not accessible to rollers or compactors with mechanical hand tampers. OHM will aerate material excessively moistened by rain to a satisfactory moisture content. The material will be finished to a smooth surface by blading, rolling with a smooth roller, or both.



Topsoil will be placed in 6-inch lifts.

OHM will compact underneath areas designated for vegetation in and around the stream channel to 85 percent of ASTM D 698. Areas underneath areas for rock (riprap) will be compacted to 85 percent of ASTM D 698.

3.4.2 Regrading

Final grades will be finished as indicated. OHM will grade areas to drain water to the realigned channel. Damaged areas will be repaired.

OHM will protect newly graded areas from traffic, erosion, and settlements that may occur. Damaged grades, elevations, or slopes will be repaired or re-established.

3.4.3 Revegetation and Stream Channel Stabilization

After final grading is performed, OHM will stabilize the stream channel by implementing a combination of stabilization controls. These controls include the placement of temporary and permanent erosion control mats, riprap, gabion baskets and revegetation.

The planting of grass seed and native vegetation sprigs will take place in the fall planting season. Fertilization, lime, and water will be applied at that time to promote rapid and successful growth. A local landscaping company will be subcontracted to perform these tasks. The graded areas will be maintained from the completion of work until the fall planting season.

The vegetated channel concept uses living plant material as a main structural component in the stabilization of slopes and channels. It is used to stabilize slopes by preventing erosion and sedimentation problems. The goal of vegetated channel is establishment of a native plant community which is capable of self-repair and increased embankment protection over time. Additional information on development and design of the vegetated channel is available in Chapter 18, "Soil Bioengineering for Upland Slope Protection and Erosion Reduction", DOA EFH.

The placement and/or construction of these controls is detailed in the contract specifications and drawings. OHM will adhere to the construction details unless directed otherwise by the contracting officer.

3.5 SOIL TESTING

To assure field quality control, OHM will take the number and size of samples required to perform the following tests.

One of each of the following tests will be performed for each material used. Additional tests will be performed for each source change.

Fill material will be tested in accordance with ASTM D 698 for moisture density relations, as applicable.

Low permeability soil material will be tested in accordance with ASTM C 136 for conformance to ASTM D 2487 gradation limits; ASTM D 1140 for material finer than the No. 200 sieve; ASTM D 698 for moisture density relations, as applicable.

Soil density will be tested in accordance with ASTM D 1556, or ASTM D 2922, and ASTM D 3017. When ASTM D 2922 and ASTM D 3017 density tests are used, density test results will be verified by performing an ASTM D 1556 density test at a location already ASTM D 2922 and ASTM D 3017 tested as specified herein. An



ASTM D 1556 density test will be performed at the start of the job, and for every 10 ASTM D 2922 and ASTM D 3017 density tests thereafter. Each lift will be tested at randomly selected locations every 1,000 square feet of existing grade in fills or 1 test per lift at a minimum.

3.6 DEMOBILIZATION

After all revegetation and restoration activities are completed, OHM will notify the applicable agencies, then remove the soil erosion and sediment control devices. The water diversion system will be removed, and the water will be redirected to the stream channel.

All support equipment, including trailers, water, telephone, and electrical service will be removed, and OHM will vacate the site.

SECTION 4.0 PROJECT SCHEDULE

OHM plans to proceed with the contaminated soil removal project according to the schedule as indicated in the attached milestone chart.

SCHEDULE

TASK NAME	MARCH	APRIL	MAY	JUNE	JULY			
AWARD	★							
PREPARE WORK PLAN	████████████████							
LANTDIV REVIEW WORK PLAN			██████					
PRE-CONSTRUCTION MEETING			██					
MOBILIZE ON-SITE				█				
CONSTRUCT LOAD OUT AREA				██				
CONSTRUCT SEDIMENT BASIN				██				
INSTALL BYPASS PUMPING				█				
GRUBBING & TREE REMOVAL				██████████████				
EXCAVATE SOIL/SEDIMENT					██████			
REGRADING & REVEGETATION					██			
DEMOBILIZATION						█		

Legend

General Notes

**REMOVAL OF
CONTAMINATED SOIL
DELIVERY ORDER 0010**

NSWC
INDIAN HEAD, MD.

PREPARED FOR

**LANTDIV
and CHESEFA**



**OHM Remediation
Services Corp.**

Drawn By: JRF	Checked By:
Date: 03/10/94	Approved By:
Scale: NONE	Drawing No. 15831-A1

15831-A1 JRF 03/10/94 rev 2

APPENDIX A

Erosion and Sediment Control Plan

EROSION AND SEDIMENT CONTROL PLAN

OHM will control soil erosion and sediment in and around all work areas. Work areas include roadways and access routes, the stream channel excavation area, the stream and tributary diversion area as well as its outfall, and the placement area at Magazine No. 606.

Roadways and access routes will be constructed such that soil erosion and sediments are controlled. Geotextile fabric will underlie stone, and silt fences will be erected around the perimeter of disturbed areas. These control measures will be implemented according to the details described in the contract specifications, drawings, and notes.

The stream channel area to be excavated will be protected from soil erosion and sediments through the construction of temporary dikes, swales, sediment basins/traps, perimeter silt fences, etc. as detailed in the contract specifications, drawings, and notes. Following final grading, erosion control mats will be placed to promote vegetation and inhibit erosion.

The stream and tributary diversion system will be constructed to protect the excavation area from soil erosion and sediment. The outfall of the diversion system will be constructed so that the water velocity will decrease to prevent erosion. The diversion system and outfall will be constructed as detailed in the contract specifications, drawings, and notes. Following removal of the diversion system, disturbed areas will be restored.

The placement area for contaminated soil at Magazine No. 606 will be excavated and filled in a manner which controls erosion and sediment. Silt fences and roadways will be erected/constructed according to the contract specifications, drawings, and notes.

The OHM site supervisor will assure the adherence to the procedures referenced in the contract specifications, drawings, and notes.

APPENDIX B

Health and Safety Plan



DRAFT
SITE-SPECIFIC
HEALTH AND SAFETY PLAN
FOR
REMOVAL OF MERCURY CONTAMINATED SOIL
NAVAL SURFACE WARFARE CENTER
INDIAN HEAD, MARYLAND

Prepared for:

U.S. NAVY
Contract N62470-93-D-3032
Delivery Order 0010

Prepared by:

OHM Remediation Services Corp.
Trenton, New Jersey

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Project Manager

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George E. Krauter, P.E.
Program Manager

May 2, 1994
OHM Project No. 15831

SECTION 1.0 INTRODUCTION

OHM Remediation Services Corp. (OHM) is pleased to present this Health and Safety Plan (HASP) which has been developed for United States Navy, LANTDIV. This HASP document is provided for the Delivery Order entitled, Mercury Contaminated Soil Removal Action, Naval Surface Warfare Center, Indian Head Maryland. 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 0010, in cooperation with the Navy. This Delivery Order will also be executed in accordance with Naval Facilities Control Plan (NAVFAC) Specification No. 05-93-3124 dated September 27, 1993.

This HASP documents the policies and procedures which protect workers and the public from potential hazards posed by work at this site. OHM considers safety the highest priority during work at a site containing potentially hazardous materials and has established a standard policy of zero exposure which must be upheld on all projects. All project activities will be conducted in a manner that minimizes the probability of injury, accident, or incident occurrence. The Site Safety Plan 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.

1.1 SITE HISTORY

The Indian Head NSWC consists of the main area and the Stump Nect Annex, containing approximately 3500 acres. Building 766 was originally the Nitroglycerine Plant office and the Plant laboratory. The building was constructed in 1953. A 3 inch drain line from Building 766 conveyed flow from the sink and floor drains to a manhole and from there to the a stream bed,tidal basin marsh area that empties into the Mattawoman Creek. From 1953 to 1981 mercury used in the laboratory was inadvertently discarded through this 3 inch drain.

In 1984, a contractor inadvertently broke the drain line and mercury was discovered leaking into the soil. The drain pipe, the Manhole and 200 55 gallon drums of soil were removed. The drain and the manhole were replaced.

Further environmental investigation of the surrounding drainage areas identified the stream bed, tidal basin marsh area as contaminated with mercury. The removal of that contamination is the purpose of this delivery order.

1.2 SCOPE OF WORK

The scope of work includes the following activities:

- Site preparation/access construction
- Install gabion weir (sediment dam)
- Pressure wash 36" concrete pipe
- Excavation of soil at bunker 606
- Excavation of contaminated stream sediments
- Transportation of contaminated sediments
- Stream bed reconstruction
- Backfill, cap contaminated sediments placement area
- Site grading/wetlands restoration
- Equipment decontamination

These activities have been analyzed for potential hazards for which hazard control measures are provided in Section 3.4 Task Specific Risk Assessment.

Figure 1.1, Site Map

SECTION 2.0 KEY PERSONNEL

The Project Manager (PM), Site Supervisor (SS), Certified Industrial Hygienist (CIH) and Site Safety Officer (SSO) are responsible for formulating and enforcing health and safety requirements, and implementing the HASP.

2.1 CERTIFIED INDUSTRIAL HYGIENIST

The CIH should be responsible for the contents of the HASP and should ensure that the HASP complies with all federal, state and local health and safety requirements. If necessary, the CIH can modify specific aspect of the HASP to adjust for on-site changes that affect safety. The CIH will coordinate with the SSO on all modifications to the HASP and will be available for consultation when required. The CIH will not necessarily be on site during OHM activities.

2.2 SITE SAFETY OFFICER

The SSO has responsibility for administering the HASP relative to site activities, and will be in the field full-time while site activities are in progress. The SSO's primary operational responsibilities will be monitoring, including personal and environmental monitoring, personal protective equipment maintenance, and assignment of protection levels. The SSO will be the main contact in any on-site emergency situation. The SSO will direct all field activities involved with safety and be responsible for stopping work when unacceptable health or safety risk exists. The SSO is responsible for assuring that all on-site personnel understand and comply with all safety requirements.

2.3 PROJECT MANAGER

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 SS and the SSO to assure that the remedial action goals are completed in a manner consistent with the HASP.

2.4 SITE SUPERVISOR

The SS is responsible for field implementation of the HASP. The SS will establish and ensure compliance with site control areas and procedures and coordinate these supervisory responsibilities with the site SSO.

2.5 EMPLOYEE SAFETY RESPONSIBILITY

Each employee is responsible for personal safety as well as the safety of others in the area. 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 OHM's Employee Safety Guide and the OHM Health and Safety Procedures.

2.6 OSHA RECORDS

Required records including the OSHA 200 log are maintained at the OHM Divisional offices.



2.7 KEY SAFETY PERSONNEL

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

Site Supervisor (site phone)	TBD
Site Safety Officer (site phone)	TBD
Project Manager	Ken Kukkonen 609-588-6433 (office) 800-759-7243 pin # 840-6346 (pager)
NER Health and Safety Manager	Kevin McMahon, M.S., CIH 609-243-7271 (office) 609-421-7523 (pager)
Vice President, Health and Safety	Fred Halvorsen, Ph.D., PE, CIH 800-231-7031

SECTION 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 in the streambed. An MSDS LIST is included with the in Appendix C.

3.1 CHEMICAL HAZARDS

3.1 CHEMICAL HAZARDS			
CHEMICAL	EXPOSURE ROUTES	PEL/ TLV	HEALTH HAZARDS/ PHYSICAL HAZARDS
Mercury	Inhalation, skin	0.05 mg/m ³	Cough, chest pain, shortness of breath; tremor, insomnia, irritability, headache, weakness, stomach pain, loss of appetite; kidney damage
			Reacts with acetylene, ammonia, chlorine, dioxide metals

Personnel will be removed from the work site and placed under observation immediately if the following initial symptoms persist:

- 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 a crew member from the site.

All OHM personnel are familiar with the field activities which will be conducted at the site. They are trained to work safely under various field conditions. 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. Also, hard hats, safety glasses, and steel-toe safety boots are required in all areas of the site.

3.3 ENVIRONMENTAL HAZARDS

Environmental factors such as weather, wild animals, insects, and irritant plants always pose a hazard when performing outdoor tasks. The SSO and SS will make every effort to alleviate these hazards should they arise.

3.3.1 Heat Stress

The combination of warm ambient temperature and protective clothing increases the potential for heat stress. These include:

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

Heat stress is covered in detail during our 40-hour OSHA 29 CFR 1910.120 approved pre-employment course. In addition, this information is discussed during safety meetings before each workday. Workers are encouraged to increase consumption of water and electrolyte-containing beverages such as Gatorade.

At a minimum, workers will break every 2 hours for 10- to 15-minute rest periods. 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.

A 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.

AMBIENT TEMPERATURE	LEVEL D PPE	LEVEL C PPE/ MODIFIED LEVEL D
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

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 5 minutes.

Monitoring for heat stress will begin when the ambient temperature reaches or exceeds 70 degrees Fahrenheit, when wearing Level C PPE, or 80 degrees Fahrenheit for site activities performed in Level D.

3.3.3 Biological Hazards

- POISON IVY (Rhus Radicans)

Poison Ivy may be found at the site. It is highly recommended that all personnel entering into an area with poison ivy wear a minimum of a paper tyvek, to avoid skin contact.

Contact with poisonous plants:

Characteristic reactions

The majority of skin reactions following contact with offending plants are allergic in nature and characterized by:

- General symptoms of headache and fever
- Itching
- Redness
- A rash

Some of the most common and most severe allergic reactions result from contact with plants of the poison ivy group, including poison oak and poison sumac. Such plants produce severe rash characterized by redness, blisters, swelling, and intense burning and itching. The victim may develop a high fever and feel very ill. Ordinarily, the rash begins within a few hours after exposure, but may be delayed 24 to 48 hours.

Distinguishing Features of Poison Ivy Group Plants

The most distinctive features of poison ivy and poison oak are their leaves, which are composed of three leaflets each. Both plants have greenish-white flowers and berries that grow in clusters.

First Aid

- a. Remove contaminated clothing; wash all exposed areas thoroughly with soap and water, followed by rubbing alcohol.
 - b. Apply calamine or other soothing lotion if rash is mild.
 - c. Seek medical advice if a severe reaction occurs, or if there is a known history of previous sensitivity.
- TICKS

Heavily vegetated areas of a site may have ticks. It is highly recommended that all personnel walking through such areas wear a minimum of a paper tyvek and latex boot covers. The ticks will stand out against the light colors. A tick or insect repellent containing DEET is also suggested.

Ticks can transmit several diseases, including Rocky Mountain spotted fever, a disease that occurs in the eastern portion of the United States as well as the western portion, and Lyme disease. Ticks adhere tenaciously to the skin or scalp. There is some evidence that the longer an infected tick remains attached, the greater is the chance that it will transmit disease.

First Aid

- a. Cover the tick with heavy oil (mineral, salad, or machine) to close its breathing pores. The tick may disengage at once; if not, allow oil to remain in place for a half hour. Carefully (slowly and gently) remove the tick with tweezers, taking care that all parts are removed.
- b. With soap and water, thoroughly, but gently, scrub the area from which the tick has been removed, because disease germs may be present on the skin; also wipe the bite area with an antiseptic.

Although use of tweezers for the removal of the tick and application of heat to the tick's body often have been attempted, these methods may leave tick parts in the wound or may injure the skin.

- c. If you have been bitten, place the tick in a jar labeled with the date, location of the bite, and the location acquired. If any symptom appears, such as an expanding red rash, contact a physician immediately.

- LYME DISEASE

Lyme disease may cause a number of medical conditions, including arthritis, that can be treated if you recognize the symptoms early and see your doctor. Early signs may include a flu-like illness, an expanding skin rash and joint pain. If left untreated, Lyme disease can cause serious nerve and heart problems as well as a disabling type of arthritis.

You are more likely to spot early signs of Lyme disease rather than see the tick or its bite. This is because the tick is so small (about the size of the head of a common pin or a period on this page and a little larger after they fill with blood), you may miss it or signs of a bite. However, it is also easy to miss the early symptoms of Lyme disease.

In its early stage, Lyme disease may be a mild illness with symptoms like the flu. It can include a stiff neck, chills, fever, sore throat, headache, fatigue, and joint pain. But this flu-like illness is usually out of season, commonly happening between May and October when ticks bite.

Most people develop a large, expanding skin rash around the area of the bite. Some people may get more than one rash. The rash may feel hot to the touch and may be painful. Rashes vary in size, shape, and color, but often look like a red ring with a clear center. The outer edges expand in size. Its easy to miss the rash and the connection between the rash and the tick bite. The rash develops from three days to as long as a month after the tick bite. Almost one third of those with Lyme disease never get the rash.

Joint or muscle pain may be another early sign of Lime disease. These aches and pains may be easy to confuse with the pain that comes from other types of arthritis. However, unlike many other types of arthritis, this pain seems to move or travel from joint to joint.

In later stages, Lyme disease may be confused with other medical problems. These problems can develop months to years after the first tick bite.

Early treatment of Lyme disease symptoms with antibiotics can prevent the more serious medical problems of later stages. If you suspect that you have symptoms of Lime disease, contact your doctor.

Lyme disease can cause problems with the nervous system that look like other diseases. These include symptoms of stiff neck, severe headache, and fatigue usually linked to meningitis. They may also include pain and drooping of the muscles on the face, called Bell's Palsy. Lyme disease can also mimic symptoms of multiple sclerosis or other types of paralysis.

Lyme disease can also cause serious but reversible heart problems, such as irregular heart beat. Finally, Lyme disease can result in a disabling, chronic type of arthritis that most often affects the knees. Treatment is more difficult and less successful in later stages. Researchers think these more serious problems may be linked to how the body's defence or immune system responds to the infection.



3.3.4 Noise

Hearing protection is required for workers operating heavy equipment 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 RISK ASSESSMENT

3.4.1 ACTIVITY HAZARD ANALYSIS FOR SITE PREPARATION/ACCESS CONSTRUCTION		
TASK BREAKDOWN	POTENTIAL HAZARDS	HAZARD CONTROL MEASURES
Road Construction	Slips, Trips & Falls	<ul style="list-style-type: none"> • Clear walkways work areas of equipment, tools, debris, excavated material, vegetation • Mark, identify, or barricade other obstructions
	Struck by, Against Heavy Equipment, Flying Debris, Protruding Objects	<ul style="list-style-type: none"> • Use reflective warning vests when exposed to vehicular traffic • Avoid equipment swing areas • Make eye contact with operators before approaching equipment • Barricade or enclose the work area • Restrict entry to the work area to authorized personnel during construction activities • Wear hard hats, safety glasses with side shields, face shields and goggles and steel-toe safety boots at all times • Understand and review hand signals
	Fire	<ul style="list-style-type: none"> • Eliminate sources of ignition from the work area • Prohibit Smoking • Provide ABC (or equivalent) fire extinguishers for all work, flammable storage areas, fuel powered generators and compressors • Store flammable liquids in well ventilated areas • Post "NO SMOKING" signs • Shut-off vehicles, equipment during refueling • Use grounding and bonding during refueling • Store combustible materials away from flammables • Separate Flammables and Oxidizers by 20 feet
	Sharp Objects	<ul style="list-style-type: none"> • Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use
	High Noise Levels	<ul style="list-style-type: none"> • Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period)

3.4.1 ACTIVITY HAZARD ANALYSIS FOR SITE PREPARATION/ACCESS CONSTRUCTION		
TASK BREAKDOWN	POTENTIAL HAZARDS	HAZARD CONTROL MEASURES
Tree Removal, Grubbing, Grading	Slips, Trips & Falls	<ul style="list-style-type: none"> • Clear walkways, work areas of equipment, tools, debris, and excavated material, paving stone • Mark, identify, or barricade other obstructions
	Struck by, Against Heavy Equipment, Flying Debris, Protruding Objects	<ul style="list-style-type: none"> • Use reflective warning vests when exposed to vehicular traffic • Avoid equipment swing areas • Avoid areas under suspended loads • Make eye contact with operators before approaching equipment • Barricade or enclose the work area • Restrict entry to the work area to authorized personnel during tree removal activities • Wear hard hats, safety glasses with side shields, and steel-toe safety boots at all times • Understand and review hand signals
	Contact Dermatitis	<ul style="list-style-type: none"> • Wear PPE to avoid skin contact with plants, insects or other skin irritants
	High Noise Levels	<ul style="list-style-type: none"> • Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period)
	Sharp Objects	<ul style="list-style-type: none"> • Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use
	Inhalation and Contact with Dust	<ul style="list-style-type: none"> • Provide workers proper skin, eye and respiratory protection based on the exposure hazards present
	High Ambient Temperature	<ul style="list-style-type: none"> • Monitor for Heat stress in accordance with OHM Health and Safety Procedures Manual

3.4.2 ACTIVITY HAZARD ANALYSIS FOR GABION WEIR INSTALLATION		
TASK BREAKDOWN	POTENTIAL HAZARDS	HAZARD CONTROL MEASURES
Weir Installation	Slips, Trips, Falls	<ul style="list-style-type: none"> • Clear walkways and fixed or portable ladders of equipment, extension cords, air-lines, tools, or other debris • Mark, identify, or barricade other obstructions
	Struck by, Against Heavy Equipment, Protruding Objects	<ul style="list-style-type: none"> • Use reflective warning vests when exposed to vehicular traffic • Avoid equipment swing areas • Make eye contact with operators before approaching equipment • Barricade or enclose the work areas • Restrict entry to the work area to authorized personnel • Wear hard hats, safety glasses with side shields, and steel-toe safety boots • Understand and review posted hand signals
	High Noise Levels	<ul style="list-style-type: none"> • Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period)
	Sharp Objects	<ul style="list-style-type: none"> • Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use
	Caught In/ Between Moving Parts	<ul style="list-style-type: none"> • Provide and use proper work gloves when the possibility of crush, pinch, or other injury may be caused by moving/stationary edges or objects • Maintain all equipment in a safe condition • Keep all guards in place during use • De-energize and locked-out machinery before maintenance or service
	Inhalation and Contact with Hazardous Substances	<ul style="list-style-type: none"> • Provide workers proper skin, eye and respiratory protection based on the exposure hazards present • Review contaminant chemical MSDSs with workers before operations begin

3.4.3 ACTIVITY HAZARD ANALYSIS FOR DECONTAMINATION OF CONCRETE PIPE		
TASK BREAKDOWN	POTENTIAL HAZARDS	HAZARD CONTROL MEASURES
Pipe Cleaning / <i>MANHOLE EVENT</i>	Flammable, Toxic, Oxygen deficient Atmospheres	<ul style="list-style-type: none"> • Test vessel atmosphere for flammable/toxic vapors, and oxygen deficiency • Wear proper level of PPE for the type of atmospheric contaminants • Review MSDS information with entrants and safety observer • Use body harness, safety belt with tripod wench for possible rescue • Obtain Confined Space Entry Permit signed by Supervisor/Safety Officer • De-energize, lock-out and tag all energized equipment • Provide safety observer outside vessel • Provide written rescue plan • Review emergency procedures before work commences
	Burns	<ul style="list-style-type: none"> • Use proper gloves, face shield/safety goggles, shin and toe guards, and splash suits to protect workers from skin burns and injury when operating laser (high pressure washers)
	Inhalation and Contact with Hazardous Substances	<ul style="list-style-type: none"> • Provide workers proper skin, eye and respiratory protection based on the exposure hazards present • Review contaminant chemical MSDSs with workers before operations begin
	Sharp Objects	<ul style="list-style-type: none"> • Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use
	Handling Heavy Objects	<ul style="list-style-type: none"> • Observe proper lifting techniques • Obey sensible lifting limits • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads
	High Ambient Temperature	<ul style="list-style-type: none"> • Monitor for Heat stress in accordance with OHM Health and Safety Procedures Manual

3.4.4 ACTIVITY HAZARD ANALYSIS FOR STREAM SEDIMENT/BUNKER SOIL EXCAVATION		
TASK BREAKDOWN	POTENTIAL HAZARDS	HAZARD CONTROL MEASURES
Excavation of Sediment/ Soil	Struck By/ Against Heavy Equipment	<ul style="list-style-type: none"> • Use reflective warning vests when exposed to vehicular traffic • Avoid equipment swing areas • Make eye contact with operators before approaching equipment • Understand and review hand signals
	Sharp Objects	<ul style="list-style-type: none"> • Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use
	High Noise Levels	<ul style="list-style-type: none"> • Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period)
	Underground Utilities	<ul style="list-style-type: none"> • Identify all underground utilities around the excavation site before work commences • Cease work immediately if unknown utility markers are uncovered
	Excavation Wall Collapse	<ul style="list-style-type: none"> • Construct diversion ditches or dikes to prevent surface water from entering excavation • Provide good drainage of area adjacent to excavation • Prevent excessive loading of the excavation face • Treat excavations over 4 feet deep as confined spaces • Complete confined space permit entry procedure • Assign a competent person to decide soil classification, proper sloping, the correct shoring, or sheeting
	Slips, Trips, Falls	<ul style="list-style-type: none"> • Clear walkways, work areas of equipment, vegetation, excavated material, tools, and debris • Mark, identify, or barricade other obstructions
	Handling Heavy Objects	<ul style="list-style-type: none"> • Observe proper lifting techniques • Obey sensible lifting limits • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads
	Inhalation and Contact with Hazardous Substances	<ul style="list-style-type: none"> • Provide workers proper skin, eye and respiratory protection based on the exposure hazards present. • Review contaminant chemical MSDSs with workers before operations begin



3.4.4 ACTIVITY HAZARD ANALYSIS FOR STREAM SEDIMENT/BUNKER SOIL EXCAVATION		
TASK BREAKDOWN	POTENTIAL HAZARDS	HAZARD CONTROL MEASURES
Excavation of Sediment/ Soil (Continued)	High Ambient Temperature	<ul style="list-style-type: none"> • Monitor for Heat stress in accordance with OHM Health and Safety Procedures Manual
Sediment Placement	Inhalation and Contact with Hazardous Substances	<ul style="list-style-type: none"> • Provide workers proper skin, eye and respiratory protection based on the exposure hazards present. • Review contaminant chemical MSDSs with workers before operations begin
	Slips, Trips, Falls	<ul style="list-style-type: none"> • Clear walkways, work areas of equipment, vegetation, excavated material, tools, and debris • Mark, identify, or barricade other obstructions
	Handling Heavy Objects	<ul style="list-style-type: none"> • Observe proper lifting techniques • Obey sensible lifting limits • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads
	Heavy Vibration	<ul style="list-style-type: none"> • Rotate compactor operators to minimize hand, wrist vibration
	High Noise Levels	<ul style="list-style-type: none"> • Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period)
Backfilling	Slips, Trips, Falls	<ul style="list-style-type: none"> • Clear walkways, work areas of equipment, vegetation, excavated material, tools, and debris • Mark, identify, or barricade other obstructions
	Struck By/ Against Heavy Equipment	<ul style="list-style-type: none"> • Use reflective warning vests worn when exposed to vehicular traffic • Avoid equipment swing areas • Make eye contact with operators before approaching equipment • Understand and review hand signals
	Sharp Objects	<ul style="list-style-type: none"> • Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use

3.4.5 ACTIVITY HAZARD ANALYSIS FOR LOADING, TRANSPORT OF CONTAMINATED SOILS		
TASK BREAKDOWN	POTENTIAL HAZARDS	HAZARD CONTROL MEASURES
Load, Transport Contaminated Soils	Struck By/ Against Heavy Equipment	<ul style="list-style-type: none"> • Use reflective warning vests worn when exposed to vehicular traffic • Avoid equipment swing areas • Make eye contact with operators before approaching equipment • Understand and review hand signals
	Slips, Trips, Falls	<ul style="list-style-type: none"> • Clear walkways work areas of equipment, tools, vegetation, excavated material and debris • Mark, identify, or barricade other obstructions
	Handling Heavy Objects	<ul style="list-style-type: none"> • Observe proper lifting techniques • Obey sensible lifting limits • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads
	Sharp Objects	<ul style="list-style-type: none"> • Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use
	High Noise Levels	<ul style="list-style-type: none"> • Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period)
	High/Low Ambient Temperature	<ul style="list-style-type: none"> • Monitor for Heat/Cold stress in accordance with OHM Health and Safety Procedures Manual

3.4.6 ACTIVITY HAZARD ANALYSIS FOR STREAMBED RECONSTRUCTION		
TASK BREAKDOWN	POTENTIAL HAZARDS	HAZARD CONTROL MEASURES
Streambed Reconstruction	Struck by, Against Heavy Equipment, Flying Debris, Protruding Objects	<ul style="list-style-type: none"> • Use reflective warning vests when exposed to vehicular traffic • Avoid equipment swing areas • Make eye contact with operators before approaching equipment • Barricade or enclose the work area • Restrict entry to the work area to authorized personnel • Wear hard hats, safety glasses with side shields, and steel-toe safety boots • Understand and review hand signals
	Slips, Trips, Falls	<ul style="list-style-type: none"> • Clear walkways, work areas of equipment, tools, construction debris, and other materials • Mark, identify, or barricade other obstructions
	Handling Heavy Objects	<ul style="list-style-type: none"> • Observe proper lifting techniques • Obey sensible lifting limits • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads
	Caught In/ Between Moving Parts	<ul style="list-style-type: none"> • Provide and use proper work gloves when the possibility of crush, pinch, or other injury may be caused by moving/stationary edges or objects • Maintain all equipment in a safe condition • Keep all guards in place during use • De-energize and lock-out machinery before maintenance or service
	High Noise Levels	<ul style="list-style-type: none"> • Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period)
	Sharp Objects	<ul style="list-style-type: none"> • Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use
	High Ambient Temperature	<ul style="list-style-type: none"> • Monitor for Heat stress in accordance with OHM Health and Safety Procedures Manual

3.7.7 ACTIVITY HAZARD ANALYSIS FOR SITE GRADING, WET LANDS RESTORATION		
TASK BREAKDOWN	POTENTIAL HAZARDS	HAZARD CONTROL MEASURES
Site, Wetlands Restoration	Struck by, Against Heavy Equipment, Flying Debris, Protruding Objects	<ul style="list-style-type: none"> • Use reflective warning vests when exposed to vehicular traffic • Avoid equipment swing areas • Make eye contact with operators before approaching equipment • Barricade or enclose the work area • Restrict entry to the work area to authorized personnel during paving activities • Wear hard hats, safety glasses with side shields, or splash/face shields and goggles, and steel-toe safety boots at all times • Understand and review posted hand signals • Halt roof, exterior scaffold work in high winds, severe weather
	Sharp Objects	<ul style="list-style-type: none"> • Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use
	High Noise Levels	<ul style="list-style-type: none"> • Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period)
	Handling Heavy Objects	<ul style="list-style-type: none"> • Observe proper lifting techniques • Obey sensible lifting limits • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads
	Contact Dermatitis	<ul style="list-style-type: none"> • Wear PPE to avoid skin contact with contaminated soil, plants, or other skin irritants • Identify and review poisonous plants with workers
	Slips, Trips, Falls	<ul style="list-style-type: none"> • Clear, walkways of equipment, construction debris, & other materials • Mark, identify, or barricade other obstructions

3.4.8 ACTIVITY HAZARD ANALYSIS FOR EQUIPMENT DECONTAMINATION		
TASK BREAKDOWN	POTENTIAL HAZARDS	HAZARD CONTROL MEASURES
Heavy Equipment & Vehicles	Slips, Trips, Falls	<ul style="list-style-type: none"> • Clear, walkways of equipment, vegetation, tools, excavated material, and debris • Mark, identify, or barricade other obstructions
	Struck by, Against Heavy Equipment, Protruding Objects, & Splashes	<ul style="list-style-type: none"> • Use reflective warning vests when exposed to vehicular traffic • Avoid equipment swing areas • Make eye contact with operators before approaching equipment • Wear hard hats, safety glasses with side shields, or goggles with splash shields and steel-toe safety boots • Understand and review hand signals
	Inhalation and Contact with Hazardous Substances	<ul style="list-style-type: none"> • Provide workers proper skin, eye and respiratory protection based on the exposure hazards present • Review contaminant chemical MSDSs with workers before operations begin
	Burns	<ul style="list-style-type: none"> • Use proper gloves, face shield/safety goggles, shin and toe guards, and splash suits to protect workers from skin burns and injury when operating laser (high pressure washers)
	Handling Heavy Objects	<ul style="list-style-type: none"> • Observe proper lifting techniques • Obey sensible lifting limits • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads
Heavy Equipment & Vehicles (Continued)	Sharp Objects	<ul style="list-style-type: none"> • Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use
	High Noise Levels	<ul style="list-style-type: none"> • Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period)
	High/Low Ambient Temperature	<ul style="list-style-type: none"> • Monitor for Heat/Cold stress in accordance with OHM Health and Safety Procedures Manual

3.4.8 ACTIVITY HAZARD ANALYSIS FOR EQUIPMENT DECONTAMINATION		
TASK BREAKDOWN	POTENTIAL HAZARDS	HAZARD CONTROL MEASURES
Roll-offs & Containers	Slips, Trips, Falls	<ul style="list-style-type: none"> • Clear, walkways of equipment, vegetation, tools, excavated material, and debris • Mark, identify, or barricade other obstructions
	Struck by, Against Heavy Equipment, Protruding Objects, & Splashes	<ul style="list-style-type: none"> • Use reflective warning vests when exposed to vehicular traffic • Avoid equipment swing areas • Make eye contact with operators before approaching equipment • Wear hard hats, safety glasses with side shields, or goggles with splash shields and steel-toe safety boots • Understand and review hand signals
Roll-offs & Containers (Continued)	Flammable, Toxic, Oxygen deficient Atmospheres	<ul style="list-style-type: none"> • Test vessel atmosphere for flammable/toxic vapors, and oxygen deficiency • Review contaminant MSDS with workers and observer before starting work • Wear proper level of PPE for the type of atmospheric contaminants • Use body harness, safety belt with tripod wench for possible rescue • Obtain Confined Space Entry Permit signed by Supervisor/Safety Officer
	Inhalation and Contact with Hazardous Substances	<ul style="list-style-type: none"> • Provide workers proper skin, eye and respiratory protection based on the exposure hazards present • Review MSDS information before starting work
	Burns	<ul style="list-style-type: none"> • Use proper gloves, face shield/safety goggles, shin and toe guards, and splash suits to protect workers from skin burns and injury when operating laser (high pressure washers)
	Handling Heavy Objects	<ul style="list-style-type: none"> • Observe proper lifting techniques • Obey sensible lifting limits • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads
	Sharp Objects	<ul style="list-style-type: none"> • Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use

3.4.8 ACTIVITY HAZARD ANALYSIS FOR EQUIPMENT DECONTAMINATION		
TASK BREAKDOWN	POTENTIAL HAZARDS	HAZARD CONTROL MEASURES
Roll-offs & Containers (Continued)	High Noise Levels	<ul style="list-style-type: none"> Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period)
	High/Low Ambient Temperature	<ul style="list-style-type: none"> Monitor for Heat/Cold stress in accordance with OHM Health and Safety Procedures Manual

SECTION 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 include streambed excavation areas, roll-off boxes, any sediment storage, staging areas and the placement area, once placement activities begin.

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 include designated decontamination pad locations and specific personnel entrance/exits of the EZ.

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 crew, office/administrative trailers and site access roads beyond the decontamination stations.

4.4 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.



WORK AND SUPPORT AREAS

- 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.

SECTION 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

<i>TASK</i>	<i>PROTECTION LEVEL</i>	<i>COMMENTS/MODIFICATIONS</i>
Site Prep Construction	Level D	Coveralls, work boots, gloves, hard hat, and safety eyewear, hearing protection
Install gabion weir (sediments dam)	Level D	Splash suits, nitrile gloves, neoprene boots
Excavation of soil at bunker 606	Level D	Coveralls, work boots, gloves, hard hat, and safety eyewear, hearing protection, if required
Streambed Excavation	Level C/D	Splash suits, nitrile gloves, neoprene boots, tyveks; down grade to Level D if mercury levels remain below "action level" see Section 7
Pressure wash 36" concrete pipe	Level D/C	Upgrade to Level C (evacuate confined space) if air monitoring "action levels" in Section 7 are exceeded; Splash suit, tyvek, work boots and gloves
Transportation of contaminated sediments	Level D	Coveralls, work boots, gloves and safety eyewear, hearing protection, if required
Sediment placement, Compaction	Level C/D	Tyvek, work boots, gloves, hard hat, and safety eyewear, hearing protection; down grade to Level D if mercury, dust levels remain below "action level" see Section 7
Stream bed reconstruction	Level D	Splash suits, nitrile gloves, neoprene boots

- Outer nitrile, neoprene, or PVC gloves over latex sample gloves
- Face shield (when projectiles or splashes pose a hazard)
- Tyvek coverall [Saranex Tyveks (Sarans) and splash gear
- Hearing Protection

5.2.3 Level C

Level C consists of the following:

- Full-face, air-purifying respirator with GMC-H cartridges, mercury/chlorine cartridges if required
- Hooded Tyvek coveralls and Saranex Tyveks (Sarans) and splash gear
- Hard hat
- Steel-toed work boots
- Nitrile, neoprene, or PVC overboots
- Nitrile, neoprene, or PVC gloves over latex sample gloves
- Face shield (when projectiles or splashes pose a hazard)
- Hearing Protection

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.

5.2.5 Level A

Level A protection consists of the items required for Level B protection with the addition of a fully-encapsulating, vapor-proof suit capable of maintaining positive pressure.



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

OHM's air-purifying respirators are the MSA "Ultra-Twin" full-face respirators.

5.6 RESPIRATOR CARTRIDGES

The crew members working in Level C will wear respirators equipped with MSA GMC-H air-purifying cartridges or Mersorb mercury vapor cartridges, unless otherwise noted. The GMC-H cartridge holds approval for:

- 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/m³
- Asbestos-containing dusts and mists
- Radon daughters
- Radionuclides
- Pesticides

The crew members working in Level C using the Mersorb cartridges will work strictly in pairs to monitor each others color change indicator for immediate replacement of spent cartridges. Workers will inspect their own cartridges when doffing respirators to exit the EZ for breaks, lunch or change of work assignment.

The Mersorb cartridge holds approval for Mercury vapor concentrations up to the use limit of the respirator's protection factor (10X the PEL for ½ mask and 100X PEL for full-face respirator -- .5mg/m³ and 5.0 mg/m³ respectively).



5.7 CARTRIDGE CHANGES

All cartridges will be changed a minimum of once daily. However, water saturation of the HEPA filter or dusty conditions may necessitate more frequent changes. Changes will occur when 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 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 RESPIRATORY PROTECTION PROGRAM

The OHM Respiratory Protection Program complies with 29 CFR 1910.134. The primary objective of respiratory protection is to protect workers from exposure to airborne contaminants when engineering controls and work practices will not protect the worker without exceeding the exposure limits.

The criteria for determining respirator need are contained in Section 7.0 of this HASP. The GMC-H cartridges will protect employees from the hazardous substances specific to this site. All respirator users are OSHA trained in proper respirator use and maintenance. The SS and SSO will observe workers during respirator use for signs of stress and will monitor air levels of contaminants to ensure that respiratory protection is sufficient. The SS, CIH, and SSO will also evaluate this HASP weekly to determine its continued effectiveness.

All respirators and cartridges used will provide adequate protection against the hazards for which they were designed in accordance with applicable standards. All persons assigned to use respirators will have medical clearance to do so.

SECTION 6.0

DECONTAMINATION PROCEDURES

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 anticipated Level C decontamination procedure. The specific stages will vary depending on the site, the task, the protection level, etc.

1. Go to end of EZ
2. Wash and rinse outer boots and gloves in water
3. Remove outer boots and let dry
4. Remove/discard outer gloves
5. Cross into CRZ
6. Wash Splash Suit
7. Rinse Splash Suit
8. Remove Splash Suit
9. Remove sample gloves and discard
10. Remove and wash respirator
11. Rinse respirator and hang to dry
12. Remove Suran/Tyvek and discard
13. Remove booties and discard
14. Remove sample gloves and discard

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.

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 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 liquids and disposable clothing will be treated as contaminated waste and disposed of properly.

SECTION 7.0 AIR MONITORING

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.

<i>Monitoring Device</i>	<i>Action Level</i>	<i>Action</i>
LEL/O ₂	>10% LEL <20.8% O ₂	Evacuate area, ventilate, upgrade to Level B if necessary, continue to monitor
PID	1-5 ppm unknowns	Level C
	5-500 ppm unknowns	Level B
	>500 ppm unknowns	Level A
Mini-RAM	>1mg/m ³ - 10mg/m ³	Level C
Mercury Vapor Analyzer	>.03mg/m ³	Level C

7.1 LOWER EXPLOSIVE LIMIT/OXYGEN (LEL/O₂) 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/O₂ measurements will be taken.

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.

For known contaminants only, to determine a protection level from PID data, the SSO will multiply the TLV of the known compound by 25. This will be the limit for Level C protection for that compound. If PID readings exceed 25 times the TLV, Level B protection will be required. Also, regardless of the TLV, a PID reading of 1,000 ppm or more will indicate that the GMC-H cartridges may become overloaded and will necessitate Level B protection. (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.

7.3 PORTABLE TOTAL DUST MONITOR

A mini-ram will be used to monitor the general respirable dust levels on this site. The air sampling will be performed at designated locations at the site perimeter, upwind and downwind of the active work areas in the (EZ). Site conditions will determine the frequency and duration of dust monitoring. Mini-ram readings will trigger dust abatement actions and PPE upgrades.

7.3.1 Type and Operational Aspects

- Real-Time Aerosol Monitor (Mini Ram Model PDM-3)
 - Principle of Operation
 - Detection of light in the near infrared region back-scattered to a sensor (photovoltaic detector) by airborne particulate in a sensing volume
 - The higher the dust concentration the more back-scattering of light to the sensor, resulting in increased readings
 - Device calibrated at the factory against an air sampling filter/gravimetric analysis reference method

7.3.2 Calibration Methods/Frequencies

There is no calibration method or procedure for calibrating the mini-ram monitor. However, it is recommended that the mini-ram monitor be re-zeroed once a week. During a zero check, the sampled air passes through the purge air filter and dryer to effect a self-cleaning of the optical chamber.

7.3.3 Preventative Maintenance

Maintenance of the mini-ram consists of replacement of filters and desiccant; battery replacement; and cleaning of the optical detection assembly.

7.4 MERCURY VAPOR ANALYZER

A gold film mercury vapor analyzer, Model 411 (or equivalent) will be used to sample for possible mercury vapor in the EZ work areas. It is designed to detect a minimum airborne concentration of .001mg/m³ of mercury. Should the "action level" for mercury be exceeded (sustained readings of .03 mg/m³ for continuous periods exceeding 5 minutes) the workers will don Level C protection using the MSA mercury/chlorine chemical filters (see Appendix F).

7.4.1 Principle of Operation

The Mercury Vapor Analyzer (MVA) operates on the principle of adsorption of mercury vapor onto a piece of thin gold film. The film will undergo a change in electrical resistance as the mercury is adsorbed. The gold film is selective in its adsorption of elemental mercury and eliminates interference from other common airborne substances. A precise amount of air is drawn in passing over the gold film and the resulting signal is displayed on an LCD meter. A sensor status circuit monitors the per cent of saturation of the gold film and if saturation occurs the film can be manually heated to remove the adsorbed mercury which is trapped within an internal activated carbon filter.

7.4.2 Calibration Procedure

The MVA is calibrated at the point of manufacture and the stability of the gold film usually maintains the calibration for a year or more. The manual outlines a calibration check using a mercury source to verify the calibration is accurate. This calibration check should be performed under ideal conditions and requires three hours to complete. Upon completion the films are heated and the MVA is ready for use.

7.4.3 Preventative Maintenance

The MVA maintenance recommends that mercury vapor not be left on the gold film any longer than necessary. The longer the contact the longer it takes the mercury to evaporate from the film. Films should be heated whenever saturation occurs, at the end of each day of use and after periods of storage exceeding three (3) months. Additional maintenance includes charging the batteries and changing the intake filter disk, to prevent dust, dirt from damaging the internal air pump.

7.5 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.

7.6 CALIBRATION REQUIREMENTS

The PID, LEL/O₂ meter will be calibrated daily prior to use. A separate log will be kept detailing date, time, span gas, or other standard, and name of person performing the calibration.

7.7 AIR MONITORING RESULTS

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

SECTION 8.0

EMERGENCY RESPONSE AND CONTINGENCY PLAN

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 ERCP:

Fire/Explosion	<ul style="list-style-type: none"> • The potential for human injury exists. • Toxic fumes or vapors are released. • The fire could spread on site or off site and possibly ignite other flammable materials or cause heat-induced explosions. • The use of water and/or chemical fire suppressants could result in contaminated run-off. • An imminent danger of explosion exists.
Spill or Release of Hazardous Materials	<ul style="list-style-type: none"> • The spill could result in the release of flammable liquids or vapors, thus causing a fire or gas explosion hazard. • 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.
Spill or Release of High Temperature Liquid or Vapor	<ul style="list-style-type: none"> • The spill can be contained on site, but the potential exists for ground-water contamination. • The spill cannot be contained on site, resulting in off-site soil contamination and/or ground-water or surface water pollution. • The spill quantity is greater than the reportable quantity limit for the material.
Natural Disaster	<ul style="list-style-type: none"> • A rain storm exceeds the flash flood level. • The facility is in a projected tornado path or a tornado has damaged facility property. • Severe wind gusts are forecasted or have occurred and have caused damage to the facility.
Medical Emergency	<ul style="list-style-type: none"> • Overexposure to hazardous materials. • Trauma injuries (broken bones, severe lacerations/bleeding, burns). • Eye/skin contact with hazardous materials. • Loss of consciousness. • Heat stress (Heat stroke). • Cold stress (Hypothermia). • Heart attack. • Respiratory failure. • Allergic reaction.



EMERGENCY RESPONSE AND CONTINGENCY PLAN

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



EMERGENCY RESPONSE AND CONTINGENCY PLAN

Once a hazard has been recognized, the Site Supervisor 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> -- Indian Head, MD	
Fire Department	301-743-3900
Police	301-870-3232 (County Sheriff)
Hospital -- Physicians Memorial Hospital	301-609-4000
Take Rt 225 to US Rt 301 turn RIGHT on 301 toward Laplata, MD; entering Laplata, 2nd traffic light turn LEFT to Route 6 (East Charles St) hospital is ¼ mile ahead	
Regional Poison Control Center	800-552-6337
<u>State Agencies</u>	
Maryland Department of the Environment	800-633-6101
<u>Federal Agencies</u>	
EPA Region Branch Response Center	215-597-9800
Agency for Toxic Substances and Disease Registry	404-639-0615 (24 HR)
U.S. Coast Guard	804-484-8192
National Response Center	800-424-8802
Project Manager Rich Novak	412-963-2300
Director, Health and Safety	
Kevin McMahon	609-588-6375
OHM Corporation (24 hour)	800-537-9540
Additional Phone #'s in Section 2 this HASP	



EMERGENCY RESPONSE AND CONTINGENCY PLAN

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 Site Supervisor. 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. Specifically:
- 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 local Fire Department.



EMERGENCY RESPONSE AND CONTINGENCY PLAN

- 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.
- Notify the USEPA Regional Administrator that cleanup procedures have been completed and that all emergency equipment is fit for its intended use before resuming operations in the affected area of the facility. The USEPA Regional Administrator's telephone number is included in the Emergency Contacts.
- Record time, date, and details of the incident, and submit a written report to the USEPA Regional Administrator. Report is due to USEPA within 15 days of the incident.

8.4 SAFE DISTANCES AND PLACES OF REFUGE

The emergency coordinator for all activities will be the Response Manager. 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.



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In the event of minor hazardous materials releases (small spills of low toxicity), workers in the affected area will report initially to the contamination reduction zone. 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
- Hazardous weather

In general, evacuation will be made to the crew trailers, 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 site 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.



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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.



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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



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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 site, as needed, to provide for safety and first aid during emergency responses.

- ABC-type fire extinguisher
- First-aid kit, industrial size
- Eyewash/safety shower
- Emergency oxygen unit
- Emergency signal horn
- Self contained breathing apparatus (two)
- Stretcher/backboard

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.



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<i>EQUIPMENT NAME</i>	<i>APPLICATION</i>
Portable H-NU Photoionization Meter	Measures selected inorganic and organic chemical concentrations
MSA Oxygen and Combustible Gas Meter	Measures oxygen and combustible gas levels
Draeger Detector Tubes	Assorted detector tubes to measure specific chemical concentrations

8.6.4 Personal Protective Equipment

A supply of two (minimum) SCBAs will be located in the support zone for use in emergency response to hazardous materials releases. They will be inspected at least monthly, according to OSHA requirements. In addition, all 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, depending on the types of hazardous materials present on site. The majority of this material will be located in the support zone, in a supply trailer or storage area. Small amounts will be placed on pallets and located in the active work areas.

- Sand or clay to solidify/absorb liquid spills.
- Lime (calcium oxide), soda ash (sodium carbonate), or baking soda (sodium bicarbonate) for neutralizing acid (pH <7) spills.
- Activated charcoal (carbon) to adsorb organic solvents (hydrocarbons) and to reduce flammable vapors.
- Citric acid for neutralizing caustic (pH >7) spills.
- Vapor-suppressing foam, if required by the Client, for controlling the release of volatile organic compounds.
- Appropriate solvents e.g. CITRIKLEEN, for decontamination of structures or equipment.

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

- Plastic shovels for recovering corrosive and flammable materials.
- Sausage-shaped absorbent booms for diking liquid spills, drains, or sewers.
- Sorbent sheets (diapers) for absorbing liquid spills.
- Overpack drums for containerizing leaking drums.



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- 55-gallon open-top drums for containerization of waste materials.

*NOTE: All contaminated soils, absorbent materials, solvents and other materials resulting from the clean-up of spilled or discharged substances shall be properly stored, labelled, 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.

8.8 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.

8.8.1 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.



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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.

8.8.2 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

8.8.3 Directions To Hospital

Written directions to the hospital and a map will be posted in all trailers in the staging area. Directions to the hospital are as follows:

Take Rt 225 to US Rt 301 turn RIGHT on 301 toward Laplata, MD; entering Laplata, 2nd traffic light turn LEFT to Route 6 (East Charles St) hospital is ¼ mile ahead

Directions: Take WV Rt 956 to Rt 220 N to Cresaptown, MD; in Cresaptown take Winchester Rd to Bradock Rd; first light on Bradock Rd turn LEFT to Seaton Drive to Hospital (See Hospital Directions Map Appendix E)



EMERGENCY RESPONSE AND CONTINGENCY PLAN

8.9 FIRE CONTINGENCY MEASURES

Because flammable/combustible materials are present at this site, fire is an ever-present hazard. 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.

8.9.1 **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.

8.10 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



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8.10.1 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.

8.10.2 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

8.11 SPILL/RELEASE CONTINGENCY MEASURES

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

8.11.1 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



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The emergency coordinator will notify the Client Representative 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 Client. 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 Client Representative and obtain his concurrence with the remedial action plan.

SECTION 9.0 TRAINING REQUIREMENTS

As a prerequisite to employment at OHM, all field employees are required to take a 40-hour training class and pass a written examination. This training covers all forms of personal protective equipment, toxicological effects of various chemicals, handling of unknown tanks and drums confined-space entry procedures, and electrical safety. This course is in full compliance with OSHA requirements in 29 CFR 1910.120. In addition, all employees receive annual 8-hour refresher training and three day on-site training under a trained experienced supervisor. Supervisory personnel receive 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 Naval Surface Warfare Center, Site 8 Nitroglycerine Plant Office which will include potential site contaminants, site physical and environmental hazards, emergency response and evacuation procedures, and emergency telephone numbers will be held at the Site 8 location by the SS and SSO before any site work activities begin.

SECTION 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**

<i>Item</i>	<i>Initial</i>	<i>Annual</i>
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

APPENDIX B

OHM HAZARD COMMUNICATION PROGRAM

APPENDIX B

OHM HAZARD COMMUNICATION PROGRAM

1.0 GENERAL

The following written hazard communication program has been established for OHM Corporation. The purpose of this program is to transmit information about the various Chemical hazards in the work place to the workers 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, and employee training in accordance with 29 CFR 1910.1200 and 29 CFR 1926.59.

The program will be available in corporate and regional Health and Safety Departments for reviews by all employees. It will also be available in the corporate library and clearly marked "Employee Right-to-Know" stations located within each individual shop and on each job site. OHM Corporation will accomplish the hazard communication requirements through formal safety training, departmental safety meetings, and job site safety meetings.

2.0 RESPONSIBILITIES

Purpose: Overall responsibility rests with all corporate officers of OHM Corporation. 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.

Scope: This program is intended to cover those employees who are directly involved with the handling of hazardous materials or supervision of those activities.

2.1 Health and Safety Department Responsibilities

1. Review operations with supervisors to determine what tasks require hazard communication training.
2. 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.
3. Follow up through safety meetings and safety audits to ensure that supervisors are carrying out prescribed company policy.
4. Notify supervisors of any operating changes affecting the hazardous materials being used.
5. Periodically audit the Hazard Communication Program's progress. Initially, this should be done biweekly, but later the audit may be done on a monthly or quarterly basis.



2.2 Training Department Responsibilities

1. Ensure that up-to-date records are maintained on training of all employees required to handle hazardous materials. 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.
2. Educate personnel upon initial training to the requirements of the Hazard Communication Standard.

2.3 Supervisor Responsibilities

1. Identify jobs requiring the use of hazardous chemicals and provide lists of those jobs and chemicals to the Health and Safety Department.
2. Provide the training required by the Hazard Communication Standard and document training of employees in the safe handling of hazardous materials.
3. Inspect engineering controls and personal protective equipment before each use. Health and Safety can help determine a suitable inspection plan for each application as needed.
4. Make daily surveys of the work area to ensure that safe practices are being followed. Advise employees of unsafe work practices on the first occasion and consider further violations as disciplinary violations.
5. Ensure required labeling practices are being followed. Labeling should be affixed to the container when it arrives. If the contents are transferred to another container, then all label information (manufacturer, product name, and product number) must also be affixed to the new container, so that all containers of the material, regardless of size, are labeled.
6. Enforce all applicable safety and health standards through periodic audits.
7. Before ordering a material, determine if a Material Safety Data Sheet exist on file. Request an MSDS for any material without one.
8. Send all new MSDSs to the Health and Safety Department after making a copy for the Employee Right-to-Know file.

2.4 Employee Responsibilities

1. Obey established safety rules and regulations
2. Use all safety procedures and personnel protective equipment as required by company procedures
3. Notify supervisor of the following:
 - a. Any symptoms or unusual effects that may be related to the use of hazardous chemicals.
 - b. Any missing or unreadable labels on containers.
 - c. Missing, damaged, or malfunctioning safety equipment.



4. Use approved labels on containers; do not remove labels (labels will be located in the warehouse).
5. Do not use unapproved containers for hazardous materials. (Is material and container compatible?)
6. Know where emergency equipment and first-aid supplies are located before considering a possibly dangerous task.
7. Know location of Material Safety Data Sheets (MSDS). These will be located in the "Employee Right-to-know" station for the respective shop/job site.
8. 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

1. Ensure MSDS are received with initial shipment of a hazardous material; if not, contact purchasing to request the appropriate MSDS and also call the Health and Safety Department to determine if there is an MSDS available until the requested MSDS arrives.
2. Ensure labels are affixed to all containers.
3. Store hazardous materials in designated locations.
4. Use proper personal protective equipment when handling hazardous materials.
5. Report damaged containers or spills to the appropriate Health and Safety Department immediately.
6. Request an MSDS from the manufacturer for any hazardous material that arrives in Findlay from a job. Also, a MSDS shall accompany any hazardous material that is sent to a job.

3.0 HAZARD DETERMINATION

OHM Corporation will rely on Material Safety Data Sheets from hazardous chemical supplies 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 chemical hazard unless approved by the Health and Safety.

4.0 LABELING

The shipping and receiving supervisors will be responsible for seeing that all containers arriving at OHM Corporation are properly and clearly labeled. Shipping and receiving 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, the supervisor or department manager 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 correctly after initial discovery.

Each supervisor or department manager shall be responsible for seeing that all portable containers used in their work area are properly labeled with chemical identity and hazard warning.



Supervisors or department managers 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 supervisor or manager 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 way to identify the material in the container, the container should be set aside, away from all personnel until it can be tested by the Health and Safety Department or laboratory personnel. Supervisors and managers shall communicate their findings or awareness of such containers to all personnel in the area and to those who enter later.

5.0 MATERIAL SAFETY DATA SHEETS (MSDS)

Each supervisor or department manager at OHM Corporation will be responsible for maintaining a current MSDS relevant to the hazardous chemicals used in their area. The Health and Safety Department will be responsible for compiling the master MSDS file for the facility and aiding all shops/job sites with the completion and maintenance of their respective MSDS files.

All MSDS will be readily available for review by all employees during each work shift. Each shop/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.

Although manufacturers are required to provide employers with MSDSs on an initial chemical shipment, OHM Corporation purchasing agents (and supervisors purchasing their own material) shall request MSDSs and updates to MSDS on all purchase orders. Supervisors and department managers that are without proper MSDSs shall be responsible for requesting this information from manufacturers for chemicals. A file of followup letters shall be maintained for all hazardous chemical shipments received without MSDSs.

6.0 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 Corporation, 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 daily, morning, shop specific safety meetings, which shall be documented according to topic, major points discussed, and names of those attending (attendance is mandatory). Also, biweekly hazardous chemical safety meetings will be prepared by the Health and Safety Department using similar documentation for shop areas. Attendance is mandatory for these meetings also. Documentation for shop safety meetings will be available in the respective Employee Right-to-know stations and biweekly safety meeting documentation will be available in the Health and Safety Department to all employees for these meetings also. Documentation for shop safety meetings will be available in the respective Employee Right-to-know stations and biweekly safety meeting documentation will be available in the Health and Safety Department to all employees for further referencing and questioning. Records of all formal training conducted at OHM Corporation is coordinated and maintained by the Training Department secretary.



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

- The requirements of 29 CFR 1910.1200--Hazard Communication--Evaluating the potential hazards of chemicals and communication information concerning hazards and appropriate protective measures to employees. This is accomplished in several different ways including, but no 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 MSDS sheets--Notices 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.
- What the company has done to lessen or prevent workers' exposure to these chemicals.

Employee training shall include at least:

- 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 and health hazards of the chemicals in the work area (accomplished through periodic physical and chemical hazard awareness sessions developed by the Health and Safety Department). These sessions shall serve as chemical hazards refreshers.
- The methods of preventing exposure to hazardous chemicals including the measures OHM Corporation has taken to protect the employees.
- Procedures to follow if OHM Corporation employees are exposed to hazardous chemicals (location of nearest phone, emergency eyewash, and shower will be included). These discussions shall include proper operating procedures for all emergency equipment.
- The details of the hazard communication program developed by OHM Corporation, including an explanation of the labeling system and the Material Safety Data Sheets, and how employees can obtain and use the appropriate hazard information.
- Standard operating procedures within each respective shop. OHM Corporation company policy determines what is considered standard operating procedures.
- Procedures for workers involved in non-routine tasks.

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



7.0 HAZARDOUS NON-ROUTINE TASKS

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

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

The following is list of some of the non-routine tasks which may occur at OHM Corporation together with some information needed to complete the tasks safely.

- Confined Space Entry
 - Obtain confined space entry procedure/permit from Health and Safety Department and follow all protocol before beginning task. Compete and have supervisor sign permit before any work begins.
 - Monitor atmosphere with explosimeter, oxygen meter, and any toxic gas meter as may be appropriate.
 - Discuss specific chemical hazards.
 - Discuss protective/safety measures the employee can take (e.g., Personal protective equipment and engineering controls) use of life lines, lock-out/tagout procedures, etc.
 - Measures the company has taken to lessen the hazards including ventilation, respirator, presence of another employee, and emergency procedures.
- Excavation, Trenching, and Shoring
 - Obtain guidelines from Health and Safety Department before beginning task.
 - Comply with all requirements set forth for this activity in 29 CFR Subpart P (excavating, trenching, shoring).
 - Discuss specific chemical hazards.
 - Follow confined space entry procedure above if trench is above shoulder height.
 - Discuss protective/safety measures the employee can take.
 - Review appropriate accident prevention steps.



- Decontamination of Equipment
 - Determine possible contaminants and the hazards associated with them.
 - Determine personal protection needed by contacting the Health and Safety Department.
 - Alert all personnel in areas of contamination and decontamination
 - Contain and secure all contaminated materials and decontamination materials.
 - Contact the Health and Safety Department for proper disposal.

It is company policy that no OHM Corporation employee will begin work on any non-routine task without first receiving a safety briefing from their supervisor or a Health and Safety Department representative.

8.0 INFORMING CONTRACTORS

- 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
- 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 Corporation 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.

The Health and Safety Department shall offer assistance in providing the above information to contractors working at OHM Corporation. On initial visit by a contractor to OHM Corporation, 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.

APPENDIX C

MSDS LIST

Material Safety Data Sheet

From Genium's Reference Collection
 Genium Publishing Corporation
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MERCURY
 (Revision C)
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26

SECTION 1. MATERIAL IDENTIFICATION

Material Name: MERCURY

Description (Origin/Uses): Used in barometers, thermometers, hydrometers, and pyrometers; in mercury arc lamps producing ultraviolet rays; in switches and fluorescent lamps; as a catalyst in oxidations of organic compounds; in alloys; in explosives; and for extracting gold and silver from ore.

Other Designations: Colloidal Mercury; Metallic Mercury; Quicksilver; Hg; Hydrargyrum;

CAS No. 7439-97-6

Manufacturer: Contact your supplier or distributor. Consult the latest edition of the *Chemicalweek*

Buyers' Guide (Genium ref. 73) for a list of suppliers.

Comments: Inorganic and organic mercury compounds are highly toxic, as is pure mercury.



Genium

HMIS

H 3 R 1

F 0 I 4

R 0 S 1

PPG* K 0

*See sect. 8

SECTION 2. INGREDIENTS AND HAZARDS

Mercury, CAS No. 7439-97-6

%
Ca 100

EXPOSURE LIMITS

OSHA PEL

Ceiling: 1 mg per 10 m³

ACGIH TLV (Skin*), 1987-88
 TLV-TWA: 0.05 mg/m³ as Hg (Mercury Vapor)

Toxicity Data**

Rabbit, Inhalation, LC₅₀: 29 mg/m³
 (30 Hrs)

*Mercury can be absorbed through intact skin, which contributes to overall exposure.

**See NIOSH, RTECS (OV4550000), for additional data with references to reproductive, mutagenic, and tumorigenic effects.

SECTION 3. PHYSICAL DATA

Boiling Point: 673°F (357°C)

Specific Gravity (H₂O = 1): 13.546 at 68°F (20°C)

Vapor Pressure: 0.0018 Torr at 77°F (25°C)

Water Solubility (%): Insoluble

Molecular Weight: 201 Grams/Mole

Melting Point: -37.93°F (-38.85°C)

Appearance and Odor: A silver, heavy liquid; odorless. Danger: Mercury vapor has no warning properties.

SECTION 4. FIRE AND EXPLOSION DATA

LOWER

UPPER

Flash Point and Method

Autoignition Temperature

Flammability Limits in Air

*

*

% by Volume

*

*

Extinguishing Media: *Mercury does not burn. Use extinguishing agents that will put out the surrounding fire.

Unusual Fire or Explosion Hazards: When exposed to the high temperatures that occur during a fire, mercury can vaporize to form extremely toxic fumes.

Special Fire-fighting Procedures: Wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive-pressure mode.

SECTION 5. REACTIVITY DATA

Mercury is stable in closed containers at room temperature under normal storage and handling conditions. It cannot undergo hazardous polymerization.

Chemical Incompatibilities: Hazardous reactions involving mercury and acetylene, ammonia, boron phosphodiiodide, chlorine, chlorine dioxide, methyl azide, sodium carbide, nitric acid, oleum, and sulfuric acid are reported (Genium ref. 84).

Conditions to Avoid: Do not expose mercury to incompatible chemicals.

Hazardous Products of Decomposition: Extremely toxic mercury metal fumes are likely to be produced during fires.

SECTION 6. HEALTH HAZARD INFORMATION

Mercury is not listed as a carcinogen by the NTP, IARC, or OSHA.

Summary of Risks: Mercury is very toxic due to its liquid and fat solubility, lack of charge, and membrane permeability. It is a slowly cumulative poison that concentrates in the brain, kidneys, and liver. It is very hazardous when spilled or heated. Mercury and its vapor are rapidly absorbed by the membranes lining the respiratory tract, the gastrointestinal (GI) tract, and the skin. Mercury is a teratogen (causes physical defects in embryos). **Medical Conditions Aggravated by Long-Term Exposure:** Preexisting problems of the target organs can be worsened. Provide preplacement and periodic medical exams emphasizing the target organs.

Target Organs: Skin, eyes, respiratory system, central nervous system (CNS), kidneys. **Primary Entry:** Skin absorption/contact, inhalation. **Acute Effects:** Erosion of the respiratory/GI tracts, nausea, vomiting, bloody diarrhea, shock, headache, metallic taste. Inhalation of high concentrations for short periods can cause pneumonitis, chest pain, dyspnea, coughing, stomatitis, gingivitis, and salivation. **Chronic Effects:** Tremors, emotional problems, loss of concentration, depression, drowsiness, fatigue, insomnia, loss of memory, kidney problems, eye lesions, vision disturbances, sore mouth and throat, problems with the sense of taste or smell, nosebleeds, nasal inflammation, loss of weight or appetite, poor hand-eye coordination, awkwardness, and unsteadiness, as well as dermatitis. **FIRST AID: Eyes.** Immediately flush eyes, including under the eyelids, gently but thoroughly with plenty of running water for at least 15 minutes. **Skin.** Immediately wash the affected area with soap and water because of the increased exposure from skin absorption. **Inhalation.** Remove exposed person to fresh air; restore and/or support his or her breathing as needed. Have medical personnel administer oxygen to treat the chemical pneumonitis that may develop. **Ingestion.** Never give anything by mouth to someone who is unconscious or convulsing. Note to physician: If indicated by degree of ingestion, saline cathartics and charcoal should be used. Chelation therapy with d-penicillamine may also be indicated.

GET MEDICAL HELP (IN PLANT, PARAMEDIC, COMMUNITY) FOR ALL EXPOSURES. Seek prompt medical assistance for further treatment, observation, and support after first aid. Treatment of chronic mercury poisoning requires expert medical care. At the first signs, immediately remove the exposed person from further exposure and have him or her examined and treated by a physician trained in occupational mercury poisoning.

SECTION 7. SPILL, LEAK, AND DISPOSAL PROCEDURES

Spill/Leak: Notify safety personnel, restrict access to the spill area to necessary personnel, and provide adequate ventilation. Clean up spills promptly. Specialized equipment and/or techniques may be required to safely deal with large mercury spills; if large quantities of mercury are used in the workplace, detailed, prior spill-management planning is recommended. Collect spilled mercury by using a suction pump and an aspirator bottle with a long capillary tube. For finely divided mercury in inaccessible cracks, corners, etc., treatment with calcium polysulfide and excess sulfur is recommended to convert the mercury globules into mercury sulfide. Vacuum cleaners may be used if they are equipped with specially designed mercury-absorbent exhaust filters. Collect the mercury into tightly sealed containers for later disposal or reclamation. Cleanup personnel must use the recommended personal protective equipment (see sect. 8).

Waste Disposal: Consider reclamation, recycling, or destruction rather than disposal in a landfill. Do not pour mercury down a drain. Mercury is very harmful to the environment. Contact your supplier or a licensed contractor for detailed recommendations. Follow Federal, state, and local regulations.

OSHA Designations

Air Contaminant (29 CFR 19010.1000 Subpart Z)

EPA Designations (40 CFR 302.4)

RCRA Hazardous Waste No. U151

CERCLA Hazardous Substance, Reportable Quantity: 1 lb (0.454 kg)*

*Per the Clean Water Act, § 407 (a); Clean Air Act, § 112; and Resource Conservation and Recovery Act, § 3001.

SECTION 8. SPECIAL PROTECTION INFORMATION

Goggles: Always wear protective eyeglasses or chemical safety goggles. Where splashing of mercury may occur, wear a full face shield or splash guard. Follow OSHA eye- and face-protection regulations (29 CFR 1910.133).

Respirator: Use a NIOSH-approved respirator per the *NIOSH Pocket Guide to Chemical Hazards* for the maximum-use concentrations and/or the exposure limits cited in section 2. Follow OSHA respirator regulations (29 CFR 1910.134). **Other:** Wear impervious gloves, boots, aprons, gauntlets, etc., to prevent any contact with mercury and the skin.

Ventilation: Install and operate general and local ventilation systems powerful enough to continuously maintain airborne levels of mercury below the OSHA PEL standard cited in section 2.

Safety Stations: Make emergency eyewash stations, washing facilities, and safety/quick-drench showers available in work areas.

Contaminated Equipment: Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them. Do not wear contact lenses in any work area. Remove contaminated clothing and launder it before wearing it again; clean mercury from shoes and equipment. Separate work and street clothes; store work clothes in special lockers and always shower before changing to street clothes.

Comments: Practice good personal hygiene; always wash thoroughly after using this material. Keep it off of your clothing and equipment. Avoid transferring it from your hands to your mouth while eating, drinking, or smoking. Do not eat, drink, or smoke in any work area.

SECTION 9. SPECIAL PRECAUTIONS AND COMMENTS

Storage/Segregation: Store mercury in a cool, dry, well-ventilated area in tightly closed unbreakable polyethylene containers. Protect these containers from physical damage.

Special Handling/Storage: Construct storage areas to have smooth, hard, nonporous floors with no cracks or spaces so that spilled mercury globules do not form in inaccessible areas.

Comments: Mercury evaporates slowly, but if it is spilled it can form many tiny globules that evaporate much faster than a single pool of it will. In an unventilated area, significant concentration of mercury vapor can develop from this enhanced evaporation effect. This poisonous vapor is particularly hazardous if breathed over a long period of time, so spills or releases of mercury require very meticulous cleaning procedures.

Transportation Data (49 CFR 172.101-2)

DOT Shipping Name: Mercury, Metal

DOT Hazard Class: ORM-B

DOT Label: None

DOT ID No. NA2809

IMO Class: 8

IMO Label: Corrosive

References: 1, 2, 8, 26, 38, 84-94, 100.

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Prepared by PJ Igoe, BS

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APPENDIX D
EXCAVATION PROCEDURES



OHM Corporation

HEALTH & SAFETY PROCEDURES

EXCAVATION

PROCEDURE NUMBER 28

Page 1 of 8

LAST REVISED 12/92 APPROVED BY: JFK/FHH

1. OBJECTIVE

OHM Remediation Services Corp. (OHM) will control the hazards posed by open excavation through strict compliance with this procedure and the provisions of the excavation permit.

2. SCOPE, APPLICATION AND PURPOSE

This procedure outlines requirements for all open excavations made in the earth's surface. Excavations are defined to include trenches. This policy is intended to protect personnel from the hazards of collapse.

3. REGULATORY REQUIREMENTS

This procedure will follow the guidelines of 29 CFR 1926, Subpart P - Excavations. In the case of United States Army Corp of Engineers projects, the requirements of EM 385-1-1, Section 23 will be observed. In the event of a conflict between these referenced standards, the more stringent will prevail.

4. GENERAL REQUIREMENTS

Safety operations while working in and around excavations involve many factors. Factors to be evaluated and discussed before starting work at daily safety meetings include:

4.1 Surface Encumbrances

All surface encumbrances that are located so as to create a hazard to employees shall be removed or supported, as necessary to safeguard employees.

4.2 Underground Installations/Utility Locations

The estimated location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be determined prior to opening an excavation.

- 4.2.1 Utility companies or the state utility protection service shall be contacted at least two (2) working days prior to excavation activities to be advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation.
- 4.2.2 OHM personnel and sub-contractors should be careful to protect and preserve the markings of approximate locations of facilities until the markings are no longer required for safe and proper excavations.
- 4.2.3 If the markings of utility locations are destroyed or removed before excavation commences or is completed, the OHM competent person must notify the utility company or utility protection service to inform them that the markings have been destroyed. Normally, it will take two (2) working days of the notice for the utility protection service to remark the locations.
- 4.2.4 OHM equipment operators shall maintain a reasonable clearance between any underground utility and the cutting edge or point of powered equipment.
- 4.2.5 When excavating with powered equipment within 18 inches of the markings of underground facilities, personnel should conduct the excavation in a careful and prudent manner, excavating by hand to determine the precise location of the facility/utility and to prevent damage.
- 4.2.6 While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees.

4.3 **ACCESS AND EGRESS**

4.3.1 **Structural Ramps**

Structural ramps that are used solely by employees as a means of access or egress from excavations shall be designed by a competent person. Structural ramps used for access or egress of equipment shall be designed by a competent person qualified in structural design, and shall be constructed in accordance with the design.

Ramps and runways constructed of two or more structural members shall have the structural members connected together to prevent displacement.

Structural members used for ramps and runways shall be of uniform thickness.

Cleats or other appropriate means used to connect runway structural members shall be attached to the bottom of the runway or shall be attached in a manner to prevent tripping.

Structural ramps used in lieu of steps shall be provided with cleats or other surface treatments on the top surface to prevent slipping.

4.3.2 Means of Egress from Trench Excavations

A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are 4 feet or more in depth so as to require no more than 25 feet of lateral travel for employees.

4.4 EXPOSURE TO VEHICULAR TRAFFIC

Employees exposed to public vehicular traffic shall be provided with and shall wear, warning vests or other suitable garments marked with or made of reflectorized or high-visibility material.

4.5 EXPOSURE TO FALLING LOADS

No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped, in accordance with 29 CFR 1926.601(b)(6), to provide adequate protection for the operator from falling objects during loading and unloading operations.

4.6 WARNING SYSTEM FOR MOBILE EQUIPMENT

When mobile equipment is operated adjacent to an excavation or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand or mechanical signals or stop logs. If possible, the grade should be away from the excavation.

4.7 HAZARDOUS ATMOSPHERES

4.7.1 Testing and Controls

In addition to the requirements set forth, 29 CFR 1926.50 - 1926.107; to prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirements shall apply:

Where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are suspected, the atmospheres in the excavation shall be tested before employees enter excavations greater than 4 feet in depth.

Adequate precautions shall be taken, to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres. These precautions include providing proper respiratory protection or ventilation as needed.

Adequate precaution shall be taken such as providing ventilation, to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 10 percent of the lower explosive limit (LEL) of the gas or vapor. When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe.

4.7.2 Emergency Rescue Equipment

Emergency rescue equipment, such as self contained breathing apparatus (SCBA), a safety harness and line, or a basket stretcher, shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment shall be attended when in use.

Employees entering bell-bottom pier holes or other similar deep and confined excavations, shall wear a harness with a life-line securely attached to it. The lifeline shall be separate from any line used to handle materials, and shall be individually attended at all times while the employee wearing the lifeline is in the excavation.

4.8 PROTECTION FROM HAZARDS ASSOCIATED WITH WATER ACCUMULATION

Employees shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline.

If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations shall be monitored by a competent person to ensure proper operation.

If excavation work interrupts the natural drainage of surface water (such as streams); diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to run-off from heavy rains will require an inspection by a competent person.

4.9 STABILITY OF ADJACENT STRUCTURES

Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protection of employees.

Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted except when:

- 4.9.1 A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure; or
- 4.9.2 The excavation is in stable rock; or
- 4.9.3 A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity; or
- 4.9.4 A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.

4.9.5 Sidewalks, pavements, and other structures shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.

4.10 PROTECTION OF EMPLOYEES FROM LOOSE ROCK OR SOIL

Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of scaling to remove loose material; installation of protective barricades at intervals as necessary on the excavation face to stop and contain falling material; or other means that provide equivalent protection.

Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least 2 feet from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

4.11 INSPECTIONS

Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are required when employee exposure can be reasonably anticipated. An Excavation/Trenching Permit must be completed by the competent person to document the inspections.

Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

4.12 FALL PROTECTION

Where employees or equipment are required or permitted to cross over excavations; walkways, or bridges with standard guardrails shall be provided.

Adequate barrier for physical protection shall be provided at all remotely located excavations. All wells, pits, shafts, etc. shall be barricaded or covered. Upon completion of exploration and similar operations, temporary wells, pits, shafts, etc., shall be covered or backfilled.

5. SOIL CLASSIFICATION

OSHA Soil Classification (Appendix A to Subpart P)

5.1 Type A means:

Cohesive soils with an unconfined compressive strength of 1.5 ton per square foot (tsf) (144 kPa) or greater. Examples of cohesive soils are: clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered Type A. However, no soil is Type A if:

- 5.1.1 The soil is fissured; or
- 5.1.2 The soil is subject to vibration from heavy traffic, pile driving, or similar effects; or
- 5.1.3 The soil has been previously disturbed; or
- 5.1.4 The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater; or
- 5.1.5 The material is subjected to other factors that would require it to be classified as a less stable material.

5.2 Type B means:

- 5.2.1 Cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa); or
- 5.2.2 Granular cohesionless soils including: angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam.
- 5.2.3 Previously disturbed soils except those which would otherwise be classed by Type C soil.
- 5.2.4 Soil that meets the unconfined compressive strength or cementation requirements for Type A, but is fissured or subjected to vibration; or

- 5.2.5 Dry rock that is not stable; or
- 5.2.6 Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4H:1H), but only if the material would otherwise be classified as Type B.
- 5.3 Type C means:
- 5.3.1 Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less; or
- 5.3.2 Granular soils including gravel, sand, and loamy sand; or
- 5.3.3 Submerged soil or soil from which water is freely seeping; or
- 5.3.4 Submerged rock that is not stable; or
- 5.3.5 Material in a sloped, layered system where the layers dip into the excavation or a slope of four horizontal to one vertical (4H:1V) or steeper.
6. TIMBER SHORING, ALUMINUM HYDRAULIC AND ALTERNATIVES TO SHORING
- Refer to 29 CFR 1926 Subpart P (Appendices C, D, and E) for details on shoring, shields, and trench boxes.
7. SELECTION OF PROTECTIVE SYSTEMS
- Refer to 29 CFR 1926 Subpart P (Appendix F) for the decision logic in selecting protective systems.
8. PERMITS
- An Excavation/Trenching Permit must be completed by the competent person each day that an excavation is open and personnel may be required to enter the excavation. The excavation permit follows this procedure.



OHM Corporation

EXCAVATION/TRENCHING PERMIT

PERMIT NO. _____

Good on This Date Only: _____ From: _____ AM ___ PM ___

Project Name: _____ Project Number: _____

Project Location: _____

Name of Competent Person: _____ - A competent person means one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them. The competent person shall also be capable of classifying soil types.

Description of Job or Special Procedures: _____

EMPLOYEE TRAINING AND PRE-EXCAVATION BRIEFING

- 1. Safe Excavation and Rescue Training Conducted on: _____ (DATE)
- 2. Mandatory pre-excavation briefing conducted on: _____ (DATE)
- 3. Does this job require special training: YES ___ NO ___

ELECTRICAL SAFETY

- 1. Are all electrical devices grounded, double insulated, or GFCI protected? YES ___ NO ___ N/A ___
- 2. Have all power cords and tools been visually inspected? YES ___ NO ___ N/A ___

SURFACE ENCUMBRANCES

- 1. Have all surface encumbrances that are located so as to create a hazard to employees been removed or supported, as necessary, to safeguard employees? YES ___ NO ___ N/A ___

UNDERGROUND INSTALLATIONS

- 1. Have the estimated locations of all underground installation been determined prior to excavation? YES ___ NO ___ N/A ___
- 2. Have utility companies been contacted and advised of proposed work? YES ___ NO ___ N/A ___
- 3. Are underground installations protected, supported or removed while excavations are open? YES ___ NO ___ N/A ___

ACCESS AND EGRESS

- 1. Are structural ramps that are used solely by personnel as a means of access or egress from excavations designed by a competent person? YES ___ NO ___ N/A ___
- 2. Are structural ramps that are used for access and egress of equipment designed by a competent person qualified in structural design and constructed in accordance with the design? YES ___ NO ___ N/A ___
- 3. Are ramps and runways constructed so structural members are connected to prevent displacement? YES ___ NO ___ N/A ___

PROTECTION FROM HAZARDS ASSOCIATED WITH WATER ACCUMULATION

- 1. Are employees prohibited from entering excavations that have accumulated water? YES___ NO___ N/A___
- 2. Is water being controlled or prevented from accumulating in excavation by the use of water removal equipment? YES___ NO___ N/A___
- 3. Is water control equipment operation being monitored by a competent person? YES___ NO___ N/A___
- 4. Are diversion ditches, dikes, or other suitable means used to prevent surface water from entering excavation? YES___ NO___ N/A___
- 5. Are excavations subjected to run-off from heavy rain immediately re-inspected by a competent person? YES___ NO___ N/A___

STABILITY OF ADJACENT STRUCTURES

- 1. Are support systems such as shoring, bracing, or underpinning provided to ensure stability of adjoining structures (i.e., buildings, walls) endangered by excavation activities? YES___ NO___ N/A___
- 2. Has any excavation below the level of the base or footing of foundations or retaining walls been:
 - Provided with a support system such as under pinning to ensure the safety of employees and stability of the structure YES___ NO___ N/A___
 - Performed in stable rock YES___ NO___ N/A___
 - Determined by a registered professional engineer that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity YES___ NO___ N/A___
 - Determined by a registered professional that the excavation work will not pose a hazard to employees YES___ NO___ N/A___
- 3. Is the undermining of sidewalks and pavement structures prohibited? YES___ NO___ N/A___

PROTECTION OF EMPLOYEES FROM LOOSE ROCK OR SOIL

- 1. Is adequate protection provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face? YES___ NO___ N/A___
- 2. Are employees protected from excavated or other material and equipment by placing this material a minimum of two (2) feet from the edge of excavations or by the use of retaining devices? YES___ NO___ N/A___

INSPECTIONS

- 1. Are daily inspections of excavations where employee exposure can be reasonably anticipated being done by the competent person? YES___ NO___ N/A___
- 2. Are inspections being performed by a competent person after every rainstorm or other hazard increasing occurrence? YES___ NO___ N/A___
- 3. Are employees removed from the excavation if the competent person finds evidence at any time of a situation that could result in a possible cave-in, protective system failure, hazardous atmosphere or other hazardous condition? YES___ NO___ N/A___

FALL PROTECTION

- | | | | |
|---|--------|-------|--------|
| 1. Are standard guardrails provided on walkways and bridges that cross over excavations? | YES___ | NO___ | N/A___ |
| 2. Are all remotely located excavations adequately barricaded or covered? | YES___ | NO___ | N/A___ |
| 3. Are temporary wells, pits, shafts and similar exploratory operations backfilled upon completion? | YES___ | NO___ | N/A___ |

I have inspected the excavation described in this permit:

(Signature of Competent Person)

(Date)

APPENDIX E
EQUIPMENT AND HAND TOOLS



OHM Corporation

HEALTH & SAFETY PROCEDURES

EQUIPMENT AND HAND TOOLS

PROCEDURE NUMBER 41

Page 1 of 5

LAST REVISED 12/92 APPROVED BY: JFK/FHH

1. OBJECTIVE

All OHM Remediation Services Corp. (OHM) equipment and hand tools used at OHM facilities and project sites will be in good operating condition with all cords and safety guards in place.

2. PURPOSE

The purpose of this procedure is to describe the basic guidelines for the safe operation of hand and power tools used in OHM shops and project sites. This procedure is an overview of 29 CFR 1910.242 and .243.

3. REQUIREMENTS

- 3.1 All hand tools and power tools shall be in good repair and will be used only for the task for which they were designed.
- 3.2 Any tool that is damaged or defective will be tagged "out-of service" and will be repaired or destroyed.
- 3.3 Surfaces and handles shall be kept clean and free of excess oil to prevent slipping.
- 3.4 Sharp tools shall not be carried in pockets.
- 3.5 Upon completion of a job, tools will be cleaned and returned to the tool box or storage area.
- 3.6 Wrenches shall have a good bite before pressure is applied. Brace yourself by placing your body in the proper position so that in case the tool slips you will not fall. Make sure hands and fingers have sufficient clearance in the event the tool slips. Always pull on a wrench, never push.
- 3.7 When working with tools overhead, the tools will be placed in a holding receptacle or secured when not in use.
- 3.8 Throwing tools from place to place, from person to person, or dropping them from heights is not permitted.

- 3.9 Only non-sparking tools will be used in atmospheres which exhibit fire or explosive characteristics.
- 3.10 All tools should be inspected prior to start-up or use to identify any defects.
- 3.11 Powered hand tools should not be capable of being locked in the "on" position.
- 3.12 Power nailing or stapling tools must only be capable of activation when in contact with the work surface. All such power devices must have a safety interlock.
- 3.13 Loose clothing, long hair, loose jewelry, rings and chains will not be worn while working with power tools.
- 3.14 Cheater pipes will not be used.
- 3.15 In applications where injury to the operator might result if motors were to restart after power failure, provisions shall be made to prevent machines from automatically restarting upon restoration of power.

4. GRINDING TOOLS

- 4.1 The work rest for a grinder should be no more than 1/8 inch from the wheel and the tongue guard no more than 1/4 inch from the wheel. Frequent inspections are necessary to insure proper distances are maintained.
- 4.2 Work or tool rests should not be adjusted while the grinding wheel is moving.
- 4.3 Inspect the grinding wheel for cracks, chips or defects. Remove the wheel from service if any defects are found.
- 4.4 Goggles shall always be worn when grinding and a transparent full face shield may be worn in conjunction with the goggles.
- 4.5 The side of a grinding wheel shall never be used unless the wheel is designed for side grinding.
- 4.6 Grinding wheels are rated for specific speeds. Rating should be checked when installing a new wheel.
- 4.7 Grinding aluminum is prohibited.

5. POWER SAWS

- 5.1 Circular saws will be fitted with blade guards.
- 5.2 Damaged, bent or cracked saw blades will be immediately removed from service and destroyed.
- 5.3 Hand fed table saws will be fitted with a splitter to prevent the work from squeezing the blade and kicking back on the operator.
- 5.4 Hand held circular saws will be equipped with a lower guard which covers the blade to the depth of the teeth. The guard should freely return to the fully closed position when withdrawn from the work surface.

6. WOOD WORKING MACHINERY

- 6.1 Dust, chips and shavings are to be removed from the machines by brush or vacuum only. Do not use compressed air.
- 6.2 The on-off switch must be located to prevent accidental start up. The operator should be able to shut off the machine without leaving the work station.
- 6.3 Planers and joiners shall be guarded to prevent contact with the blades.
- 6.4 A push stick will be used when the cutting operation requires the hands of the operator to come close to the blade. Also, small pieces will require the use of a push stick.
- 6.5 Saw blades will be adjusted so that the blade only clears the top of the cut. The blade should never extend more than one-eighth of an inch above the top of the cut.
- 6.6 Automatic feed devices should be used whenever feasible.

7. PNEUMATIC TOOLS AND EQUIPMENT

- 7.1 Tool retainers will be installed and remain in operation on pneumatic impact tools to prevent the tool from being ejected from the barrel during use.
- 7.2 Safety lashing or tie wire will be used to secure connections between tool/hose/compressor if they are of the quick connection (Chicago fittings) type.

- 7.3 Hose should not be laid in walkways, on ladder or in any manner that presents a tripping hazard.
- 7.4 Compressed air should never be used to blow dirt from hands, face or clothing.
- 7.5 Compressed air should be reduced to less than 30 psi and be exhausted through a chip guarded nozzle if it is to be used for cleaning purposes. Proper respiratory, hand, eye and ear protection must be worn.
- 7.6 Never raise or lower a tool by the air hose.

8. EXPLOSIVE-ACTUATED FASTENER TOOLS

- 8.1 Explosive-actuated tools must comply with the requirements of the American National Standards Institute (ANSI) standard A 10.3 - 1970.
- 8.2 Explosive-actuated tools will be operated, repaired, serviced and handled only by individuals that have been trained by a manufacturer's representative and possess the proper license.
- 8.3 An explosive-actuated tool should never be used in a flammable or explosive atmosphere.
- 8.4 The operator must wear goggles or a full face shield as well as safety glasses.
- 8.5 All explosive-actuated tools must not be able to be fired unless the tool is pressed against the work surface with a force of at least 5 lb. greater than the weight of the tool.
- 8.6 The tool must not be able to fire if the tool is dropped when loaded.
- 8.7 Firing the tool should require two separate operations, with the firing movement being separate from the motion of bringing the tool to the firing position.
- 8.8 Never fire into soft substrate where there is potential for the fastener to penetrate and pass through, creating a flying projectile hazard.
- 8.9 Do not use explosive-actuated fasteners in reinforced concrete if there is the possibility of striking the re-bar. Nor should the tool be used on cast iron, glazed tile, surface hardened steel, glass block, live rock or face brick.

- 8.10 An explosive-actuated tool should be loaded only prior to the intended firing moment. Never load and leave an explosive-actuated tool unattended.

9. CHAIN SAWS

- 9.1 Inspect the saw prior to each use and periodically during daily use.
- 9.2 A chain saw must be operated with both hands at all times.
- 9.3 Never cut above chest height.
- 9.4 A saw chain should not move when the saw is in the idle mode.
- 9.5 Before a cut is initiated, the operator must first clear an escape path and have firm footing.
- 9.6 The saw must be shut off when carrying through brush and slippery surfaces. The saw may be carried while idling no more than 50 feet.
- 9.7 The operator of the saw must don all the applicable protective gear. This may include, but is not limited to, loggers safety hat, safety glasses, steel-toed boots, protective leggings, and hearing protection.
- 9.8 Saws should be fitted with an inertia break and hand guard.

10. HAND OPERATED PRESSURE EQUIPMENT

- 10.1 Pressure equipment such as grease guns, paint and garden sprayers shall be directed away from the body and other personnel in the area. The person operating any equipment such as this, which has a potential for eye injury, must wear protective goggles.
- 10.2 The noise produced when using certain types of pressure equipment may require the use of hearing protection.
- 10.3 Never allow the nozzle of a pressurized tool to come in contact with any body parts while operating. There is potential for injection of a chemical directly into the users body, resulting in severe injury or death.
- 10.4 Each operation must be evaluated for the need for respirator use.

APPENDIX F

MERCURY VAPOR CHEMICAL CARTRIDGE FILTER USAGE

April 10, 1992

Jerry Foster
Project Manager
Weyerhaeuser Paper Company
P.O. Box 787
Plymouth, N.C. 27962

Dear Mr. Foster:

This letter is in response to your consultant's concerns over the use of MSA Mersorb indicator cartridges with full-face respirators, instead of half-mask belt-mounted respirators. Although the NIOSH approval for the MSA Mersorb cartridge specifically applies to the belt mounted respirator, it is my professional opinion, as an industrial hygienist, that the full-face respirator, equipped with Mersorb cartridges, provides the same, if not more protection, against potential mercury vapor exposures.

A full-face respirator has a protection factor (PF) of 50X while a half-mask belt mounted respirator has a PF of 10X. For this reason, OHM specifies only the use of full-face respirators when wearing level C protection for site remedial operations.

The reason the Mersorb indicator cartridge is specifically approved for the belt mounted respirator is that the respirator wearer is able to monitor the color indicator patch on the cartridge, which notifies the wearer to change the cartridge when the color changes (orange to brown) and the cartridge is expended. OHM conducts its site remedial operations in conformance with OSHA's 1910.120 standard, which requires the use of the "buddy system" when working in the exclusion zone. The buddy system is designed for site personnel to work in pairs with each person monitoring the other's health condition for symptoms of chemical exposures and heat stress. The OHM Site Safety Officer (SSO) for this project has briefed OHM site personnel that the buddy system will also be used to monitor each others color indicator patch for a color change that warrants changing the cartridges. In addition, the SSO has briefed OHM site personnel to inspect their own cartridges when taking breaks and lunch for the color change.

APPENDIX C

QC Plan



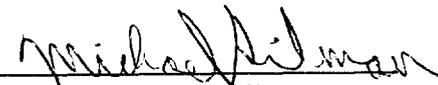
DRAFT
DELIVERY ORDER
QUALITY CONTROL PLAN
FOR
REMOVAL OF MERCURY CONTAMINATED SOIL
NAVAL SURFACE WARFARE CENTER
INDIAN HEAD, MARYLAND

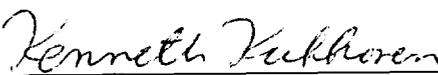
Prepared for:

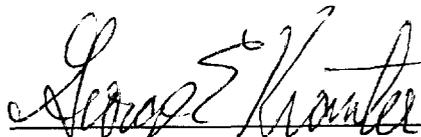
U.S. NAVY
Contract N62470-93-D-3032
Delivery Order 0010

Prepared by:

OHM Remediation Services Corp.
Trenton, New Jersey


Michael I. Gilman
Program QC Manager


Kenneth Kukkonen, P.E.
Project Manager


George E. Krauter, P.E.
Program Manager

May 2, 1994
OHM Project No. 15831QC

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SECTION 1.0 STATEMENT OF QC PROGRAM

OHM Remediation Services Corp. (OHM), a subsidiary of OHM Corporation, will provide and maintain an effective Contractor Quality Control (QC) Program as required by contract clauses. This program will be performed in conjunction with the Program Quality Control Plan (OHM, 1994) as applicable and in accordance with the requirements of Contract No. N62470-93-D-3032, Atlantic Division, Naval Facilities Engineering Command, dated August 1993. OHM will perform the inspections and tests required to ensure that materials, workmanship, and construction conform to the drawings, specifications, and contract requirements. OHM will perform the test or inspection specified, unless the required inspection and/or test is specifically designated to be performed by the Government.



PROGRAM ORGANIZATION AND PERSONNEL RESPONSIBILITIES

- Monitoring project progress to ensure schedule and budget maintenance

Ensure CQC program is being performed.

2.3 SITE SUPERVISOR, TO BE NAMED

The site supervisor is responsible for day-to-day on-site activities. He communicates with the project manager to update him on project progress and QC activities.

2.4 PROGRAM QC MANAGER, MICHAEL GILMAN

The program QC manager is responsible for delivery order quality and, for this delivery order, will provide support to the project manager on an as-needed basis. If an independent site audit were to take place during site activities, the program QC manager representative would perform the audit. The program QC manager will oversee work performed by the site QC representative. The QC manager will also monitor the correction of any nonconforming work. He will also be responsible for reviewing the laboratory QC program to ensure its conformance with the contract program requirements.

2.5 QUALITY CONTROL REPRESENTATIVE, TO BE NAMED

The responsibilities of the QC representative will include:

- Perform, or cause to be performed, daily inspections and tests of the scope and characters necessary to achieve the quality of construction outlined in the plans and specifications for work under the contract.
- Maintain the latest applicable drawings and specifications with amendments and/or approved modifications at the job site and assure that they are used for shop drawings, fabrication, construction, inspections, and testing.
- Maintain marked-up drawings at the site depicting as-built conditions. The drawings will be available for review by the NTR at all times.
- Maintain a Government furnished submittal register for the duration of the contract. The format for this submittal register is presented in Appendix B. A review of the register will be performed at least every 14 days in conjunction with the scheduled dates on the register and in relation to the actual work status. Appropriate actions will be undertaken should slippages or other changes so necessitate.
- Review shop drawings and/or other submittals for compliance with the contract requirements prior to their transmission to the Navy.
- Authorization to temporarily shut down a portion of work if work practices or procedures are determined to be incorrect or out of compliance with the specifications.
- Authorization to stop a work task or series of tasks after consultation with the site supervisor and NTR in the event that severe weather conditions interfere with quality of work.
- Responsible for testing construction and backfill materials for compliance with specifications and authorized to reject materials to be used if they are not in compliance.



PROGRAM ORGANIZATION AND PERSONNEL RESPONSIBILITIES

- Establish and maintain a Rework Items List program and a tracking and/or suspense system to monitor and assure inspection and testing activities and frequencies are in accordance with the contract requirements. This list will be submitted on a monthly basis.
- Attend and assist the Government at the prefinal inspection and final acceptance inspection.
- Assist in preparing Contractor Production Report.
- Prepare and submit daily Contractor QC Report.
- Prepare, maintain, and continually update the Construction Testing Plan and Log for the field activities.

SECTION 3.0 METHODS OF INSPECTION

A three-phase control system will be implemented for each major work task and will include preparatory, initial, and followup inspections. The QC representative will assure that no work proceeds until the appropriate inspections phase has been performed. An inspection schedule listing the expected major phases of work for which the inspections will be conducted is presented in Table. In addition to and independent of the QC representative, the SSO and site supervisor will implement this same control system as part of their normal duties/responsibilities. The inspection phases are discussed in the following paragraphs.

A preparatory inspection will be performed by the QC representative prior to beginning physical work. This will include a review of contract requirements; a check of the data sheets to assure that materials and/or equipment have been tested, submitted, and approved; a check to assure that provisions for required control testing have been made; and a physical examination of materials and drawings or submittal data and that material and/or equipment are on hand.

As a part of this preparatory work, the QC representative will review shop drawings, certificates, and other submittal data prior to submission to the NTR. Each submittal presented to the NTR will bear the date and the signature of the QC representative indicating that the submittal has been reviewed and is in compliance with plans and specifications or show the required changes to meet the specifications. The NTR will be notified a minimum of 24-hour prior to the beginning of the preparatory inspection.

An initial inspection will be performed by the QC representative as soon as a representative segment of the particular item of work has been accomplished. The initial inspection will include examination of the quality of workmanship and a review of control testing results for compliance with contract requirements, use of defective or damaged materials, omissions, and dimensional requirements.

Follow-up inspections will be performed by the QC representative daily or as frequently as necessary to assure continuing compliance with contract requirements, including control testing, until completion of the particular segment of work.

In addition to this three-phase inspection control system special inspections or testing may be conducted in the event of an approved change or modification to work plans or field operations. The QC representative will coordinate scheduling of special inspections with the Contracting Officer at the time when a change or modification in work operations has been approved.

It is OHM responsibility to identify and correct deficiencies in the work. To ensure that defective work is corrected and not built upon, a Rework Items System will be implemented. Rework items identified in the work during any of the inspections or testing programs by a party to this contract will be corrected as soon as practicable and recorded by completing a Rework Items List. The list will be issued to the site supervisor and a copy attached to the inspection report. The QC representative will be responsible for obtaining correction by the responsible party and will return the notice report upon correction with a description of the action taken and date completed. The list will be updated accordingly. Rework items will be corrected prior to the final inspection. Copies of the Rework Items List are presented in the Program QC Plan and Procedures.

Safety inspections will be performed by the site safety officer on a daily basis to assure compliance with occupational health and safety requirements of the contract. Daily QC reports will be used to document the safety inspection and other inspections, and will address the safety deficiencies observed and correction actions taken.

SECTION 4.0 SAMPLING PROCEDURES

OHM sampling procedures will meet the requirements of the project scope of work. The Contractor Sampling and Analysis Plan (CSAP) has not been included at this time due to the limited sampling and testing within OHM's scope of work.

SECTION 5.0

FIELD VERIFICATION TESTING

The following procedures will be used by the OHM QC representative during the performance of his/her duties to verify compliance with the contract requirements. Additions or modifications to these procedures may be necessary to address changing circumstances. The responsibilities of the QC representative are fully described in Section 2.0.

5.1 GEOTECHNICAL QUALITY CONTROL PROCEDURES

Specific field verification testing will be performed in accordance with this plan. OHM will utilize a subcontracted soils testing firm to be named during the cost estimating phase to perform the required field soils testing as per contract specifications. The geotechnician/OHM laboratory manager maintains a QA program of which the equipment is calibrated on regular intervals and all measurements are traceable to National Bureau of Standards. The laboratory testing capabilities include:

- Field control
 - Water content (Nuclear Density Gauge)
 - Density (Nuclear Density Gauge)

In accordance with Section 3 of the Work Plan, laboratory soils testing will be performed to ASTM methods.

Although the field testing is developed from accepted test procedures (e.g. ASTM), it should be noted that while each test is an approved procedure to test for a specific characteristic, not every test can stand alone in remediation verification. Some tests are less comprehensive than others and require periodic verification by other, more detailed tests. Field tests of this type do not usually determine the primary characteristic of interest, but instead are correlated with it. In the event that any single test fails to meet the specification requirements, a second test will be performed. Should the second test fail, the appropriate corrective action will be taken in the field. If the second test meets the specification requirements, then the corresponding verification test will be conducted. The results of that test will then be used to determine the acceptance or rejection of the construction task being monitored.

Field test will be performed by the appropriate QC team personnel as soon as possible after material receipt or completion of a specific portion of the work. Testing will be performed on a timely basis to provide prompt confirmation or rejection of the material or constructed work. This will help minimize the possibility of having to remove satisfactory work which has been added to defective material or work.

5.1.1 Field Sampling

Samples of excavated materials and constructed work will be obtained in the field for verification testing. The site technician will collect the specified samples, as appropriate, as soon as areas are deemed clean or a portion of the constructed work is completed to obtain results as promptly as possible.

5.2 INSPECTIONS

In addition to QC representative directed inspections, standard inspections will be performed during the course of remediation to verify the quality of the final constructed work. There will be visual inspections performed by the site supervisor, a qualified general foreman, or other appropriate personnel. These inspections are supplemental to the QC inspections and are intended to enhance the QC inspections by identifying problem areas that may require more stringent QC inspection. In the event of a discrepancy between one of these visual inspections and the field verification test performed as per this document, the field verification test result will take precedence.



Inspections will be performed in accordance with these plan and checklists developed for the remediation. Inspections performed to a guide procedure will be documented in the daily field log while inspections performed to a checklist will be documented on the checklist.

5.3 PERFORMANCE DOCUMENTATION

Construction inspection personnel (site supervisor, general foreman, and QC representative) will keep a daily log of project activities. Whenever possible, information will be recorded on a standardized form or in a bound filed logbook. Documentation will include a daily log of construction activities; the appropriate field test, laboratory test, and survey data forms; photographs; and field collection and sampling custody forms.

Construction inspection personnel (e.g., site supervisor and general foreman) will keep a daily log of project activities. Copies of the daily logs will be sent to the site supervisor on a daily basis. After review of the logs, they will be routed to other members of the project team as needed.

As part of the remediation control activities, a photographic record is to be prepared. Photographs will be in color. As examples, photographs could be taken of field testing, sampling locations, remediation processes, and final constructed features.

Photographs are to be identified with the project number, date taken, and a brief description. This may be done individually on the back of the photographs or in an album in which the photographs are mounted. Album photographs must be provided with individual descriptions and dates taken.

Appropriate remediation control test, survey, and material installation data forms will also be prepared. They will include the activity location. All requested information will be addressed. If not applicable, requested information will be designated as such. Results of field and laboratory testing will be sent to the NTR, the project manager and site supervisor as soon as they become available.

Field construction verification records will be collected and maintained by the site supervisor until they are submitted to the project central file.

Field construction verification records will be collected and maintained by the site supervisor until they are submitted to the project central file.

5.4 REVIEW OF CONSTRUCTION CONTROL DATA

The QC representative will review the remediation QC data to verify that remediation specifications are being met, to determine when defective material or work may require removal and/or reconstruction, and to determine when additional testing may be required to confirm the quality of the material or work. The results of field tests, field inspections, receiving inspections, and surveys will be reviewed by the QC representative. The review will be made on a daily basis to prevent the construction of new work over defective material or work which is later found to be defective.

5.5 AS-BUILT DOCUMENTATION

All appropriate documentation will be retained in the project records system to provide, documentation of how the remedial action was actually built. Final as-built drawings and specifications will be prepared utilizing this information and retained as a permanent record of the final location, dimensions, and orientation of the construction.



FIELD VERIFICATION TESTING

At contract closeout, record documents will be delivered to the NTR. A transmittal letter in duplicate accompanying the submittal will contain:

- Date
- Contract name and number
- Contractor's name, address, and telephone number
- Number and title of each record document
- Signature of contractor or his authorized representative.

SECTION 6.0 INSPECTION AND TESTING DOCUMENTATION

Daily records of inspections and tests performed for each shift or subcontractor operation will be signed by the QC representative and the original and one copy provided to the Government no later than the next working day. Samples of reports and forms to be utilized are included in the Program QC Plan.

The QC representative will prepare a daily CQC report/production report which will include, as a minimum, the following:

- Project identification
- Data on weather and any delays attributable to such weather.
- Number of personnel on site (OHM and subcontractors).
- A listing of construction equipment and indication of equipment usage on the report day.
- Factual evidence that continuous QC inspections and tests have been performed. This includes, but is not limited to the following data:
 - Type and number of inspections or tests performed
 - Results of inspections or tests including computations
 - Evaluation of test results--accept or reject work
 - Nature of defects, if present
 - Causes for rejection
 - Safety inspections/violations
 - Proposed remedial action
 - Corrective actions taken
- The records will cover both conforming and conforming work.
- A statement that supplies and materials incorporated into the work are in full compliance with the requirements of the contract.

SECTION 7.0

MEETINGS/COORDINATION

7.1 COORDINATION AND MUTUAL UNDERSTANDING MEETING

After submission of the QC plan addendum and prior to the start of construction, OHM's project manager, program QC manager, and QC representative will meet with COTR and the NTR to discuss the QC program required by the this delivery order. The purpose of this meeting is to develop a mutual understanding of the QC details, including forms to be used; administration of on-site and off-site work, and coordination of the OHM management, production, and the QC representative's duties with the NTR. Minutes of the meeting will be prepared by the QC manager and signed by both OHM and the COTR.

7.2. QC MEETINGS

After the start of construction, the OHM QC representative will conduct QC meetings once every two weeks or as required by the COTR/delivery order at the work site, or where specified, with the project superintendent and the foreman responsible for the upcoming work. The OHM QC representative will prepared the minutes of the meeting and provide a copy to the OCTR within 2 working days after the meeting. The COTR may attend any of these meetings. The QC representative will notify the COTR at least 48 hours in advance of each meeting. As a minimum, the following will be accomplished at each meeting:

- Review the minutes of the previous meeting.
- Review the schedule and the status of the work:
 - Work or testing accomplished since last meeting
 - Rework items identified since last meeting
 - Rework items completed since last meeting.
- Review the status of submittals:
 - Submittals reviewed and approved since last meeting
 - Submittals required in the near future.
- Review the work to be accomplished in the next 2 weeks and documentation required. Schedule the three phases of control and testing:
 - Establish completion dates for rework items
 - Preparatory phases required
 - Initial phases required
 - Follow-up phases required
 - Testing required
 - Status of off-site work or testing
 - Documentation required.

Resolve QC and production problems

Address items that may require revising the QC plan:

- Changes in procedures.

**TABLE 1
INSPECTION SCHEDULE**

ACTIVITY	PREPARATORY	DONE	INITIAL	DONE	FOLLOWUP	DONE
<u>No. 1150</u> Surface Water Management Facility	Materials meet specification: Hay bales, silt fence Alignment		Proper installation Alignment and location		Proper installation	
<u>No. 1120</u> Roadway	Materials meet specification: Gravel Alignment and width		Proper workmanship Roadway thickness Alignment and width			
<u>No. 1130</u> Decontamination Pads	Materials meet specification: Location defined		Proper installation Pad thickness Proper grades		Meets intent of design	
<u>No. 1140</u> Dewatering Rolloff Boxes	Materials meet specification: Stone base, fabric Location defined		Proper installation Pad thickness		Proper installation Meets intent of design	
<u>No. 1160</u> Borrow Material	Sample and analysis Geotechnical properties					

**TABLE 1 (continued)
INSPECTION SCHEDULE**

ACTIVITY	PREPARATORY	DONE	INITIAL	DONE	FOLLOWUP	DONE
<u>No. 1500</u> Excavation Magazine No. 606 Stream Bed	Initial limits of area defined		Field screening of excavation Visual inspection of excavation			
<u>No. 1560</u> Confirmation Sampling and Analysis	Sampling and laboratory procedures established		Quality control of sampling and analysis procedures Chain of custody forms			
<u>No. 1630</u> Back fill Magazine No. 606 Stream Bed	Material meets specification Material availability Excavation approved for backfill		Lift thickness Density testing		Grades Density testing	

SUBMITTAL REGISTER
Removal of Mercury Contaminated Soil
Naval Surface Warfare Center, Indian Head, Maryland

Delivery Order 0010

Contract No. N62470-93-D-3032

Project Title: Removal of Mercury Contaminated Soil

Location: Naval Surface Warfare Center

Contractor: OHM Remediation Services Corp.

Submittal No.	Spec Section No.	SD No., and type of Submittal Material or Product	Spec Para No.	Classification Approval by Contracting Officer *	Government or A/E Reviewer	Transportation Control No.	Planned Submittal Date	Contractor Action			Approving Authority Action				Contractor Mailed to Contractor/ Received from Approved Authority	Remarks
								Action Code	Date of Action	Date Forward to Approved Authority/ Date Received From Contractor	Date Forwarded to other Reviewer	Date Received from other Reviewer	Action Code	Date of Action		
(a)	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
1)	01010	SD-18														
		Site Health & Safety Plan (G)	1.2.1													
		Environmental Protection Plan	1.2.1													
		CQC Plan Addenda	1.2.1													
		Work Plan (G)	4.2													
2)	01010	As-built Records	1.3.1.1													
3)	01010	Environmental Conditions Report	1.3.1.2													
4)	01010	Status Report	1.3.1.3													
5)	01010	QC Meeting Minutes	1.3.1.4													
6)	01010	Test Results Summary Report	1.3.1.5													
7)	01010	Contractor Production Report	1.3.1.6													
8)	01010	QC Report	1.3.1.7													
9)	01010	Rework Item List	1.3.1.8													
10)	01010	Excavation Permits	1.3.1.9													
11)	01010	Contractor Closeout Report	1.3.1.10													

***Navy Notes:**

Approved By:
 G: Contracting Officer
 Blank: CQC Manager

***NASA Notes:**

Approved By:
 Blank: Contracting Officer

***Army Notes:**

Classification:
 GA: Government Approval
 FIO: For Information Only

Action Codes:

NR: Not Reviewed
 A: Approved
 AN: Approved as Noted
 RR: Disapproved; Revise and Resubmit

(Others may be prescribed by Transmittal Form)

Date: 05/02/94

TABLE 2

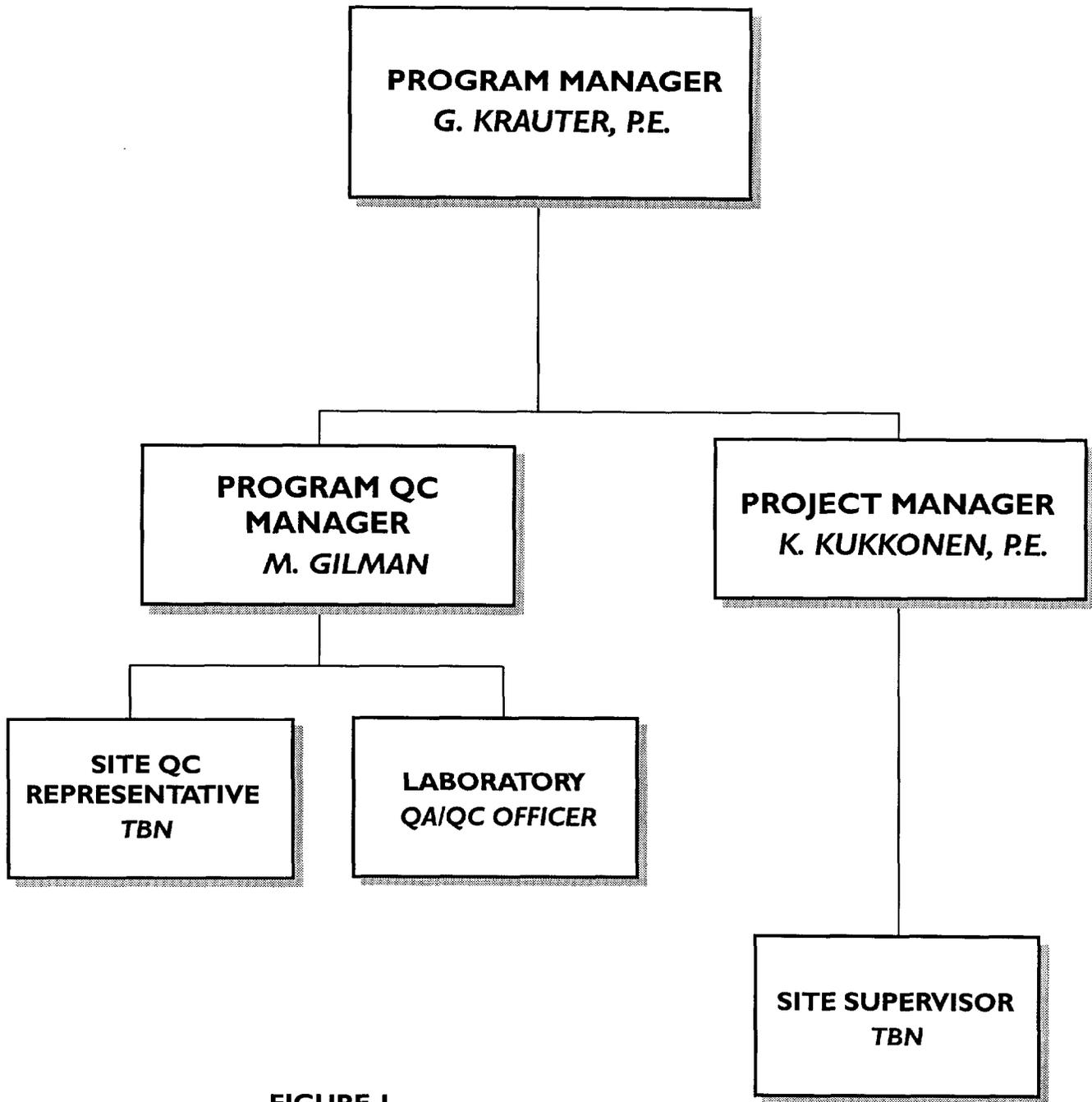


FIGURE I

QC ORGANIZATION CHART
 Removal of Mercury Contaminated Soil
 Naval Surface Warfare Center
 Indian Head, Maryland
 Delivery Order 0010

Prepared for

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



**OHM Remediation
 Services Corp.**