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FINAL WORK PLAN FOR SOIL REMOVAL ACTION AT SITE 28 NSWC INDIAN HEAD MD
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SHAW ENVIRONMENTAL

FINAL WORK PLAN
REMOVAL ACTION AT SITE 28
NAVAL SUPPORT FACILITY, INDIAN HEAD
INDIAN HEAD, MARYLAND
TASK ORDER 093

Prepared for Department of the Navy
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List of Acronyms

bgs	below ground surface
BTEX	Benzene, Toluene, Ethylbenzene, and Xylene
CF	clean fill source
CFR	Code of Federal Regulations
COC	chain-of-custody
cy	cubic yards
DOD	Department of Defense
DD	disposal drum
DDESB	Department of Defense Explosive Safety Board
DL	disposal liquid
DRO	Diesel Range Organics
DW	disposal waste
E&S	erosion and sediment
EE/CA	Engineering Evaluation/Cost Analysis
EP/PP	Environmental Protection/Pollution Prevention Plan
ESCP	Erosion and Sediment Control Plan
ESS	Explosive Safety Submission
EZ	Exclusion Zone
FEAD	Facilities Engineering and Acquisition Division
GC/MS	gas chromatograph/mass spectrometer
GRO	Gasoline Range Organics
IAS	Initial Assessment Study
ID	Identification
IDW	investigative-derived waste
IHDIV	Indian Head Division
LANTDIV	Department of the Navy, Atlantic Division
LCS	laboratory control sample
MB	method blank
MDE	Maryland Department of the Environment
MEC	Munitions or Explosives of Concern
MPPEH	Material Potentially Presenting an Explosive Hazard
MRL	maximum reporting limit
MS/MSD	matrix spike/matrix spike duplicate
NAVFAC	Naval Facilities Engineering Command
NELAC	National Environmental Laboratories Accreditation Conference
NOS	Naval Ordnance Station
NOSSA	Naval Ordnance Safety and Security Activity
NSF-IH	Naval Support Facility – Indian Head
NSWC	Naval Surface Warfare Center
NTR	Navy Technical Representative
OE	Ordnance and Explosives
PBA	Project Business Administrator
PM	Project Manager
PRG	Preliminary Remediation Goal
QA	Quality Assurance
QC	Quality Control
QCP	Quality Control Plan
RAO	Remedial Action Objective
RI	Remedial Investigation
RPD	relative percent difference
SAR	Site Approval Request
SATTP	Strauss Avenue Thermal Treatment Point
Shaw	Shaw Environmental, Inc.
SM	sample matrix

List of Acronyms (continued)

SOP	Standard Operating Procedure
SOW	scope of work
SSHSP	Site-Specific Health and Safety Plan
SSO	Site Safety Officer
TAL	Target Analyte List
TAT	turn-around-time
TCLP	Toxicity Characteristic Leaching Procedure
TPH	Total Petroleum Hydrocarbons
USEPA	United States Environmental Protection Agency
UXO	Unexploded Ordnance
WMA	Water Management Administration

1.0 INTRODUCTION

Shaw Environmental, Inc. (Shaw) was contracted by the Department of the Navy, Atlantic Division (LANTDIV), Naval Facilities Engineering Command (NAVFAC), to perform a removal action at Site 28, Naval Support Facility, Indian Head, Maryland. The work will be performed under Contract No. N62470-02-D-3260, Task Order 093.

1.1 Purpose

This work plan describes in detail the tasks to be performed and the techniques that will be utilized to complete the removal action at Site 28. The following appendices are included in this plan:

- Appendix A Quality Control Plan (QCP)
- Appendix B Site-Specific Health and Safety Plan (SSHSP)
- Appendix C Erosion and Sediment Control Plan (ESCP)
- Appendix D Environmental Protection/Pollution Prevention Plan (EP/PP Plan)
- Appendix E Naval Ordnance Safety and Security Activity (NOSSA) Explosive Safety Submission (ESS) Determination and NOSSA Response Letter

1.2 Site Background

The Naval Support Facility, Indian Head (NSF-IH) is located in northwestern Charles County, Maryland, approximately 25 miles southwest of Washington, DC (Figures 1 and 2). The NSF-IH provides services in energetics, ordnance devices and components, and other related ordnance engineering standards, including chemicals, propellants and their propulsion systems, explosives, pyrotechnics, warheads, and simulators.

Site 28 is in the northeast corner of the facility, on the shore of Mattawoman Creek. The site encompasses observation Well 14 and the former locations of the zinc recovery furnace and shoreline burning cage. Because of past activities at the site, there are both potential human health and ecological risks associated with constituents in the soil.

Site 28 is also referred as the “Original Naval Ordnance Station (NOS) Burning Ground.” During WW1, the Navy initiated a metal-recycling program, which was vital during WW II and continues to present day. In 1928, the zinc recovery furnace, designated Building 415, was erected. The last station map on which the building appears is dated October 31, 1952, indicating that the building was demolished in the early 1950s.

Well 14 was installed in 1918 to a depth of 430 feet below ground surface (bgs) and was initially used as a potable water well, but it became an observation well in 1988 and remains so today.

Previous investigations included an Initial Assessment Study (IAS) to evaluate sites at NSF-IH and to determine if a potential threat to human health and the environment existed. The report concluded that smokeless powder may have been burned at the site and various contaminated wastes were burned openly. Several soil sampling events were conducted following the IAS. Soil sample results indicated several chemicals of concern: copper, magnesium, sulfate, zinc, and lead.

In 2003, a Remedial Investigation (RI) was conducted by CH2M Hill. Site 28 was then divided into two zones: Zones A and B. Zone A was a former zinc recovery furnace and a former burning cage. The location of the former burning cage is unknown. Zone B is south of Zone A and is referred to as the "Original Burning Ground" and the "Shoreline Burning Cage". The human health risk assessment determined that potentially unacceptable risk was present for future adults, children, lifetime residents, and construction workers exposed to soil in Zone A and groundwater at the site. The soil in Zone B does not pose an unacceptable risk to human health or the environment and, therefore, the Removal Action at Site 28 will only address the soil in Zone A.

The ecological risk assessment determined that potentially unacceptable risk was present in Zone A soil and sediment as well. A baseline ecological risk assessment is currently underway by CH2M Hill to address potential ecological risks at Site 28.

In September 2006, CH2M Hill provided an Engineering Evaluation/Cost Analysis (EE/CA) to present remedial action alternatives to reduce risks to human health and ecological receptors associated with site soil to acceptable levels through excavation and removal and/or treatment of affected soil at Site 28 (Figure 3). Alternative 2 – Soil Removal for Human Health and Ecological Risks was selected for the remedial action at Site 28.

1.3 Project Objectives

The objective of this project is to execute Alternative 2 – Soil Removal as derived from the EE/CA.

The Remedial Action Objectives (RAO) for Site 28 are to:

- Reduce potential risks to human health and ecological receptors associated with site soil contaminants to acceptable levels, represented by the agreed upon Preliminary Remediation Goals (PRG).
- Restore the site to existing, but improved, conditions (e.g., grading and vegetation).
- Site activities will include the installation of erosion and sediment (E&S) controls, clearing and grubbing, installation of access roads and staging areas, partial removal and replacement of the 24-

inch culvert, repair portions of the gravel access road, excavation and screen material for loadout, transportation and disposal of the waste, regrading, site restoration, and surveying. A description of the work activities for the above scope is included in Section 2.0.

Note that groundwater will not be a part of this remedial action. Land use controls will be implemented to prohibit the use of groundwater at the site as a potable water supply.

1.4 Project Organization

Key Shaw personnel involved in the successful completion of this project are presented on the Project Organization Chart (Figure 4). These personnel include the LANTDIV Program and Deputy Managers, the Project Manager, Site Superintendent, Site Quality Control (QC) Manager, Site Safety Officer (SSO), Project Business Administrator (PBA), Unexploded Ordnance (UXO) Technicians, equipment operators, and laborers. In addition, various subcontractors and vendors will be used to supply the specialized services and materials needed for project completion.

2.0 DESCRIPTION OF ACTIVITIES

This section discusses the major field activities associated with the removal action at Site 28, and a project schedule is included as Figure 5. The activities discussed below are in sequential order. However, field conditions, weather, or client direction may alter the sequencing of activities.

2.1 Mobilization and Site Preparation

This section discusses the activities that will be completed in order to prepare for the removal work.

2.1.1 Mobilization/Site Set up

Sufficient personnel, equipment, and materials will be mobilized to the site to complete the project as defined in this work plan. Initially, key individuals will mobilize to the site to receive the trailer and other equipment essential to the start of project activities. Initial site set up will include preparing an office and connecting utilities. Personnel will mobilize from the Monroeville, Pennsylvania and Trenton, New Jersey offices, although some personnel will mobilize from other locations.

Upon completion of the initial site set up, the second phase will begin, which will include the mobilization of construction equipment necessary for intrusive activities. This will include, but is not limited to, the mobilization of excavation, hauling, and grading equipment and additional personnel necessary to complete the project as outlined in this work plan. The project needs and logistics will be coordinated through Shaw's Trenton, New Jersey office. All initial and subsequent mobilizations and site set up will be carried out according to this work plan.

2.1.2 Site Preparation

Once initial mobilization and site set up are completed, site preparation will begin. Site preparation includes the installation of temporary support facilities and installation of E&S controls.

The installation of support facilities will include the delivery of sanitation facilities and trash dumpsters, providing electrical and phone hookups if available, establishing staging areas, and setting up emergency equipment such as pumps, hoses, and tanks. A connex box will be provided for the storage of small tools and small power equipment. E&S controls will be installed as described in Section 2.2.

2.1.3 Waste Staging and Mechanical Screening Area

The excavated waste material will be staged at the material screening area prior to screening and loading on haul trucks. A soil berm consisting of clean overburden will be installed around the portion of the staging area inside the excavation limits for the material requiring off-site disposal. A loadout area will be located within the material screening area adjacent to the haul road.

A mechanical screening area will be set up to screen the contaminated soil and is located near Well 14 (Figure 3). Even though no Material Potentially Presenting an Explosive Hazard (MPPEH) or Munitions or Explosives of Concern (MEC) is expected to be identified the material requiring off-site disposal will be mechanically screened prior to loadout as a precautionary measure.

A decontamination pad/wash station will be set up near the mechanical screening area for decontaminating onsite heavy equipment as needed prior to final demobilization.

2.1.4 Site Survey

During initial site set up, a Shaw surveyor will set up survey control points throughout the site and mark out the limits of disturbance. Shaw will provide survey support for the duration of the removal action and will determine volumes of waste removed from the site based on pre-excavation and post-excavation surveys.

The Site QC Manager will conduct a pre-construction survey prior to the start of work. The results of the survey, including photo documentation, will be submitted to the Facilities Engineering and Acquisition Division/Navy Technical Representative (FEAD/NTR) in an Environmental Conditions Report as required by the EP/PP Plan.

2.1.5 Utility Search

A utility search will be conducted through the FEAD office as part of the approval process for Shaw's excavation permit application. Shaw's Site QC Manager will submit an application for an excavation permit to the FEAD office and request a utility mark out prior to beginning the excavation activities. At a minimum, Shaw will contact Miss Utility (1-800-257-7777) for areas outside the Navy fence line. Shaw will supply the Navy with a drawing outlining the work area at least one week prior to the planned field activities. A field inspection to verify the locations of the utilities, if present, will be conducted prior to excavation activities.

2.2 E&S Controls Installation and Maintenance

This section describes the various E&S controls that will be used during earthmoving activities at the site. All controls will comply with the manufacturer's installation specifications and will be installed as directed by the Site Superintendent. All control measures will be installed in accordance with the ESCP (Appendix C) and "1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control" by the Water Management Administration (WMA) of the Maryland Department of the Environment (MDE).

The installation of E&S control features will allow the site activities to take place while minimizing any threat to the adjacent waterways. Work covered under this task includes installation of super silt fence,

perimeter dike/swale, temporary pipe slope drain, temporary gabion outlet structures, stabilized construction entrance, stone check dam, erosional control matting, seeding, vegetation, and wetland planting.

At a minimum, the E&S controls will be inspected weekly and after each significant rain event. The stabilized construction entrance will be inspected daily. The Site QC Manager will keep a log of the E&S inspections. Any necessary maintenance will be performed immediately and documented in the E&S log. All of the E&S controls will remain in place until the vegetation is established. Once the vegetation is established, a final inspection by MDE and the FEAD/NTR will be performed to approve the removal of the E&S controls.

2.2.1 Super Silt Fence

Super silt fence will be installed at the locations shown on Sheet ES-3 of Appendix C in accordance with Detail 2 on Sheet ES-4. No other ground disturbing activities will be performed until the super silt fence is in place.

2.2.2 Perimeter Dike/Swale

A perimeter dike/swale will be installed along the northeast side of the site as shown in Sheet ES-3 in accordance with Detail 1 of Sheet ES-4. At the end of the swale and Swale 4, a rip-rap apron will also be installed near Mattawoman Creek.

2.2.3 Temporary Pipe Slope Drain

A temporary pipe slope drain will be installed at the southern end of the existing culvert to channel the clean water from the culvert to Mattawoman Creek during excavation activities (Sheet ES-3 and Detail 4 on Sheet ES-4). A rip-rap apron will be installed at the southern end of the pipe slope drain near Mattawoman Creek. After excavation activities and installation of the proposed culvert are completed (Section 2.7), the pipe slope drain will be removed along with the existing culvert.

2.2.4 Temporary Gabion Outlet Structure

A temporary gabion outlet structure will be installed on the dirty water side of the dike/swale and at the end of swale 4 near Mattawoman Creek as shown on Sheet ES-3 of Appendix C in accordance with Details 7 & 8 of Sheet ES-4.

2.2.5 Stabilized Construction Entrance

To reduce the amount of soil transported onto paved public roads by motor vehicles or runoff, a stone pad with underlining filter fabric will be constructed at all points of vehicular ingress and egress. The stabilized construction entrance will be installed at the locations shown on Sheet ES-3 of the ESCP in accordance with Detail 3 of Sheet ES-4. Heavy equipment will be used for the installation of the stone

pad. New stone will be added as necessary or accumulated soil will be removed, so that the stone entrance will perform its intended function to reduce tracking of sediment onto streets and provide a stable area to enter and exit the site.

2.2.6 Stone Check Dam

A stone check dam will be placed near the middle of perimeter dike/swale. Sheet ES-3 shows the location of the stone check dam and Sheet ES-4 (Detail 5) provides the detail of the stone check dam.

2.2.7 Temporary Seeding

Temporary seeding will be utilized during construction activities to temporarily stabilize disturbed areas that will remain disturbed for more than 30 days. The temporary seed mixture is included on Sheet ES-6 of Appendix C.

2.2.8 Permanent Seeding

Permanent seeding and mulch will be placed in all of the disturbed areas as described in Section 2.8.2, Site Vegetation. The permanent seed mixture is included on Sheet ES-6 of Appendix C.

2.2.9 Wetland Plants

Native wetland plants will be installed according to the direction of the NSF-IH Natural Resources Department (Figure 6). The list of native plant species is presented on Table 1 for each habitat. Habitats are based on the *United States Fish and Wildlife Service Native Plants for Wildlife Habitat and Conservation Landscaping: Chesapeake Bay Watershed*. The disturbed soil around the planted trees in the forested slope will be stabilized with standard seed and straw or erosion control matting where needed.

2.2.10 Dust Control

If necessary, a water truck with a sprinkler attachment or similar equipment will be utilized to control dust in all excavation areas and haul roads. The water source for the truck will be determined by the FEAD/NTR. Water will be applied in sufficient quantity to prevent the creation of dust, but excessive watering that may result in a muddy condition will not be permitted. Determination of the need for dust control will be the responsibility of the Site Manager as indicated by changes in site conditions on a continuing basis.

2.3 Clearing and Grubbing

Tree cutting, stump removal, and brush clearing will be required to install erosion control features. Large trees will be cut in manageable lengths and disposed of off site. Branches, small trees, and brush will be chipped and spread on site and will not require off-site disposal. Roll-offs will be used for the disposal of stumps.

2.4 Waste characterization sampling

During the initial phase of field work, representative samples will be obtained of the waste within the soil/debris area at Site 28. The sample results will be used to characterize the waste and prepare the waste profiles for the disposal documentation. Section 3.1 describes the waste characterization sampling procedures.

2.5 Soil and Debris Excavation handling

This section discusses the activities associated with the removal and disposal of the soil and debris from Site 28 within the area shown on Figure 3. An estimated 2,419 cubic yards (cy) (3,991 tons) of soil and debris, approximately 5 roll-off boxes for clearing and grubbing and E&S material, and 10 drums of investigative-derived waste (IDW) are to be removed from Site 28. The contaminated soil removal will consist of soil and miscellaneous construction debris.

2.5.1 Soil and Debris Removal and Material Handling

Once the E&S controls are in place and the fence line is removed to allow excavation access outside of the fence, excavation of soil and debris will begin in the lower portion of the site. An excavator will be used to remove the material from the surface to an average of 2 ft bgs in the area that was determined to be a threat to human health (outlined in blue on Figure 3) and 1 ft bgs in the area that was determined to be a threat to ecological receptors (outlined in yellow and brown on Figure 3).

Once the material is removed, confirmation samples will be collected by CH2M Hill (following the approach in the EE/CA) to verify that the soil is clean. The excavation depth also depends on the depth to groundwater and grading of the slope. No soil and debris will be excavated below groundwater. Since the site is on a slope, the depth for excavation in the upper part of the slope is assumed to extend to about 5 feet bgs and in the lower portion to about 1 foot bgs. During daily activities, a smaller section of the existing fence line (10 ft-20 ft) will be taken down to allow equipment access to excavation areas outside the fence line. The chain-link fence will then be re-secured at the end of each work shift with the existing clamps and bolts to the main support corner poles.

After the excavator removes the soil, a trac loader will transport the material to the material screening area and stage it for mechanical screening within the limits of excavation. At the material screening area, a second excavator, with the support of an additional trac loader, will be used to load the soil and debris in the mechanical screener. Approximately 2,419 cy (3,991 tons) of soil and debris will be removed and mechanically screened before being shipped off site. It is estimated that approximately 200 cy/day will be screened with a two-deck screener consisting of a five-inch top and a two-inch bottom. The removal process will be observed by an UXO Technician. If single base grains are found during the excavation, work will stop and an ESS to address the grains will be prepared and submitted to NOSSA for approval. If other potential MEC or MPPEH are encountered, work will stop and NOSSA will be contacted to re-

assess the site. Depending on NOSSA's re-assessment of the site, an ESS/SAR may need to be prepared to address the items before work can continue at the site. Note that if waste characterization results indicate that some or all waste is hazardous, Shaw will prepare a lined stockpile/staging area for loadout within the limits of excavation.

2.5.2 Waste Loadout and Disposal

The excavator and trac loader will be used to relocate the waste from the waste staging area into the loadout area. The waste material will then be loaded onto haul trucks for off-site disposal. If the UXO Technician(s) identify any potential MEC or MPPEH, work must stop and NOSSA must be contacted to re-assess the site. Depending on NOSSA's re-assessment of the site, an ESS/SAR may need to be prepared before work can continue at the site. NOSSA's current determination is that no ESS/SAR is needed at this time (Appendix E). Kiln dust may be used to absorb any excess water content from the waste material during loading.

A trucking company will be subcontracted to haul the waste to an approved non-hazardous disposal facility. The disposal facility selected for this project will be determined once the waste characterization sample analysis has been reviewed and the disposal pricing is obtained from the potential disposal facilities. Site personnel will inspect each loaded truck before it leaves the site. The inspection will verify that no waste or soil is on the outside of the truck that could potentially be deposited onto the roads and that there is no standing water within the truck bed. If standing water is observed, kiln dust will be added and mixed into the load. The truck inspection will also verify that the trucks are in working order and acceptable for travel on public roads. The preferred truck route is shown on Figure 3.

2.6 Mechanical Screening

This section discusses the procedures to be followed during the mechanical screening of excavated material.

2.6.1 MPPEH Training

The mechanical screening operation will be supported by two Shaw UXO Technicians designated by the Shaw Ordnance and Explosives Service Center. They will be qualified in accordance with Department of Defense Explosives Safety Board (DDESB) Technical Paper 18 (TP 18) and listed in the Huntsville UXO Technician credentials database. The most qualified UXO Technician will conduct Explosive Ordnance Recognition training for those of the field crew who previously have not had the training. The training that will be performed prior to conducting the screening operation will consist of describing basic MPPEH characteristics, identification, and safety precautions.

2.6.2 Exclusion Zone

There is a very low probability that potential MEC or MPPEH will be encountered; however in the event such an item is discovered, an exclusion zone (EZ) will be established in order to protect site workers from exposure to fragmentation and overpressure hazards of an unexpected initiation of energetic material. The EZ will encompass the area of activity in essentially a bubble and will be provided for access and egress control. Only essential personnel will be authorized unescorted access in the EZ.

2.6.3 Mechanical Screening Operations

A UXO Technician will be present at all mechanical screening activities of material excavated from the removal action at Site 28. The screening machine, Scalper 107's (or equivalent), will be used to screen the material through a 5-inch screen and a 2-inch screen. Other pieces of equipment will be used as well, which will include excavators and trac loaders.

The process will involve using an excavator to excavate material and load it onto a trac loader for delivery to the screening area. As a precautionary measure, a UXO Technician will observe the excavation for any suspect MEC or MPPEH.

An excavator, with support from a trac loader, will load the screening units for processing. The screening operation will be observed by one of the UXO Technicians throughout the screening process. Using hand signals, the UXO Technician assigned to the screening operation will communicate with the excavator operator to stop feeding the Scalper if suspected MEC or MPPEH are observed. Upon receiving the signal to stop, the loader operator will immediately notify the second screening team and then place the excavator bucket on the ground, shut down the equipment, and move outside the EZ along with the other excavator operator. In the event a possible MEC or MPPEH item is observed during screening, the UXO Technician with the assistance of the second UXO Technician (if necessary) will then examine the item to determine if it is truly MEC or MPPEH-related. This UXO Technician will have the ability to start and stop the Scalper during the screening operation. If a possible MEC or MPPEH is detected at any point in the process, the equipment operators will be told to stop their machines and move outside the EZ. Once the material has been screened and determined not to be MEC or MPPEH, the material will be placed in the loadout pad for disposal and screening can continue.

However, if the item is determined to be MEC or MPPEH, then work will stop and NOSSA will be contacted to re-assess the site. Depending on NOSSA's re-assessment of the site, an ESS/SAR may need to be prepared before work can continue at the site.

2.6.4 MPPEH Identification and Classification

The likelihood of encountering additional MPPEH during the excavation and loadout is minimal. However, in the event that MEC or MPPEH is encountered, then work will stop and NOSSA will be

contacted to re-assess the site. Depending on NOSSA's re-assessment of the site, an ESS/SAR may need to be prepared before work can continue at the site.

2.7 Site Restoration

An existing culvert located just west of Well 14 that runs under the gravel access road toward Mattawoman Creek (Sheet ES-3) will require partial removal, replacement, and realignment with Swale 4. Swale 4 will then be reshaped, armored, and extended to Mattawoman Creek (Detail 6 of Sheet ES-4).

Site restoration will include activities associated with returning the site to suitable conditions in preparation for demobilization. These activities include backfilling, site vegetation, final site inspection, and removal of temporary facilities and structures.

2.7.1 Backfilling

Approximately 3,561cy (5,342 tons) select fill and 1,187 cy (1,424 tons) of topsoil will be obtained from an off-site source. The select fill material will be compacted with a 10 ton vibratory compactor in 8 to 12-inch loose lifts; with no compaction tests required. Topsoil will be graded in one 6-inch lift over the compacted select fill material.

2.7.2 Site Vegetation

Permanent vegetation will be established in all disturbed areas within the limits of disturbance. Seed and fertilizer will be applied to the disturbed areas as described in the ESCP of Appendix C. Native wetland plants will be planted along the disturbed area per the direction of NSF-IH Natural Resources Department (Table 1).

2.7.3 Final Site Inspection

Prior to the site teardown and demobilization, Shaw, Navy personnel, United States Environmental Protection Agency (USEPA), and MDE representatives may conduct a site inspection. The inspection will focus on the work that was performed. Items that require further work will be documented by the Site QC Manager and corrected within a reasonable time. Once completed, the Navy, USEPA, and MDE will be notified in writing and a final site inspection (if necessary) will be conducted with the same personnel.

2.8 Site Teardown

Once the project is completed, the temporary facilities such as the sanitary units and trash dumpsters will be removed from the site. The electrical and telephone lines will be disconnected from the site trailer. Other temporary facilities such as the equipment decontamination pad and waste staging area will be removed. The temporary structures, such as safety delineations, will be removed when appropriate and the spent materials will be properly disposed. The temporary E&S controls, such as super silt fence, will

be removed and placed in a dumpster for disposal once vegetation has been established and approval has been obtained from the FEAD and MDE.

2.9 Demobilization

Personnel and equipment will be demobilized when they are no longer needed at the site. No equipment or personnel will be demobilized until their tasks are complete and approved. Once the final inspection is complete, and the work is accepted, Shaw will demobilize any remaining personnel, equipment, and support facilities.

3.0 FIELD SAMPLING AND ANALYSIS PLAN

This section presents the sampling and analysis program associated with the soil removal action at Site 28. Two sampling procedures are required in conjunction with the planned soil removal action. These sampling procedures include waste characterization sampling, and clean fill sampling. The associated analytical requirements are also provided in this section. This Field Sampling and Analysis Plan (FSAP) provides assurance that data are collected, analyzed, reviewed, and reported in a consistent and representative manner. This FSAP is required reading for representative field and laboratory personnel involved in sample handling and data reporting for the samples collected as a part of these removal actions.

Waste characterization sampling will be performed by Shaw as early in the program as possible to allow for advance selection of the disposal facility. Representative samples of the soil and sediment areas will be obtained and submitted to an off-site laboratory for characterization. The results will be used to prepare a waste profile for disposal of the excavated soil. Samples will also be obtained as early as possible from the clean fill borrow source for the incoming clean fill material and topsoil.

3.1 Sampling Methods and Procedures

The following sections describe the types of sampling, frequencies for the sampling activities, and the associated chemical analyses to be performed for the samples collected.

3.1.1 Waste Characterization

During the initial phase of fieldwork for the removal action, representative samples of the soil and sediment will be obtained within the soil removal areas defined at Site 28 (Figure 3). The sample results will be used to characterize the waste and to prepare a waste profile for disposal documentation. Initially, five composite soil samples will be collected from within the three designated removal areas for this purpose. Two composite samples from each of the two larger excavation areas and one composite sample from the smaller excavation area will be collected. Additional sample collection and analysis may be required if other waste is encountered.

Each composite waste characterization sample set will be obtained from the bucket of the excavator or by using a hand shovel. A sample set will consist of one grab sample for volatiles analysis and one composite sample for the remainder of the analysis listed in Table 2. The specific procedures for obtaining the grab and composite samples are presented below:

Grab Sample

- Identify the appropriate excavator bucket or shovel sample that represents an average of the majority of the type of soil to be excavated.

- Collect a grab sample of soil from the excavator bucket or shovel using an Encore™ sampler for total petroleum hydrocarbons (TPH) gasoline range organic (GRO) analysis and benzene, toluene, ethylbenzene, and xylenes (BTEX).
- Close the Encore™ sampler, label the sample, and package it for shipment to the lab.
- Collect one 4-ounce soil jar for the Toxicity Characteristic Leaching Procedure (TCLP) Volatiles analysis.

Note: Analytical requirements will be determined by the disposal facility and the analysis listed above and presented in Table 2 may require modification based on the disposal facility permit.

Composite Sample

- Identify a minimum of three excavator bucket or shovel samples that represent an average of the type of soil to be excavated.
- Collect an equal amount of sample (minimum of 8 ounces) from each bucket or shovel and place the samples in a stainless steel mixing bowl.
- Mix the samples thoroughly and fill the required bottles, as listed in Table 2, with portions of the mixed sample.
- Secure the sample jar lid, label the sample, and package the sample for shipment.

3.1.1.1 Waste Characterization Sample Analysis

It will be necessary to collect waste characterization samples which will be analyzed for the following parameters to ensure that the waste is not hazardous:

- Full TCLP (Volatiles, Semivolatiles, Pesticides, Metals, and Herbicides) by SW-846
- Ignitability by SW-846 1010, Corrosivity by SW846 9045, and Reactive cyanide and sulfide by SW-846 Chapter 7.3.
- Additional analyses that may be required by the disposal facility include:
- TPH GRO by SW-846 8015M
- TPH Diesel Range Organics (DRO) by SW-846 8015M
- PCBs by SW-846
- Total Organic Halides by SW-846 9023
- BTEX by SW-846 8260B.

Disposal samples will be collected at a frequency of one five-point composite per 500 cy of excavated material. These samples will be analyzed by SW-846 methodology. Refer to Table 2 in this FSAP for the specific methods. These results will be evaluated against the TCLP Maximum Contaminant Concentrations (40 CFR 261 6/96) as part of the waste profiling to ensure proper disposal to an approved off-site facility prior to being loaded into haul trucks for disposal at a Navy-approved disposal facility.

3.1.2 Top Soil and Fill Samples

Shaw may be required to import "clean fill" for the purpose of backfilling or site restoration. One composite per 1,000 cy per source will be collected. The fill and topsoil from these areas will be analyzed to ensure it is not contaminated for the following contaminants of concern:

- TCL VOC by SW-846 8260B
- TCL SVOC by SW-846 8270C
- TCL Pesticides by SW-846 8081A
- Total PCBs by SW-846 8082
- Target Analyte List (TAL) Metals by SW-846 6010B/7471A
- Cyanide, Total by SW-846 9014
- TPH DRO by SW-846 8015M
- TPH GRO by SW-846 8015M

Replacement fill and top soil samples will then be shipped to a Navy approved environmental laboratory for analysis. The Navy shall approve all results of these sample analysis prior to placement.

Table 2 of this FSAP summarizes the analytical methodology, sample containers, holding times, preservation, sample frequency, reporting format, and associated quality assurance/quality control (QA/QC) required for the investigative, confirmation, waste characterization and replacement fill samples.

3.2 Project Organization and Responsibilities

All project personnel, including field, laboratory, and subcontractor personnel, are subject to the requirements of this FSAP. Following is an overview of responsibilities provided for this scope of work.

3.2.1 Primary Contractor Tasks

The Shaw project manager (PM) serves as the focal point for control of all project activities. The PM will be supported by the project team which will provide reviews, guidance, and technical advice on project execution issues. The project team will consist of supervisory, health and safety, technical, and QA/QC

staff members to ensure safe and compliant progress of the remediation goals. Individuals of the project team each have specific responsibilities involving adherence with the Statement of Work, Health and Safety Plan (HASP), and FSAP.

3.2.2 Subcontractor Activities

The selection of qualified subcontractors will be in accordance with Shaw procurement and QA procedures. The bulk of the work will be accomplished by Shaw personnel, but a selection of environmental laboratories for Navy work are procured and coordinated based on capacity and capability. Shaw performs quality checks to determine that the subcontractors have fulfilled the procurement requirements necessary to perform site or off-site activities. All subcontractors will be required to follow the procedures of the FSAP.

3.2.3 Qualifications and Training of Personnel

Personnel assigned to the project, including field personnel and subcontractors, will be qualified to perform the tasks to which they are assigned. Said personnel will meet requirements set forth in Naval Environmental compliance documentation OPNAVINST 5090.1B 25-5.8. This includes but is not limited to basic sampling techniques; field testing methodology, task-specific sampling methods, maintenance of environmental paperwork, and how to avoid cross contamination. In addition to education and experience, specific training may be required to qualify individuals to perform certain activities. Training will be documented appropriately and the forms placed in the project file as a record. Project personnel will receive an orientation to the full FSAP, and the HASP as appropriate to their responsibilities before participation in project activities. Training of field personnel will be provided by the Site Supervisor, the QA Officer, or by a qualified designee.

3.3 Sampling Procedures Overview

3.3.1 Purpose

The sampling events for this project may include, but are not limited, to the following:

- Backfill and Top Soil Source Sampling
- Waste Soil Disposal Characterization

Sampling procedures will be compliant with USEPA, state, and applicable Department of Defense (DOD) specifications. This FSAP meets or exceeds guidelines set forth by Naval Environmental compliance documentation OPNAVINST 5090.1B Chapter 25, NAVSEA T0300-AZ-PRO-010, and National Environmental Laboratory Accreditation Program (NELAP) quality system requirements. The matrix and required analytical will determine which sample collection procedure(s) is appropriate. Section 3.4 provides specific techniques to be used when collecting waste characterization and fill samples. The

remainder of Section 3.0 of this FSAP addresses information that is consistent for any type of field sampling.

3.3.2 Preparations for Field Sampling

The Site Supervisor will oversee procurement of all required sampling equipment (Table 3). Where feasible, single-use disposable equipment will be used to minimize decontamination time and effort. For events requiring bailers and tubing, Teflon® and/or silicone will be used. Where metal equipment is to be used for soil sample collection and/or compositing, the augers, bowls, spoons, etc. will be made of stainless steel.

The Site Supervisor will ensure that all permits and authorizations have been acquired prior to the start of any sampling at Site 28. The Project Chemist or appropriate representative will notify the chosen laboratory to provide USEPA-approved sample bottles, preservative, and shipping containers. The laboratory may also be requested to provide deionized water for decontamination of equipment, trip blanks, chains of custody, custody seals, and approved packing material to protect sample bottles during transit.

3.3.3 Sample Log Book

It will be necessary for the sampling person or crew to maintain daily field notes. Items that must be included are sampling protocol, any changes to the procedures, meetings, instructions, safety precautions, personnel protection, and activities pertaining to the samples. The person taking notes must be knowledgeable enough about these activities to know which details are important.

Repetition of information recorded in other permanent logs should be avoided, but enough information should be recorded to present a clear and accurate picture of technical activities. At a later date, should a question arise concerning a specific event or a procedure used, it will be answered from these notes. The following information should be logged into the logbooks and/or database:

- Date and time of sampling.
- Sample number, locations, type, matrices, volumes, sample identification (ID) and descriptions, type and number of sample containers, names and signatures of individuals performing sampling tasks, chain-of-custody (COC) and air bill numbers, preservatives, date samples were sent and date results were received.
- Name of laboratories and contacts to which the samples were sent, turn-around-time (TAT) requested, and data results, when possible.
- Unusual appearance or odor of a sample.
- Weather conditions.

- Additional samples and reasons for collecting them.
- Levels of protection used (with justification).
- Meetings and telephone conversations held with LANTDIV, NTR, regulatory agencies, project manager, or supervisor.
- Details concerning any samples split with another agency.
- Details of QC samples collected.

These notes should be dated and signed (each page) for validity. All logbooks will be bound and pre numbered. All logbook entries will be made with indelible ink and legibly written. The language will be factual and objective. No erasures will be permitted. If an incorrect entry is made, the error will be crossed out with a single strike mark, initialed, and dated.

3.3.4 Sample Custody and Documentation

Sample custody can be defined as physical possession of samples, having samples within visual range, or having samples located in a restricted access area. Sample possession during all sampling efforts must be traceable from the time of collection until the results are verified and reported. The sample custody procedures provide a mechanism for documentation of all information related to sample collection and handling. The primary piece of documentation to ensure sample custody is the COC form. Shaw personnel are responsible for providing evidence of sample custody from the time of collection until the laboratory receives the samples. The laboratory will be able to provide documentation of sample custody from that point to sample disposal.

As part of appropriate documentation, all sample bottles will be adequately labeled. The label will present sample identification and collection information. It will be pre-printed from the sample tracking system or completed with indelible ink. At a minimum, all sample labels will include the following sample information:

- Field sample location and unique sample identifier
- Project name and number
- Analysis requested for each bottle
- Method of preservation for each bottle
- Date and time of collection
- Initials of sample technician.

A sample numbering system will be utilized in the field to uniquely identify each sample collected at Site 28. The sample number will be traceable to the site, location, and depth (where applicable). The

sample identification and description will be recorded by the Site Supervisor or representative in the sample collection logs.

Sampling nomenclature as follows:

- Waste Characterization Soil Samples: XXXXXX-DW-00X
- Clean/Back Fill Soil Samples: XXXXXX-CF-00X
- Top Soil Samples: XXXXXX-TS-00X
- Where:
- XXXXX Project Number
- SM Sample matrix or type (DW = disposal waste, DL = disposal liquid, DD = disposal drum, CF = clean fill source, TS = topsoil source)
- NNN Sequential number starting at 001 (Sequence number in Sample Log Book)

3.3.5 Field Custody Procedures

The sampling team with the Site Supervisor will maintain overall responsibility for the care and custody of the collected samples until they are transferred or properly dispatched to the fixed-base laboratory. All shipping or sample transfer activities will be documented.

Transfer of custody and shipping procedures will include:

- The Site Supervisor instructing sampling team personnel in the proper COC procedures before sampling begins.
- A COC entry made in the field for each sample. This document will accompany the samples in shipment, and a copy will be maintained at the site for placement in the project files at the conclusion of field activities. The custody of individual sample containers will be documented by recording each sample identification and the number of bottles on the appropriate COC form.
- COC records initiated in the field will be placed in a plastic bag and taped to the underside of the top of the shipping cooler used for sample transport.
- Each time responsibility for custody of the sample changes, the new custodian will sign and date the record.
- All coolers must be secured at the site with two custody seals prior to transport. Custody seals should be signed and dated by the person relinquishing custody of the samples being shipped. They should be placed over the opening of each cooler so that the cooler cannot be opened without breaking the seal.

3.3.6 Laboratory Custody Procedures

All samples to be analyzed by the off-site laboratory will be shipped via overnight courier service. Upon receipt, a representative of the laboratory shall check the integrity of the custody seals, then locate, sign, and date the COC. The laboratory is responsible for verifying that the COC and containers are in agreement. The COC, a Cooler Receipt Form, and information regarding any discrepancies between the COC and bottle labels will be faxed to the Project Chemist prior to preparation for analysis. The Laboratory Information Management System will provide evidence of sample custody from receipt by the laboratory until appropriate disposal.

3.3.7 Sample Containers, Preservation, and Holding Times

Samples must be placed in sample containers certified by the manufacturer to be pre-cleaned to USEPA specifications. Containers provided by the fixed-base laboratory will be compatible with the matrix and intended analysis, and properly prepared and preserved to maintain sample integrity. Table 2 of the FSAP specifies the types of containers needed for each analytical method and matrix.

Physical and chemical preservation includes techniques designed to stabilize the concentrations of analytes in the sample matrix during the time from sample collection through preparation and analysis. All samples shall be preserved by cooling to 4°C + 2°C immediately after sample collection. Whenever possible, chemical preservatives will come prepared from the laboratory.

The final pH of the chemically-preserved samples will be checked using pH paper and the result recorded. The pH paper will not be dipped into the sample container to measure pH, but an aliquot of sample shall be removed for pH testing and then properly disposed. If the pH check indicates pH adjustment is necessary, additional preservative will be added to attain the correct sample pH.

A sample holding time establishes the recommended maximum time that a sample may be held under preservation before extraction and analysis without compromising sample representativeness. Preservation techniques and holding times are standardized by the USEPA according to analytical method. Table 2 of this FSAP summarizes the latest information on preservation techniques and holding times for the requested analyses.

Chemical preservation is not usually recommended for solid matrix samples. Unpreserved samples that require preservation by the laboratory should be indicated on the sample label and should be flagged on the COC to identify these samples to the laboratory receiving personnel as requiring special handling.

3.3.8 Sample Packaging and Shipment

Samples that are collected for off-site laboratory analysis that require overnight shipment will be generally prepared by:

- Sealing the container in an outer ziplock storage bag.
- Securely wrapping and taping each collected bottle in bubble wrap (or other similar shock-absorbing material).
- A temperature blank will be included in each cooler. The temperature will be recorded upon receipt at the laboratory to verify sample temperatures during transport.
- When collecting volatile samples, including GRO samples, the field personnel will include trip blanks in each of the coolers containing volatile samples.

At least three sides of the container must be wrapped or surrounded with material when placing the samples into the shipping cooler. Adequate ice will be placed in doubled ziplock bags and added to the cooler around and over the top of the sample containers to form a cooling layer to help ensure proper preservation during shipment. In addition, most samples will have been pre-cooled to the desired temperature prior to packing for shipment.

Trip blanks are volatile bottles that have been prepped by the laboratory using laboratory grade water and are shipped with the field sample containers, and returned unopened to the laboratory for volatile analysis. Trip blanks are used to indicate if any contamination during shipment of containers to the field, storage of containers at the site, or shipment from the site to the laboratory has occurred. Trip blanks will be included in each cooler used for shipping volatile samples. If more than one cooler will be sent on a given day, each cooler should contain a set of trip blank samples. To minimize the number of trip blanks being analyzed, care should be taken to place all volatile samples in one cooler.

Temperature blanks are nalgene bottles containing water that will be included in each sample cooler. Upon receipt at the laboratory, the temperature will be recorded to verify the sample temperatures during transport. Completed and signed COCs will be placed into the cooler in a protective ziplock bag and taped to the underside of the cooler lid. A minimum of 2 custody seals will be applied across the opening of the cooler and the lid secured by wrapping the cooler with clear plastic packing tape. The cooler will then be ready for shipment according to the methods required by the overnight delivery service. At a minimum, the laboratory address, telephone number, and contact name should be included on the original air bill and, if multiple packages are sent, on each sample cooler.

At all times from the point of sample collection in the field through storage, inventory, preparation, and shipment, the samples must remain sealed, protected from sources of contamination, and adequately preserved by chilling.

As shipping regulations are subject to frequent updates without notification, the sample technician should, at least quarterly, petition a set of applicable shipping regulations from the overnight shipper to be assured of regulatory compliance.

3.3.9 Decontamination

All reusable equipment that may directly or indirectly contact samples shall be cleaned in a designated decontamination area. In addition, the contractor shall take care to prevent the sample from coming into contact with potentially contaminating substances, such as tape, oil, engine exhaust, corroded surfaces, or dirt. To minimize the possible contribution of even trace levels of contamination from sampling equipment, adequate decontamination must be completed prior to each use of the equipment. Sampling and drilling devices shall be scrubbed with a solution of potable water and Alconox™, or equivalent laboratory-grade detergent. The equipment will then be rinsed with copious quantities of potable water followed by a deionized water rinse. If equipment has come in contact with oil or grease, it will be rinsed with pesticide-grade methanol followed by pesticide-grade hexane. The equipment will be air-dried on a clean surface. If the sampling device shall not be used immediately after decontamination, it shall be wrapped in oil-free aluminum foil. Decontamination fluids shall be collected in appropriate storage containers. These will be sampled for characterization and disposal by an approved facility.

3.3.10 Cross-Contamination Minimization

Cross-contamination is the introduction of contaminants into the sample through sampling and/or sample handling procedures. It can cause an otherwise representative sample to become non-representative. The most important means of minimizing cross-contamination are as follows:

- Sampling expendables, i.e., sampling gloves, glass thieves, tongue depressors, pipettes, string, dip jars, etc., should not be reused. Used expendables should be labeled so they are not confused with non-contaminated trash.
- Minimum contact should be made between the sampler and the sample medium. For example, a sampler should not touch the sample while loading the sample in the container.
- Sample collection activities should proceed progressively from the least contaminated area to the most contaminated area.
- Sampling equipment should be constructed of Teflon®, stainless steel, or glass that has been properly pre-cleaned for collecting samples. Equipment constructed of plastic or polyvinyl chloride should not be used to collect samples for trace organic analyses. Any tools used in sampling must be carefully decontaminated prior to first use and after each use. Equipment and Supplies Checklist is provided in Table 3.
- Activities that could contaminate samples are prohibited in the sample handling and preparation area. These activities and the possible contaminants include:

Activity	Possible Contaminants
Smoking	Poly Aromatic Hydrocarbons
Spraying for insects	Pesticides, oils, solvents
Spraying for weeds	Herbicides, oils, solvents
Refueling	BTEX and hydrocarbons
Painting and paint stripping	Solvents

3.4 Waste Characterization and Fill Sampling

3.4.1 Purpose

This section identifies the steps and technical areas that will be encountered in conducting a soil/debris program. The role of a sampling run is identified along with procedures that will guide the sample technician in conducting a compliant program.

3.4.2 General Sampling Procedures

All sampling events should be well planned and coordinated with the Project Manager, the Site Supervisor, and the Project Chemist as required by this FSAP. All target analyte lists should be reviewed with both the laboratory that will perform the analysis and the sample technician(s) (see Table 2 of the FSAP).

Sampling personnel are critically important to sampling program success, since the sample technician is often in the best position to detect areas of suspicion. Even sophisticated sampling procedures should not be relied upon to replace good judgment and common sense on the part of sampling personnel in discerning the difference between routine and extreme case scenarios. Sampling personnel must be alert to unusual conditions in their surroundings such as dead animal or plant life, odors not normally associated with an area, and changes in the visual appearance of the location to be sampled.

Soil/disposal samples will be collected using a stainless steel trowel, a split-spoon sampler, or hand auger. All soil/debris sampling equipment that may come into contact with samples or sampling surfaces will be constructed of stainless steel, borosilicate glass, or Teflon®. All equipment used for collection, transfer, and homogenization will be properly decontaminated before collecting samples and between sampling locations.

After the sample is collected, the soil/samples (with the exception of volatiles) will be homogenized as thoroughly as possible in a stainless-steel bowl. Samples collected for chemical analysis will be placed in the appropriate sample containers, labeled with proper identification, and packed in a cooler with ice pending shipment to the laboratory. To maintain integrity, samples collected in the field must be placed in a dedicated sample ice chest, on ice, and chilled to 4ºC from the time of collection until receipt by the laboratory for analysis.

3.4.3 Sample Collection of Waste Characterization and Clean Fill Samples

All soil samples will be visually classified and documented on a sample collection log. The Site Supervisor will choose the method for sampling, such as split-spoon sampler or auger, based on the task-specific FSAP. The following procedure is applicable to both discreet samples and sub-samples to be combined for compositing.

Don a fresh pair of sample gloves. For volatile and GRO analysis in soil, a grab sample will be collected directly from the sampling point using an Encore™ sampler or its equivalent and not homogenized prior to sampling. For the remaining analysis the place the sample, or subsamples to be composited into a stainless steel bowl. The sample is then thoroughly homogenized using a stainless steel spoon. If the sample aliquot is to large to reasonably homogenize in the stainless steel bowl, the sample should be carefully divided into quarters and then each of these quarters further divided into quarters. One of each of the second set of quarters is then recombined into the mixing bowl and then homogenized. The sample is then placed into the appropriate number and size jars as identified in Table 2 of this FSAP, taking care to minimize headspace as much as possible, and then labeled and stored in a cooler at 4°C. No duplicate samples or equipment blank samples are required for fill material and or waste characterization samples.

All sample documentation and chain of custody procedures outlined in Section 3.3.4 should then be followed. After proper documentation has been performed, sample packaging and shipping as outlined in Section 3.3.8 of this document should be completed.

3.5 Laboratory and Data Performance Criteria

3.5.1 Measurement Performance Criteria

The results from the soil samples collected for waste characterization will be evaluated against the TCLP Maximum Contaminant Concentrations (40 CFR 261 6/96).

3.5.2 Analytical Laboratory and Laboratory Certification

All confirmation, waste characterization, and clean fill analytical samples will be sent to an off-site laboratory to complete the analytical requirements. The chosen laboratory will have current National Environmental Laboratories Accreditation Conference (NELAC) certification as well as appropriate state certifications. The chosen laboratory will provide copies of all current certifications to Shaw prior to project start up.

3.5.3 Laboratory Quality Systems Manual

The chosen laboratory will be required to have a detailed Quality Systems Manual designed to meet the quality program requirements of NELAC and ISO Guide 25. This Quality Systems Manual is included in will be provided to Shaw prior to project start up.

3.5.4 Laboratory Standard Operating Procedures

The laboratory has established Standard Operating Procedures (SOPs), and each SOP has a specific SOP Number with revisions dates. Distribution of updated SOPs are documented on an SOP cover page. Superseded copies of the SOPs are collected according to the distribution list contained within the SOP cover page. As changes occur, these documents are updated and the staff is trained to apply the changes. These SOPs provide specific operational instructions on the execution of each quality element and assure compliance with the requirements of the Quality Systems Manual. Analytical method SOPs are based upon USEPA-approved methods or other recognized standard methods.

3.5.5 Laboratory Training Procedures

Laboratory senior management staff retains oversight responsibility for the data integrity program and retains the ultimate responsibility for execution of the data integrity program elements. Senior laboratory management staff is responsible for providing the resources required to conduct SOPs, ethics training, and operate data integrity evaluation procedures.

Laboratory employees receive technical ethics training during new employee orientation. All employees are required to attend ethics refresher training and to sign an ethical conduct agreement annually, which verifies their understanding of the laboratory's ethics policy and the analyst's ethical responsibilities. Training on data integrity procedures and SOPs are conducted by the individual departments' group leaders within the laboratory. All records of training are retained at the laboratory in the individual staff training folders and are maintained by the laboratory quality assurance officer. All information related to staff qualifications, experience, external training courses, and education are placed into the individuals training file. Verification documentation for laboratory orientation, health and safety, and quality assurance training is also maintained with the training file. Additional training documentation is added to the files as it occurs. This includes data for initial and continuing demonstrations of proficiency, performance evaluations, study data and notes, and attendance lists from individual and group training sessions.

3.5.6 Laboratory Corrective Action and Reporting Procedure

Routine corrective action is defined as procedures used to return out of control analytical systems back to control. This level of corrective action applies to all analytical quality control parameters and analytical system specification as defined in the laboratory SOPs. Bench analysts have full responsibility and authority for performing routine corrective action. Routine corrective actions are documented as part of the analytical record. Defective processes, holding time violations, systematic errors and quality defects that occur are to be reported by the bench chemist immediately to the section supervisor and a non-conformance record initiated. The section supervisor will notify the designated Shaw Laboratory Project Manager who will then notify the Shaw LANTDIV Project Chemist (Natasha Sullivan). All notifications

must be made in a timely manner. The non-conformance record should become part of the analytical record.

3.5.7 Laboratory Instrument Calibration Procedures

Calibrations use a series of reference standards to establish the concentration range for performing quantitative analyses. Method specific procedures for calibration are followed prior to any analysis and are established in the laboratory SOPs and in the analytical method. It is the laboratory's responsibility to maintain logbooks of these calibrations.

3.5.7.1 Initial Calibrations

Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run, and of producing a linear calibration curve. Initial Calibrations are verified using a calibration standard, and continuing validity of an existing calibration must be verified prior to sample analysis. The response to the standard must meet the criteria as stated in the laboratory SOPs and or analytical method. If the criterion has not achieved corrective action, re-calibration is performed before any samples may be analyzed.

3.5.7.2 Continuing Calibration Verifications

Continuing Calibration Verification is used on a daily basis to verify whether instrument performance and quantitation models are relatively unchanged from the day that the Initial Calibration was performed. This process requires testing a known amount of target analyte(s), usually around mid-to-low point of Initial Calibration and calculating its value using quantitation model obtained during the process of initial calibration.

Continuing Calibration Verification is performed at the beginning of the analytical sequence, then used to verify calibration every 10 samples and at the end of the analytical sequence. Such frequency is necessary since the sample matrix can interfere with instrument performance. This is not required for gas chromatograph/mass spectrometer GC/MS methods. The analytical sequence is restricted to certain period of time.

In the event of a failing Continuing Calibration Verification refer to the laboratory method SOP for corrective action. Corrective action may include re-analysis of the samples.

3.5.8 Laboratory Quality Control Samples

Prior to the analysis of the field sample, the laboratory analyst must determine that the method is functioning properly. Specific control parameters indicate whether critical processes meet specified requirements before continuing with the analysis. Method specific control parameters must meet criteria

before sample analysis can be conducted. Each of the following parameters is related to processes that are under the control of the laboratory and can be adjusted if out of control.

3.5.8.1 Method Blanks

A method blank (MB) is analyzed during the analysis of any field sample (one per analytical batch). The method blank is defined as a sample. It contains the same standards (internal standard, surrogates) and reagents that are added to the field sample during analysis. If the MB contains target analytes at concentrations that exceed the method criteria as defined in the laboratory SOPs and or analytical method, the source of the contamination is eliminated before proceeding with analysis. Corrective action may include re-extraction of sample aliquot and or re-analysis.

3.5.9 Laboratory Control Samples

Laboratory control samples (LCS) are used to monitor laboratory accuracy by calculating the percent recoveries of known spiked compounds. All LCS percent recoveries must be within the specified performance limits. These performance limits are derived from published method specifications or from statistical controls generated from the laboratory method performance data. If the spike accuracy exceeds the performance limits, corrective action as specified in the laboratory SOPs for the method is performed and verified before continuing with a field sample analysis.

The analysis of samples can be initiated following a successful demonstration that the method is operating within established controls. Additional controls are incorporated into the analysis of each sample to determine if the method is functioning with established specifications for each individual sample. Sample QC data is evaluated and compared to established laboratory performance criteria as defined within the laboratory SOPs and or analytical method. If the criteria is not achieved the method or the SOP specifies the corrective action required to continue sample analysis.

The following subsections describe sample control parameters.

3.5.9.1 Matrix Spike/Matrix Spike Duplicates (MS/MSD)

Matrix Spike (MS)/Matrix Spike Duplicates (MSD) are analyzed one per twenty samples or one for each analytical batch. Matrix spike and spike duplicates are replicate sample aliquots to which the surrogate standard and spike standard are added. The matrix spike and spike duplicate are then extracted and taken though all cleanup procedures along with the other samples within the analytical batch to monitor the analytical precision and accuracy for the sample and matrix. Precision and accuracy are method dependent. If precision and accuracy criteria are not achieved, corrective action is required as established in the laboratory SOPs. If the recoveries indicate that the problem is procedure related, re-extraction and re-analysis is required. If the recoveries indicate that the failures are sample related, the Shaw Chemist will be contacted and a decision will be made to either report the data as is with a notation in the analytical narrative or if the samples should be re-extract and re-analyzed.

3.5.9.2 Surrogate Spikes (Organic Parameters)

Surrogate spikes are organic compounds that are similar in behavior to the target analytes but unlikely to be found in nature. They are added to quality control and field samples to measure the method performance for each individual sample. Surrogate accuracy limits are derived form published method specifications or by statistical evaluation of laboratory generated surrogate accuracy data. Accuracy data is compared to the applicable performance limits. If the surrogate accuracy exceeds the performance limits, corrective action, as specified in the method or laboratory SOP, is performed before sample data can be reported. These corrective actions may include re-extraction and or re-analyzing sample.

3.5.9.3 Internal Standards (Organic Methods)

Internal standards are retention time and instrument response markers added to every sample to be used as references for quantitation. Their response is compared to reference standards and used to evaluate instrument sensitivity on a sample-specific basis. Internal standard retention time is also compared to reference standards to assure that target analytes can be located by their individual relative retention time. If the internal standard retention time criteria as described in the laboratory SOP are not met, corrective action is required. If failure is due to instrument performance issues, the problem must be identified, corrected, and the sample must be re-analyzed. If no instrument problem is found the sample must be re-analyzed. If upon re-analysis the responses are still not within limits, the problem may be considered sample matrix interference.

3.5.9.4 Serial Dilutions (Metals Analysis)

Serial dilution of metal samples are analyzed to determine if the analytical matrix effects may have impacted the data being reported. If the value of the serially diluted samples does not agree with the undiluted value with a method specified range, the sample matrix may be causing interference, which may lead to either a high or low bias. If the serial dilution criterion is not achieved as defined with the laboratory SOP, the data should be flagged to indicate possible bias matrix effect.

3.5.9.5 Field Duplicate Sample Evaluation

For chemical data, sampling precision will be evaluated by obtaining one duplicate sample for every 10 samples collected for each type of media (10% frequency). Precision will be evaluated by calculating the relative percent difference (RPD) as follows:

- RPD (%) = [(XA-XB)/ XM] * 100
- Where:
- XA and XB are the concentration in the sample and its duplicate, and
- XM is the mean value of the concentrations in the sample and its duplicate, (XA + XB)/2

The RPD will be calculated for the field duplicates for each analytical parameter that was detected in both samples. The RPD is calculated only for those analytes that are detected at levels exceeding the method detection limits in both samples of the duplicate pair. If one of the duplicate pair is detected above the method reporting limit (MRL) and the remaining is non-detect, then the data will be qualified as estimated or rejected depending upon the severity (i.e. >2MRL). It is expected that the field duplicates for solid matrices will have a RPD less than 50% for inorganic and organic parameters. If the criteria is not met for the field duplicates, a careful examination of the sampling techniques, sample media, and analytical procedure in conjunction with other analytical quality control criteria will be conducted to identify the cause of the high RPD and the usefulness of the data.

3.6 Laboratory Reporting Deliverables

All data produced by the laboratory will be required to undergo several levels of review, which will include two levels of management review at the laboratory. For fill and waste characterization samples, the laboratory will be providing a summary report in PDF format which will include the following:

- Signed cover page by Laboratory Director
- Laboratory Analytical Case Narrative
- Sample Summary which will include Client Identification, Laboratory Accession Number, Sampling date and Sampling Time
- Copy of the Chain-of-Custody Record
- Copy of Sample Receipt Confirmation Form
- Sample Result I Forms
- MB Summary Forms, LCS Summary Forms, MS/MSD Forms, and Surrogate Recovery Results will be included.

The laboratory will also submit a Microsoft Excel file containing the data in an electronic deliverable.

3.7 Laboratory Sample Disposal

All samples will be retained under proper storage conditions for a minimum of 30 days following completion of the analytical report. The laboratory disposes of all laboratory wastes following the requirements of the Resource Conservation and Recovery Act.

The laboratories sample management generates a sample disposal list from their Laboratory Information System, which lists all samples whose holding period has expired. Data from each sample is compared to the hazardous waste criteria established by the specific State agency. Samples containing constituents at

concentrations above the criteria are labeled as hazardous, segregated, scheduled for removal from the facility, and disposed of as hazardous waste.

3.8 Data Verification

The Shaw LANTDIV Chemist will verify that data has been received for all samples that have been sent to the laboratory. An evaluation of this data will be performed to determine whether the laboratory met the QC requirements for the analytical as stated in the analytical methods and laboratory SOPs. Analytical results will be compared to remediation goals for investigative and confirmation samples, and TCLP Maximum Contaminant Concentrations (40 CFR 261 6/96) for disposal samples; if any results exceed these limits the Shaw Project Manager will be notified.

4.0 HEALTH AND SAFETY

A SSHSP has been prepared for Site 28 and is included as Appendix B to this work plan. The SSHSP documents the policies and procedures that protect workers and the public from potential hazards posed by work at the site. Topics of the SSHSP include:

- Key Personnel and Management
- Job Safety Analyses
- Work and Support Areas
- Protective Equipment
- Decontamination Procedures
- Air Monitoring
- Emergency Response
- Training Requirements
- Medical Surveillance Program.
- UXO Hazard Control Briefing

All of the policies and procedures included in the SSHSP will be followed for the removal action at Site 28.

5.0 CLOSEOUT REPORT

Following demobilization, Shaw will prepare a closeout report describing the activities performed for this removal action. This report will include the following:

- Project objectives and scope of work
- Description of activities completed
- Variations from the original scope of work
- Test results
- Weekly QC reports and inspection logs
- Photographic log of work performed
- Waste manifests and other disposal documentation.

The Site QC Manager will be responsible for the collection of the day-to-day information listed above as described in the QCP of Appendix A. In addition, record drawings will be included in the report showing the sample locations and excavation areas. This report will be initially submitted in draft form with the final report submitted after the Navy and agency comments to the draft are addressed.

TABLES

Table 1
Wetland Plant List
Removal Action at Site 28
Indian Head, Maryland

Freshwater Intertidal Marsh (random spacing for all plants)	***Size***	***Spacing***
Spartina pectinata - Prairie cordgrass	2" plugs	2 feet (0.25 plants/ft^2)
Scirpus acutus - Hardstem bullrush	2" plugs	
Scirpus pungens - Three-square	2" plugs	
Pontederia cordata - Pickerelweed	2" plugs	
Total Number Plants Required	**2,725**	
Scrub-Shrub High Marsh (random spacing for all plants)	***Size***	***Spacing***
Alnus serrulata - Smooth alder	1.5'-2'	8-10 feet (0.01 plants/ft^2)
Sambucus canadensis - Elderberry	1.5'-2'	
Viburnum dentatum - Arrow-wood	1.5'-2'	
Cephalanthus occidentalis - Buttonbush	1.5'-2'	
Clethra alnifolia - Sweetpepper bush	1.5'-2'	
Total Number Plants Required	**635**	
Forested Slope (random spacing for all trees/shrubs)	***Size***	***Spacing***
Acer rubrum - Red maple	2'-3'	10 feet
Acer saccharinum - Silver maple	2'-3'	
Nyssa sylvatica - Blackgum	3'-4'	
Platanus occidentalis - Sycamore	3'-4'	
Quercus phellos - Willow oak	2'-3'	
Vaccinium corymbosum - highbush blueberry	1.5'-2'	
Cercis canadensis - eastern redbud	1.5'-2'	
Quercus alba - white oak	2'-3'	
Total Number Plants Required	**500**	

Note: The wetland plant species listed will be planted according to the above list, depending on availability and site conditions.

Table 2
Analytical Requirements
Removal Action at Site 28
Indian Head, Maryland

Sample Task	Sample Point	Matrix	Sample Frequency	Approx No. Samples	Sample Type	Sampling Equipment	TAT	Analytical Report Format	[1]Required Analysis	Analytical Method	Holding Time	Sample Preservation	Sample Containers
Waste Characterization Sampling	Within soil / sediment areas	Soil	5 Total	5	Grab for Volatiles	Excavator Bucket Hand Shovel SS Spoon SS Bowl	7 days	Summary Report	TCLP Volatiles	SW846 1311/5030B 8260B	14 days to leaching/ 14 Days to analysis	Cool to 4° C	(1) 4oz jar
					3 Point Composite for remaining soil				TCLP Semivolatiles	SW846 1311/3510C 8270C	14 days to leaching/ 40 days analysis	Cool to 4° C	(3) 8oz jar
									TCLP Pesticide	SW8461311/3510C 8081A	14 days to leaching/ 40 days analysis	Cool to 4° C	
									TCLP Herbicides	SW846 1311/8151A	14 days to leaching/ 40 days analysis	Cool to 4° C	
									TCLP Metals	SW846 1311/3010A 6010B/7471A	180 Days/ Hg 28 days	Cool to 4° C	
									Ignitability (Flashpoint)	SW846 1010	14 Days	Cool to 4° C	
									Reactive Cyanide/Sulfide	SW846 CHAP 7.3.3.2/ 7.3.4.1	7 Days	Cool to 4° C	
									Corrosivity as pH	SW846 9045	Immediate	Cool to 4° C	
									PCBs	SW846 3550B/8082	14 days to extraction/ 40 days analysis	Cool to 4° C	
									Total Organic Halides	SW846 9023	28 days	Cool to 4° C	(1) 4oz jar
					Grab				BTEX	SW-846 5035A/8260B	48 hours to preservation/14 Days to analysis	Cool to 4° C (preserve at lab)	3- 5g EnCore Samplers
									TPH GRO/DRO	SW846 5035A/3550B 8015 M	14 Days to analysis - GRO 14 days to extraction/ 40 days analysis-DRO	Cool to 4° C	3- 5g EnCore Samplers (1) 4oz jar
Waste Characterization Sampling	IDW	Liquid	If Required	If Required	Grab for Volatiles	Hand Shovel SS Spoon SS Bowl	7 days	Summary Report	TCLP Volatiles	SW846 1311/5030B 8260B	7 days to leaching/ 14 Days to analysis	Cool to 4° C	(3) 40 mL volatile vials
					Grab				TCLP Semivolatiles	SW846 1311/3510C 8270C	7 days to leaching/ 40 days analysis	Cool to 4° C	(2) amber liters
									TCLP Pesticide	SW8461311/3510C 8081A	7 days to leaching/ 40 days analysis	Cool to 4° C	(2) amber liters
									TCLP Herbicides	SW846 1311/8151A	7 days to leaching/ 40 days analysis	Cool to 4° C	(2) amber liters
									TCLP Metals	SW846 1311/3010A 6010B/7471A	180 Days/ Hg 28 days	Cool to 4° C	(1) nalgene liter
									Ignitability (Flashpoint)	SW846 1010	14 Days	Cool to 4° C	(1) 500 ml nalgene
									Reactivity	SW846 CHAP 7.3.3.2/ 7.3.4.1	7 Days	Cool to 4° C	(1) 1 nalgene
									Corrosivity as pH	SW846 CHAP 7.3	Immediate	Cool to 4° C	(1) 500 ml nalgene
									PCBs	SW846 3550B/8082	7 days to extraction/ 40 days analysis	Cool to 4° C	(2) amber liters
									Total Organic Halides	SW846 9023	28 days	Cool to 4° C	(2) amber liters
					Grab for volatiles and GRO				BTEX	SW846 5030B/8260B	14 Days to analysis	1:1 HCL/Cool to 4° C	(3) 40 ml voa vials
									TPH GRO/DRO	SW846 5030B/3510C 8015 M	14 Days to analysis - GRO 7 days to extraction/ 40 days analysis-DRO	1:1 HCL - GRO Cool to 4° C - GRO and DRO	(3) 40 mL volatile vials (2) amber liters
Waste Characterization Sampling	QA/QC Trip Blanks	Water	1 per shipment	2	Grab for Volatiles	Lab Supplied	7 days	NEESA Level C	TCL Volatiles	SW846 5030B/8260B	14 Days to analysis	1:1 HCL/Cool to 4° C	(3) 40 ml voa vials
Top Soil and Clean Fill Sampling	Fill Sources	Soil	1 per source	4	Grab for Volatiles	Hand Shovel SS Spoon SS Bowl	7 days	NEESA Level C	TCL Volatiles	SW-846 5035A/8260B	48 hours to preservation/14 Days to analysis	Cool to 4° C/ (preserve at lab)	(3) 5g EnCore Samplers
					Grab				TCL Semivolatiles	SW-846 3550B/8270C	14 days to extraction/40 days to analysis	Cool to 4° C	(3) 8oz jar
									TCL Pesticide/PCBs	SW-846 3550B 8081A/8082	14 days to extraction/40 days to analysis	Cool to 4° C	
									TAL Metals	SW-846 3050B 6010B/7471A	180 Days ICP Metals/Hg 28 days	Cool to 4° C	
									Cyanide	SW-846 9014	14 Days to analysis	Cool to 4° C	
					Grab GRO				TPH GRO/DRO	SW846 5035A/3550B 8015 M	14 Days to analysis - GRO 14 days to extraction/ 40 days analysis-DRO	Cool to 4° C	3- 5g EnCore Samplers (1) 4oz jar
Top Soil and Clean Fill Sampling	QA/QC Trip Blanks	Water	1 per shipment	1	Grab for Volatiles	Lab Supplied	7 days	NEESA Level C	TCL Volatiles	SW846 5030B/8260B	14 Days to analysis	1:1 HCL/Cool to 4° C	(3) 40 ml voa vials

[1] Sample analysis may vary, before sampling the Regional Transport and Disposal (T&D) Coordinator will contact the disposal facility to determine any additional or unnecessary analyses.

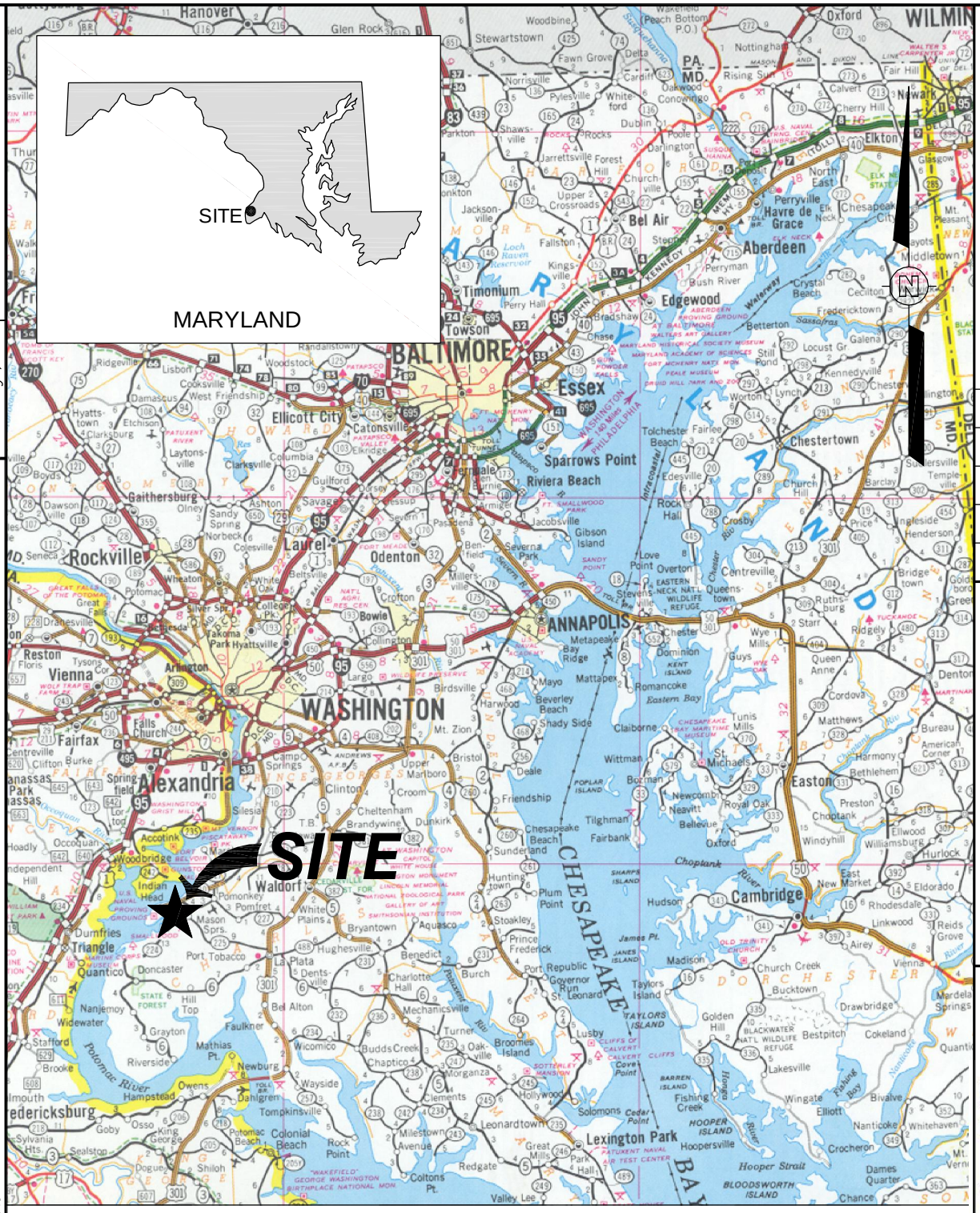
[2] Dedicated sampling equipment will be used at each sample location. Equipment blanks will not be required due to the use of dedicated sampling equipment. However, one field blank sample will be collected per day of sampling.

[3] Sample points have the potential to have very high moisture content. In the event that it is not possible to use the Encore sampling device four ounce soil septa jars will be substituted for the volatile aliquot.

Table 3
Equipment and Supplies Checklist
Removal Action at Site 28
Indian Head, Maryland

Equipment	Required	Calibration	Comments
Materials	√		
Paper towels	√		
Trash bags	√		
Aluminum foil	√		
De-ionized water	√		
Alconox® detergent	√		
Plastic sheet	√		
Nylon rope	√		
Teflon® bailers			
Teflon® or silicone tubing			
Cooler	√		
Ice	√		
Baggies	√		
Bubble wrap	√		
Stainless steel bowl	√		
Forceps	√		
1:1 HNO_3	√		
Appropriate PPE	√		PPE - personal protective equipment
Instruments			
Dual interface probe	√		
PID or FID	√		PID - photoionization detector
			FID - flame ionization detector

FIGURES



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APPROXIMATE SCALE

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REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

REVISIONS

Shaw™ Shaw Environmental, Inc.

DESIGNED BY	D. Pringle	5/17/07	CHECKED BY	S. Seger	5/17/07
DRAWN BY	B. Snyder	5/17/07	APPROVED BY	S. Carriere	5/17/07

NAVFAC Naval Facilities Engineering Command NAVFAC WASHINGTON

NAVAL SUPPORT FACILITY, INDIAN HEAD — INDIAN HEAD, MARYLAND

SITE 28 – REMOVAL ACTION

SITE LOCATION MAP

SCALE:	SIZE:
AS SHOWN	A

DELIVERY ORDER NO. 093

CONSTR. CONTRACT NO. N62470-02-D-3260

NAVFAC DRAWING NO. --

SHEET I.D. FIGURE 1

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OFFICE	DRAWING NUMBER
Pittsburgh, PA	126566-A2

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NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND

SITE 28 – REMOVAL ACTION

SITE VICINITY MAP

Shaw Shaw Environmental, Inc.

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REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

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CONTR. CONTRACT NO. N62470-02-D-3260
NAVFAC DRAWING NO. —
SHEET I.D. FIGURE 2

OFFICE Pittsburgh, PA | DRAWING NUMBER 126566-D8

LEGEND:

- LIMITS OF EXCAVATION
- LIMITS OF WORK
- ZONE BOUNDARY
- FENCE LINE
- SUPER SILT FENCE
- EARTH DIKE
- STONE CHECK DAM
- LIMITS OF SOIL EXCAVATION BASED ON POTENTIAL ECOLOGICAL RISK
- LIMITS OF SOIL EXCAVATION BASED ON POTENTIAL HUMAN HEALTH RISK
- LIMITS OF SOIL/SEDIMENT EXCAVATION BASED ON ECOLOGICAL RISK
- TRUCK ROUTE

SITE 28 BOUNDARY

STABILIZED CONSTRUCTION ENTRANCE

TRUCK PULL OFF

ZONE A
FORMER ZINC RECOVERY FURNACE AND FORMER BURNING CAGE

MATTAWOMAN CREEK

MATERIAL SCREENING AREA

WELL NO. 14

EXISTING 24 INCH CULVERT

GRAVEL ACCESS ROAD

EARTH DIKE

SWALE 1

SWALE 2

SWALE 3

SWALE 4

SUPER SILT FENCE

STONE CHECK DAM

TRUCK PULL OFF

STABILIZED CONSTRUCTION ENTRANCE

ZONE B
FORMER SHORELINE BURNING CAGE

SCALE 0 30 60 90 FEET

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

REVISIONS

Shaw® Shaw Environmental, Inc.

DESIGNED BY D. Pringle 5/18/07 | CHECKED BY S. Sager | DRAWN BY B. Snyder 5/18/07 | APPROVED BY S. Carriere

NAVFAC Naval Facilities Engineering Command Atlantic Headquarters

NAVAL SUPPORT FACILITY, INDIAN HEAD — INDIAN HEAD, MARYLAND

SITE 28 - REMOVAL ACTION

OPERATIONAL LAYOUT

SCALE: AS SHOWN | SIZE: D

TASK ORDER NO. 093

CONSTR. CONTRACT NO. N62470-02-D-3260

NAVFAC DRAWING NO.

FIGURE 3

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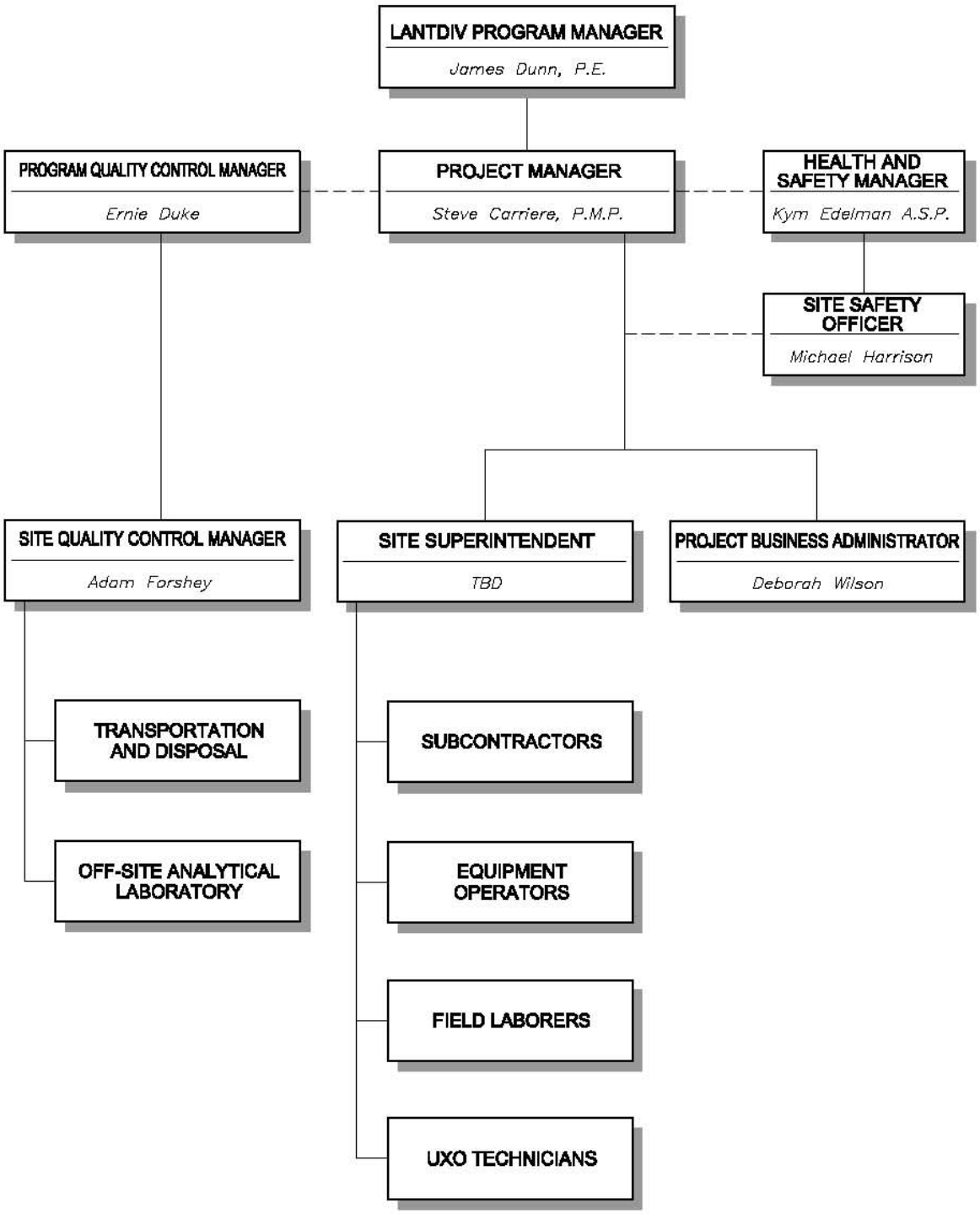

REV	DATE	BY	CHK'D	APPR'D	DESCRIPTION/ISSUE

REVISIONS

Shaw Environmental, Inc.

DESIGNED BY	S. Seger	06/31/07	CHECKED BY	S. Seger
DRAWN BY	B. Faison	06/31/07	APPROVED BY	S. Carriere

NAVFAC Naval Facilities Engineering Command

NAVAL SUPPORT FACILITY, INDIAN HEAD — INDIAN HEAD, MARYLAND

SITE 28 – REMOVAL ACTION

PROJECT ORGANIZATION CHART

SCALE: AS SHOWN	SIZE: A
DELIVERY ORDER NO. 093	
CONSTR. CONTRACT NO. N62470-02-D-3260	
NAVFAC DRAWING NO. —	
SHEET I.D. FIGURE 4	

OFFICE: Pittsburgh, PA

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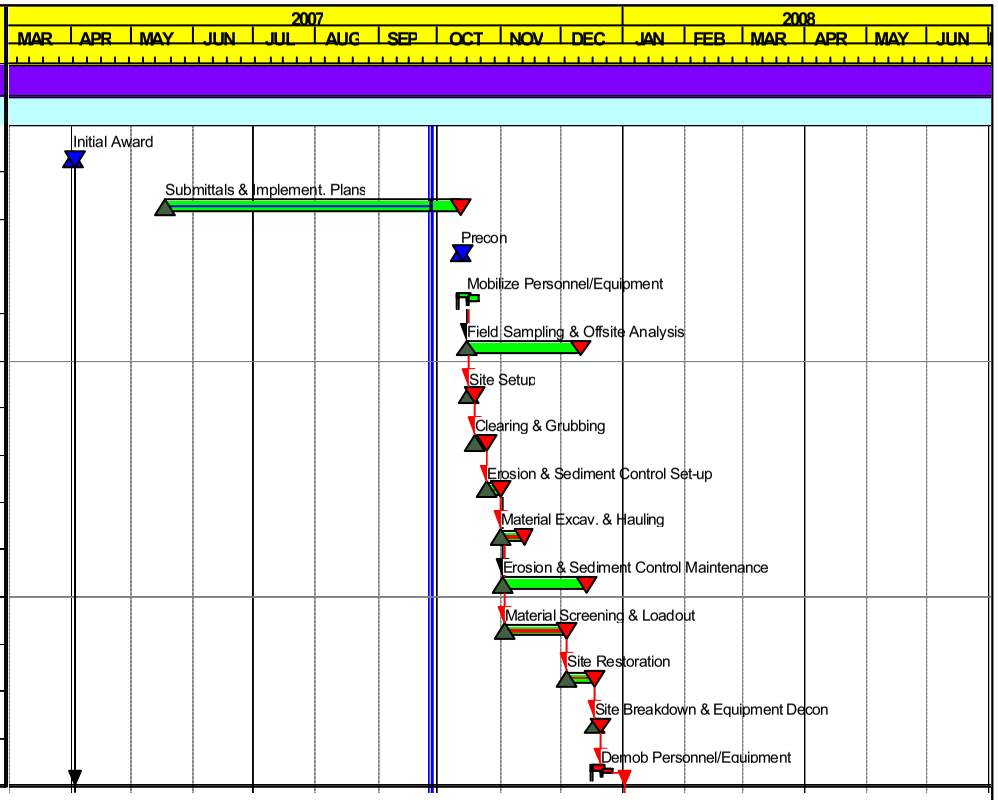
Plotted by: william.snyder Image: NAVFAC

Activity ID	Activity Description	Early Start	Early Finish	Orig Dur
Site 28 - Indian Head, MD				
FIELD ACTIVITIES - Site 28				
01000000	Initial Award	02APR07A	02APR07A	1
01003000	Submittals & Implement. Plans	18MAY07A	11OCT07	30
01003003	Precon	12OCT07*	12OCT07	1
01001000	Mobilize Personnel/Equipment	15OCT07*	15OCT07	1
03004000	Field Sampling & Offsite Analysis	15OCT07	10DEC07	47
01004000	Site Setup	16OCT07	18OCT07	3
03001000	Clearing & Grubbing	19OCT07	24OCT07	5
05007000	Erosion & Sediment Control Set-up	25OCT07	31OCT07	6
08001000	Material Excav. & Hauling	01NOV07	12NOV07	10
05007050	Erosion & Sediment Control Maintenance	02NOV07	13DEC07	34
08002000	Material Screening & Loadout	03NOV07	03DEC07	18
20004000	Site Restoration	04DEC07	17DEC07	13
20004010	Site Breakdown & Equipment Decon	18DEC07	20DEC07	3
20005000	Demob Personnel/Equipment	21DEC07	21DEC07	1



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Finish Date	05FEB08
Data Date	28SEP07
Run Date	09OCT07 17:39

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093S

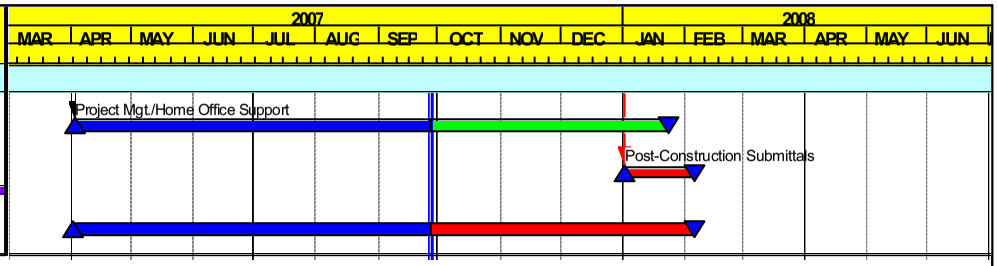
Sheet 1 of 2

Site 28 - Indian Head, MD
LANTDIV RAC IV T. O. 093 - Job 126566

Figure 5 - Project Schedule

SHAW ENVIRONMENTAL, INC.

Activity ID	Activity Description	Early Start	Early Finish	Orig Dur
GENERAL SUPPORT ACTIVITIES				
99003000	Project Mgt./Home Office Support	03APR07A	23JAN08	123
21006050	Post-Construction Submittals	02JAN08	05FEB08	30
Total		02APR07A	05FEB08	255



Start Date 02OCT06 Finish Date 05FEB08 Data Date 28SEP07 Run Date 09OCT07 17:39	093S Sheet 2 of 2 **Site 28 - Indian Head, MD** **LANTDIV RAC IV T. O. 093 - Job 126566** Figure 5 - Project Schedule	**SHAW ENVIRONMENTAL, INC.**

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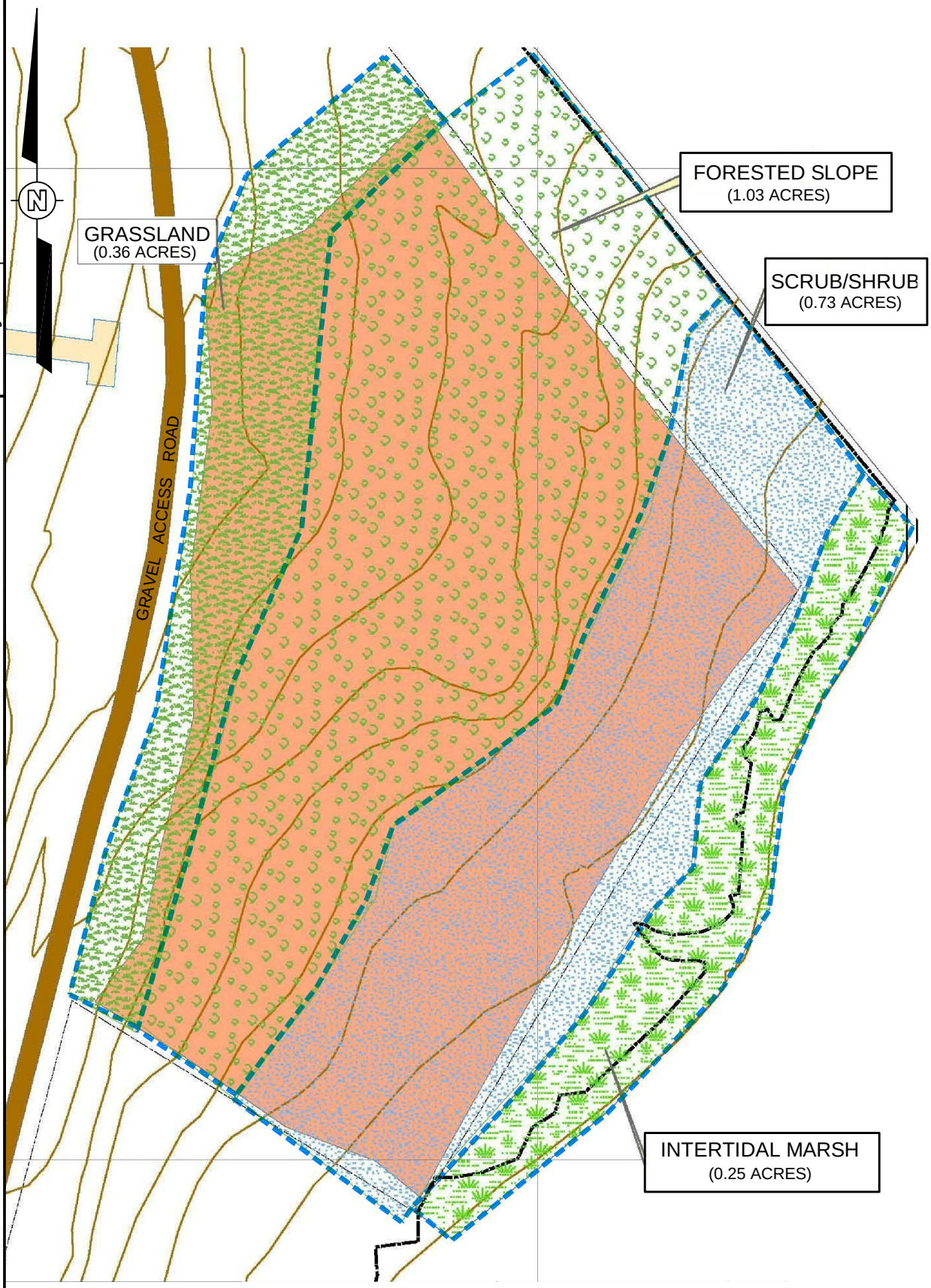

SCALE

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OFFICE: Pittsburgh, PA

DRAWING NUMBER: 126566-A5

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site28_planting.jpg

Xref:

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Plotted By: bernadette.oconnor

REVISIONS

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

Shaw Environmental, Inc.

DESIGNED BY	-	—	CHECKED BY	S. Seger 9/26/07
DRAWN BY	DP/BBF	9/25/07	APPROVED BY	S. Carriere -/-/--

NAVFAC Naval Facilities Engineering Command NAVFAC WASHINGTON

NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND

SITE 28 - REMOVAL ACTION

WETLAND PLANTING MAP

SCALE: AS SHOWN

SIZE: A

TASK ORDER NO. 093

CONSTR. CONTRACT NO. N62470-02-D-3260

NAVFAC DRAWING NO. --

SHEET I.D.

FIGURE 6

APPENDIX A

Quality Control Plan

Shaw Environmental, Inc.

PROGRAM QUALITY CONTROL PLAN ADDENDUM
REMOVAL ACTION FOR SITE 28
NAVAL SUPPORT FACILITY, INDIAN HEAD
INDIAN HEAD, MARYLAND

Prepared for:

DEPARTMENT OF NAVY
NAVAL FACILITIES ENGINEERING COMMAND
Washington Navy Yard, Building 212
1314 Harwood Street, S. E.
Washington, DC 20374-5018

Contract No. N62470-02-D-3260
Task Order No. 093

Prepared by:

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500 E. Main St, Suite 1630
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Project Manager

Ernest P. Duke
Program QC Manager

James A. Dunn, Jr. P.E.
Program Manager

June 2007
Shaw Project 126566

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STATEMENT OF QC PROGRAM

This Site Specific Addendum to the Program QC Plan is prepared and submitted for Task Order 093, for a Removal Action at Site 28 at the Naval Support Facility Indian Head located at Indian Head, Maryland. This plan incorporates methods and procedures from the Program Quality Control Plan approved by the Atlantic Division, Naval Facilities Engineering Command. The Program Quality Control Plan was developed specifically to be responsive to the Contract Specification, Contract No. N62470-02-D-3260, Atlantic Division, Naval Facilities Engineering Command. Shaw Environmental, Inc. (Shaw) will perform the inspections and tests required to ensure that materials, workmanship, and construction conform to drawings, specifications, and contract requirements**.**

Note to Employees – Concept of Quality Control

Quality control should not be considered a person or an organization of personnel, but a concept to perform in such a manner that the end product of our efforts provides a quality product and customer satisfaction. The quality control individual or group cannot inspect quality into the final product, but only inspect and document the results of our efforts. The only people that can build quality into the product are the individuals performing the task of producing the end product.

It should be noted by all employees that the documentation requirements of Shaw procedures, plans, and the Task Order Specifications are considered equally as important as the end product itself. When it is stated that the documentation will be approved prior to the start of work, this is exactly what is intended. To eliminate problems in this area requires careful planning and execution by everyone.

We would do well to remember that our livelihood depends on how well we satisfy our customer. To accomplish this requires teamwork and attention to detail by all employees and contractors.

I. QUALITY CONTROL ORGANIZATION

The Site QC Manager will have the authority to implement and manage the QC Plan, the three phases of quality control and the authority to stop work, which is not in compliance with the contract.

Mr. Adam Forshey will function as the Site QC Manager for this task order under the direction and oversight of Mr. Duke, Shaw Program QC Manager. Mr. Forshey maintains current US Army Corps of Engineers (USACE) Construction Quality Management for Contractors, QC certification.

Mr. Forshey will work closely with the Project Manager and Site Superintendent, but will report directly to Mr. Ernest Duke, Program QC Manager regarding QC related issues on the site. Mr. Duke, Shaw Program QC Manager will serve to resolve any QC related issues, which need his involvement. The Site QC Manager will have a direct line of communication to Mr. Duke on QC issues.

The relationship between the QC organization, and production personnel of the task order, is provided in the Organizational Chart, Figure I-1.

II. IDENTIFICATION OF PERSONNEL ASSIGNED TO THE QC ORGANIZATION

Figure II-1 provides the resume of the Site QC Manager.

III. APPOINTMENT LETTERS

The Site QC Manager Appointment letter is presented as Figure III-1.

IV. OUTSIDE ORGANIZATIONS

A list of outside organizations such as subcontractors employed by Shaw for work under this task order is provided in Exhibit IV-1. This list provides each firm's name and address and a description of the services each firm will provide. This list will be maintained current and will be available for review.

V. INITIAL SUBMITTAL REGISTER & REVIEWER

V.1 Submittal Register

The Initial Submittal Register is provided as Exhibit V-1. The status of each submittal will be recorded as changes occur.

V.2 Personnel Authorized to Review and Certify Submittals

The Site QC Manager is responsible for the management of the submittal process. The final review and certification for submittals requiring government approval and the final review

and approval for submittals requiring contractor approval is to be performed by the QC Manager. Other personnel authorized to review and certify submittals other than the Site QC Manager are identified on Exhibit V-2. Any additional personnel assigned to perform submittal review and certification must be approved by the CO prior to performance.

VI. TESTING LABORATORY ACCREDITATION

Testing laboratory accreditation requirements are addressed in the Program QC Plan Section 1, Part 4.7, Construction Testing. A copy of the accreditation will be provides as a submittal.

VII. TESTING PLAN & LOG PREPARATION

A Testing Plan and Log has been prepared for this TO and is provided as Exhibit VII-1. This log will be updated and submitted monthly.

VIII. REWORK ITEMS

Rework Items will be documented on the Daily QC Report and on the Rework Items Log. This will be used to report and track rework Items. This list will be updated and submitted monthly.

IX. DOCUMENTATION PROCEDURES

The Daily QC Report form and Daily Production Report form will be used to document daily activities at the site. These reports will be completed on a daily basis and submitted to the Contracting Officer Representative.

X. QUALITY CONTROL INSPECTION PLAN

The Quality Control Inspection Plan, Exhibit X-1, lists the TO Workplan sections and definable feature of work with provisions for recording the corresponding checklist/report for each phase of the three-phase control process. As each control phase is satisfactorily preformed, the Site QC Manager will record the corresponding checklist/report number and date.

This list has been prepared to correspond to the subtasks of the task order. It will be maintained as provided in Section 1, Part 4.4 of the PQCP. The list will be keyed to the construction schedule. Each preparatory, initial and follow-up phase checklist/report will reflect the construction activity number derived from the construction schedule.

XI. PERSONNEL MATRIX

The personnel matrix, Exhibit XI-1, shows each section of the TO Workplan with identification of who will review and certify submittals, who will perform and document the three phases of control, and who will perform and document testing. This matrix should be completed as much as possible prior to and during site mobilization.

FIGURE I-1

QC ORGANIZATIONAL RELATIONSHIP WITH PRODUCTION PERSONNEL SHAW ENVIRONMENTAL, INC. TASK ORDER NO. 093

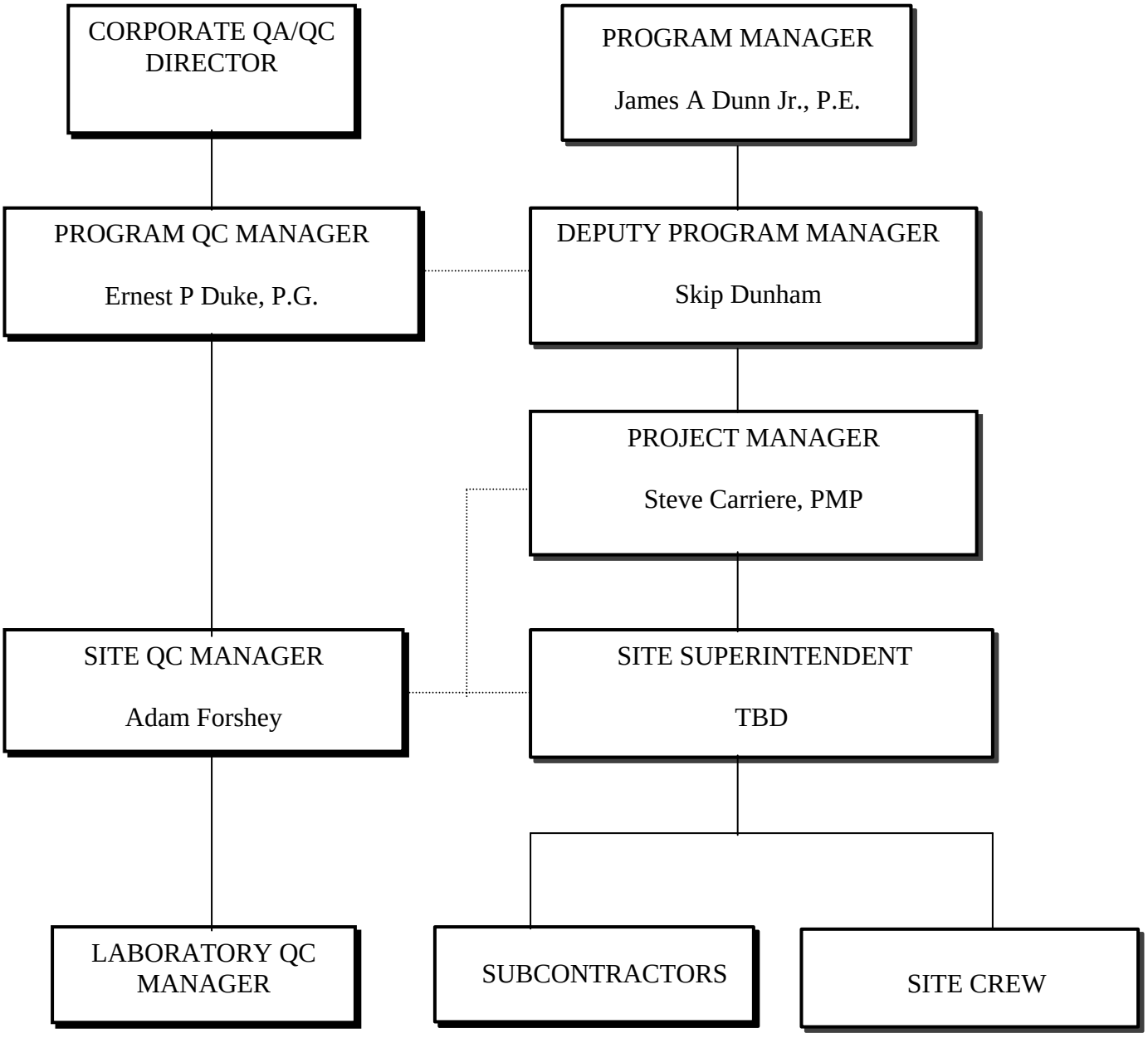

Figure II-1

Site QC Manager

Adam J. Forshey Jr.

Professional Qualifications

Mr. Forshey was hired in August 2005 to assist in all phases of various environmental/engineering projects. He has written and edited multiple technical reports and documents including project work plans and closure reports. He has experience with troubleshooting existing systems/equipment and has researched specifications, applications, and costs in order to prepare estimates for remediation projects/systems including water treatment plants, air sparge/soil vapor extraction systems, and above ground storage tanks. Mr. Forshey has also served as the Site Quality Control Manager on various small projects, making sure proper documentation was maintained. He has provided surveying support for as-built and topographic site conditions and sampling support for groundwater, surface water, decon water, and soils.

Education

Bachelor of Science, Mechanical Engineering, Ohio University, Athens, Ohio, 2005

Additional Training/Continuing Education

OSHA Disaster Site Worker, Shaw E&I, 2006
OSHA 10 Hour Construction Safety, Shaw E&I, 2006
Competent Person: Drilling Oversight, Shaw E&I, 2006
Troxler Nuclear Gauge Safety Training, Shaw E&I, 2006
Air Shipment of Dangerous Goods: IATA, Shaw E&I, 2005
8-Hour HAZWOPER Refresher, Shaw E&I, 2005
U.S. Army Corps of Engineers Construction Quality Management for Contractors (CQC) Training, AGC of Virginia, 2005
40-Hour Hazardous Waste Operations and Emergency Response (HAZWOPER), Bechtel Jacobs Company LLC., 2003
RCRA Hazardous Waste Contingency Plan, Bechtel Jacobs Company LLC., 2003
Waste Minimization and Pollution Prevention, Bechtel Jacobs Company LLC., 2002
Nuclear Criticality Safety for Support Personnel, Bechtel Jacobs Company LLC, 2002
Safety Leadership Training, Bechtel Jacobs Company LLC., 2002
RadWorker/RadWorker II, Bechtel Jacobs Company LLC, 2002

Experience and Background

08/2005 - Present
Engineer 1, Shaw Environmental & Infrastructure, Inc., Virginia Beach, Virginia

Responsibilities include working under the supervision of engineering project managers on both field and office assignments in all phases of a variety of environmental/engineering projects. Also responsible for assisting with report writing, researching background and hydro geologic information for individual sites, preparing estimates by researching materials and suppliers, serving as a quality control person for various small projects to make sure documentation is maintained, and performing graph and trend analysis for operating remediation systems.

The following is a summary of key projects:
Engineer, Site 9 Landfill Area Phase II - Repair Mash Cap, 116621, Naval Facilities Engineering Command Washington, Dahlgren, VA, 07/2006 - Present

Prepared the Draft & Final Work Plans for this project which includes making repairs to the existing marsh cap at the Site 9 Landfill Area. The repair efforts include the installation of geotextile, geogrid, and riprap along the edge of existing Reno mattresses to prevent further undermining of the Reno mattresses. Work Plan preparation included the writing of Work Plan text, E&S plans, and Site Specific Health and Safety Plans.

Site Engineer/Site QC Manager, Remedial/ Removal Action for UXO 32 - Scrap Yard, 831866/119340, Naval Facilities Engineering Command Washington, Indian Head, MD, 07/2006 - Present
Prepared Work Plans, an Explosive Safety Submission, and helped with several additional waivers/documents for UXO 32 operations. This project involves the PELAN testing and demilitarization by water jet cutting of hundreds of Materials Potentially Presenting an Explosive Hazard (MPPEH) and suspect Munitions and Explosives of Concern (MEC). Remedial/Removal actions include the excavation of soils, screening of soils, excavation of railroad tracks, and abandonment and installation of monitoring wells.

Engineer, Interim Removal Action at Site 8 & SSA 14, 114749, Department of the Navy - Atlantic Division, Naval Weapons Station, Yorktown, Virginia, 10/2005 - Present
Assisted in the preparation and revision of the Project Work Plan for this project involving the sampling and excavation of contaminated soils and site restoration. Work Plan assistance included reviewing and revising Work Plan text, Quality Control Plan, Health and Safety Plan, Field Sampling Plan, and all design drawings/figures. Also created a procurement schedule for the projects equipment and supplies.

Engineer, Interim Removal Action at Site 41B, 118088, Department of the Navy - Atlantic Division, Camp Peary, Williamsburg, Virginia, 10/2005 - Present
Assisted in the preparation and revision of the Project Work Plan for this project involving the sampling and excavation of contaminated soils, demolition of a concrete tank and building, removal of a drainage pipe, and site restoration. Work Plan assistance included reviewing and revising Work Plan text, Quality Control Plan, Health and Safety Plan, Field Sampling Plan, and all design drawings/figures. Also created a procurement schedule for the projects equipment and supplies.

Engineer, Air Sparging/ Soil Vapor Extraction Groundwater Remediation Building LP-20, 112825, Department of the Navy - Atlantic Division, Norfolk Naval Base, Norfolk, Virginia, 10/2005 - Present
Researched, specified, and selected vendors of new rotary screw air compressors for an air sparging/soil vapor extraction system. Also evaluated the compatibility of new compressor systems with remaining piping and equipment.

Engineer, Yorktown Fuel Farm Water Treatment Plant, 115274, Department of the Navy - Atlantic Division, Yorktown, Virginia, 09/2005 - Present
Analyzed and calculated compressed air consumption of equipment in order to determine the effectiveness of air compressors for future plant development. Specified and selected vendors for potential air compressor and air dryer systems. Conducted troubleshooting and specification of various equipment including flow elements, level sensors, pumps, and control valves.

Site Engineer/ Site QC Manager, Interim Removal Action at Site 57 - Building 292 TCE Contamination, 120359, Naval Facilities Engineering Command Washington, Indian Head, MD, 06/2006 - 08/2006
Acted as the Site QC Manager and Site Engineer for the Interim Removal Action at Site 57. This project involved the excavation, staging, and transportation/disposal of TCE and Arsenic contaminated soils. Responsibilities included organizing and conduction Preparatory QC meetings and Bi-Weekly QC meetings with Navy personnel. Also prepared Daily CQC Reports, Submittals, and other documentation for the Navy.

Assistant Project Engineer and Quality Control Manager, TO 42 - SPCC Upgrades, 115749, Department of the Navy - Atlantic Division, Camp Lejeune, North Carolina, $5,200,000.00, 01/2006 - 07/2006
Implemented remedial construction activities as required for compliance by the Base wide Integrated Contingency

Plan (based on SPCC Upgrades). Upgrades included tank removal/installation, labeling, tank painting and repair, lighting, gauges, and traffic protection bollards. Upgrades also included the installation of secondary containment control structures, spill control gates, boom structures, tank delivery overfill protection, and loading/unloading spill containment structures.

06/2002 - 09/2003
Engineering Intern, Bechtel Jacobs Company LLC., Piketon, Ohio

Responsibilities included tracking project completion, estimating time requirements for future sites, and serving as a means of communication between management and subcontractors on a phytoremediation project. Also responsible for assisting with the predesign of an in-situ chemical oxidation system which included developing a numerical integrator to theoretically determine the most efficient mixture of oxidant and groundwater, revising AutoCAD drawings of system layout, and performing preliminary fluid flow calculations.

Figure III-1
Site QC Manager – Letter of Appointment

Shaw® Shaw Environmental, Inc.

June 5, 2007

Adam Forshey
Shaw Environmental, Inc.
500 E. Main St, Suite 1630
Norfolk, Virginia

RE: Site Quality Control Manager
Contract N62470-02-D-3260
Task Order 093
Indian Head, Maryland

Dear Mr. Forshey:

This letter will serve as your appointment to function as the Site Quality Control Manager on the referenced project and will also clarify your duties and authority in this position. In this position, you will be authorized to use available resources to satisfy all applicable requirements of the Program and Task Order Quality Control Plans.

This authorization specifically gives you the authority to direct removal and replacement or correction of nonconforming materials or work and stop work authority when continuation would be unsafe to personnel, harmful to the environment, or result in a significant degradation of quality.

You will be expected to work closely with the Project Manager, Site Superintendent and other project personnel, but you will not be directly responsible to anyone but me for resolution of quality issues when working in the capacity of Site Quality Control Manager.

If you have any question in this matter, please contact me via email at Ernie.Duke@Shawgrp.com or call me at (412) 380-6115.

Respectfully,

QC Manager
NAVFAC RAC Program

EXHIBIT IV-1

SUBCONTRACTOR LIST Shaw Environmental, Inc. Removal Action at Site 28 Naval Support Facility Indian Head Task Order No. 093	
COMPANY NAME AND ADDRESS	**DESCRIPTION OF SERVICES PROVIDED**
TBD	Utility Locations
Accutest Laboratory	Chemical Analytical Testing
TBD	Transportation and Disposal Services

EXHIBIT V-1

SUBMITTAL REGISTER

Task Order No. 093 Contract No. N62470-02-D-3260	Project No. 126566 Project Title: Removal Action at Site 28, Indian Head, Md.	Revision No. 01 Shaw Environmental, Inc.

							Contractor Action			Approving Authority					
Spec. Sect.	SD Number and Submittal Description	Spec Paragraph Number	Approving Authority	Other Reviewers	Transmittal Control No.	Planned Submittal Date	Action Code	Date of Action	Date Forwarded to App. Auth/ from Contr	Date Forward to Other Reviewer	Date Rcvd from Other Reviewer	Action Code	Date of Action	Date Rcvd from Appx Auth	Remarks
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
	SD-01 Preconstruction														
	Work Plan		G												
	Erosion and Sediment Control Plan		G												
	Site Specific Health and Safety Plan		G												
	Construction Quality Control Plan		G												
	Environmental Protection/Pollution Prevention Plan														
	SD-11 Closeout Submittals														
	Contractor's Closeout Report														
	Status Reports														
	QC Meeting Minutes														
	Test Results Summary Report														
	Daily Contractor Production Reports														
	Daily QC Reports														
	Rework Items List														
	Documentation Photos														
	SD-13 Certifications														
	Testing Laboratory Accreditation														
	DD1348-A1 form														
	SD-10 Test Reports														
	Confirmation Sample Results		G												
	Clean Fill Source Sample Results		G												
	Agronomic Sample Results														
	Laboratory Waste Profiling Analysis Results of IDW Water														

EXHIBIT V-1

SUBMITTAL REGISTER

	Laboratory Waste Profiling Analysis Results of Debris and Waste Soil														

Task Order No. 0076
Contract No. N62470-02-D-3260

Project No.
Project Title: Removal Action at Site 32 Webster Field Annex

Revision No. 01
Shaw Environmental, Inc.

							Contractor Action			Approving Authority					
Spec. Sect.	SD Number and Submittal Description	Spec Paragraph Number	Approving Authority	Other Reviewers	Transmittal Control No.	Planned Submittal Date	Action Code	Date of Action	Date Forwarded to App. Auth/ from Contr	Date Forward to Other Reviewer	Date Rcvd from Other Reviewer	Action Code	Date of Action	Date Rcvd from Appx Auth	Remarks
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
	SD-08 Statements														
	Treatment/Disposal Facility Permits		G												
	SD-18 Records														
	Waste Shipment Manifests														

Notes:
Approved By:
G: Government
Blank: QC Manager
Reference; QMP-16.2 Submittal Management Process

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

EXHIBIT V-2

LIST OF PERSONNEL AUTHORIZED TO REVIEW AND CERTIFY SUBMITTALS Shaw Environmental, Inc. Removal Action at Site 28 Naval Support Facility Indian Head Task Order No. 093		
	SUBMITTAL TYPE:	AUTHORIZED PERSONNEL:
Work Plan Submittals	Preconstruction	Project Manager
All Work Plan/ Addendum Sections (1)	All Types	QC Manager, Program QC Manager, Project Manager and Site Engineer

(1) Note: Submittals requiring Government approval - QC Manager shall perform the final review and certification.
Submittals requiring Contractor approval - QC Manager shall perform the final review and approval.

EXHIBIT VII-1

TESTING PLAN AND LOG
Shaw Environmental, Inc.
Removal Action at Site 28 Naval Support Facility Indian Head
Task Order No. 093

CONTRACT NUMBER			PROJECT TITLE: Removal Action at Site 28								
N62470-02-D-3260			LOCATION: Indian Head, MD								
WORK PLAN SECTION AND PARAGRAPH NUMBER	ITEM OF WORK	TEST REQUIRED	ACCREDITED/ APPROVED LAB		SAMPLED BY	TESTED BY	LOCATION OF TEST		DATE COMPLETED	DATE FORWARDED TO CONTR. OFF.	REMARKS
			YES	NO			ON SITE	OFF SITE			

CONTRACT NUMBER			PROJECT TITLE: Removal Action at Site 28								
N62470-02-D-3260			LOCATION: Indian Head, MD								
WORK PLAN SECTION AND PARAGRAPH NUMBER	ITEM OF WORK	TEST REQUIRED	ACCREDITED/ APPROVED LAB		SAMPLED BY	TESTED BY	LOCATION OF TEST		DATE COMPLETED	DATE FORWARDED TO CONTR. OFF.	REMARKS
			YES	NO			ON SITE	OFF SITE			
SAP Table 1	Waste Characterization Analysis	Waste Soil and Debris Areas: TCLP Volatives, TCLP Semivolatiles, TCLP Pesticides, TCLP Herbicides, TCLP Metals, PCBs, RCI, TOX, BTEX, TPH GRO/DRO									Five Waste Characterization Samples as described in 3.1.1 and Table 2
SAP Table 1	Waste Characterization Analysis	IDW Waste Liquid: TCLP Volatives, TCLP Semivolatiles, TCLP Pesticides, TCLP Herbicides, TCLP Metals, PCBs, RCI, TOX, BTEX and TPH GRO/DRO									One Liquid Waste Characterization Sample if required for IDW per Table 2
SAP Table 1	Site Restoration	Clean Fill Source and Topsoil for Import Soil Materials - TCL Volatiles, TCL Semivolatiles, TCL Pesticides & PCBs, TAL Metals, Cyanide and TPH GRO/DRO									One Per Source
E&S Plan	Site Restoration	Agronomic Testing of the Topsoil									One Per Source

EXHIBIT VIII-1

REWORK ITEMS LIST
Shaw Environmental, Inc.
Removal Action at Site 28 Naval Support Facility Indian Head
Task Order No. 093

Contract No. N62470-02-D-3260

Removal Action at Site 28 Naval Support Facility Indian Head

Location:

NUMBER	DATE IDENTIFIED	DESCRIPTION	CONTRACT REQUIREMENT (Spec. Section and Par. No., Drawing No. and Detail No., etc.)	ACTION TAKEN BY QC MANAGER	RESOLUTION	DATE COMPLETED

EXHIBIT X-1

QUALITY CONTROL INSPECTION PLAN Shaw Environmental, Inc. Removal Action at Site 28 Naval Support Facility Indian Head Task Order No. 093								
			Control Check Verification					
Specification Section	**Definable Feature of Work**	**Subtasks**	**Date**	**Preparatory Phase Checklist/Report No.**	**Date**	**Initial Phase Checklist/Report No.**		**Follow-up Phase Checklist/Report No.**
WP 2.1	**Mobilization and Site Setup**							
		Support Facilities						
		Waste Staging and Mechanical Screening Area						
		Site Survey						
		Utility Search						
WP 2.2	**Erosion and Sediment Controls**							
		Super Silt fence						
		Earth Dike						
		Stabilized Construction Entrance						
		Stone Check Dams						
		Temporary Seeding						
		Permanent Seeding						
		Wetland Plants						
		Dust Control						
WP 2.3	**Clearing and Grubbing**							
		Clearing and Grubbing						

Specification Section	Definable Feature of Work	Subtasks	Control Check Verification					
			Date	Preparatory Phase Checklist/Report No.	Date	Initial Phase Checklist/Report No.		Follow-up Phase Checklist/Report No.
WP 2.4 & 3.1	**Waste Characterization Sampling**							
		Waste Profile Analysis						
WP 2.5	**Soil and Debris Excavation and Handling**							
		Excavation and Removal of Soil and Debris						
		Verify Removal to required depths						
		Waste Loadout						
WP 2.6	**Mechanical Screening**							
		MPPEH Training						
		Establish an Exclusion Zone						
		MPPEH Screening Operations						
		MPPEH Identification and Classification						
		Inert MPPEH Items						
		Containing Possible Energetic material						
WP 2.7	**Culvert Placement and Access Road Repair**							
		Removal, Replacement and Realignment in Swale 4						
WP 2.8	**Site Restoration**							
		Backfill						
		Site Vegetation						
		Final Site Inspection						
WP 2.9	**Site Teardown and Demobilization**							
		Removal of temporary facilities						

EXHIBIT XI-1

PERSONNEL MATRIX Shaw Environmental, Inc. Removal Action at Site 28 Naval Support Facility Indian Head Task Order No. 093			
SPECIFICATION SECTION	SUBMITTALS TO BE REVIEWED BY:	THREE PHASE TO BE PERFORMED BY:	TESTING TO BE VERIFIED BY:
All Sections	Site QC Manager [(1)], Program QC Manager, Project Manager or Project Engineer	Site QC Manager	Site QC Manager

[(1)] Note: Submittals requiring Government approval - QC Manager shall perform the final review and certification.
Submittals requiring Contractor approval - QC Manager shall perform the final review and approval.

APPENDIX B

Site-Specific Health and Safety Plan

Shaw Environmental, Inc.

SITE-SPECIFIC HEALTH AND SAFETY PLAN
REMOVAL ACTION FOR SITE 28
NAVAL SUPPORT FACILITY, INDIAN HEAD
INDIAN HEAD, MARYLAND

Contract No. N62470-02-D-3260
Task Order No. 093

Prepared for:

NAVAL FACILITIES ENGINEERING COMMAND WASHINGTON
1314 Harwood Street, S.E.
Washington Navy Yard, DC 20374-5018

Prepared by:

Shaw Environmental, Inc.
500 East Main Street, Suite 1630
Norfolk, Virginia 23510

Project No. 126566

June 8, 2007

Site-Specific Health and Safety Plan Approval
for the Remedial/Removal Actions at Indian Head, Maryland
Site 28

I have read and approve this site-specific health and safety plan for activities at Indian Head with respect to project hazards, regulatory requirements, and Shaw procedures.

David Mummert, CIH
Program Certified Industrial Hygienist

Steve Carriere, PMP
Project Manager

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3	Activity Hazard Analyses
4	Route to Hospital and Health Resource Clinic
5	Health and Safety Plan Amendment Documentation Form
6	Hurricane Preparedness Plan
7	Accident Prevention Plan
8	Safety Plan Acknowledgement
9	OSHA 300 Log
10	Blood Borne Pathogens Exposure Control Plan

List of Acronyms

AHA	Activity Hazard Analyses
BAC	Blood Alcohol Concentration
CIH	LANTDIV Program Certified Industrial Hygienist
CFR	Code of Federal Regulations
CPR	Cardiopulmonary Resuscitation
CRZ	Contamination Reduction Zone
dBA	A-Weighted Decibel
°C	Degrees Celsius
°F	Degrees Fahrenheit
EMS	Emergency Medical Services
EPA	Environmental Protection Agency
ERCP	Emergency Response Contingency Plan
eV	electron volt
EZ	Exclusion Zone
f/b	flash/bang
FEAD	Facilities Engineering Acquisition Division
H_2S	Hydrogen Sulfide
HAZWOPER	Hazardous Waste Operations and Emergency Response Standard
HSM	Health and Safety Manager
HSS	Health and Safety Specialist
JSA	Job Safety Analyses
LEL	Lower Explosive Limit
LEPC	Local Emergency Planning Committee
mg/m^3	Milligrams per cubic meter
MHR	maximum heart rate
mph	Miles Per Hour
MPPEH	Material Potentially Presenting an Explosive Hazard
MSDS	Material Safety Data Sheet
NIOSH	National Institute for Occupational Safety and Health
NRR	Noise Reduction Rating
NSF-IH	Naval Support Facility, Indian Head
O_2	Oxygen
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Level
PID	Photoionization Detector
PM	Project Manager
PPE	Personal Protection Equipment
PVC	Polyvinyl Chloride
RCRA	Resource Conservation and Recovery Act
Shaw	Shaw Environmental, Inc.
SS/SSO	Site Superintendent/Site Safety Officer
SSHSP	Site-Specific Safety and Health Plan
SZ	Support Zone

List of Acronyms (continued)

TLV	Threshold Limit Value
TSCA	Toxic Substances Control Act
TWA	Time-Weighted Average
UEL	Upper Explosive Limit
USACE	U.S. Army Corps of Engineers
USCG	United States Coast Guard
UXO	Unexploded Ordnance
UXO 32	UXO 32 – Scrap Yard

1.0 Introduction

1.1 Objective

The objective of this plan is to provide a mechanism for establishing safe working conditions at the site. The safety organization, procedures, and protective equipment have been established based upon an analysis of potential hazards. Specific hazard control methodologies have been evaluated and selected to minimize the potential of accident or injury.

1.2 Policy Statement

The policy of Shaw is to provide a safe and healthful work environment for all employees. Shaw considers no phase of operations or administration to be of greater importance than injury and illness prevention. Safety takes precedence over expediency and shortcuts. At Shaw, it is believed all accidents and injuries are preventable. Shaw will take every reasonable step to reduce the possibility of injury, illness, or accident.

This Site-Specific Health and Safety Plan (SSHSP) prescribes the procedures that must be followed during referenced site activities. Operational changes that could affect the health and safety of personnel or the community will not be made without the prior approval of the Project Manager and the Health and Safety Manager.

The provisions of this plan are mandatory for all personnel and subcontractors assigned to the project. All visitors to the work site must abide by the requirements of the plan.

1.3 References

This SSHSP complies with applicable Occupational Safety and Health Administration (OSHA), U.S. Environmental Protection Agency (EPA), and Shaw Health & Safety policies and procedures. This plan follows the guidelines established in the following:

- Standard Operating Safety Guides, EPA (Publication 9285.1-03, June 1992).
- Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, National Institute for Occupational Safety and Health (NIOSH), OSHA, U.S. Coast Guard (USCG), EPA (86 116, November 1985).
- Title 29 of the Code of Federal Regulations (CFR), Part 1910.
- Title 29 of the CFR, Part 1926.
- U.S. Army Corps of Engineers (USACE) Safety and Heath Requirements Manual EM 385-1-1 (current).
- Shaw Health and Safety Procedures HS001 through HS999 (current).

1.4 Disclaimer

The enclosed SSHSP has been designed for the methods presently contemplated by Shaw Environmental, Inc. (Shaw) for execution of the proposed work to be conducted at Indian Head Site 28. This SSHSP may not be appropriate if the work is not performed by Shaw or does not employ the methods presently contemplated by Shaw. Additionally, this plan will require amendment if the scope of work is modified by the Navy. This plan applies to Shaw employees and subcontractors under the direct supervision of Shaw.

2.0 Site History/Scope of Work

2.1 Site Location/Background

The Naval Support Facility, Indian Head (NSF-IH), is located in northwestern Charles County, Maryland, approximately 25 miles southwest of Washington, DC (Figure 2-1). The NSF-IH provides services in energetics, ordnance devices and components, and other related ordnance engineering standards, including chemicals, propellants, and their propulsion systems, explosives, pyrotechnics, warheads, and simulators.

Site 28 is in the northeast corner of the facility, on the shore of Mattawoman Creek. The site encompasses observation Well 14, and the former locations of the zinc recovery furnace and shoreline burning cage. Because of past activities at the site, there are both potential human health and ecological risks associated with constituents in the soil.

Background documents also refer to Site 28 as the "Original NOS (Naval Ordnance Station) Burning Ground." During WW1, the Navy initiated a metal-recycling program, which was vital during WW II and continues to present day. In 1928, the zinc recovery furnace, designated Building 415, was erected. The last station map on which the building appears is dated October 31, 1952, an indication that the building was demolished in the early 1950s.

Well 14 was installed in 1918 to a depth of 430 feet below ground surface. Initially it was used as a potable water well, but it became an observation well in 1988 and remains so today.

2.2 Scope of Work

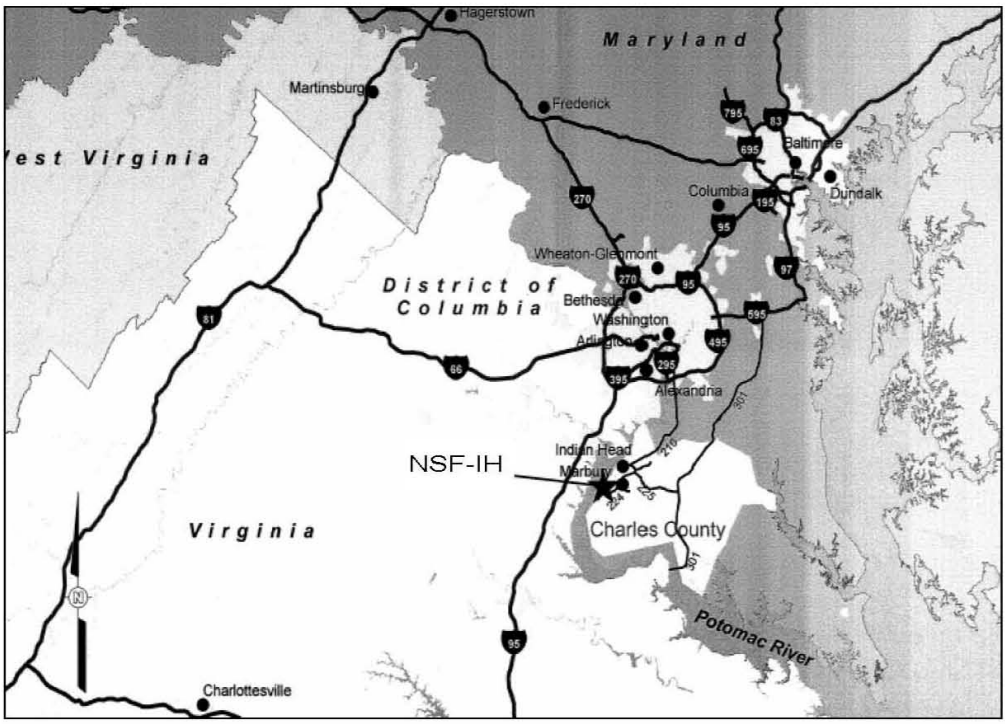
The objective of this plan is to present all necessary information to perform the remedial/removal activities at Site 28 in a safe and efficient manner according to the design documents. The scope of work under this SSHSP includes the following:

- Mobilization and site setup
- Clearing and grubbing
- Waste characterization field sampling.
- Set up and maintenance of erosion and sediment controls
- Material excavation and hauling
- Material screening and load-out
- Site restoration
- Site breakdown and equipment decontamination

These activities have been analyzed for potential hazards for which control measures are provided in Attachment 3. An Accident Prevention Plan is included as Attachment 7, which

describes policies and procedures to help prevent accidents, as well as actions to be taken in the event of an accident.

Figure 2-2
Site Map



3.0 Key Personnel and Management

The Project Manager (PM), Site Superintendent/Site Safety Officer (SS/SSO), Program Certified Industrial Hygienist (CIH), Senior Supervisor Unexploded Ordnance (UXO), and Program Health and Safety Manager (HSM) are responsible for formulating and enforcing health and safety requirements, and for implementing this SSHSP. The following summarizes the health and safety responsibilities of the site management.

3.1 Project Safety Responsibilities

The PM has the overall responsibility for the project and to assure that the requirements of the contract are attained in a manner consistent with the SSHSP requirements. The PM will coordinate with the SS/SSO to assure that the work is completed in a manner consistent with the SSHSP. The SS/SSO is responsible for field implementation of the SSHSP. The SS will be the main contact in any on-site emergency situation and will insure off-site emergency agencies have been contacted prior to the start of work. The PM, CIH, HSM, Health and Safety Specialist (HSS) and SS/SSO are authorized to administer this SSHSP. All site personnel are authorized to stop work when an imminent health or safety risk exists. The PM and CIH are responsible for reviewing the SSHSP and ensuring that the SSHSP is complete and accurate. The HSS will also provide technical and administrative support for the Health and Safety Program and will be available for consultation when required. Each employee is responsible for personal safety, as well as the safety of others in the work area.

3.2 Key Safety Personnel

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

Project Manager	Steve Carriere (609) 234-6361 (cellular)
Site Superintendent	To be determined
Site Safety Officer	Michael Harrison (618) 599-3838 (cellular)
Facilities Engineering Acquisition Division	LT Mike O'Donnell (301) 744-2177
Contracting Officer Technical Representative	Cathy Gardner (301) 744-2181
Senior UXO Supervisor	TBD

Program Certified Industrial Hygienist	Dave Mummert, CIH (419) 425-6129 (office) (419) 348-1544 (cellular)
Program Health and Safety Manager	Kym Edelman (757) 640-6950 (office) (757) 435-5384 (cellular)
Environmental, Remediation, and Consulting (ERC) Health and Safety	Joe Hoyt, CHST (804) 337- 6982 (cellular)

4.0 Activity Hazards

4.1 Chemical Hazards

SITE –SPECIFIC CHEMICAL HAZARDS

Based on a review of the Engineering Evaluation/Cost Analysis Site 28, prepared by CH2M Hill in September 2006, the primary site contaminants are heavy metals including: antimony, cadmium, copper, lead, mercury, nickel, silver, and zinc.

Hazard information regarding the chemicals associated with the site activities at Site 28 are provided below. Prior to the initiation of site activities, a site pre-work health and safety briefing will be conducted with all site personnel and will include an in-depth review of the site contaminants, the associated hazards, personal protective equipment (PPE), and decontamination procedures.

Table 4-1 summarizes the potential chemical hazards which workers may be exposed to and their associated health/physical hazards. All site personnel must review the Material Safety Data Sheet (MSDS) for each chemical listed (Attachment 1).

Table 4-1 Potential Chemical Hazards

Chemical	Exposure Routes	Permissible Exposure Limit (PEL) / Threshold Limit Value (TLV)	Health Hazards / Physical Hazards
Antimony	Inhalation, ingestion	0.5 milligram per cubic meter (mg/m^3)	Irritation eyes, skin, nose, throat, mouth; cough; dizziness; headache; nausea, vomiting, diarrhea; stomach cramps; insomnia; anorexia; unable to smell properly.
Cadmium	Inhalation, ingestion	0.005 mg/m^3	Pulmonary edema, dyspnea (breathing difficulty), cough, chest tightness, sunsternal pain, headache; chills, muscle aches; nausea, vomiting, diarrhea; anosmia, emphysema, proteinuria, mild ememia; potential occupational carcinogen Incompatible with strong oxidizers; elemental sulfur, selenium & tellurium.
Copper	Skin, eye, inhalation	0.1 mg/m^3	Irritant to the eyes and upper respiratory tract. Symptoms include metal fume fever: chills, muscle aches, nausea, fever, dry throat, weakness, lassitude, metallic or sweet taste, and discoloration of the skin and hair.

Table 4-1 Potential Chemical Hazards

Chemical	Exposure Routes	Permissible Exposure Limit (PEL) / Threshold Limit Value (TLV)	Health Hazards / Physical Hazards
Lead	Skin, eye, inhalation, ingestion	0.2 mg/m^3	A respiratory irritant; dry throat, cough, tight chest, dyspenia; nausea, vomiting, mental confusion, flu-like fever; CNS effects. Reacts with oxidizers; displaces hydrogen from water and steam creating potential fire, explosion hazard.
Mercury	Skin, eye, inhalation, ingestion	0.1 mg/m^3	Irritation eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria.
Nickel	Skin, eye, inhalation, ingestion	1 mg/m^3	Sensitization dermatitis, allergic asthma, pneumonitis; [potential occupational carcinogen].
Silver	Skin, eye, inhalation, ingestion	0.1 mg/m^3	Blue-gray eyes, nasal septum, throat, skin; irritation, ulceration skin; gastrointestinal disturbance.
Zinc	Inhalation	5 mg/m^3	Metal fume fever: chills, muscle ache, nausea, fever, dry throat, cough; lassitude (weakness, exhaustion); metallic taste; headache; blurred vision; low back pain; vomiting; malaise (vague feeling of discomfort); chest tightness; dyspnea (breathing difficulty), rales, decreased pulmonary function.

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

- Loss of appetite
- Weakness in wrists or ankles
- Dizziness or stupor
- Nausea, headaches, or cramps
- Irritation of the eyes, nose, or throat
- Chest pains and coughing

- Rashes or burns.

4.2 Hazard Communication

The purpose of hazard communication (Employee Right-to-Know) is to ensure that the hazards of all chemicals located at this field project site are transmitted (communicated) according to 29 CFR 1910.1200 to all personnel and subcontractors. Hazard communication will include: container labeling, material safety data sheets, and employee information and training

4.2.1 Container Labeling

Shaw personnel will ensure that all containers are labeled according to contents. These drums and containers will include those from manufacturers and those produced on site by operations, such as gasoline and diesel safety cans. All incoming and outgoing labels shall be checked for identity, hazard warning, and name and address of responsible party.

4.2.2 Material Safety Data Sheets

There will be an MSDS located on site for all site contaminants and each hazardous chemical known to be used on site. MSDSs are located in Attachment 1 of the SSHSP.

4.2.3 Employee Information and Training

Training employees on chemical hazards is accomplished through an ongoing corporate training program. All site employees shall maintain their Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) training, in accordance with 29 CFR 1910.120 and 29 CFR 1926.65. Additionally, chemical hazards are communicated to employees through daily safety meetings held at Shaw field projects, and by an initial site orientation program.

At a minimum, Shaw and related subcontractor employees will be instructed on the following:

- An in-depth review of the soil and surface contaminants of concern identified and listed in Section 4.1.
- OSHA regulated chemicals and their hazards in the work area.
- How to prevent exposure to these hazardous chemicals.
- What the company has done to prevent workers' exposure to these chemicals.
- Procedures to follow if they are exposed to these chemicals.
- How to read and interpret labels and MSDSs for hazardous substances found on Shaw sites.
- Emergency spill procedures.
- Proper storage and labeling.

Before any new hazardous chemical is introduced on site, each Shaw and related subcontractor employee will be given information in the same manner as during the safety class. The Site Superintendent will be responsible for seeing that the MSDS on the new chemical is available for review by on-site personnel. The information pertinent to the chemical hazards will be communicated to project personnel.

Morning safety meetings will be held and the hazardous materials used on site will be discussed. Attendance is mandatory for all on-site employees.

4.3 Physical Hazards

To minimize physical hazards, Shaw has developed standard safety protocols that will be followed at all times. Activity Hazard Analyses (AHAs), located in Attachment 3, have been developed for each principal activity and for all major hazards to which employees may be exposed, including water jet cutting operations.

The SS/SSO will observe the general work practices of each crew member and equipment operator, and enforce safe procedures. The crew leaders and SS/SSO will inspect the work areas. All hazards will be corrected in a timely manner. A variety of physical hazards may be encountered during work activities at this site. Hard hats, safety glasses and steel-toe safety boots are required in all areas of the site. Site-specific hazards and all necessary precautions will be discussed at the daily safety meetings. Failure to follow safety protocols will result in removal of an employee from the site and appropriate disciplinary actions

4.4 SPECIAL SITE-SPECIFIC HAZARDS- Explosive Materials

The work at the NSF-IH is within a restricted area and is potentially hazardous due to the danger from explosive materials. The following restrictions apply, unless a waiver from the NSF-IH is obtained:

- Liquid petroleum gas and explosives are prohibited.
- Matches and lighters are prohibited in the restricted areas. Give matches and lighters to the security personnel at the gate prior to entering the area.
- Obey all roadblocks, signs, and gates at entrances to the restricted area.
- Do not operate mobile or fixed transmitters of radio frequency in the restricted area identified by road signs.
- Cell phones that do not have the HERO sticker from Base Safety will not be used anywhere within the restricted area.

4.5 Environmental Hazards

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

4.5.1 Heat Stress

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

- Heat Rash: is caused by a hot, humid environment and plugged sweat glands.
  - **Symptoms:** It is a bumpy red rash which itches severely. It is not life-threatening.
  - **Treatment:** Dry clothes that help sweat evaporate will reduce the chance of heat rash. Washing regularly and keeping the skin clean and dry will help prevent heat rash.
  -
- Heat Cramps are caused by a loss of body salt through excessive sweating.
  - **Symptoms:** Painful muscle cramps.
  - **Treatment:** To help prevent heat cramps, drink plenty of non-alcoholic, caffeine-free fluids while working in a hot environment. Check with your doctor about the use of salt tablets. They may be recommended in some cases. Anyone suffering from heat cramps should be watched carefully for signs of more serious heat stress. If the cramps persist or other symptoms develop, seek medical attention immediately.
  -
- Heat Exhaustion results from inadequate salt and water intake and signals that the body's cooling system is not working properly.
  - **Symptoms:** The victim will sweat heavily, their skin will be cool and moist, their pulse weak, and they will seem tired, confused, clumsy, irritable or upset, they may breathe rapidly--even pant--and their vision may be blurred. The victim may strongly argue that they are okay even with these obvious symptoms. If you suspect heat exhaustion, don't let the victim talk you out of seeking immediate medical attention. The heat exhaustion will affect their ability to exercise good judgment.
  - **Treatment:** Until medical help arrives, try to cool the victim and offer sips of cool water as long as the victim is conscious. Immediate medical attention is required. Heat exhaustion can quickly lead to heat stroke.
- Heat Stroke is the deadliest of all heat stress conditions. It occurs when the body's cooling mechanism has shut down after extreme loss of salt and fluids.
  - **Symptoms:** The body temperature will rise, the victim's skin is hot, red, and dry, their pulse fast, and they may complain of headache or dizziness. They will

probably be weak, confused, and upset. Later stages of heat stroke cause a loss of consciousness and may lead to convulsions.

- **Treatment:** In the event of heat stroke, seek immediate medical attention. Until help arrives, try to cool the victim and offer sips of cool water if the victim is conscious.

Heat stress prevention is outlined in Shaw Health and Safety Procedure HS400, Working in Hot Environments. This procedure will be available on site. This information will be reviewed during safety meetings. Workers are encouraged to increase consumption of water and electrolyte-containing beverages; e.g., Gatorade. Heat stress can be prevented by assuring an adequate work/rest schedule. Guidelines are presented in Table 4-2 and should be used in conjunction with HS400.

In addition, workers are encouraged to take rests and report symptoms whenever they feel any adverse effects that may be heat-related. The frequency of breaks may need to be increased based on worker recommendation to the SS/SSO. Heat stress can be prevented by assuring an adequate work/rest schedule and adequate fluid consumption. A guide for work/rest schedules for various protection levels are given below in Table 4-2. The number of hours before a work/rest period is based on experience with similar work. The time periods should be considered maximum. Individual physical variables and differences in physical work activities may require revisions to site plans. This table should be used as a guide. Professional judgment of the SS/SSO is necessary to assure a fully protective plan to prevent heat stress disorders.

Table 4-2 Guidelines For Work/Rest Periods

Temperature	Level D	Level C	Level B	Level A
90+ F*	2.0	1.5	1.0	0.5
87.5 F	2.5	2.0	1.5	1.0
82.5 F	3.0	2.5	2.0	1.5
77.5 F	3.5	3.0	2.5	1.5
72.5	4.0	3.5	2.5	1.5

*Work above 100º F will be reviewed with the Project HSS to determine specific requirements.

Alternately, the work/rest schedule can be calculated based on heat stress monitoring results. Each individual will count his/her radial (wrist) pulse as early as possible during each rest period. If the heart rate exceeds 75 percent of their calculated maximum heart rate (MHR = 180 – age) at the beginning of the rest period, then the work cycle will be decreased by one-third (as specified in the ACGIH TLV/BEI, dated 2005). The rest period will remain the same. An individual is not permitted to return to work until his/her sustained heart rate is below 75 percent of their calculated maximum heart rate.

Body temperature, measured orally or through the ear canal, may also be monitored to assess heat stress. Workers should not be permitted to continue work when their body temperature

exceeds 100.4°F (degrees Fahrenheit) or 38°C (degrees Celsius). Monitoring should be conducted at the beginning of each break period, as noted above.

Monitoring for heat stress will begin when the ambient temperature reaches or exceeds 70°F when wearing chemical protective clothing (Level C, B, A), or 80ºF for site activities performed with no chemical protective clothing (Level D). Monitoring will include pulse rate, weight loss, oral/or ear canal temperature, signs and symptoms of heat stress, and fluid intake.

4.5.2 Exposure to Cold

With outdoor work in the winter months, the potential exists for hypothermia and frostbite. Several forms of cold stress, as well as preventative measures, are described in this section of the SSHASP.

4.5.2.1 Cold Stress Conditions and Symptoms

Typical cold weather injuries are included in Table 4-4A, including symptoms and first aid precautions. If cold stress conditions develop, professional medical attention will be sought.

Table 4-4A Cold Weather Injuries

Cause	Symptoms	First Aid
FROSTBITE		
Freezing of tissue, normally due to exposure below 32 degrees Fahrenheit (°F).	Numbness in affected area. Tingling, blistered, swollen or tender areas. Pale, yellowish waxy-looking skin.	Warm affected area with direct body heat. Consult with medical personnel ASAP. **Do not** thaw frozen area if treatment will be delayed. **Do not** massage or rub affected area. **Do not** wet area or rub with snow or ice.
CHILBLAIN		
Repeated exposure of bare skin for prolonged periods to temperatures 20°F to 60°F (for those not acclimated to cold weather).	Swollen, red skin. Tender, hot skin, usually accompanied by itching.	Warm affected area with direct body heat. **Do not** massage or rub. **Do not** wet area or rub with snow or ice. **Do not** expose affected area to open fire, stove or any other intense heat source.
IMMERSION FOOT (TRENCH FOOT)		
Prolonged exposure of the feet to wet conditions at temperatures between 32°F to 50°F. Inactivity and damp socks (or tightly laced boots that impair circulation) speed onset and severity.	Cold numb feet may progress to hot with shooting pains, swelling redness, and bleeding.	Re-warm feet by exposing them to warm air. Evacuate victim to a medical facility. **Do not** massage, rub, moisten or expose affected area to extreme heat source.
DEHYDRATION		

Table 4-4A Cold Weather Injuries		
Cause	Symptoms	First Aid
Depletion of body fluids.	Dizziness. Weakness.	Replace lost water. Water should be sipped, not gulped. Get medical treatment.
HYPOTHERMIA		
Prolonged cold exposure and body heat loss. May occur at well above freezing, especially when a person is immersed in water.	Lack of shivering. Drowsiness, mental slowness, lack of coordination. Can progress to unconsciousness, irregular heartbeat, and death.	Strip off clothing and wrap victim in blankets or a sleeping bag. Get victim to a heated location and medical treatment, as soon as possible.

In cold weather, the potential for frostbite exists, especially in body extremities. Personnel will be instructed to pay particular attention to hands, feet, and any exposed skin when dressing. Personnel will be advised to obtain more clothing if they begin to experience loss of sensation due to cold exposure.

4.5.2.2 Monitoring and Preventative Actions

Typical cold stress monitoring and prevention procedures are included in Tables 4-4B and 4-4C, including temperatures to initiate monitoring, protective clothing uses, and administrative practices to prevent or reduce the potential for cold stress related injury/illness. Table 4-4D shows the equivalent chill temperature based on wind speed, as well as the associated danger. For weather conditions below -43°C or -45°F with no wind and/or similar conditions (Table 4-4E), all work will cease.

Table 4-4B Cold Stress Prevention*

	Temperature	Preventative Action
1	<61°F	Use thermometer to measure ambient temperature.
2	<40°F	Cold weather protective clothing available; check core body temperature at breaks using oral or ear canal thermometer. Maintain core body temperature above 96.8°F to avoid hypothermia.
3	<30°F	Record ambient temperature and wind speed every 4 hours; compare to wind chill chart when below 19.4°F.
4	<19°F	Provide and use heated warming shelters for work breaks and when cold stress symptoms appear.
5	<10°F	Constant observation of workers, i.e., "buddy system," rest in heated shelters (see work-rest schedule); dry clothing available for change-out; acclimate new workers.
6	<0°F / >5 mile per hour (mph) winds	Obtain medical certification for workers subject to hypothermia risk.

* *Based on "1998 ACGIH Threshold Limit Values... for Physical Agents."*
Note: *Refer to wind chill and work/warm-up charts attached.*

Table 4-4C Cold Weather Clothing

	Cold Weather Clothing Requirements
1	If wind chill is a factor at a work location, the cooling effect of the wind shall be reduced by shielding the work area or providing employees an outer windbreak layer garment.
2	Extremities, ears, toes, and nose shall be protected from extreme cold by protective clothing.
3	Employees performing light work whose clothing may become wet shall wear an outer layer of clothing which is impermeable to water.
4	Employees performing moderate to heavy work whose clothing may become wet shall wear an outer layer of clothing which is impermeable to water.
5	Outer garments must provide for ventilation to prevent wetting of inner clothing by sweat, or if not possible, a heated shelter for warming/drying clothing, or a change of clothing, shall be provided prior to returning to work in a cold environment.

Protective clothing greatly reduces the possibility of hypothermia in workers. However, personnel will be instructed to wear warm clothing and to stop work to obtain more clothing if they become too cold. Employees will also be advised to change into dry clothes if their clothing becomes wet from perspiration or from exposure to precipitation.

Employees will be instructed to use heated shelters on site, at regular intervals, depending upon the severity of ambient temperatures. Symptoms of cold stress, including heavy shivering, excessive fatigue, drowsiness, irritability, or euphoria necessitate immediate return to the shelter.

Table 4-4D Wind Chill Chart

Cooling Power of Wind on Exposed Flesh Expressed as Equivalent Temperature (under calm conditions)*												
Actual Temperature Reading (°F)												
Estimated Wind Speed	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
(in mph)	Equivalent Chill Temperature (°F)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little additional effect.)	**LITTLE DANGER** In less than an hour with dry skin. Maximum danger of false sense of security.				**INCREASING DANGER** Danger of freezing of exposed flesh within one minute.				**GREAT DANGER** Flesh may freeze within 30 seconds			
	Trench foot and immersion foot may occur at any point on this chart.											
* Developed by U.S. Army Research Institute of Environmental Medicine, Natick, Massachusetts. (Shaded area) Equivalent chill temperature requiring dry clothing to maintain core body temperature above 36°C (98.6°F) per cold stress TLV.												

Table 4-4E TLVs Work/Warm-up Schedule for Four-Hour Shift*

Air Temperature Sunny Sky		No Noticeable Wind		5 mph Wind		10 mph Wind		15 mph Wind		20 mph Wind	
°C (appx.)	°F (appx.)	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks
-26 to -28	-15 to -19	Normal	1	Normal	1	75 min	2	55 min	3	40 min	4
-29 to -31	-20 to -24	Normal	1	75 min	2	55 min	3	40 min	4	30 min	5
-32 to -34	-25 to -29	75 min	2	55 min	3	40 min	4	30 min	5	Non-emergency work should cease	
-35 to -37	-30 to -34	55 min	3	40 min	4	30 min	5	Non-emergency work should cease			
-38 to -39	-35 to -39	40 min	4	30 min	5	Non-emergency work should cease					
-40 to -42	-40 to -44	30 min	5	Non-emergency work should cease							
< -43	< -45	Non-emergency work should cease									

* Adapted from Occupational Health and Safety Division, Saskatchewan Department of Labor.

4.5.3 Noise

Hearing protection is required for workers operating or working near heavy equipment, where the noise level is greater than 85 A-weighted decibel (dBA) (Time Weighted Average [TWA]) as well as personnel working around heavy equipment. The SS/SSO will determine the need and appropriate testing procedures (i.e., sound level meter and/or dosimeter) for noise measurement in accordance with Shaw HS402 "Hearing Conservation Program."

Noise monitoring should be conducted during the beginning of each activity, as well as any time modifications lead to increased noise levels (e.g., adding additional equipment). A sound level meter will be used to measure noise levels at selected locations in the work area and on the site perimeter when equipment is operating normally. When used, noise-monitoring equipment must be calibrated before and after each shift.

If continuous noise levels are found to exceed 85 dBA at any location within the work area, warning signs will be posted. Workers and visitors will be notified that hearing protection is required. Appropriate hearing protection (e.g., ear plugs) will be worn whenever personnel are working, or visitors are present in that location. A supply of earplugs will be maintained on site.

Action levels in the following table will trigger the use of appropriate hearing protection (plugs or muffs). Hearing protection must be able to attenuate noise below 90 dBA (8-hour TWA). Each hearing protection or device has a Noise Reduction Rating (NRR) assigned by the EPA. The calculation for a hearing protection device's effectiveness is: noise reading dBA – (NRR – 7dB) < 90 dBA.

Instrument	Measurement	Action
Type I or Type II Sound Level Meter or Dosimeter	>80 dBA → 85 dBA	Hearing protection recommended. Limit work duration to 8-hour shifts.
	>85 dBA → 90 dBA	Hearing protection required. Limit work duration to 8-hour shifts.
	>90 dBA → 115 dBA	Hearing protection required. Investigate use of engineering controls. Limit work duration to 8-hour shifts.
	>115 dBA	Stop work. Consult Project HSM

4.5.4 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 Tyvek® coverall, to avoid skin contact.

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.

COMMON POISON IVY
(RHUS RADICANS)

- Grows as a small plant, vine, and shrub.
- Grows everywhere in the United States except California and parts of adjacent states. Eastern oak leaf poison ivy is one of its varieties.
- Leaves always consist of three glossy leaflets.
- Also know as three-leaf ivy, poison, creeper, climbing sumac, poison oak, markweed, picry, and mercury.

Spring

Summer

Fall

Winter

WESTERN POISON OAK
(RHUS DIVERSILOBA)

- Grows in shrub and sometimes vine form.
- Grows in California and parts of adjacent states.
- Sometimes called poison ivy or years.
- Leaves always consist of three leaflets.

POISON SUMAC
(RHUS VERNIX)

- Grows as woody shrub or small tree from 5 to 25 feet tall.
- Grows in most of eastern third of United States.
- Also known as swamp sumac, poison elder, poison ash, poison dogwood, and thunderwood.

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.

A barrier cream (e.g., Ivy Block, Stockhousen, Inc., 1-800-334-0242) should be applied to the exposed skin before entering and working in areas with possible poisonous plants.

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

- Remove contaminated clothing; wash all exposed areas thoroughly with soap and water, followed by rubbing alcohol. A one percent hydrocortisone cream (over-the-counter) will aid in healing and reducing itch.
- Apply calamine or other soothing lotion if rash is mild.
- Seek medical advice if a severe reaction occurs, or if there is a known history of previous sensitivity.

Contaminated Clothing. The irritating substances emitted by poison ivy group plants will remain on clothing for prolonged periods of time - up to weeks or months, if not washed thoroughly. It may be necessary to wash contaminated clothing separately and more than once before reusing.

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 Tyvek® and latex boot covers. The ticks will stand out against the light colors. A tick repellent or insect containing DEET is also recommended.

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.

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.

First Aid

- Carefully (slowly and gently) remove the tick with tweezers, taking care that all parts are

removed.

- 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.

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 November 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. It's 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 Lyme 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 Lyme disease, report it to your Superintendent and seek medical attention.

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 heartbeat. 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 defense or immune system responds to the infection.

West Nile Virus and West Nile Encephalitis. West Nile Virus/West Nile Encephalitis is rapidly becoming a health concern in the United States. West Nile Virus was first identified in the United States in the New York area in 1999 and is closely related to the St. Louis Encephalitis Virus, which is routinely found in the United States.

"Encephalitis" means an inflammation of the brain, and it can be caused by viral and bacterial infections. West Nile Encephalitis can be a serious or even fatal illness; although this is rare in humans. This illness develops in approximately one out of every 150 infections, and is generally confined to older and physically compromised individuals.

West Nile Encephalitis is a viral infection of the brain transmitted through the bite of a mosquito, which has previously fed on birds and/or horses that were infected with West Nile Virus. Dead birds in an area may mean that West Nile Virus is circulating between the birds and the mosquitoes in that area. West Nile Virus is not transmitted from one person to another. Human illness from West Nile Virus is rare, even in areas where the virus has been reported.

Symptoms of Exposure. Most people who become infected with West Nile Virus will have either no symptoms or only mild ones. Symptoms of West Nile Encephalitis include high fever, headache, confusion, muscle aches and weakness, seizures, or paralysis. At its most serious, the infection can result in coma, permanent neurological damage, and death. Symptoms usually occur five to 15 days following the bite of an infected mosquito. Because West Nile Encephalitis is a viral infection, antibiotics are not effective, and there is no specific treatment available other than general support therapy.

Protective Measures at Projects. There is no vaccine to protect humans against West Nile Virus. Individuals at project sites can reduce their risk from being infected with West Nile Virus by taking the following actions to protect against mosquito bites:

- Review the hazards of West Nile Virus periodically in morning safety meetings.
- Increase protective measures when working at dawn, dusk, and in the early evening.
- Reduce the area of exposed skin when working outdoors. Long-sleeved shirts with sleeves rolled down are recommended. Understand that mosquitoes may bite through thin clothing, so personnel should evaluate the actual Level D clothing worn, e.g., heavy long sleeve work shirts and heavy jeans may be indicated. Also, the risk or threat of mosquito bites is reduced for those activities that require the use of disposable coveralls.

- For activities where only Level D PPE is specified, consider using disposable coveralls when working in wooded, highly vegetated, or swampy areas.

- Use an insect repellent containing approximately 25 percent DEET (N, N-diethyl-meta-toluamide). DEET in concentrations greater than 25 percent provides no additional protection, but repel insects longer. However, at some point there is no direct correlation between concentration and repellency. For example, 50 percent DEET provides about four hours of protection against mosquitoes, but increasing the concentration to 100 percent provides only one additional hour of protection. Use the repellent according to the manufacturers' directions provided on the container. Use just enough repellent to cover exposed skin and clothing. Do not treat unexposed skin. Frequent re-application is unnecessary for effectiveness. Avoid prolonged and excessive use of DEET.

- After returning from outdoor field activities, wash treated skin with soap and water.

- Personnel should report flu-like symptoms to the SS/SSO.

DEET is safe for pregnant and lactating women, and is generally safe for children. You should avoid applying it to open wounds and irritated skin as it may further irritate the skin or cause discomfort.

Sweating, perspiration, and getting wet may wash away the repellent and may require that DEET-containing repellent be re-applied.

To remove the breeding places on a project, the following precautions will be followed as practical:

- Cut tall grass and weeds.
- Drain accumulated water in such items as drums, buckets, pools and plastic containers.
- Repair holes in door and window screens.
- Eliminate stagnate water puddles, as practical.
- Limit outdoor activities at dawn, dusk and early evening, when mosquitoes are most active, as practical.

4.5.5 Lightning

The procedures provided below will be used to protect site personnel from lightning related injuries.

Training. A tailgate safety meeting will be conducted to increase awareness to the hazards and prevention of lightning related incidents.

Detection of Lightning. The SS/SSO will be proactive in monitoring conditions that may produce thunderstorms and lightning. A daily and weekly weather forecast will be tracked and communicated to site personnel. When signs of impending storms, i.e., increasing wind,

darkening skies, or lightning appear, local weather monitoring will be increased. The National Weather Service (http://www.nws.noaa.gov) should be consulted frequently. Personnel will be notified when thunderstorms may impact the site.

The "flash/bang" (f/b) technique of measuring the distance to lightning will be reviewed with all personnel. The f/b technique is defined as: for each five seconds from the time of observing the lightning flash to hearing the associated thunder, the lightning is one mile away.

Suspension/Resumption of Activities. All outside activities will be suspended when a lightning flash is immediately in the area or an f/b of 20 seconds (4 miles away) is noted. Personnel may continue indoor work activities. Outdoor activities will resume when 30 minutes has passed since the last observable f/b is 20 seconds or greater.

Lightning Protection. When notification is given, all outside work activities will stop and personnel will gather in the Support Zone (SZ) for a head count and further instructions. Indoor work will continue, except for the use of electrical equipment, telephones and computers. When a safe location is not present and personnel are caught by a sudden lightning event, employees should seek the lowest possible area, away from large objects which might attract lightning or fall over, e.g., trees, utility poles. The employee should assume a crouching position with their head lowered and hands over their ears. AVOID: WATER, HIGH GROUNDS, HEAVY EQUIPMENT AND TALL, ISOLATED OBJECTS.

First Aid

An employee that is struck by lightning needs immediate assistance (call 911). The body will not carry an electrical charge, but receives an electrical shock and may be burned. Personnel certified in first-aid/Cardiopulmonary Resuscitation (CPR) should inspect for shock and burns around fingers, toes, buckles and jewelry. Stay with the injured employee until medical help arrives.

4.6 Vehicle and Heavy Equipment Safety Management

4.6.1 Vehicle Safety

Motor vehicle incidents are the number one cause of occupational fatalities, accounting for one in three deaths. Fifty percent or more of vehicle safety incidents occur while backing up. Shaw employees involved in the operation and use of Shaw and/or leased or rented vehicles will comply with the Shaw Health and Safety procedures HS800 “Motor Vehicle Operation: General Requirements” and HS810 “Commercial Vehicle Operation and Maintenance.” Shaw requires employees to use seat belts at all times when traveling in Shaw owned or leased/rented vehicles. The SS/SSO will develop a parking area plan, including backing vehicles into parking spaces, using spotters for backing vehicles, and policy mandated vehicle inspections.

Shaw employees are expected to incorporate safe actions and preparations to avoid vehicle accidents and personal injury during work and off-hours. Breaks should be planned into lengthy job mobilizations and demobilizations, including rotation of drivers at regular intervals. If parking areas are busy or crowded, and more than one worker is traveling in the same vehicle, one worker should remain outside the vehicle as it leaves the parking space to assist the driver with traffic observation. Vehicles traveling before dawn and at dusk in rural or wooded areas should be prepared to brake for wildlife (e.g., deer) crossing roadways.

Shaw employees arriving at work areas should park vehicles away from delivery, heavy equipment, and vehicle loading/unloading locations to prevent parked vehicles from damage by various deliveries. Heavy equipment operators should inspect areas and request vehicles to be moved or spotters used, if necessary, to maneuver equipment in tight areas. Employees who observe near misses or potential risks to parked or moving vehicles must report these to the SS/SSO immediately.

Shaw employees are expected to use the vehicle inspection form and check/test the safety systems on the vehicle on a daily basis. Check the following: brakes, mirrors, seat belts, tires, leakage from the undercarriage, lights, and turn signals. Vehicles with safety deficiencies must be reported immediately and not driven until properly repaired. Vehicles used to run errands from different project sites should have telephone numbers of the job site in the vehicle in case calls for assistance are required.

Because of the different ways alcohol can affect behavior, even in very small amounts, the best and safest course is not to drink before driving. At Shaw, a driver with blood alcohol concentration (BAC) over 0.04 percent is considered to be under the influence and subject to disciplinary action. Personnel involved in motor vehicle incidents are subject to drug and alcohol testing.

Weather conditions can have a profound effect on driving. On slippery roads, drive more slowly. Stop and turn with care. Keep several car lengths from other vehicles. At speeds in excess of 35 miles per hour (mph), the chances of hydroplaning increase with speed. In general, keep back one car length for every 10 mph to prevent striking the car ahead.

Vehicles will be operated in accordance with the requirements listed below:

- Seatbelt use is mandatory for all passengers.
- Personnel may not ride in the back of cargo vehicles.
- The driver must make a 360 degree walk around the assigned vehicle prior to vehicle movement.
- A ground guide is used to back up any vehicle.
- Vehicle speed is limited to the posted speed limits for developed roadways, 25 mph maximum on dirt roads and 10 mph maximum off-road (based on conditions).

- Vehicle driven in four wheel low and low gear when on dirt roads or off road driving where steep grades dictate.
- All operators must possess a valid driver's license.
- Fuel or gasoline is not to be transported inside the passenger compartment.
- No vehicle is left running when unattended.
- Parking brakes are used when vehicles are parked.

In the event of a vehicle incident, notify your Project Manager immediately and complete all required reports.

4.6.2 Heavy Equipment, Crane and Lifting Operations

Forklifts, cranes, excavators, loaders, and other material handling equipment present various physical hazards on remediation sites. The following critical safety practices shall be followed to prevent safety incidents during heavy equipment operation.

- All equipment will be inspected prior to each use.
- All operators will have training or equivalent experience to be permitted to operate heavy equipment.
- Spotters will be used to back-up equipment and direct traffic in all "blind" areas.
- Standard hand signals will be used to communicate between operators and ground crew.
- All heavy equipment will have operable back-up alarms.
- Heavy equipment will be parked in areas where operators will not be exposed to strains or slip/trip/fall hazards during mounting and dismounting of equipment.
- All heavy equipment will be equipped with operable seat belts; belts will be used by all operators.
- Written lifting plans will be developed and reviewed for all critical lifts.

4.7 Manual Material Lifting

Many different types of objects may be handled manually during site operations. Care should be taken when lifting and handling heavy or bulky items because they are the cause of many back injuries. The following fundamentals address the proper lifting techniques that are essential in preventing back injuries:

- The size, shape, and weight of the object to be lifted must first be considered. No individual employee is permitted to lift any object that weighs more than 60 pounds. Multiple employees or the use of mechanical lifting devices are required for objects over the 60-pound limit.

- The anticipated path to be taken by the lifter should be inspected for the presence of slip, trip, and fall hazards.
- The feet shall be placed far enough apart for good balance and stability (typically shoulder width). **THE FOOTING SHALL BE SOLID.**
- The worker shall get as close to the load as possible. The legs shall be bent at the knees.
- The back shall be kept as straight as possible and abdominal muscles should be tightened.
- To lift the object, the legs are straightened from their bending position.
- A worker shall never carry a load that cannot be seen over or around.
- When placing an object down, the stance and position are identical to that for lifting. The legs are bent at the knees and the object lowered.

When two or more workers are required to handle the same object, coordination is essential to ensure that the load is lifted uniformly and that the weight is equally divided between the individuals carrying the load. When carrying the object, each worker, if possible, shall face the direction in which the object is being carried. In handling bulky or heavy items, the following guidelines shall be followed to avoid injury to the hands and fingers:

- A firm grip on the object is essential; leather gloves shall be used if necessary.
- The hands and object shall be free of oil, grease, and water that might prevent a firm grip, and the fingers shall be kept away from any points that could cause them to be pinched or crushed, especially when setting the object down.
- The item shall be inspected for metal slivers, jagged edges, burrs, and rough or slippery surfaces prior to being lifted.

4.8 Activity Hazard Analyses

Attachment 3 contains AHAs for primary site tasks, including water jet cutting operations. Additional safety analysis can be found in the respective SOP in the Material Potentially Presenting an Explosive Hazard (MPPEH) Support Plan. The AHAs contain detailed information on physical and chemical hazards, and provide control measures for these hazards. The AHAs will be field checked by the SS/SSO on an ongoing basis and revised as necessary. All revisions will be communicated to the work crew. In addition to the AHAs, Job Safety Analyses (JSAs) will be completed daily in accordance with Shaw HS045 “Job Safety Analyses” (see Attachment 2).

5.0 Work and Support Areas

Work zones will be established prior to the initiation of site activities, or whenever air monitoring readings exceed the action levels outlined in Section 8.1. When necessary, each work area will be clearly identified using signs or physical barriers.

5.1 Support Zone

The uncontaminated SZ, or clean zone, will be located upwind, in an area outside the Exclusion Zone (EZ) and Contamination Reduction Zone (CRZ) and within the geographic perimeters of the site. The area is used for material staging, vehicle parking, office facilities, sanitation facilities, and receipt of deliveries. Personnel entering this zone may include delivery personnel, visitors, security guards, etc., who will not necessarily be permitted in the EZ. All personnel arriving in the SZ will, upon arrival, report to the SS/SSO and sign the site visitor log.

5.2 Contamination Reduction Zone

Personnel and equipment decontamination will be performed in the CRZ that is adjacent to the EZ. All personnel entering or leaving the EZ will pass through this area to prevent any cross-contamination, and for the purpose of accountability. Personal protective outer garments and respiratory protection will be removed in the CRZ and properly labeled. All water generated from equipment and personal decontamination will be contained on site, and disposed of in an appropriate manner.

5.3 Exclusion Zone

The EZ will be the area around the designated excavation area, and/or the areas with elevated air monitoring readings. This area has the highest potential for exposure to contamination by contact, ingestion, or inhalation. All employees will use proper PPE when working in these areas. The location of the EZ will be identified by fencing, or other appropriate means, primarily around the excavation areas and the stockpiles. A daily entry log records the time of entry and exit from the EZ for each person.

A log of all personnel visiting, entering, or working on the site shall be maintained by the SS/SSO. Visitors will attend a site orientation given by the SS/SSO and sign the SSHSP.

The following are standard safe work practices that apply to all site personnel and will be discussed in the safety briefing prior to initiating work on the site:

- Eating, drinking, chewing gum or tobacco, and smoking is prohibited in the EZ/CRZs.
- Hands and face must be washed upon leaving the EZ and before eating, drinking, chewing gum or tobacco, and smoking.

- 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.
- Visual contact will be maintained between buddies on site when performing hazardous duties.
- All personnel must comply with established safety procedures. Any staff member who does not comply with safety policy, as established by the SS/SSO, 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.

6.0 Protective Equipment

This section specifies the levels of PPE, which are required for each principal activity performed at this site. All site personnel must be trained in the use of all PPE utilized. The PPE procedures outlined in Shaw Health and Safety procedures HS600 "Personal Protective Equipment" and HS601 "Respiratory Protection Program" will be applied to project activities.

6.1 Anticipated Protection Levels

The following protection levels have been established for the site work activities.

Table 6-1 Anticipated Protection Levels

Task	Initial PPE Level	Upgrade PPE Level	Skin Protection	Respiratory Protection	Other PPE
Site preparation, clearing and grubbing, road foundation and pavement, set up and maintenance of erosion and sediment controls, site restoration	Level D	None	Leather work gloves as appropriate	None	Hard hat, steel-toe work boots, safety eyewear (safety glasses with side shields or goggles and face shield), and hearing protection >85 dBA
Field sampling	Modified Level D	Level C	Tyvek coveralls, latex or rubber over-boots, inner cotton glove liners (based on weather) or inner sample gloves, and outer sample gloves	Initial: None Upgrade: Full-face air-purifying respirators with multi-contaminant cartridges	Hard-hat, steel-toe work boots, safety glasses, and hearing protection >85 dBA
Material excavation and hauling, material screening and load-out	Modified Level D	Level C	Tyvek coveralls, latex or rubber over-boots, inner cotton glove liners (based on weather) or inner sample gloves, and outer nitrile gloves;	Initial: None Upgrade: Full-face air-purifying respirators with multi-contaminant cartridges	Hard-hat, steel-toe work boots, safety glasses, and hearing protection >85 dBA
Task	**Initial PPE**	**Upgrade PPE**	**Skin Protection**	**Respiratory Protection**	**Other PPE**

	Level	Level			
Equipment decontamination	Modified Level D	None	Poly-coated Tyvek or rain suits, latex or rubber over-boots, inner cotton glove liners (based on weather) or inner sample gloves, and outer nitrile gloves	Full-face air-purifying respirators with multi-contaminant cartridges	Hard-hat, steel-toe work boots, full-face shield and hearing protection >85 dBA. Metatarsal and shin guards are required for decontamination activities
General SZ activities	Level D	None	None	None	Hard-hat, steel-toe work boots, safety glasses, leather work gloves as required for material handling, and reflective vests when working in high traffic areas

6.2 Protection Level Descriptions

This section lists the minimum requirements for each protection level. Modification to these requirements may have been noted above.

6.2.1 Level D

Level D consists of the following:

- Safety glasses with side shields
- Hard hat
- Steel-toed work boots
- Work clothing as prescribed by weather
- Leather work gloves
- Cut resistant gloves when handling sharp objects
- Reflective vests for ground personnel working around heavy equipment or roadways
- Hearing protection in areas >85 dBA.

6.2.2 Modified Level D

- Modified Level D consists of the following:

- Safety glasses with side shields
- Hard hat
- Steel-toed work boots
- Tyvek® coverall (when handling dry materials)
- Poly-coated Tyvek® coverall or polyvinyl chloride (PVC) rain suit (when handling wet materials)
- Latex over-boots
- Inner latex sample gloves
- Outer nitrile gloves
- Hearing protection in areas >85 dBA
- Full-face shield when splash hazards are present.

6.2.3 Level C

Level C consists of the following:

- Safety glasses with side shields or full-face shield and goggles as required for splash hazards
- Hard hat
- Steel-toed work boots
- Inner work clothing as prescribed by weather
- Leather work gloves as required for material handling
- Inner cotton glove liners (as prescribed by the weather)
- Outer nitrile gloves (lined nitrile gloves should be used during cold weather)
- Rubber or latex over-boots
- Tyvek coveralls or poly-coated Tyvek, as required to protect against splash hazards
- Full-face air-purifying respirator with P100 cartridges.

6.2.3.1 Air Purifying Respirators

A NIOSH-approved full-face powered air purifying respirator with (P-100) cartridges will be used for operational support activities.

6.2.3.2 Cartridge Changeout Schedule

All cartridges will be disposed of at the end of each work shift.

6.2.3.3 Inspection And Cleaning

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

6.2.3.4 Fit Testing

Annual respirator fit tests are required of all personnel wearing negative-pressure respirators. A qualitative fit test is required.

6.2.3.5 Facial Hair

Personnel who have facial hair that interferes with the respirator's sealing surface will not be permitted to wear a respirator and will not be permitted to work in areas requiring respirator use.

6.2.3.6 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. Contact lenses are permitted to be used with full-face respirators based on a decision by OSHA.

6.2.3.7 Medical Certification

Only workers who have been certified by a physician as being physically capable of respirator use 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 will receive a written physician's opinion that they are fit for general hazardous waste operations as per 29 CFR 1910.120(f)(7).

6.3 Site- Specific Personal Protective Equipment

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

The SS/SSO will be responsible for monitoring all aspects of the PPE program. This includes donning and doffing, temperature related stress monitoring, inspection, and decontamination. PPE selection is identified in Table 6-1 for each specified task. The SS/SSO, in consultation with the HSS, and the HSM, will direct changes in PPE based on changing conditions. The site-specific SSHSP will serve as written certification that the workplace was evaluated concerning PPE requirements.

7.0 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.

7.1 Personnel Decontamination

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

7.1.1 Modified Level D Decontamination

- Go to end of EZ.
- Remove and discard latex booties.
- Remove outer gloves and discard.
- Remove protective suit.
- Remove inner sample gloves and discard.
- Wash face and hands.

7.1.2 Level C Decontamination

- Go to end of the work area.
- Wash outer boots and stage to let dry; or remove and discard latex booties.
- Remove outer gloves and discard.
- Remove outer suit and discard.
- Remove outer sample gloves and discard.
- Remove inner suit and discard (if applicable).
- Remove and wash respirator.

– Soap and water solution
– First rinse
– Disinfect respirator (1 cap full of bleach to 1 gallon of water)
– Final rinse
– Hang respirator to dry
– Remove inner sample gloves and discard
– Wash face and hands.

7.1.3 Suspected Contamination

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

7.1.4 Personal Hygiene

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

7.2 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 SS/SSO.

7.3 Disposal

All spent decontamination liquids and disposable clothing will be treated as contaminated waste unless determined otherwise by accepted testing methods. Wastes will be containerized and stored until test results are received. Wastes will then be disposed of according to State and f=Federal regulations.

8.0 Air Monitoring

Air monitoring will be conducted in order to characterize personnel exposures and fugitive emissions from site contaminants. Principal contaminants of concern are listed in Section 3.0 of this plan. The target compounds selected for air monitoring purposes at Site 28 are heavy metals. Results of air monitoring will be used to ensure the proper selection of protective clothing and equipment, including respiratory protection, to protect on-site personnel and off-site receptors from exposure to unacceptable levels of site contaminants. Descriptions of air monitoring strategies, procedures, and equipment are provided below. Modification of this plan, including additional monitoring, may be considered and judged necessary by the CIH, in conjunction with the HSM and SSO.

8.1 Work Area Air Monitoring

Work area air monitoring at Site 28 will include direct reading methods. Air monitoring will be conducted during any work requiring soil or sediment disturbance, or water handling. These activities include clearing and grubbing, material excavation and hauling, and load-out.

During work activities, direct reading air monitoring will be performed to determine exposure to workers. A photoionization detector (PID) meter will be used to monitor for toxic vapors. A lower explosive limit (LEL)/oxygen (O_2) meter will be available to test for potential combustible vapors and to check oxygen levels. A Particulate Meter (i.e., Mini Ram, Data Ram) will be used to monitor for airborne particulates. A summary of air monitoring information is provided in Table 8-1.

Marlowe's calculation was utilized to determine the levels of airborne dust that would need to be generated to approach exposure limits for each of the site contaminants. Based on the highest concentrations found in soil samples, with a safety factor of 4, levels of dust would have to reach 11.75 mg/m^3 before reaching the TLV for site contaminants. Therefore, a limit of $5mg/m^3$ is conservative, and would protect employees from airborne contamination exceeding the TLV.

Table 8-1 Air Monitoring Information

Monitoring Device	Monitoring Location/ Personnel	Monitoring Frequency	Action Level	Action
LEL/O_2	EZ/area sampling	Periodically at the discretion of the SSO	>10% LEL <20.8% O_2	Evacuate area, ventilate, upgrade to Level B, if necessary, continue to monitor
PID	EZ work area and breathing zone of workers	Periodically at the discretion of the SSO	<5 ppm* >5 ppm <10 ppm >10 ppm	Modified D Level C Stop work and evaluate
Mini Ram (total dust)	EZ work area and breathing zone of workers	Periodically at the discretion of the SSO	<5 mg/m^3* 5.0 - 15.0 mg/m^3* >15 mg/m^3*	Modified D Level C Stop work and evaluate

* Sustained levels above background for five (5) minutes.

8.2 Instrumentation

The following is a description of the air monitoring equipment to be used at this site.

8.2.1 Lower Explosive Limit/Oxygen/Hydrogen Sulfide (LEL/O_2/H_2S) Meter

8.2.1.1 Types and Operational Aspects

MSA Watchman LEL/O_2/H_2S Meter or equivalent.

8.2.1.2 Principle of Operation

- An oxygen detector uses an electrochemical sensor; produces a minute electric current proportional to the oxygen content.
- Combustible gas indicators use a combustion chamber containing a filament that ignites flammable vapors; filament is heated or coated with a catalyst (platinum) to facilitate combustion.
- Hydrogen sulfide monitors are required to measure personnel breathing zones when site personnel are potentially exposed to H_2S during site remedial operations. An action level of 2.5 ppm for 5 minutes requires an upgrade to Level B protection because air-purifying respirators are not appropriate respiratory protection for H_2S exposures.

- Filament is part of a balanced resistor circuit; combustion in the chamber causes the filament temperature to increase; results in increased filament resistance.
- Change in the filament's resistance causes an imbalance in the circuit proportional to the percent of the lower explosive limit (percent LEL).
- Concentrations greater than the LEL, and lower than the upper explosive limit (UEL), will indicate that a combustible atmosphere is present.
- Concentrations greater than the UEL will read above 100 percent LEL then return to zero. (NOTE: Some devices have catchment mechanisms which will cause the needle to remain at 100 percent until the meter is reset. This type of response indicates the gas mixture is too rich to burn and is not combustible. The danger is that the addition of air to the gas mixture could dilute it and allow the concentration to enter the flammable range [less than the UEL]).
- Oxygen meter set at the factory to alarm at 19.5 percent (oxygen deficient atmosphere); combustible gas meter set by the user to alarm at 10 percent LEL.

8.2.1.3 Calibration Methods/Frequencies

Before the calibration of the combustible gas indicator can be checked, the unit must be in operating condition. The combustible gas indicator (LEL) is normally calibrated on pentane, as being representative of the flammability characteristics of most commonly encountered combustible gases. The meter scale is calibrated from zero to 100 percent LEL, which corresponds in actual volume concentrations of 0 to approximately 14 percent pentane in air. A booklet of response curves is supplied with the Watchman Meter. These curves may be used to interpret meter readings when sampling combustible gases other than pentane. All direct reading air monitoring equipment will be calibrated daily before and after each period of use in accordance with manufacturers' instructions and standard industrial hygiene practice. For hydrogen sulfide, ensure proper function of the sensor response by checking with a known concentration of hydrogen sulfide prior to each use. The SS/SSO will record and log such calibration information into an air monitoring notebook.

8.2.1.4 Preventative Maintenance

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

8.2.2 Real Time Aerosol Monitor (Model Pr 100 Data Ram)

8.2.2.1 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.

8.2.2.2 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.

8.2.2.3 Preventative Maintenance

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

Prior to entering a confined-space area or hot work involving welding, cutting, or other high heat-producing operations where flammable or combustible vapors may be present, LEL/O_2 measurements will be taken.

8.2.3 Photo ionization Detector Photovac 2020 or Equivalent

The PID Photovac 2020 is designed for trace gas analysis in ambient air and is calibrated with certified standards of benzene, vinyl chloride, and isobutylene. Other optional calibrations are available (e.g., ammonia, ethylene oxide, H_2S, etc.).

The SSO will use a PID with a 10.6 electron volt (eV) lamp. This lamp has been determined to be most responsive to the contaminants on site. Optional probes containing lamps of 9.5 and 11.7 eV are interchangeable in use within individual read-out assemblies for different applications.

The SSO will record and log calibration information into an air monitoring notebook. Maintenance of the Photovac 2020 consists of changing pre-filters, cleaning the lamp and ion chamber, and replacement of the lamp or other component parts or subassemblies.

8.3 Air Monitoring Log

The SS/SSO will ensure that all air monitoring data is logged into a notebook. Data will include instrument used, wind direction, work process, etc. The Program CIH or HSM will periodically review this data.

8.4 Calibration Requirements

The PID and the LEL/O_2/H_2S will be calibrated daily before and after use, based on the manufacturers' recommendations and standard industrial hygiene practices. The Data Ram will be zeroed daily before use. A separate log will be kept by the HSS and/or SS/SSO detailing date, time, span gas, or other standard, and name of person performing the calibration.

8.5 Air Monitoring Results

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

9.0 Emergency Response and Contingency Plan

This section presents the Emergency Response and Contingency Plan (ERCP).

9.1 Pre-Emergency Planning

Prior to engaging in remediation activities at the site, Shaw 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	• 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.
Spill or Release of Hazardous Materials	• 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.
Natural Disaster	• A rainstorm 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. • Hurricanes.
Medical Emergency	• 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). • Heart attack. • Respiratory failure. • Allergic reaction.

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, based on their level of response.

- It will be the responsibility of the Site Superintendent to brief the site response team, either on site or Shaw Employees or off-site responders, on anticipated hazards at the site. The Site Superintendent shall assume the role of Emergency Coordinator and 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 air horns.

9.2 Emergency Recognition And Prevention

Because unrecognized hazards may result in emergency incidents, it will be the responsibility of the SS/SSO, through daily site inspections and employee feedback (Safety Observation Program, daily safety meetings, and AHA), to recognize and identify all hazards that are found at the site. These may include:

Chemical Hazards	• Materials at the site • Materials brought to the site
Physical Hazards	• Fire/explosion • Slip/trip/fall • Excessive noise
Mechanical Hazards	• Pinch points • Vehicle traffic
Environmental Hazards	• Electrical Storms • High winds • Heavy Rain/Snow • Temperature Extremes (Heat Stress) • Poisonous Plants/Animals

Once a hazard has been recognized, the SS/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

- PPE selection/use

- Following all Shaw standard operating procedures.

Table 9-1 Emergency Telephone Numbers

Local Agencies	
Base Fire Protection Division	(301) 744-4333
Ambulance	(301) 744-4333
Fire	(301) 744-4333
Security	(301) 744-4333
Dispatch	(301) 744-4381
LEPC	Will be notified by Fire/Dispatch
Hospital	
Civista Medical Center	(301) 609-4000
701 E. St. Charles Street	
LaPlata, MD	
Health Resources Clinic	
Convenient Health Care	
12090 Old Line Center	(301) 645-8550
Waldorf, MD 20602	
See Attachment 4 for directions to the hospital and clinic.	
National Capital Poison Center	(800) 222-1222
Federal Agencies	
Center for Disease Control	(404) 639-3311
National Response Center	(800) 424-8802
Department of the Navy, Atlantic Division (LANTDIV)	
Facilities Engineering Acquisition Division - LT Mike O'Donnell	(301) 744-2177
Contracting Officer Technical Representative – Cathy Gardner	(301) 744-2181
Shaw Personnel	
Project Manager – Steve Carriere	(609) 234-6361 (cellular)
Site Superintendent – To be determined	
Site Safety Officer – Michael Harrison	(618) 599-3838 (cellular))
UXO Supervisor - To be determined	TBD
LANTDIV Safety Manager- Kym Edelman	(757) 435-5384 (cellular)
Program CIH – Dave Mummert	(419) 425-6129 (office)
ERC Health and Safety Manager – Joe Hoyt	(804) 337-6982 (cellular)
Shaw E & I (24 hour)	(866) 299-3445

9.3 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 Superintendent. In the event an emergency occurs and the Emergency Coordinator is not on site, the SS/SSO 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.

9.3.1 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. Shaw will follow procedures as directed by the Fire Department, LEPC, State and Federal agencies as required. Shaw 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.

9.3.2 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.
- Notify the Facilities Engineering Acquisition Division (FEAD). The FEAD will contact the local Emergency Response Teams if their help is necessary to control the incident. Table 9-1 provides telephone numbers for emergency assistance.
- Direct on site personnel to control the incident until, if necessary, outside help arrives.
- Ensure that the building or area where the incident occurred and the surrounding areas are evacuated, and shut off possible ignition sources, if appropriate. The

Emergency Response Team is responsible for directing site personnel such that they avoid the area of the incident and leave emergency control procedures unobstructed.

- If fire or explosion is involved, notify facility Fire Department.
- Notify Shaw Project Manager.
- Notify FEAD.
- 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 the area outside of the site maybe necessary, and if so, notify the FEAD. The FEAD will contact the local Police Department and the Office of Emergency Management.

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.

9.3.3 Safe Distances and Places of Refuge

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

In the event of minor hazardous materials releases (small spills of low toxicity), workers in the affected area will report initially to the CRZ. 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.

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 9-1.

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
- Medical emergency
- Hazardous weather.

In general, evacuation will be made to the main entrance to the Shaw site, 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.

9.3.4 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.

9.3.5 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. The crew Superintendent will have a two-way radio. Prior to using any two-way radios at the site, Shaw will receive approval from the Base. Only the Emergency Coordinator will initiate total site evacuation; however, in his absence, decisions to preserve the health and safety of employees will take precedence.

9.3.6 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 SZ will assemble at the entrance to the site for a head count and await further instruction from the Emergency Coordinator.
- ALL persons in the EZ and CRZ 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 Coordinator.
- The Emergency Coordinator, or designee, will make a final tally of persons. No attempt to find persons not accounted for will involve endangering lives of Shaw 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 Superintendent.

- Personnel will be assigned by the Emergency Coordinator to be available to direct and brief emergency responders.
- Re-entry into the site will be made only after the Emergency Coordinator gives clearance. At his direction, a signal or other notification will be given for re-entry into the facility.
- Drills will be held upon mobilization to the site and annually, thereafter, to practice all of these procedures with the same seriousness as an actual emergency.

9.4 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 9-1 provide a quick reference guide to follow in the event of a major spill.

9.4.1 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.

The 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.

9.4.2 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, and may include:

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

The Emergency Coordinator will notify the FEAD 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
- Sorbent materials
- Personal safety equipment
- Steel drums

- Miscellaneous hand tools.

As specified in regulations developed under the Comprehensive Environmental Response Compensation Liability Act of 1980 (Superfund), Shaw practice is to report a spill of one pound or more of any hazardous material for which a reportable quantity has not been established and is listed under the Solid Waste Disposal Act, Clean Air Act, Clean Water Act, or Toxic Substances Control Act (TSCA). Shaw 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 Resource Conservation and Recovery Act (RCRA).

Clean up personnel will take the following measures:

- Make sure all unnecessary persons are removed from the hazardous 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.
- Determine the major components in the waste at the time of the spill. Remove all surrounding materials that could be especially reactive with materials in the waste.
- 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.

9.4.3 Emergency Response Equipment

The following equipment will be staged in the SZ and throughout the site, as needed, to provide for safety and first aid during emergency responses:

- ABC type fire extinguisher
- Industrial Size First Aid Kit
- Eyewash

- Emergency signal horn.

9.4.4 Emergency Spill Response Clean-Up Materials and Equipment

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

The materials listed below may 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 SZ. Small amounts will be placed on pallets and located in active work areas.

- Appropriate solvents (e.g., CITRIKLEEN, for decontamination of structures or equipment).
- Sand or clay to solidify/absorb liquid spills.

9.4.5 Medical Emergency Contingency Measures

The procedures listed below will be used to respond to medical emergencies. The SS/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. In accordance with 29 CFR 1910.1030, first-aid/CPR trained personnel will receive Blood Borne Pathogens training.

9.4.6 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 of 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 Superintendent will inform the Emergency Coordinator by radio, and the local Emergency Medical Services (EMS) will be immediately called. The EMS will be notified that decontamination procedures will be bypassed, and the EMS responders shall take precaution against site contaminants that may be present on the employee. Information of the site

contaminants will be provided to the EMS by the SSO. The Shaw SSO will notify the Hospital Emergency Room of the condition and any site contaminants. An on-site person will be appointed to meet the EMS and quickly take him/her to the victim. Any injury within the EZ will be evacuated by Shaw 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.

Following any response, an accident/injury/illness report will be completely and properly filled out and submitted to the Program Health and Safety /Project CIH in accordance with Shaw reporting procedures.

A list of emergency telephone numbers is provided in Table 9-1.

Non Life-Threatening Incident. All injuries, no matter how small, will be reported to the SS/SSO. If it is determined that no threat to life is present, the SS/SSO will direct the injured person through decontamination procedures 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 SS.

9.4.7 Notification

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

- Base Fire Department or EMS
- On site Emergency Coordinator
- Workers in the affected areas
- Shaw PM
- FEAD

9.4.8 Fire Contingency Measures

Shaw personnel and subcontractors are not trained professional firefighters. Therefore, if there is any doubt that a fire cannot be contained and extinguished quickly, 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.

- "No Smoking" signs will be conspicuously posted in areas where flammable materials are present and throughout the exclusion and contamination reduction zones.
- Fire extinguishers will be located in all Shaw site dedicated vehicles and 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.

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

- Anyone who sees a fire will notify his/her supervisor who will then contact the Emergency Coordinator via 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 (a.k.a. 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 worker has extinguished a small fire, the Emergency Coordinator will be notified.

9.5 Hazardous Weather Contingency Measures

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

- Lightning
- Heavy Rains
- High Winds

9.5.1 Response

- All equipment will be shut down and secured to prevent damage.
- Personnel will be moved to safe refuge. 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.

9.5.2 Notification

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

- Shaw employees and subcontractors
- Shaw PM
- FEAD.

10.0 Training Requirements

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

All personnel entering the work areas will be trained in the provisions of this site safety plan and will be required to sign the Site Safety Plan Acknowledgment in Attachment 8.

Site-specific training for activities at the site will include potential site contaminants, hazard communication, as per 29 CFR 1926.59/1910.1200, site physical and environmental hazards, and emergency response and evacuation procedures. Emergency telephone numbers will be held at the site location by the SS/SSO before any site work activities begin.

Outlines of the orientation for Shaw personnel and subcontract personnel and visitors are presented below:

SHAW/SUBCONTRACTORS	VISITOR ORIENTATION
• SSHSP sign off • Sign in/out procedures • Site background • Chain of command • Rules and regulations • Hours of work • Absences • Equipment • Emergency Information • Emergency signal • Gathering point • Responsibilities/roles • Emergency phone numbers • Work Zones • Contaminants, MSDSs [Hazard Communication Program] • AHAs (Activity Hazard Analyses) • Forms, site-specific Incident Reporting • UXO Awareness	• SSHSP signoff • Review of Site map • Work Zones in progress • Hazard Communication • Emergency plan/signals • Training/medical requirements • Zones/areas open to visitors

11.0 Medical Surveillance Program

All Shaw 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 Shaw's worker medical profile is shown below. This program was developed in conjunction with a consultant toxicologist and Shaw's occupational health physician. Other medical consultants are retained when additional expertise is required.

All field personnel performing activities in a designated EZ or CRZ shall have completed within the past 12 months a comprehensive medical examination. The annual medical includes the following elements:

- Medical and occupational history questionnaire.
- Physical examination.
- Complete blood count, with differential.
- Liver enzyme profile.
- Chest x-ray, once every 3 years, for non-asbestos workers.
- Pulmonary function test.
- Audiogram.
- Electrocardiogram for persons older than 35 years of age, or if indicated during the physical examination.
- Visual acuity.
- Follow-up examinations, at the discretion of the examining physician or the corporate medical director.

The medical surveillance program meets the requirements of the OSHA Standard 29 CFR 1910.120 and 29 CFR 1926.65(f).

The following information is provided in the event that medical attention is necessary.

The Shaw Medical Director is:

Dr. Jerry H. Berke, MD, MPH
Health Resources
600 West Cumming Park
Suite 3400
Woburn, Mass 01801-6350
781-935-8581 (direct dial)
800-350-4511 (toll free)

The following Health Resource Clinic will be used for all non life-threatening medical emergencies:

Health Resource Clinic:

Convenient Health Care
12090 Old Line Center
Waldorf, MD 20602
301-645-8550

The Shaw Medical Director and the HSM will be immediately notified of any suspected exposures to hazardous materials/wastes.

Attachment 1
Material Safety Data Sheets (MSDSs)

NIOSH Publication No. 2005-149: **September 2005**

NIOSH Pocket Guide to Chemical Hazards

Antimony	**CAS** 7440-36-0
Sb	**RTECS** CC4025000
Synonyms & Trade Names Antimony metal, Antimony powder, Stibium	**DOT ID & Guide** 1549 157 (inorganic compounds, n.o.s.) 2871 170 (powder) 3141 157 (inorganic liquid compounds, n.o.s.)

Exposure Limits	NIOSH REL*: TWA 0.5 mg/m^3 [*Note: The REL also applies to other antimony compounds (as Sb).]
	OSHA PEL*: TWA 0.5 mg/m^3 [*Note: The PEL also applies to other antimony compounds (as Sb).]

IDLH 50 mg/m^3 (as Sb) See: 7440360	**Conversion**

Physical Description
Silver-white, lustrous, hard, brittle solid; scale-like crystals; or a dark-gray, lustrous powder.

MW: 121.8	BP: 2975°F	MLT: 1166°F	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 6.69
Fl.P: NA	UEL: NA	LEL: NA	

Noncombustible Solid in bulk form, but a moderate explosion hazard in the form of dust when exposed to flame.

Incompatibilities & Reactivities
Strong oxidizers, acids, halogenated acids [Note: Stibine is formed when antimony is exposed to nascent (freshly formed) hydrogen.]

Measurement Methods
NIOSH 7301, 7303, P&CAM261 (II-4); OSHA ID121, ID125G, ID206
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection) Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet or contaminated Change: Daily	**First Aid** (See procedures) Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately

Respirator Recommendations NIOSH/OSHA

Up to 5 mg/m^3:
(APF = 10) Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100, P100. Click here for information on selection of N, R, or P filters.
(APF = 10) Any supplied-air respirator

Up to 12.5 mg/m^3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered air-purifying respirator with a high-efficiency particulate filter.

Up to 25 mg/m^3:

(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters.
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode
(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 50 mg/m^3:
(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin, nose, throat, mouth; cough; dizziness; headache; nausea, vomiting, diarrhea; stomach cramps; insomnia; anorexia; unable to smell properly

Target Organs Eyes, skin, respiratory system, cardiovascular system

See also: INTRODUCTION See ICSC CARD: 0775 See MEDICAL TESTS: 0016

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NIOSH Pocket Guide to Chemical Hazards

Cadmium dust (as Cd)	**CAS** 7440-43-9 (metal)
Cd (metal)	**RTECS** EU9800000 (metal)
Synonyms & Trade Names Cadmium metal: Cadmium Other synonyms vary depending upon the specific cadmium compound.	**DOT ID & Guide** 2570 154 (cadmium compound)

Exposure Limits	NIOSH REL*: Ca See Appendix A [*Note: The REL applies to all Cadmium compounds (as Cd).]
	OSHA PEL*: [1910.1027] TWA 0.005 mg/m^3 [*Note: The PEL applies to all Cadmium compounds (as Cd).]

IDLH Ca [9 mg/m^3 (as Cd)] See: IDLH INDEX	**Conversion**

Physical Description
Metal: Silver-white, blue-tinged lustrous, odorless solid.

MW: 112.4	BP: 1409°F	MLT: 610°F	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 8.65 (metal)
Fl.P: NA	UEL: NA	LEL: NA	

Metal: Noncombustible Solid in bulk form, but will burn in powder form.

Incompatibilities & Reactivities
Strong oxidizers; elemental sulfur, selenium & tellurium

Measurement Methods
NIOSH 7048, 7300, 7301, 7303, 9102; OSHA ID121, ID125G, ID189, ID206
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection)
Skin: No recommendation
Eyes: No recommendation
Wash skin: Daily
Remove: No recommendation
Change: Daily

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap wash
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations (See Appendix E) NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, ingestion

Symptoms Pulmonary edema, dyspnea (breathing difficulty), cough, chest tightness, substernal (occurring beneath the sternum) pain; headache; chills, muscle aches; nausea, vomiting, diarrhea; anosmia (loss of the sense of smell), emphysema, proteinuria, mild anemia; [potential occupational carcinogen]

Target Organs respiratory system, kidneys, prostate, blood

Cancer Site [prostatic & lung cancer]

See also: INTRODUCTION See ICSC CARD: 0020 See MEDICAL TESTS: 0035

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NIOSH Pocket Guide to Chemical Hazards

Copper fume (as Cu)	**CAS** 1317-38-0 (CuO)
CuO/Cu	**RTECS** GL7900000 (CuO)
Synonyms & Trade Names CuO: Black copper oxide fume, Copper monoxide fume, Copper(II) oxide fume, Cupric oxide fume Cu: Copper fume [Note: Also see specific listing for Copper (dusts and mists).]	**DOT ID & Guide**

Exposure Limits	**NIOSH REL**: TWA 0.1 mg/m^3
	OSHA PEL: TWA 0.1 mg/m^3

IDLH 100 mg/m^3 (as Cu) See: IDLH INDEX	**Conversion**

Physical Description
Finely divided black particulate dispersed in air. [Note: Exposure may occur in copper & brass plants and during the welding of copper alloys.]

MW: 79.5	BP: Decomposes	MLT: 1879°F (Decomposes)	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 6.4 (CuO)
Fl.P: NA	UEL: NA	LEL: NA	

CuO: Noncombustible Solid

Incompatibilities & Reactivities
CuO: Acetylene, zirconium [Note: See Copper (dusts and mists) for properties of Copper metal.]

Measurement Methods
NIOSH 7029, 7300, 7301, 7303; OSHA ID121, ID125G, ID206
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection) Skin: No recommendation Eyes: No recommendation Wash skin: No recommendation Remove: No recommendation Change: No recommendation	**First Aid** (See procedures) Breathing: Respiratory support

Respirator Recommendations NIOSH/OSHA

Up to 1 mg/m^3:
(APF = 10) Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100, P100. Click here for information on selection of N, R, or P filters.
(APF = 10) Any supplied-air respirator

Up to 2.5 mg/m^3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered air-purifying respirator with a high-efficiency particulate filter.

Up to 5 mg/m^3:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters.

(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode
(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 100 mg/m^3:
(APF = 2000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure- demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, skin and/or eye contact

Symptoms Irritation eyes, upper respiratory system; metal fume fever: chills, muscle ache, nausea, fever, dry throat, cough, lassitude (weakness, exhaustion); metallic or sweet taste; discoloration skin, hair

Target Organs Eyes, skin, respiratory system (increase(d) risk with Wilson's disease)

See also: INTRODUCTION

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NIOSH Pocket Guide to Chemical Hazards

Lead	**CAS** 7439-92-1
Pb	**RTECS** OF7525000
Synonyms & Trade Names Lead metal, Plumbum	**DOT ID & Guide**

Exposure Limits	NIOSH REL*: TWA 0.050 mg/m^3 See Appendix C [*Note: The REL also applies to other lead compounds (as Pb) -- see Appendix C.]
	OSHA PEL*: [1910.1025] TWA 0.050 mg/m^3 See Appendix C [*Note: The PEL also applies to other lead compounds (as Pb) -- see Appendix C.]

IDLH 100 mg/m^3 (as Pb) See: 7439921	**Conversion**

Physical Description
A heavy, ductile, soft, gray solid.

MW: 207.2	BP: 3164°F	MLT: 621°F	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 11.34
Fl.P: NA	UEL: NA	LEL: NA	

Noncombustible Solid in bulk form.

Incompatibilities & Reactivities
Strong oxidizers, hydrogen peroxide, acids

Measurement Methods
NIOSH 7082, 7105, 7300, 7301, 7303, 7700, 7701, 7702, 9100, 9102, 9105; OSHA ID121, ID125G, ID206
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection)
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: Daily
Remove: When wet or contaminated
Change: Daily

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap flush promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations (See Appendix E) NIOSH/OSHA

Up to 0.5 mg/m^3:
(APF = 10) Any air-purifying respirator with an N100, R100, or P100 filter (including N100, R100, and P100 filtering facepieces) except quarter-mask respirators. Click here for information on selection of N, R, or P filters.
(APF = 10) Any supplied-air respirator

Up to 1.25 mg/m^3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered, air-purifying respirator with a high-efficiency particulate filter

Up to 2.5 mg/m^3:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters.
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode

(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 50 mg/m^3:
(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode

Up to 100 mg/m^3:
(APF = 2000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypotension

Target Organs Eyes, gastrointestinal tract, central nervous system, kidneys, blood, gingival tissue

See also: INTRODUCTION See ICSC CARD: 0052 See MEDICAL TESTS: 0127

NIOSH Publication No. 2005-149: September 2005

NIOSH Pocket Guide to Chemical Hazards

Mercury compounds [except (organo) alkyls] (as Hg)

CAS 7439-97-6 (metal)

Hg (metal)

RTECS OV4550000 (metal)

Synonyms & Trade Names
Mercury metal: Colloidal mercury, Metallic mercury, Quicksilver
Synonyms of "other" Hg compounds vary depending upon the specific compound.

DOT ID & Guide
2809 172 (metal)

Exposure Limits

NIOSH REL: Hg Vapor: TWA 0.05 mg/m^3 [skin]
Other: C 0.1 mg/m^3 [skin]

OSHA PEL†: C 0.1 mg/m^3

IDLH 10 mg/m^3 (as Hg) See: 7439976

Conversion

Physical Description
Metal: Silver-white, heavy, odorless liquid. [Note: "Other" Hg compounds include all inorganic & aryl Hg compounds except (organo) alkyls.]

MW: 200.6	BP: 674°F	FRZ: -38°F	Sol: Insoluble
VP: 0.0012 mmHg	IP: ?		Sp.Gr: 13.6 (metal)
Fl.P: NA	UEL: NA	LEL: NA	

Metal: Noncombustible Liquid

Incompatibilities & Reactivities
Acetylene, ammonia, chlorine dioxide, azides, calcium (amalgam formation), sodium carbide, lithium, rubidium, copper

Measurement Methods
NIOSH 6009; OSHA ID140
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection)
Skin: Prevent skin contact
Eyes: No recommendation
Wash skin: When contaminated
Remove: When wet or contaminated
Change: Daily

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations
Mercury vapor: NIOSH
Up to 0.5 mg/m^3:
(APF = 10) Any chemical cartridge respirator with cartridge(s) providing protection against the compound of concern†
(APF = 10) Any supplied-air respirator
Up to 1.25 mg/m^3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered, air-purifying respirator with cartridge(s) providing protection against the compound of concern†(canister)
Up to 2.5 mg/m^3:
(APF = 50) Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against the compound of concern†

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern†
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode/PAPRTS(canister)
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 10 mg/m^3:
(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode
Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure- demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern/Any appropriate escape-type, self-contained breathing apparatus

Other mercury compounds: NIOSH/OSHA
Up to 1 mg/m^3:
(APF = 10) Any chemical cartridge respirator with cartridge(s) providing protection against the compound of concern†
(APF = 10) Any supplied-air respirator

Up to 2.5 mg/m^3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered, air-purifying respirator with cartridge(s) providing protection against the compound of concern†(canister)

Up to 5 mg/m^3:
(APF = 50) Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against the compound of concern†
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern†
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode/PAPRTS(canister)
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 10 mg/m^3:
(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode
Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern/Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria

Target Organs Eyes, skin, respiratory system, central nervous system, kidneys

See also: INTRODUCTION See ICSC CARD: 0056 See MEDICAL TESTS: 0136

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NIOSH Pocket Guide to Chemical Hazards

Nickel metal and other compounds (as Ni)

CAS 7440-02-0 (Metal)

Ni (Metal)

RTECS QR5950000 (Metal)

Synonyms & Trade Names
Nickel metal: Elemental nickel, Nickel catalyst
Synonyms of other nickel compounds vary depending upon the specific compound.

DOT ID & Guide

Exposure Limits	
	NIOSH REL*: Ca TWA 0.015 mg/m^3 See Appendix A [*Note: The REL does not apply to Nickel carbonyl.]
	OSHA PEL*†: TWA 1 mg/m^3 [*Note: The PEL does not apply to Nickel carbonyl.]

IDLH Ca [10 mg/m^3 (as Ni)] See: 7440020

Conversion

Physical Description
Metal: Lustrous, silvery, odorless solid.

MW: 58.7	BP: 5139°F	MLT: 2831°F	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 8.90 (Metal)
Fl.P: NA	UEL: NA	LEL: NA	

Metal: Combustible Solid; nickel sponge catalyst may ignite SPONTANEOUSLY in air.

Incompatibilities & Reactivities
Strong acids, sulfur, selenium, wood & other combustibles, nickel nitrate

Measurement Methods
NIOSH 7300, 7301, 7303, 9102; OSHA ID121, ID125G
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection)
Skin: Prevent skin contact
Eyes: No recommendation
Wash skin: When contaminated/Daily
Remove: When wet or contaminated
Change: Daily

First Aid (See procedures)

Skin: Water flush immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Sensitization dermatitis, allergic asthma, pneumonitis; [potential occupational carcinogen]
Target Organs Nasal cavities, lungs, skin **Cancer Site** [lung and nasal cancer]
See also: INTRODUCTION See ICSC CARD: 0062 See MEDICAL TESTS: 0156

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NIOSH Pocket Guide to Chemical Hazards

Silver (metal dust and soluble compounds, as Ag)

CAS 7440-22-4 (metal)

Ag (metal)

RTECS VW3500000 (metal)

Synonyms & Trade Names
Silver metal: Argentum
Synonyms of soluble silver compounds such as Silver nitrate ($AgNO_3$) vary depending upon the specific compound.

DOT ID & Guide

Exposure Limits

NIOSH REL: TWA 0.01 mg/m^3

OSHA PEL: TWA 0.01 mg/m^3

IDLH 10 mg/m^3 (as Ag) See: IDLH INDEX

Conversion

Physical Description
Metal: White, lustrous solid.

MW: 107.9	BP: 3632°F	MLT: 1761°F	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 10.49 (metal)
Fl.P: NA	UEL: NA	LEL: NA	

Metal: Noncombustible Solid, but flammable in form of dust or powder.

Incompatibilities & Reactivities
Acetylene, ammonia, hydrogen peroxide, bromoazide, chlorine trifluoride, ethyleneimine, oxalic acid, tartaric acid

Measurement Methods
NIOSH 7300, 7301, 9102; OSHA ID121
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection)
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated ($AgNO_3$)
Change: Daily
Provide: Eyewash

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Water flush
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations NIOSH/OSHA
Up to 0.25 mg/m^3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode£
(APF = 25) Any powered, air-purifying respirator with a high-efficiency particulate filter£
Up to 0.5 mg/m^3:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters.
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece
Up to 10 mg/m^3:
(APF = 2000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Blue-gray eyes, nasal septum, throat, skin; irritation, ulceration skin; gastrointestinal disturbance

Target Organs Nasal septum, skin, eyes

See also: INTRODUCTION See ICSC CARD: 0810 See MEDICAL TESTS: 0208

NIOSH Publication No. 2005-149: **September 2005**

NIOSH Pocket Guide to Chemical Hazards

Zinc oxide	**CAS** 1314-13-2
ZnO	**RTECS** ZH4810000
Synonyms & Trade Names Zinc peroxide	**DOT ID & Guide** 1516 143

Exposure Limits	**NIOSH REL**: Dust: TWA 5 mg/m^3 C 15 mg/m^3 Fume: TWA 5 mg/m^3 ST 10 mg/m^3
	OSHA PEL†: TWA 5 mg/m^3 (fume) TWA 15 mg/m^3 (total dust) TWA 5 mg/m^3 (resp dust)

IDLH 500 mg/m^3 See: 1314132	**Conversion**

Physical Description
White, odorless solid.

MW: 81.4	BP: ?	MLT: 3587°F	Sol(64°F): 0.0004%
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 5.61
Fl.P: NA	UEL: NA	LEL: NA	

Noncombustible Solid

Incompatibilities & Reactivities
Chlorinated rubber (at 419°F), water [Note: Slowly decomposed by water.]

Measurement Methods
NIOSH 7303, 7502; OSHA ID121, ID143
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection) Skin: No recommendation Eyes: No recommendation Wash skin: No recommendation Remove: No recommendation Change: No recommendation	**First Aid** (See procedures) Breathing: Respiratory support

Respirator Recommendations NIOSH/OSHA

Up to 50 mg/m^3:
(APF = 10) Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100, P100. Click here for information on selection of N, R, or P filters.
(APF = 10) Any supplied-air respirator

Up to 125 mg/m^3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered air-purifying respirator with a high-efficiency particulate filter.

Up to 250 mg/m^3:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters.
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode

(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 500 mg/m^3:
(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode
Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation

Symptoms Metal fume fever: chills, muscle ache, nausea, fever, dry throat, cough; lassitude (weakness, exhaustion); metallic taste; headache; blurred vision; low back pain; vomiting; malaise (vague feeling of discomfort); chest tightness; dyspnea (breathing difficulty), rales, decreased pulmonary function

Target Organs respiratory system

See also: INTRODUCTION See ICSC CARD: 0208 See MEDICAL TESTS: 0246

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NIOSH Pocket Guide to Chemical Hazards

Gasoline

CAS 8006-61-9

RTECS LX3300000

Synonyms & Trade Names
Motor fuel, Motor spirits, Natural gasoline, Petrol [Note: A complex mixture of volatile hydrocarbons (paraffins, cycloparaffins & aromatics).]

DOT ID & Guide
1203 128

Exposure Limits
NIOSH REL: Ca See Appendix A
OSHA PEL†: none

IDLH Ca [N.D.] See: IDLH INDEX

Conversion 1 ppm = 4.5 mg/m^3 (approx)

Physical Description
Clear liquid with a characteristic odor.

MW: 110 (approx)	BP: 102°F	FRZ: ?	Sol: Insoluble
VP: 38-300 mmHg	IP: ?		Sp.Gr(60°F): 0.72-0.76
Fl.P: -45°F	UEL: 7.6%	LEL: 1.4%	

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities
Strong oxidizers such as peroxides, nitric acid & perchlorates

Measurement Methods
OSHA PV2028
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection)
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet (flammable)
Change: No recommendation
Provide: Eyewash, Quick drench

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap flush immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin, mucous membrane; dermatitis; headache, lassitude (weakness, exhaustion), blurred vision, dizziness,

slurred speech, confusion, convulsions; chemical pneumonitis (aspiration liquid); possible liver, kidney damage; [potential occupational carcinogen]

Target Organs Eyes, skin, respiratory system, central nervous system, liver, kidneys

Cancer Site [in animals: liver & kidney cancer]

See also: INTRODUCTION

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Diesel exhaust	**CAS**
	RTECS HZ1755000
Synonyms & Trade Names Synonyms vary depending upon the specific diesel exhaust component.	**DOT ID & Guide**

Exposure Limits	**NIOSH REL**: Ca See Appendix A
	OSHA PEL: none

IDLH Ca [N.D.] See: IDLH INDEX	**Conversion**

Physical Description
Appearance and odor vary depending upon the specific diesel exhaust component.

Properties vary depending upon the specific component diesel exhaust component.			

Incompatibilities & Reactivities
Varies

Measurement Methods
NIOSH 2560, 5040
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection) Skin: No recommendation Eyes: No recommendation Wash skin: No recommendation Remove: No recommendation Change: No recommendation	**First Aid** (See procedures) Breathing: Respiratory support

Respirator Recommendations NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, skin and/or eye contact

Symptoms Eye irritation, pulmonary function changes; [potential occupational carcinogen]

Target Organs Eyes, respiratory system

Cancer Site [in animals: lung tumors]

See also: INTRODUCTION

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Oil mist (mineral)	**CAS** 8012-95-1
	RTECS PY8030000
Synonyms & Trade Names Heavy mineral oil mist, Paraffin oil mist, White mineral oil mist	**DOT ID & Guide**

Exposure Limits	**NIOSH REL**: TWA 5 mg/m^3 ST 10 mg/m^3
	OSHA PEL: TWA 5 mg/m^3

IDLH 2500 mg/m^3 See: 8012951	**Conversion**

Physical Description
Colorless, oily liquid aerosol dispersed in air. [Note: Has an odor like burned lubricating oil.]

MW: Varies	BP: 680°F	FRZ: 0°F	Sol: Insoluble
VP: <0.5 mmHg	IP: ?		Sp.Gr: 0.90
Fl.P(oc): 380°F	UEL: ?	LEL: ?	

Class IIIB Combustible Liquid: Fl.P. at or above 200°F.

Incompatibilities & Reactivities
None reported

Measurement Methods
NIOSH 5026, 5524
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection)
Skin: Prevent skin contact
Eyes: No recommendation
Wash skin: When contaminated
Remove: When wet or contaminated
Change: Daily

First Aid (See procedures)
Skin: Soap wash
Breathing: Fresh air

Respirator Recommendations NIOSH/OSHA

Up to 50 mg/m^3:
(APF = 10) Any air-purifying respirator with an N100, R100, or P100 filter (including N100, R100, and P100 filtering facepieces) except quarter-mask respirators. Click here for information on selection of N, R, or P filters.
(APF = 10) Any supplied-air respirator

Up to 125 mg/m^3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered, air-purifying respirator with a high-efficiency particulate filter

Up to 250 mg/m^3:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters.
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode
(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter
(APF = 50) Any self-contained breathing apparatus with a full facepiece

(APF = 50) Any supplied-air respirator with a full facepiece
Up to 2500 mg/m^3:
(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode
Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, skin and/or eye contact

Symptoms Irritation eyes, skin, respiratory system

Target Organs Eyes, skin, respiratory system

See also: INTRODUCTION

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Antimony	**CAS** 7440-36-0
Sb	**RTECS** CC4025000
Synonyms & Trade Names Antimony metal, Antimony powder, Stibium	**DOT ID & Guide** 1549 157 (inorganic compounds, n.o.s.) 2871 170 (powder) 3141 157 (inorganic liquid compounds, n.o.s.)

Exposure Limits	NIOSH REL*: TWA 0.5 mg/m^3 [*Note: The REL also applies to other antimony compounds (as Sb).]
	OSHA PEL*: TWA 0.5 mg/m^3 [*Note: The PEL also applies to other antimony compounds (as Sb).]

IDLH 50 mg/m^3 (as Sb) See: 7440360	**Conversion**

Physical Description
Silver-white, lustrous, hard, brittle solid; scale-like crystals; or a dark-gray, lustrous powder.

MW: 121.8	BP: 2975°F	MLT: 1166°F	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 6.69
Fl.P: NA	UEL: NA	LEL: NA	

Noncombustible Solid in bulk form, but a moderate explosion hazard in the form of dust when exposed to flame.

Incompatibilities & Reactivities
Strong oxidizers, acids, halogenated acids [Note: Stibine is formed when antimony is exposed to nascent (freshly formed) hydrogen.]

Measurement Methods
NIOSH 7301, 7303, P&CAM261 (II-4); OSHA ID121, ID125G, ID206
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection) Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet or contaminated Change: Daily	**First Aid** (See procedures) Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately

Respirator Recommendations NIOSH/OSHA

Up to 5 mg/m^3:
(APF = 10) Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100, P100. Click here for information on selection of N, R, or P filters.
(APF = 10) Any supplied-air respirator

Up to 12.5 mg/m^3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered air-purifying respirator with a high-efficiency particulate filter.

Up to 25 mg/m^3:

(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters.
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode
(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 50 mg/m^3:
(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin, nose, throat, mouth; cough; dizziness; headache; nausea, vomiting, diarrhea; stomach cramps; insomnia; anorexia; unable to smell properly

Target Organs Eyes, skin, respiratory system, cardiovascular system

See also: INTRODUCTION See ICSC CARD: 0775 See MEDICAL TESTS: 0016

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Cadmium dust (as Cd)	**CAS** 7440-43-9 (metal)
Cd (metal)	**RTECS** EU9800000 (metal)
Synonyms & Trade Names Cadmium metal: Cadmium Other synonyms vary depending upon the specific cadmium compound.	**DOT ID & Guide** 2570 154 (cadmium compound)

Exposure Limits	NIOSH REL*: Ca See Appendix A [*Note: The REL applies to all Cadmium compounds (as Cd).]
	OSHA PEL*: [1910.1027] TWA 0.005 mg/m^3 [*Note: The PEL applies to all Cadmium compounds (as Cd).]

IDLH Ca [9 mg/m^3 (as Cd)] See: IDLH INDEX	**Conversion**

Physical Description
Metal: Silver-white, blue-tinged lustrous, odorless solid.

MW: 112.4	BP: 1409°F	MLT: 610°F	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 8.65 (metal)
Fl.P: NA	UEL: NA	LEL: NA	

Metal: Noncombustible Solid in bulk form, but will burn in powder form.

Incompatibilities & Reactivities
Strong oxidizers; elemental sulfur, selenium & tellurium

Measurement Methods
NIOSH 7048, 7300, 7301, 7303, 9102; OSHA ID121, ID125G, ID189, ID206
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection)
Skin: No recommendation
Eyes: No recommendation
Wash skin: Daily
Remove: No recommendation
Change: Daily

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap wash
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations (See Appendix E) NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, ingestion

Symptoms Pulmonary edema, dyspnea (breathing difficulty), cough, chest tightness, substernal (occurring beneath the sternum) pain; headache; chills, muscle aches; nausea, vomiting, diarrhea; anosmia (loss of the sense of smell), emphysema, proteinuria, mild anemia; [potential occupational carcinogen]

Target Organs respiratory system, kidneys, prostate, blood

Cancer Site [prostatic & lung cancer]

See also: INTRODUCTION See ICSC CARD: 0020 See MEDICAL TESTS: 0035

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Copper fume (as Cu)	**CAS** 1317-38-0 (CuO)
CuO/Cu	**RTECS** GL7900000 (CuO)
Synonyms & Trade Names CuO: Black copper oxide fume, Copper monoxide fume, Copper(II) oxide fume, Cupric oxide fume Cu: Copper fume [Note: Also see specific listing for Copper (dusts and mists).]	**DOT ID & Guide**

Exposure Limits	**NIOSH REL**: TWA 0.1 mg/m^3
	OSHA PEL: TWA 0.1 mg/m^3

IDLH 100 mg/m^3 (as Cu) See: IDLH INDEX	**Conversion**

Physical Description
Finely divided black particulate dispersed in air. [Note: Exposure may occur in copper & brass plants and during the welding of copper alloys.]

MW: 79.5	BP: Decomposes	MLT: 1879°F (Decomposes)	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 6.4 (CuO)
Fl.P: NA	UEL: NA	LEL: NA	

CuO: Noncombustible Solid

Incompatibilities & Reactivities
CuO: Acetylene, zirconium [Note: See Copper (dusts and mists) for properties of Copper metal.]

Measurement Methods
NIOSH 7029, 7300, 7301, 7303; OSHA ID121, ID125G, ID206
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection) Skin: No recommendation Eyes: No recommendation Wash skin: No recommendation Remove: No recommendation Change: No recommendation	**First Aid** (See procedures) Breathing: Respiratory support

Respirator Recommendations NIOSH/OSHA

Up to 1 mg/m^3:
(APF = 10) Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100, P100. Click here for information on selection of N, R, or P filters.
(APF = 10) Any supplied-air respirator

Up to 2.5 mg/m^3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered air-purifying respirator with a high-efficiency particulate filter.

Up to 5 mg/m^3:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters.

(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode
(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 100 mg/m^3:
(APF = 2000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure- demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, skin and/or eye contact

Symptoms Irritation eyes, upper respiratory system; metal fume fever: chills, muscle ache, nausea, fever, dry throat, cough, lassitude (weakness, exhaustion); metallic or sweet taste; discoloration skin, hair

Target Organs Eyes, skin, respiratory system (increase(d) risk with Wilson's disease)

See also: INTRODUCTION

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Lead	**CAS** 7439-92-1
Pb	**RTECS** OF7525000
Synonyms & Trade Names Lead metal, Plumbum	**DOT ID & Guide**

Exposure Limits	NIOSH REL*: TWA 0.050 mg/m^3 See Appendix C [*Note: The REL also applies to other lead compounds (as Pb) -- see Appendix C.]
	OSHA PEL*: [1910.1025] TWA 0.050 mg/m^3 See Appendix C [*Note: The PEL also applies to other lead compounds (as Pb) -- see Appendix C.]

IDLH 100 mg/m^3 (as Pb) See: 7439921	**Conversion**

Physical Description
A heavy, ductile, soft, gray solid.

MW: 207.2	BP: 3164°F	MLT: 621°F	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 11.34
Fl.P: NA	UEL: NA	LEL: NA	

Noncombustible Solid in bulk form.

Incompatibilities & Reactivities
Strong oxidizers, hydrogen peroxide, acids

Measurement Methods
NIOSH 7082, 7105, 7300, 7301, 7303, 7700, 7701, 7702, 9100, 9102, 9105; OSHA ID121, ID125G, ID206
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection)
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: Daily
Remove: When wet or contaminated
Change: Daily

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap flush promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations (See Appendix E) NIOSH/OSHA

Up to 0.5 mg/m^3:
(APF = 10) Any air-purifying respirator with an N100, R100, or P100 filter (including N100, R100, and P100 filtering facepieces) except quarter-mask respirators. Click here for information on selection of N, R, or P filters.
(APF = 10) Any supplied-air respirator

Up to 1.25 mg/m^3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered, air-purifying respirator with a high-efficiency particulate filter

Up to 2.5 mg/m^3:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters.
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode

(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 50 mg/m^3:
(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode

Up to 100 mg/m^3:
(APF = 2000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypotension

Target Organs Eyes, gastrointestinal tract, central nervous system, kidneys, blood, gingival tissue

See also: INTRODUCTION See ICSC CARD: 0052 See MEDICAL TESTS: 0127

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Mercury compounds [except (organo) alkyls] (as Hg)

CAS 7439-97-6 (metal)

Hg (metal)

RTECS OV4550000 (metal)

Synonyms & Trade Names
Mercury metal: Colloidal mercury, Metallic mercury, Quicksilver
Synonyms of "other" Hg compounds vary depending upon the specific compound.

DOT ID & Guide
2809 172 (metal)

Exposure Limits

NIOSH REL: Hg Vapor: TWA 0.05 mg/m^3 [skin]
Other: C 0.1 mg/m^3 [skin]

OSHA PEL†: C 0.1 mg/m^3

IDLH 10 mg/m^3 (as Hg) See: 7439976

Conversion

Physical Description
Metal: Silver-white, heavy, odorless liquid. [Note: "Other" Hg compounds include all inorganic & aryl Hg compounds except (organo) alkyls.]

MW: 200.6	BP: 674°F	FRZ: -38°F	Sol: Insoluble
VP: 0.0012 mmHg	IP: ?		Sp.Gr: 13.6 (metal)
Fl.P: NA	UEL: NA	LEL: NA	

Metal: Noncombustible Liquid

Incompatibilities & Reactivities
Acetylene, ammonia, chlorine dioxide, azides, calcium (amalgam formation), sodium carbide, lithium, rubidium, copper

Measurement Methods
NIOSH 6009; OSHA ID140
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection)
Skin: Prevent skin contact
Eyes: No recommendation
Wash skin: When contaminated
Remove: When wet or contaminated
Change: Daily

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations
Mercury vapor: NIOSH
Up to 0.5 mg/m^3:
(APF = 10) Any chemical cartridge respirator with cartridge(s) providing protection against the compound of concern†
(APF = 10) Any supplied-air respirator
Up to 1.25 mg/m^3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered, air-purifying respirator with cartridge(s) providing protection against the compound of concern†(canister)
Up to 2.5 mg/m^3:
(APF = 50) Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against the compound of concern†

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern†
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode/PAPRTS(canister)
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 10 mg/m^3:
(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode
Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure- demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern/Any appropriate escape-type, self-contained breathing apparatus

Other mercury compounds: NIOSH/OSHA
Up to 1 mg/m^3:
(APF = 10) Any chemical cartridge respirator with cartridge(s) providing protection against the compound of concern†
(APF = 10) Any supplied-air respirator

Up to 2.5 mg/m^3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered, air-purifying respirator with cartridge(s) providing protection against the compound of concern†(canister)

Up to 5 mg/m^3:
(APF = 50) Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against the compound of concern†
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern†
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode/PAPRTS(canister)
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 10 mg/m^3:
(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode
Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern/Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria

Target Organs Eyes, skin, respiratory system, central nervous system, kidneys

See also: INTRODUCTION See ICSC CARD: 0056 See MEDICAL TESTS: 0136

NIOSH Publication No. 2005-149: September 2005

NIOSH Pocket Guide to Chemical Hazards

Nickel metal and other compounds (as Ni)

CAS 7440-02-0 (Metal)

Ni (Metal)

RTECS QR5950000 (Metal)

Synonyms & Trade Names
Nickel metal: Elemental nickel, Nickel catalyst
Synonyms of other nickel compounds vary depending upon the specific compound.

DOT ID & Guide

Exposure Limits	
	NIOSH REL*: Ca TWA 0.015 mg/m^3 See Appendix A [*Note: The REL does not apply to Nickel carbonyl.]
	OSHA PEL*†: TWA 1 mg/m^3 [*Note: The PEL does not apply to Nickel carbonyl.]

IDLH Ca [10 mg/m^3 (as Ni)] See: 7440020

Conversion

Physical Description
Metal: Lustrous, silvery, odorless solid.

MW: 58.7	BP: 5139°F	MLT: 2831°F	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 8.90 (Metal)
Fl.P: NA	UEL: NA	LEL: NA	

Metal: Combustible Solid; nickel sponge catalyst may ignite SPONTANEOUSLY in air.

Incompatibilities & Reactivities
Strong acids, sulfur, selenium, wood & other combustibles, nickel nitrate

Measurement Methods
NIOSH 7300, 7301, 7303, 9102; OSHA ID121, ID125G
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection)
Skin: Prevent skin contact
Eyes: No recommendation
Wash skin: When contaminated/Daily
Remove: When wet or contaminated
Change: Daily

First Aid (See procedures)

Skin: Water flush immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Sensitization dermatitis, allergic asthma, pneumonitis; [potential occupational carcinogen]
Target Organs Nasal cavities, lungs, skin **Cancer Site** [lung and nasal cancer]
See also: INTRODUCTION See ICSC CARD: 0062 See MEDICAL TESTS: 0156

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NIOSH Publication No. 2005-149: **September 2005**

NIOSH Pocket Guide to Chemical Hazards

Silver (metal dust and soluble compounds, as Ag)

CAS 7440-22-4 (metal)

Ag (metal)

RTECS VW3500000 (metal)

Synonyms & Trade Names
Silver metal: Argentum
Synonyms of soluble silver compounds such as Silver nitrate ($AgNO_3$) vary depending upon the specific compound.

DOT ID & Guide

Exposure Limits

NIOSH REL: TWA 0.01 mg/m^3

OSHA PEL: TWA 0.01 mg/m^3

IDLH 10 mg/m^3 (as Ag) See: IDLH INDEX

Conversion

Physical Description
Metal: White, lustrous solid.

MW: 107.9	BP: 3632°F	MLT: 1761°F	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 10.49 (metal)
Fl.P: NA	UEL: NA	LEL: NA	

Metal: Noncombustible Solid, but flammable in form of dust or powder.

Incompatibilities & Reactivities
Acetylene, ammonia, hydrogen peroxide, bromoazide, chlorine trifluoride, ethyleneimine, oxalic acid, tartaric acid

Measurement Methods
NIOSH 7300, 7301, 9102; OSHA ID121
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection)
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated ($AgNO_3$)
Change: Daily
Provide: Eyewash

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Water flush
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations NIOSH/OSHA
Up to 0.25 mg/m^3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode£
(APF = 25) Any powered, air-purifying respirator with a high-efficiency particulate filter£
Up to 0.5 mg/m^3:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters.
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece
Up to 10 mg/m^3:
(APF = 2000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Blue-gray eyes, nasal septum, throat, skin; irritation, ulceration skin; gastrointestinal disturbance

Target Organs Nasal septum, skin, eyes

See also: INTRODUCTION See ICSC CARD: 0810 See MEDICAL TESTS: 0208

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NIOSH Pocket Guide to Chemical Hazards

Zinc oxide	**CAS** 1314-13-2
ZnO	**RTECS** ZH4810000
Synonyms & Trade Names Zinc peroxide	**DOT ID & Guide** 1516 143

Exposure Limits	**NIOSH REL**: Dust: TWA 5 mg/m^3 C 15 mg/m^3 Fume: TWA 5 mg/m^3 ST 10 mg/m^3
	OSHA PEL†: TWA 5 mg/m^3 (fume) TWA 15 mg/m^3 (total dust) TWA 5 mg/m^3 (resp dust)

IDLH 500 mg/m^3 See: 1314132	**Conversion**

Physical Description
White, odorless solid.

MW: 81.4	BP: ?	MLT: 3587°F	Sol(64°F): 0.0004%
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 5.61
Fl.P: NA	UEL: NA	LEL: NA	

Noncombustible Solid

Incompatibilities & Reactivities
Chlorinated rubber (at 419°F), water [Note: Slowly decomposed by water.]

Measurement Methods
NIOSH 7303, 7502; OSHA ID121, ID143
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection) Skin: No recommendation Eyes: No recommendation Wash skin: No recommendation Remove: No recommendation Change: No recommendation	**First Aid** (See procedures) Breathing: Respiratory support

Respirator Recommendations NIOSH/OSHA

Up to 50 mg/m^3:
(APF = 10) Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100, P100. Click here for information on selection of N, R, or P filters.
(APF = 10) Any supplied-air respirator

Up to 125 mg/m^3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered air-purifying respirator with a high-efficiency particulate filter.

Up to 250 mg/m^3:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters.
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode

(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 500 mg/m^3:
(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode
Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation

Symptoms Metal fume fever: chills, muscle ache, nausea, fever, dry throat, cough; lassitude (weakness, exhaustion); metallic taste; headache; blurred vision; low back pain; vomiting; malaise (vague feeling of discomfort); chest tightness; dyspnea (breathing difficulty), rales, decreased pulmonary function

Target Organs respiratory system

See also: INTRODUCTION See ICSC CARD: 0208 See MEDICAL TESTS: 0246

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NIOSH Pocket Guide to Chemical Hazards

Gasoline

CAS 8006-61-9

RTECS LX3300000

Synonyms & Trade Names
Motor fuel, Motor spirits, Natural gasoline, Petrol [Note: A complex mixture of volatile hydrocarbons (paraffins, cycloparaffins & aromatics).]

DOT ID & Guide
1203 128

Exposure Limits
NIOSH REL: Ca See Appendix A
OSHA PEL†: none

IDLH Ca [N.D.] See: IDLH INDEX

Conversion 1 ppm = 4.5 mg/m^3 (approx)

Physical Description
Clear liquid with a characteristic odor.

MW: 110 (approx)	BP: 102°F	FRZ: ?	Sol: Insoluble
VP: 38-300 mmHg	IP: ?		Sp.Gr(60°F): 0.72-0.76
Fl.P: -45°F	UEL: 7.6%	LEL: 1.4%	

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities
Strong oxidizers such as peroxides, nitric acid & perchlorates

Measurement Methods
OSHA PV2028
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection)
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet (flammable)
Change: No recommendation
Provide: Eyewash, Quick drench

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap flush immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin, mucous membrane; dermatitis; headache, lassitude (weakness, exhaustion), blurred vision, dizziness,

slurred speech, confusion, convulsions; chemical pneumonitis (aspiration liquid); possible liver, kidney damage; [potential occupational carcinogen]

Target Organs Eyes, skin, respiratory system, central nervous system, liver, kidneys

Cancer Site [in animals: liver & kidney cancer]

See also: INTRODUCTION

NIOSH Publication No. 2005-149: **September 2005**

NIOSH Pocket Guide to Chemical Hazards

Diesel exhaust	**CAS**
	RTECS HZ1755000
Synonyms & Trade Names Synonyms vary depending upon the specific diesel exhaust component.	**DOT ID & Guide**

Exposure Limits	**NIOSH REL**: Ca See Appendix A
	OSHA PEL: none

IDLH Ca [N.D.] See: IDLH INDEX	**Conversion**

Physical Description
Appearance and odor vary depending upon the specific diesel exhaust component.

Properties vary depending upon the specific component diesel exhaust component.			

Incompatibilities & Reactivities
Varies

Measurement Methods
NIOSH 2560, 5040
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection) Skin: No recommendation Eyes: No recommendation Wash skin: No recommendation Remove: No recommendation Change: No recommendation	**First Aid** (See procedures) Breathing: Respiratory support

Respirator Recommendations NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, skin and/or eye contact

Symptoms Eye irritation, pulmonary function changes; [potential occupational carcinogen]

Target Organs Eyes, respiratory system

Cancer Site [in animals: lung tumors]

See also: INTRODUCTION

NIOSH Publication No. 2005-149: **September 2005**

NIOSH Pocket Guide to Chemical Hazards

Oil mist (mineral)	**CAS** 8012-95-1
	RTECS PY8030000
Synonyms & Trade Names Heavy mineral oil mist, Paraffin oil mist, White mineral oil mist	**DOT ID & Guide**

Exposure Limits	**NIOSH REL**: TWA 5 mg/m^3 ST 10 mg/m^3
	OSHA PEL: TWA 5 mg/m^3

IDLH 2500 mg/m^3 See: 8012951	**Conversion**

Physical Description
Colorless, oily liquid aerosol dispersed in air. [Note: Has an odor like burned lubricating oil.]

MW: Varies	BP: 680°F	FRZ: 0°F	Sol: Insoluble
VP: <0.5 mmHg	IP: ?		Sp.Gr: 0.90
Fl.P(oc): 380°F	UEL: ?	LEL: ?	

Class IIIB Combustible Liquid: Fl.P. at or above 200°F.

Incompatibilities & Reactivities
None reported

Measurement Methods
NIOSH 5026, 5524
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection)
Skin: Prevent skin contact
Eyes: No recommendation
Wash skin: When contaminated
Remove: When wet or contaminated
Change: Daily

First Aid (See procedures)
Skin: Soap wash
Breathing: Fresh air

Respirator Recommendations NIOSH/OSHA

Up to 50 mg/m^3:
(APF = 10) Any air-purifying respirator with an N100, R100, or P100 filter (including N100, R100, and P100 filtering facepieces) except quarter-mask respirators. Click here for information on selection of N, R, or P filters.
(APF = 10) Any supplied-air respirator

Up to 125 mg/m^3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered, air-purifying respirator with a high-efficiency particulate filter

Up to 250 mg/m^3:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters.
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode
(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter
(APF = 50) Any self-contained breathing apparatus with a full facepiece

(APF = 50) Any supplied-air respirator with a full facepiece
Up to 2500 mg/m^3:
(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode
Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, skin and/or eye contact

Symptoms Irritation eyes, skin, respiratory system

Target Organs Eyes, skin, respiratory system

See also: INTRODUCTION

Attachment 2
Site-Specific Health and Safety Procedures

NOTE: Health and safety procedures that will be utilized during the project are listed below. Copies of all the Health and Safety Procedures (HS001-999) are available on the Intranet (ShawNet).

HS020	Accident Prevention Program: Reporting, Investigation, and Review
HS021	Accident Prevention Program: Management Safety Inspections
HS045	Job Safety Analysis (JSA)
HS051	Tailgate Safety Meetings
HS060	Hazard Communication Program
HS100	Medical Policies and Procedures
HS101	Drug and Alcohol Testing
HS307	Excavation and Trenching
HS308	Underground/Overhead Utility Contact Prevention
HS315	Control of Hazardous Energy Sources (Lockout/Tagout)
HS400	Working in Hot Environments
HS401	Cold Stress
HS402	Hearing Conservation Program
HS512	Handling of Blood or Other Potentially Infectious Material
HS600	Personal Protective Equipment
HS601	Respiratory Protection Program
HS800	Motor Vehicle Operation: General Requirements
HS822	Crane Operations

PROCEDURE

Subject: ACCIDENT PREVENTION PROGRAM: REPORTING, INVESTIGATION, AND REVIEW

1.0 PURPOSE AND SUMMARY

The purpose of this procedure is to establish the requirements for incident reporting, investigation, and review. This procedure is an integral part of the company's overall accident prevention program and aids in the identification of potential causal factors and corrective actions necessary to prevent incident re-occurrence. Key elements of this procedure include:

- **All occupational injuries/illnesses, vehicle accidents, and near miss incidents must be promptly reported and investigated.**

- All Occupational Safety and Health Administration (OSHA) recordable injuries/illnesses and chargeable vehicle accidents must be reviewed by an Accident Review Board. The Accident Review Board report is submitted to the Corporate Safety Department, for safe keeping, on behalf of the Legal Department .

- All incidents involving a fatality, major injury/illness, or resulting in significant property damage will be immediately reported to: the business line Health & Safety Manager; the Corporate Health and Safety Department; the business line President and the Legal Department.

- All OSHA recordable injuries/illnesses, chargeable vehicle accidents, fatalities, major injury/illness, or incidents resulting in significant property damage are subject to being classified as A Confidential Attorney-Client / Attorney Work Product investigation status.

- All business line Health & Safety Managers are required to submit a Monthly Loss Report, by the 10th of the following month, summarizing all chargeable vehicle accidents and all injury/illness cases requiring outside medical care that took place during the previous reporting month to the Baton Rouge Corporate Safety Office.

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3.0 RESPONSIBILITY MATRIX

3.1 Procedure Responsibility

The Corporate Health & Safety Department is responsible for the issuance, revision, and maintenance of this procedure.

3.2 Action/Approval Responsibilities

The Responsibility Matrix is Attachment 1.

4.0 DEFINITIONS

Chargeable Vehicle Accident - Any **at-fault** vehicle accident meeting any **one** of the following criteria:

- An individual other than an employee of the company is a party in the accident
- Property owned by a person or entity other than the company is damaged
- When company owned, leased or rented vehicles are involved and damage exceeds $1,000.00.
- When an employee is driving a personal vehicle while on company business and damage exceeds $1,000.00.

Company - All affiliates, indirect and wholly owned subsidiaries of Shaw Environmental & Infrastructure, Inc. (Shaw E & I).

Days Away From Work - Days away from work are the number of **calendar** days following the injury or illness, excluding the date of the injury.

Restricted Work – Occurs when, as the result of a work-related injury or illness:

- A physician or other licensed health care professional recommends that the employee not perform one or more of the routine functions of his or her job, or not work the full workday that he or she would otherwise have been scheduled to work

Note: Employers may stop counting days away from work and days of restricted work activity once the total of either or the combination of both reaches 180 days.

Near Miss Incident - Any incident where no injury occurred, but where the potential for injury existed.

OSHA Recordable Case – See Attachment 7

Vehicle - Any passenger vehicle, including trucks, used upon the highway or in private facilities for transporting passengers and/or property. For the purpose of this procedure, off-road vehicles such as earthmoving equipment, forklifts, non-highway use trucks, etc., are not considered vehicles.

5.0 TEXT

5.1 Incident Reporting Process

Employees are required to immediately report to their direct supervisor all occupational injuries, illnesses, accidents and near miss incidents having the potential for injury. Site Safety Officers / Managers or any supervisor (but preferably the supervisor directly responsible for the involved employees) with first-hand knowledge of an incident is required to:

- Immediately arrange for appropriate medical attention and notify the responsible health and safety representative.

- **As soon as practical but not longer than one hour after occurrence**, notify the Shaw Notification Hotline/Helpdesk by calling 1-866-299-3445 of any injury requiring off-site medical treatment, any chargeable vehicle accident or equipment incident involving property damage exceeding $1,000 in value (Shaw or third party).

- Inform Health Resources of all incidents requiring off-site medical attention by calling 1-800-350-4511. This call should be made prior to transporting the employee such that they can coordinate physicians services prior to arrival of the employee to the clinic, and provide the following information:

  - Company Name (Shaw E&I) & Business Line (e.g. DOD, Commercial)
  - Employee Name
  - Name of treating medical facility and phone number
  - Brief description of incident.

  Health Resource's role is to interface with the treating physician to ensure that appropriate care is provided to the injured employee.

- Complete the *Authorization for Treatment, Release of Medical Information*, and *Return to Work* (Attachment 9A, 9B, 9C) and the *Supervisor's Employee Injury Report* (Attachment 2) for all cases requiring off-site medical attention. The Site Safety Officer / Manager or responsible supervisor shall ensure that the forms are completed and faxed to Health Resources at (800) 853-2641 prior to leaving the medical facility or as soon as reasonably possible.

- Post accident drug and alcohol testing shall occur in accordance with HS101 Drug and Alcohol Testing, immediately following an accident.

  NOTE: Prior to performing non-DOT post accident testing, it is the responsibility of the employee's supervisor to ensure that Health Resources has verified that this testing is not prohibited or restricted by state or local regulations.

- Prior to an injured employee returning to his/her job duties, a follow-up call by Health Resources will be made to the project site. The purpose of this call is to ensure work restrictions are clarified and planned work activities are consistent with medical recommendations.

- The Site Safety Officer and Supervisor shall initiate/complete the appropriate company documentation in accordance with the following incident classifications:

  - OSHA Recordable Cases
    a. Supervisor's Employee Injury/Illness Report (Attachment 2)
    b. Incident Investigation Report (Attachment 5)
    c. Witness Statement Form (Attachment 6)
    d. Accident Review Board (Attachment 7)

  - First Aid Cases
    a. Supervisor's Employee Injury/Illness Report (Attachment 2)
    b. Incident Investigation Report (Attachment 5)

  - Chargeable Vehicle Accidents
    a. Vehicle Accident Report (Attachment 3)
    b. Incident Investigation Report (Attachment 5)
    c. Witness Statement (Attachment 6)
    d. Accident Review Board (Attachment 7)
    e. Driving Record Certification (Procedure HS800)

  - Non-Chargeable Vehicle Accidents
    a. Vehicle Accident Report (Attachment 3)
    b. Incident Investigation Report (Attachment 5)
    c. Witness Statement (Attachment 6)

- Incidents Involving Equipment
  a. Incident Investigation Report (Attachment 5)
  b. Witness Statement Form (Attachment 6)
  c. Equipment, General Liability, Property Damage, and Loss Report (Attachment 5).

- Near Miss
  a. Incident Investigation Report (Attachment 5)

- Property Damage/General Liability
  a. Equipment, General Liability, Property Damage, and Loss Report (Attachment 4).
  b. Witness Statement (Attachment 6)

5.2 Supervisor's Employee Injury/Illness Report (Attachment 2)

The Supervisor's Employee Injury Report is to be completed for all incidents that result in an employee occupational injury or illness requiring off-site medical attention. It is to be initiated by the supervisor of the injured employee and forwarded to the respective Business Line Safety Manager for comments. Upon completion of review and comments the report should be forwarded to the Shaw Corporate Claims department in Baton Rouge.

5.3 Vehicle Accident Report (Attachment 3)

The Vehicle Accident Report must be completed for any vehicle accident in which a company vehicle is involved. This includes company-owned or leased vehicles, rental vehicles, and personal vehicles being used for company business. This report is to be initiated by both the employee involved in the accident and his/her direct supervisor and forwarded to the respective Business Line Safety Manager for comments. Upon completion of review and comments the report should be forwarded to the Shaw Corporate Claims department in Baton Rouge.

5.4 Equipment, General Liability, Property Damage, and Loss Report (Attachment 4)

The General Liability, Property Damage, and Loss Report is to be used for all losses or damage to company property in excess of $1,000.00. This form must be completed for all third party property, regardless of value, damaged as a result of company activities. The employee most familiar with the events that contributed to the loss or damage will complete the form, then forward it to the project/location manager. The Corporate Claims Department must receive a copy of the report within one business day of the incident.

5.5 Incident Investigation Report (Attachment 5)

All injuries, illnesses, accidents, and near miss incidents will be investigated. Once arrangements for immediate medical care have been made, the employee's direct supervisor, with assistance from the health and safety representative and Business Line Health and Safety Manager, will:

- Collect the facts;
- Describe and document (include sketch, photos, etc.) how the incident occurred;
- List witnesses and collect written statements;

  If applicable, contact the employee's Functional Manager in an effort to gain relative information
- Identify the causative factors;
- Identify potentially unsafe acts or unsafe conditions that may have contributed to the incident;
- Identify potential systematic deficiencies; and
- List the corrective actions which are to be taken to prevent re-occurrence of the incident, the person responsible for the corrective action, and the date by which action is to be completed.

The investigation will be started as soon as possible after the incident and a written report submitted to the appropriate health and safety representative within 72 hours. In addition to the previous information, reports from external sources (police, insurance carriers, testing laboratories, etc.) are to be obtained as soon as they become available and forwarded to the Business Line Safety Manager.

5.6 Witness Statement Form (Attachment 6)

The witness statement form was created to allow for consistency in the development of the investigation process. If there are witnesses to the accident/incident, this form should be completed and signed by the subject witness and attached to the incident investigation report. It is essential that the witness statement be executed immediately following the incident to ensure an accurate account of the events.

5.7 Accident Review Board (ARB) (Attachment 7)

As a directive of the Corporate Legal Department, each of the respective Business Line Health and Safety Managers whose project/location experiences an OSHA recordable or a chargeable vehicle accident is required to convene an ARB within **10 days** of the accident. The purpose of the Accident Review Board is to review the information, gathered for each incident, and take appropriate action to prevent its recurrence. The Accident Review Board shall be composed of the project/location manager, the employee's direct supervisor, a health and safety representative, and the employee(s) involved in the incident.

Additionally, there may be cases that involve an employee that has been assigned to a project and the Functional Manager of that employee may not have direct knowledge of an incident. In cases such as these, the Functional Manager shall be notified of the incident and requested to participate in the ARB. Also, as determined by the Business

Line Health and Safety Manager, a representative of other internal sources of expertise should be involved where applicable.

All OSHA recordable injuries/illnesses, chargeable vehicle accidents, fatalities, major injury/illness, or incidents resulting in significant property damage are subject to being classified under a Confidential Attorney-Client / Attorney Work Product investigation status. The determination as to whether the ARB is classified as a Confidential Attorney-Client / Attorney Work Product investigation status must be executed as soon as possible and always prior to initiation of the ARB process. If the determination is made to initiate the ARB under a Confidential Attorney-Client / Attorney Work Product status, all documents concerning the investigation process, including the ARB, will be submitted to the Corporate Safety Department, for purposes of confidentiality and safe keeping, on behalf of the Legal Department, in anticipation of litigation.

Unless the investigation is considered as a Confidential Attorney-Client / Attorney Work Product investigation, the ARB report shall be completed as soon as practicable and forwarded to the Corporate Safety Department, via the Corporate Claims fax number. Upon completing review of the draft ARB, the Business Line Safety Manager will be notified and the ARB shall be completed by the Business Line Safety Manager and signed by all members of the ARB.

It is generally not acceptable to discipline an employee for having an accident. However, if the Accident Review Board determines that the accident resulted from an intentional unsafe act or violation of company procedure on the employee's part, the employee may be subject to disciplinary action in accordance with the company's progressive disciplinary action system (see Human Resources Procedure HR207).

5.7 Monthly Loss Report

Each business line Health and Safety Manager is responsible to submit a Monthly Loss Report summarizing incidents that took place within their business line during the previous month. The business line Health and Safety Manager is responsible for submitting a consolidated package for the entire business line to the corporate health and safety office for **receipt no later than the 10th working day of the following month**.

6.0 EXCEPTION PROVISIONS

Variances and exceptions may be requested pursuant to the provisions of Procedure HS013, Health and Safety Procedure Variances.

7.0 CROSS REFERENCES

HR207 Disciplinary Action
HS013 Health and Safety Procedure Variances
HS101 Drug and Alcohol Testing
HS800 Motor Vehicle Operations - General Requirements
HS810 Commercial Motor Vehicles

8.0 ATTACHMENTS

1. Responsibility Matrix

2. Supervisor's Employee Injury/Illness Report
3. Vehicle Accident Report
4. Equipment, General Liability, Property Damage, and Loss Report
5. Incident Investigation Report
6. Witness Statement
7. Accident Review Board Report
8. Injury/Illness Classification Guidelines
9. Medical Forms
   a. Authorization for Treatment of Occupational Injury/Illness
   b. Authorization for Release of Medical Information
   c. Return to Work Examination Form.

ATTACHMENT 1

ACCIDENT PREVENTION PROGRAM: REPORTING, INVESTIGATION, AND REVIEW RESPONSIBILITY MATRIX

Action	Procedure Section	*Responsible Party*					
		Employee	Supervisor	Project/ Location Manager	Health and Safety Officer	Business Line Health and Safety Manager	Corporate Health & Safety Manager
Issue, Revise, and Maintain Procedure	3.1						X
Report All Incidents to Supervisor	5.1	X					
Notify Health and Safety Representative	5.1		X				
Arrange Medical Care	5.1		X		X		
Notify Health Resources or Gates McDonald of Incident	5.1		X		X		
Initiate/Complete Company Forms	5.1		X				
Complete Investigation of Incident	5.5		X	X	X		
Conduct Accident Review Board	5.6		X	X	X		
Complete Monthly Loss Report	5.8					X	

Attachment 2

REPORT ALL WORKER'S COMPENSATION INJURIES TO SHAW CLAIMS DEPARTMENT
FAX REPORT WITHIN 24 HOURS OF INCIDENT TO 225-932-2636.
Phone all injuries/ illnesses to Shaw Notification Hotline/Helpdesk
1-866-299-3445

Supervisor's Employee Injury/Illness Report Form

EMPLOYEE INFORMATION

Employee's Social Security Number: | Claim Number:
Employee's Name: | Home Phone Number:
Home Address: | Business Line Code:
Male Female | Date of Birth: | Hire Date:
Dependents: | Dependents Under 18: | Marital Status:
Occupation: | Department Name:
State Hired: | Currently Weekly Wage: | Hourly Wage:
Hours/Days Worked Per Week: | Days Per Week | Hours Worked Per Day:
Employment Status: | Employee Report No.: N/A | Employee ID No.: N/A
Salaried Continued: | Paid For Date of Injury: | Education No. of Years:
Ever Injured on the Job: | Supervisor Name & Phone:

EMPLOYER INFORMATION

Employer Name: **The Shaw Group, Inc.**
Work Location:
Contact Name: **John Mollere** | Telephone Number: **(800)747-3322, Ext. 572**
Employer SIC: | Employer Location Code:
Employer FED ID: | Employer Code: N/A
Nature of Business:
Policy Number:

ACCIDENT INFORMATION

Date and Time of Injury:
Did the Accident Occur at the Work Location: | If no, where did the accident occur? N/A
Accident Address:
Nature of Accident:
Give a Full Description of the Accident: (Be as Factually Complete As Possible)

Are Other WC Claims Involved? No | Date and Time Reported to Employer:
Person Reported To:

WITNESS INFORMATION

Were There Any Witnesses?

If Yes, List Names and How to Contact Them:

INJURY INFORMATION

Which Part of the Body Was Injured? (e.g. Head, Neck, Arm Leg)

What Was the Nature of Injury? (e.g. Fracture, Sprain, Laceration)

Part of Body Location: (e.g. Left, Right, Upper, Lower)

Injury Description:

Source of Injury: | Is Employee Hospitalized?

Lost Time: | If Yes, What was First Full Day Out:

Date Last Day Worked: | Date Disability Began: N/A

Date Returned to Work: | Estimated Return Date: N/A

MEDICAL INFORMATION

ER Treated & Released: | Hospitalized: | Phy./Clinic:

Hospital - Name, Address, Phone Number: | Was Employee Transported via Ambulance: Yes No

N/A

Clinic - Name, Address, Phone Number:

ADDITIONAL COMMENTS & INFORMATION

REPORT PREPARED BY

Name: | Title:

Signature: | Phone:

ATTACHMENT 3
VEHICLE ACCIDENT REPORT
Page 1 of 2

ACCIDENT DESCRIPTION

This report is to be initiated by the employee involved in the accident or his/her direct supervisor. Please answer all questions completely. This report must be forwarded to the appropriate health and safety representative within 24 HOURS of the accident. Attach police report.

ACCIDENT DATE _____ TIME _____ ☐ A.M. or ☐ P.M.

LOCATION OF ACCIDENT (CITY, STATE) _____

DESCRIPTION OF ACCIDENT _____

_____

_____

WITNESS _____ PHONE NO. _____

ADDRESS _____ CITY _____ STATE _____ ZIP _____

POLICE OFFICER'S NAME AND BADGE # _____ DEPARTMENT _____

COMPANY VEHICLE

DRIVER _____ DRIVERS LICENSE NO. _____ STATE _____

ADDRESS _____ CITY _____ STATE _____ ZIP _____

WORK PHONE NO. _(____)_____ S.S. NO. _____ PROJECT NAME/NO. _____

VEHICLE NO. _____ YEAR _____ MAKE _____ MODEL _____ LICENSE PLATE NO. _____

STATE _____ VEHICLE OWNER: ☐ COMPANY ☐ LEASED/RENTED ☐ PRIVATE VEHICLE

VEHICLE TYPE: ☐ COMMERCIAL MOTOR VEHICLE ☐ NON-COMMERCIAL

IF NOT COMPANY-OWNED: OWNER _____ PHONE NO _(____)_____

ADDRESS _____ CITY _____ STATE _____ ZIP _____

VEHICLE DAMAGE _____

NO. OF VEHICLES TOWED FROM SCENE _____ NUMBER OF INJURIES _____ NUMBER OF FATALITIES _____

WERE HAZARDOUS MATERIALS RELEASED? ☐ NO ☐ YES IF YES, DESCRIBE MATERIALS _____

_____

OTHER VEHICLE

DRIVER _____ DRIVERS LICENSE NO. _____ STATE _____

ADDRESS _____ CITY _____ STATE _____ ZIP _____

PHONE NO. _(____)_____ S.S. NO. _____

OWNER'S NAME (☐ CHECK IF SAME AS DRIVER) _____

ADDRESS _____ CITY _____ STATE _____ ZIP _____

INSURANCE COMPANY _____ POLICY NO. _____

AGENT'S NAME _____ PHONE NO. _(____)_____

ADDRESS _____ CITY _____ STATE _____ ZIP _____

VEHICLE YEAR _____ MAKE _____ MODEL _____ PLATE NO. _____ STATE _____

VEHICLE I.D. NO. _____

VEHICLE DAMAGE _____

PASSENGERS: ☐ NO ☐ YES INJURIES: ☐ NO ☐ YES (If Yes, list names and telephone numbers below)

_____

_____

_____

VEHICLE ACCIDENT REPORT

WEATHER: ☐ Clear ☐ Cloudy ☐ Fog ☐ Rain ☐ Sleet ☐ Snow Other _____

PAVEMENT: ☐ Asphalt ☐ Steel ☐ Concrete ☐ Wood ☐ Gravel/Dirt ☐ Brick/Stone Other _____

CONDITION: ☐ Dry ☐ Wet ☐ Icy ☐ Pot Holes Other _____

TRAFFIC CONTROL: ☐ Traffic Light ☐ Stop Sign ☐ Railroad ☐ No Intersection ☐ No Control

ROADWAY: Number of Lanes Each Direction: _____ ☐ Residential ☐ Divided Highway ☐ Undivided Highway

Draw and name roadways showing each vehicle, direction of travel, and point of impact. Indicate travel before the accident with a solid line, and post-accident movement with a broken line.

SYMBOLS:

Your Vehicle ①

Other Vehicle(s) ② ③

Pedestrian

Stop Sign

Yield

Railroad

ADDITIONAL INFORMATION: _____

EMPLOYEE _____ (Print) _____ (Signature) _____ (Date)

SUPERVISOR _____ (Print) _____ (Signature) _____ (Date)

HEALTH & SAFETY REP. _____ (Print) _____ (Signature) _____ (Date)

ATTACH POLICE REPORT TO VEHICLE ACCIDENT REPORT

REPORT MUST BE FAXED TO:
CORPORATE CLAIMS DEPARTMENT (FAX: 225-932-2636)
WITHIN 24 HOURS, OR NOT LATER THAN NEXT BUSINESS DAY
REPORT ALL VEHICLE ACCIDENTS TO SHAW NOTIFICATION HOTLINE/HELPDESK
(PHONE: 1-866-299-3445)

ATTACHMENT 4

EQUIPMENT, GENERAL LIABILITY, PROPERTY DAMAGE, AND LOSS REPORT

This report is to be completed for all losses or damage to company property in excess of $1,000.00 and all third party damage, regardless of value, resulting from company activities.

PROJECT/LOCATION _____ PROJECT NO. _____ DATE _____
ADDRESS _____
HOW DID DAMAGE OR LOSS OCCUR: _____

DESCRIPTION AND VALUE ($) OF DAMAGED/LOST/STOLEN PROPERTY: _____

LOCATION OF DAMAGED/LOST/STOLEN PROPERTY (Before Loss): _____

DATE AND TIME OF DAMAGE, LOSS, OR THEFT: Date: _____ Time: _____ a.m./p.m.

OWNER OF DAMAGED/LOST/STOLEN PROPERTY:
Name _____ Phone No. (____) _____
Address _____ City _____
Employer and Address _____

INJURED PARTIES (Also complete a Supervisor's Employee Injury Report if a Company Employee):
Name _____ Phone No. (____) _____
Address _____ City _____
Employer and Address _____
Description of Injury _____

WITNESSES:
1. Name _____ Home Phone (____) _____
   Home Address _____ City _____
   Employer and Address _____
2. Name _____ Home Phone (____) _____
   Home Address _____ City _____
   Employer and Address _____

WERE PICTURES TAKEN? ☐ YES ☐ NO
WERE POLICE NOTIFIED? ☐ YES ☐ NO DEPT. _____ REPORT NO. _____

COMPLETED BY: _____ _____ _____
(Print) (Signature) (Date)

PROJECT/LOCATION MANAGER: : _____ _____ _____
(Print) (Signature) (Date)

REPORT MUST BE FAXED TO:
CORPORATE CLAIMS DEPARTMENT (FAX: 225-932-2636)
WITHIN 24 HOURS, OR NOT LATER THAN NEXT BUSINESS DAY

ATTACHMENT 5
INCIDENT INVESTIGATION REPORT

*** MUST BE COMPLETED WITHIN 72 HOURS ***

Investigation Date _____ Date of Incident _____

Employee Name _____

Supervisor Name _____

Project Number/Name _____ / _____

Location of Incident _____

- Incident Classification

Injury	☐ First Aid	Vehicle	☐ Chargeable	DOT	☐ DOT Vehicle
	☐ OSHA Recordable		☐ Non-chargeable		☐ DOT Reportable
	☐ Lost Workday				
	☐ Restricted Workday	Near Miss	☐	General Liability	☐

- Description (Provide facts, describe how incident occurred, provide diagram [on back] or photos)

_____

_____

- Analysis (What unsafe acts or conditions contributed to the incident?)

_____

_____

_____

_____

- Corrective Action(s) (List corrective action items, responsible person, scheduled completion date)

_____

_____

_____

- Witness Names (Complete Attachment 6 – Employee Witness Statement)

_____

_____

_____

_____

	Print Name	Signature	Date
Investigated By	_____	_____	_____
Project/Location Mgr.	_____	_____	_____

(Attach Additional Pages if Needed)

ATTACHMENT 6
Employee Witness Statement

MUST BE COMPLETED WITHIN 24 HOURS OF THE INCIDENT

This form should be completed by every employee working in the crew of the injured employee and by every other employee with knowledge of events or circumstances involved in the incident. This information is being solicited from you so that the company can accurately assess the reported incident to avoid similar occurrences in the future. Describe only the facts for which you have personal knowledge. If you have no knowledge of the incident, write "no knowledge".

Company _____

Exact Location of Incident/Accident _____

Name of Injured Employee _____

Date of Incident/Accident _____ Time _____ am pm

Date of this Statement _____ Time _____ am pm

Time your shift begins? Time _____ am pm Ends _____ am pm

Witness Information:

Name _____

Home Phone No. _____

Home Address _____

County _____ Zip _____

Witness' Supervisor Name _____

If not employed by Shaw E&I, enter name of company _____

Company Phone Number _____

Did You See the Incident/Accident? _____

How Far From You (approx., in feet) Did the Incident/Accident Occur? _____

Stating Only Factual Information, Describe in Detail What Happened and Include Any Applicable Events Leading to the Incident/Accident.

_____

_____

_____

_____

_____

_____

_____

_____

I certify that, to the best of my knowledge, all of the above information is complete, accurate and factual. I acknowledge that the intentional falsification or altering of facts or making misleading statements may be grounds for disciplinary action.

_____ _____

Witness Signature/Date Print Name

ATTACHMENT 7

ACCIDENT REVIEW BOARD

DATE:	LOCATION:
BOARD MEMBERS:	
ACCIDENT DATE:	EMPLOYEE(S) INVOLVED IN INCIDENT:
INVESTIGATION COMPLETE: YES ☐ NO ☐	ACCIDENT CLASSIFICATION:

THE FOLLOWING INFORMATION MUST BE PROVIDED BY THE REVIEW BOARD FOR THIS INCIDENT (PRINT):

SUPERVISOR: _____ **PROJECT/LOCATION MGR.:** _____

POTENTIAL CAUSE OF ACCIDENT:

ACTION BY BOARD*:

* ALL ACTIONS BY THE ACCIDENT REVIEW BOARD ARE SUBJECT TO FINAL REVIEW BY THE HUMAN RESOURCES AND LEGAL DEPARTMENTS.

ACCEPTED: _____ (Employee Signature)	_____ (Supervisor Signature)
APPROVED: _____ (Project/Location Manager)	REJECTED FOR: _____
APPROVED: _____ (Business Line Health and Safety Manager or Designee)	REJECTED FOR: _____
APPROVED: _____ (Business Line Vice President)	REJECTED FOR: _____

The determination as to whether the ARB is classified as being considered as a Confidential Attorney-Client / Attorney Work Product investigation must be executed as soon as possible and always prior to initiation of the ARB process.

ATTACHMENT 8

INJURY/ILLNESS CLASSIFICATION GUIDELINES

First Aid Treatment – If the incident requires only the following types of treatment, consider it first aid. **Do Not** record the case if it involves only:

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

Medical Treatment – Includes managing and caring for a patient for the purpose of combating disease or disorder. The following are **not** considered medical treatments and are not recordable:

- Visits to a doctor or licensed health care professional (LHCP) solely for the purpose of observation or counseling
- Diagnostic procedures, including administering prescription medications that are used solely for diagnostic purposes
- Any procedure that can be labeled first aid (see above descriptions)

Loss of Consciousness - If an employee loses consciousness as the result of a work-related injury/illness, the case must be recorded no matter what type of treatment was provided. The rationale behind this recording requirement is that loss of consciousness is generally associated with more serious injuries.

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

Transfer to Another Job - Injuries requiring transfer of the employee to another job are also considered serious enough to be recordable regardless of the type of treatment provided. Transfers are seldom the sole criterion for recordability because injury cases are almost always recordable on other grounds, primarily medical treatment or restriction of work or motion.

ATTACHMENT 9
MEDICAL FORMS

AUTHORIZATION FOR TREATMENT OF OCCUPATIONAL INJURY/ILLNESS

Employee Name: _____
Social Security #: _____ Injury: ☐ Illness: ☐
Job Title: _____ Incident Date: _____
Project/Location _____ Location of Accident/Exposure:
Telephone #: _____ _____
H&S Representative: _____
Body Part(s) Injured: _____
Describe in detail how incident occurred: _____

TO TREATING PHYSICIAN:

In the case of occupational injury/illness, please examine the employee and render necessary conservative treatment directly related to the occupational injury/illness.

Light Duty Work:
It is the policy of our company to provide work assignments, whenever possible, for employees with physical activity restrictions resulting from an occupational injury/illness. If the employee will be subject to a restriction, please contact **Health Resources** before releasing the employee, so that a light duty assignment may be arranged.

Medically Unfit to Return to Work:
It is the policy of our company to assist employees unable to return to work, due to an injury/illness, in obtaining needed medical care and other available benefits. Medical findings are also used to help evaluate unsafe conditions that may have led to the incident. Please help us assist our employees by contacting **Health Resources** with your findings as soon as possible, preferably before the employee leaves your office, but not later than the close of business on the day of initial treatment.

Health Resources: Telephone: 1-800-350-4511 Fax: (800) 853-2641

Please Send Reports To Both of the Following:
Health Resources
600 West Cummings Park, Suite 3400
Woburn, Massachusetts 01801

AND

The Shaw Group, Inc. Corporate Claims Department
4171 Essen Lane
Baton Rouge, LA 70809

Please Send Bills To:
The Shaw Group, Inc. Corporate Claims Department
4171 Essen Lane
Baton Rouge, LA 70809

DOCTOR, Please provide:
Medical Diagnosis: _____
Treatment Provided: _____
_____
Recommended Work Limitation/Restriction: _____
Return Visit Needed: No ☐ Yes ☐ Date if Yes _____ First Aid Only ☐
Physician Name: _____ Physician Telephone: _____
Physician Signature: _____ Date: _____

YOU MUST CALL HEALTH RESOURCES FOR ALL OCCUPATIONAL INJURIES/ILLNESSES REQUIRING OUTSIDE MEDICAL TREATMENT: 1-800-350-4511.
FAX COMPLETED FORM TO HEALTH RESOURCES (800) 853-2641.

ATTACHMENT 9B
MEDICAL FORMS

AUTHORIZATION FOR RELEASE OF PROTECTED MEDICAL INFORMATION

Patient Identification

Printed Name: _____ **Date of Birth:** _____

Address: _____

_____

Social Security #: _____ Home Telephone: _____

Authority to Release Protected Health Information

I hereby authorize the release of information, identified in this authorization form, from the medical records associated with my occupational injury / illness and provide such information to:

HEALTH RESOURCES
600 West Cummings Park, Suite 3400
Woburn, Massachusetts 01801
Phone: (800) 350-4511
Fax: (800) 853-2641

AND

The Shaw Group Inc.
4171 Essen Lane
Baton Rouge, Louisiana 70809
Phone: 225-932-2500
Fax: 225-932-2636

The Information To Be Released includes the following:

Complete health record	Discharge summary	Progress notes
History and physical exam	Consultation reports	X-ray films / images
Laboratory test results	X-ray & Image reports	Itemized bill
Diagnosis & treatment codes	Complete billing record	

Other, (specify) _____

Purpose of the Requested Disclosure of Protected Health Information

I am authorizing the release of my Protected Health Information as a result of an occupational injury or illness.

Drug and/or Alcohol Abuse, and/or Psychiatric, and/or HIV/AIDS Records Release

I understand if my medical or billing record contains information in reference to previous drug and/or alcohol abuse, psychiatric care, sexually transmitted disease, hepatitis B or C testing, and/or other sensitive information, I agree to its release. *Check One:* ☐ **Yes** ☐ **No**

I understand if my medical or billing record contains information in reference to HIV/AIDS (Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome) testing and/or treatment I agree to its release. *Check One:* ☐ **Yes** ☐ **No**

Right to Revoke Authorization

Except to the extent that action has already been taken in reliance on this authorization, the authorization may be revoked at any time by submitting a written notice to ***The Corporate Claims Dept.*** at ***The Shaw Group Inc., 4171 Essen Lane, Baton Rouge, Louisiana 70809***. Unless revoked, this authorization will expire at which time completion of treatment for the injury or illness has been accomplished.

Re-disclosure

I understand the information disclosed by this authorization may be subject to re-disclosure by the recipient and no longer be protected by the Health Insurance Portability and Accountability Act of 1996.

Signature of Patient or Personal Representative Who May Request Disclosure

I understand that I do not have to sign this authorization, and my treatment or payment for services will not be denied if I do not sign this form. However, if health care services are being provided to me for the purpose of providing information to a third-party (e.g. fitness-for-work test), I understand that services may be denied if I do not authorize the release of information related to such health care services to the third-party. I can inspect or copy the protected health information to be used or disclosed. **I hereby release and discharge** *The Shaw Group Inc* **of any liability and the undersigned will hold** *The Shaw Group Inc* **harmless for complying with this Authorization.**

Signature: _____ **Date:** _____

Description of relationship if not patient:

_____

ATTACHMENT 9C
MEDICAL FORMS

RETURN-TO-WORK EXAMINATION FORM

Exam Date: _____ / _____ / _____ Employee Name: _____

Birth Date: _____ / _____ / _____ Social Security #: _____ - _____ - _____

Job Title: _____ Sex: ❑ Male ❑ Female

~~*Examining Provider:* Please complete this form and fax to Health Resources at (800) 653-2641. Please~~ contact Health Resources at (800) 350-4511 to report status of employee post-treatment.

DIAGNOSIS: _____

TREATMENT PLAN: _____

MEDICATIONS: _____

PHYSICAL THERAPY: _____

OTHER: _____

❑ May return to full duty work effective ____/____/

❑ May return to limited duty from ____/____/____ to ____/____/

❑ Unable to return to work from ____/____/____ to ____/____/

WORK LIMITATIONS:

❑ Restricted lifting/pushing/pulling: maximum weight in lbs: _____ (company limits all lifting to ≤ 60 lbs).

❑ Work only with right/left hand.

❑ Restricted repetitive motion right/left hand.

❑ Sitting job only.

❑ Restricted operation of moving equipment.

❑ Other: _____

FOLLOW-UP PLAN:

❑ Release from care.

❑ Schedule for follow-up appointment on ____/____/____.
Time _____ AM/PM

❑ Referral to _____
Appointment date ____/____/____ Time _____ AM/PM

Comments: _____

_____	_____	_____
Examiner's Name (*print*)	Examiner's Signature	Date

PROCEDURE

Subject: ACCIDENT PREVENTION PROGRAM: MANAGEMENT SAFETY INSPECTIONS

1.0 PURPOSE AND SUMMARY

This procedure establishes the requirement for management safety inspections of project and office locations. These inspections are an integral part of the overall accident prevention program and help to demonstrate management's commitment to safety. Key requirements of this procedure include:

- Project managers are required to conduct one inspection per month and ensure that at least one other inspection is conducted during the month;
- Office managers are required to conduct an office safety inspection once every six months.
- Completed inspection reports are given to the project/office health and safety representative for review. A copy of the completed report will then be forwarded to the respective business line health and safety manager.

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2.0 Table of Contents
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3.0 RESPONSIBILITY MATRIX

3.1 Procedure Responsibility

The Director of Health and Safety is responsible for the issuance, revision, and maintenance of this procedure.

3.2 Action/Approval Responsibilities

The Responsibility Matrix is Attachment 1.

4.0 TEXT

Inspections of project and office locations by managers, supervisors, and the health and safety staff are critical factors in a comprehensive accident prevention program. Management safety inspections help demonstrate management's commitment to safety and verify that proper work practices are in use. These inspections are also used to verify the existence of safe work conditions and regulatory compliance. All employees are afforded the opportunity to participate in the inspection process via the safety interview process.

4.1 Safety Inspections and Documentation

Safety inspections are required by various tiers of the management structure. The objective is for operation managers to visibly demonstrate their concern for safety in the workplace by direct contact with employees while in the workplace. Each inspection is to be documented on the appropriate Safety Inspection Report (Attachment 2 or 3).

The primary responsibilities of the inspector include:

- Interviewing employees with regard to health and safety issues and how they might be corrected;
- Observing and correcting unsafe conditions and acts; and
- Verifying that corrective actions have been assigned to a responsible employee and implemented.

Positive safety observations and safety issues not specifically addressed in the Safety Inspection Report can be documented on the last page of the report. A list of all corrective action items will be maintained showing the corrective action, responsible person, and the date action is to be completed. Completed reports are to be given to the project/office health and safety representative, then forwarded to the respective business line health and safety manager.

4.1.1 Management Site Visits

Each senior manager is encouraged to make an informal safety inspection and review previously conducted inspection reports, during each site visit, to demonstrate their commitment to safety and reinforce the responsibilities of project management. Findings during this informal inspection are to be brought to the attention of the project manager so that corrective action can be initiated.

4.1.2 Project Managers

All project managers are required to complete at least one safety inspection per month and ensure that at least one other safety inspection per month is conducted. In the event that the project manager is not present at the project site during the month, this responsibility may be delegated to the project supervisor.

4.1.3 Office Managers

Office managers are required to conduct an office safety inspection once every six months. Managers are encouraged to conduct more frequent inspections if the office location is being remodeled or if new space is being occupied that was not previously inspected.

4.1.4 Project Supervisors

Project supervisors are expected to inspect their projects monthly and ensure that corrective actions are implemented. Dependent upon project manager participation, project supervisors may also be required to conduct an additional monthly inspection. The requirement to conduct these inspections cannot be delegated.

4.1.5 Health and Safety Representative

Health and safety representatives must continually observe activities and correct unsafe acts/conditions as soon as reasonably possible. They are also required to review each Safety Inspection Report completed at their location to ensure that corrective actions are implemented. Once this review is complete, they will forward the reports to the appropriate business line health and safety manager.

4.2 Workshops

Health and safety representatives will present workshops and/or conduct joint inspections to help managers and supervisors develop their inspection skills.

5.0 EXCEPTION PROVISIONS

Variances and exceptions may be requested pursuant to the provisions of Procedure HS013, Health and Safety Procedure Variances.

6.0 CROSS REFERENCES

HS013 Health and Safety Procedure Variances

7.0 ATTACHMENTS

1. Responsibility Matrix
2. Project Safety Inspection Report
3. Office Safety Inspection Report
4. Laboratory Inspection Report

ATTACHMENT 1

ACCIDENT PREVENTION PROGRAM: MANAGEMENT SAFETY INSPECTIONS RESPONSIBILITY MATRIX

Action	Procedure Section	*Responsible Party*				
		Senior Managers	**Project/ Office Manager**	**Project Supervisors**	**Health and Safety Representative**	**Director of Health and Safety**
Issue, Revise, and Maintain Procedure	3.1					X
Conduct Informal Safety Inspections and Review Previously Completed Reports	4.1.1	X				
Conduct Safety Inspections	4.1.2 4.1.3 4.1.4		X	X		
Give Completed Reports to Health and Safety Representative	4.1.2 4.1.3 4.1.4		X	X		
Review Reports and Forward to Health and Safety Manager	4.1.5				X	
Conduct Inspection Workshops	4.2				X	

ATTACHMENT 2

PROJECT SAFETY INSPECTION REPORT

PROJECT _____ DATE _____

BUSINESS LINE: _____ PROJECT NAME/NUMBER:
PROGRAM MANAGER: _____ PROJECT MANAGER:
GENERAL PROJECT DESCRIPTION:
SITE ACTIVITIES AT TIME OF INSPECTION:

INTERVIEWED EMPLOYEE:
SAFETY ISSUE:
CORRECTIVE ACTION:

ASSIGNED TO: _____ FOLLOW-UP DATE:
CORRECTION VERIFIED BY: _____ DATE:

INTERVIEWED EMPLOYEE:
SAFETY ISSUE:
CORRECTIVE ACTION:

ASSIGNED TO: _____ FOLLOW-UP DATE:
CORRECTION VERIFIED BY: _____ DATE:

INSPECTION COMPLETED BY: _____ DATE:

HEALTH AND SAFETY REVIEW BY: _____ DATE:

PROJECT SAFETY INSPECTION REPORT

PROJECT _____ DATE _____

	YES	NO	N/A
FIRST AID			
1. Are first aid kit locations identified and accessible?			
2. Are emergency eye wash/safety showers available and inspected monthly?			
3. Are first aid kits inspected weekly?			
4. Is a qualified first aid/CPR provider on site?			
PERSONAL PROTECTIVE EQUIPMENT			
1. Have levels of personnel protection been established?			
2. Are respirators decontaminated, inspected, and stored according to standard procedures?			
3. Have employees been fit-tested?			
4. Is defective personal protective equipment tagged and taken out of service?			
5. Does compressed breathing air meet CGA Grade "D" minimum?			
6. Are there sufficient sizes and quantities of protective equipment?			
7. At a minimum, are employees utilizing safety glasses, hard hats, and steel toe boots?			
FIRE PREVENTION			
1. Are employees smoking only in designated outdoor areas?			
2. Are fire lanes established and maintained?			
3. Are flammable liquid dispensing systems bonded?			
4. Are approved safety cans available for storage of flammable liquids?			
5. Has the local fire department been contacted?			
6. Are fire extinguishers available and inspected monthly?			
7. Are flammables and combustibles properly stored?			
8. Are flammable storage cabinets available and used when needed?			
AIR MONITORING			
1. Is required air monitoring being conducted?			
2. Are air monitoring instruments calibrated daily?			
3. Are air monitoring logs up to date?			
4. Are instrument user manuals available?			
5. Are instruments being maintained?			
6. Are employees notified of personal sampling results within 5 days of receipt?			
WELDING AND CUTTING			
1. Are fire extinguishers present at welding and cutting operations?			
2. Are confined spaces evaluated prior to and during cutting and welding operations?			
3. Have Hot Work Permits been completed?			
4. Are proper helmets, goggles, aprons, and gloves available for welding and cutting operations?			
5. Are welding machines properly grounded?			
6. Are oxygen and fuel gas cylinders stored a minimum of 20 feet apart?			
7. Are only trained personnel permitted to operate welding and cutting equipment?			
8. Are gas cylinders transported in a secured vertical position with caps in place?			
HAND AND POWER TOOLS			
1. Are defective hand and power tools tagged and taken out of service?			
2. Is eye protection available and used when operating power tools?			

PROJECT SAFETY INSPECTION REPORT

PROJECT _____ DATE _____

	YES	NO	N/A
3. Are guards and safety devices in place on power tools?			
4. Are power tools inspected before each use?			
5. Are nonsparking tools available when necessary?			
6. Is the correct tool being used for the job?			
MOTOR VEHICLES			
1. Are vehicles regularly inspected?			
2. Are personnel licensed for the vehicles they operate?			
3. Are unsafe vehicles tagged and reported to supervision?			
4. Is vehicles safety equipment operating properly?			
5. Are loads secure?			
6. Are vehicle occupants using safety belts?			
7. Are current insurance cards and blank accident report forms located in vehicles?			
EMERGENCY PLANS			
1. Are emergency telephone numbers posted?			
2. Have emergency escape routes been designated?			
3. Are employees familiar with the emergency signal?			
4. Has the emergency route to the hospital been established and posted?			
5. Is a vehicle on site that can transport injured employees to the hospital?			
MATERIALS HANDLING			
1. Are materials stacked and stored to prevent sliding or collapsing?			
2. Are tripping hazards identified?			
3. Are semi-trailers chocked?			
4. Are fixed jacks used under semi-trailers?			
5. Are riders prohibited on materials handling equipment?			
6. Are approved manlifts provided for the lifting of personnel?			
7. Are personnel in manlifts wearing approved fall protection devices?			
FIRE PROTECTION			
1. Has a fire alarm system been established?			
2. Do employees know the location and use of all fire extinguishers?			
3. Are fire extinguisher locations posted?			
4. Are combustible materials segregated from open flames?			
5. Have fire extinguishers been professionally inspected during the last year?			
6. Are fire extinguishers visually inspected monthly?			
ELECTRICAL			
1. Is electrical equipment and wiring properly guarded and maintained in good condition?			
2. Are extension cords kept out of wet areas?			
3. Is damaged electrical equipment tagged and taken out of service?			
4. Have underground electrical lines been identified by proper authorities?			
5. Has a lockout/tagout system been established?			
6. Are GFCIs being used on all temporary electrical systems and as needed?			
7. Are extension cords being inspected daily (i.e., group pin in place, no unapproved splices)?			
8. Are warning signs exhibited on high voltage equipment (250V or greater)?			

PROJECT SAFETY INSPECTION REPORT

PROJECT _____ DATE _____

	YES	NO	N/A
9. Is adequate distance maintained from overhead electrical lines?			
10. Are switches, circuit breakers, and switchboards installed in wet locations enclosed in weatherproof enclosures?			
CRANES AND RIGGING			
1. Are cranes inspected daily prior to use?			
2. Are crane swing areas barricaded or demarked?			
3. Is all rigging equipment tagged with an identification number and rated capacity?			
4. Is rigging equipment inspection documented?			
5. Are slings, chains, and rigging inspected before each use?			
6. Are damaged slings, chains, and rigging tagged and taken out of service?			
7. Are slings padded or protected from sharp corners?			
8. Do employees keep clear of suspended loads?			
9. Are rated load capacities and special hazard warnings posted on crane?			
10. Are the records of annual crane inspection available?			
11. Has accessible areas within the swing radius of the rear of the crane been barricaded?			
12. Do crane operators have required training/certification?			
COMPRESSED GAS CYLINDERS			
1. Are breathing air cylinders charged only to prescribed pressures?			
2. Are like cylinders segregated and stored in well ventilated areas?			
3. Is smoking prohibited in cylinder storage areas?			
4. Are cylinders stored secure and upright?			
5. Are cylinders protected from snow, rain, etc.?			
6. Are cylinder caps in place before cylinders are moved?			
7. Are fuel gas and oxygen cylinders stored a minimum of 20 feet apart?			
8. Are propane cylinders stored and used only outside of buildings?			
SCAFFOLDING			
1. Is scaffolding placed on a flat, firm surface?			
2. Are scaffold planks free of mud, ice, grease, etc.?			
3. Is scaffolding inspected before each use?			
4. Are defective scaffold parts taken out of service?			
5. Have employees completed scaffold user training?			
6. On scaffolds where platforms are overlapped, is planking overlapped a minimum of 12 inches?			
7. Does scaffold planking extend over end supports between 6 to 18 inches (dependent upon platform length)?			
8. Are employees restricted from working on scaffolds during storms and high winds?			
9. Are all pins in place and wheels locked?			
10. Is required perimeter guarding (top rail, mid rail, and toe board) present?			
11. Has a competent person been designated to oversee scaffold construction?			
12. Are employees prohibited from moving mobile scaffold horizontally while employees are on them?			
13. Are all scaffold components manufactured by the same company?			
WALKING AND WORKING SURFACES			
1. Are ladders regularly inspected?			
2. Are access ways, stairways, ramps, and ladders clean of ice, mud, snow, or debris?			

PROJECT SAFETY INSPECTION REPORT

PROJECT _____ DATE _____

	YES	NO	N/A
3. Are ladders being used in a safe manner?			
4. Are ladders kept out of passageways, doors, or driveways?			
5. Are broken or damaged ladders tagged and taken out of service?			
6. Are metal ladders prohibited in electrical service?			
7. Are stairways and floor openings guarded?			
8. Are safety feet installed on straight and extension ladders?			
9. Is general housekeeping being maintained?			
10. Are ladders tied off?			
11. Are handrails and side rails installed along the unprotected sides of stairways having 4 or more risers or rising more than 30 inches?			

SITE SAFETY PLAN

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

SITE POSTERS

1. Are the following posters displayed in a prominent and accessible area?			
A. Minimum Wage			
B. OSHA Job Protection			
C. Equal Employment Opportunity			
2. Are all required state-specific posters displayed?			

SITE CONTROL

1. Are work zones clearly marked?			
2. Are support trailers located to minimize exposure from a potential release?			
3. Are support trailers accessible for approach by emergency vehicles?			
4. Is the site properly secured during and after work hours?			
5. Is an exclusion zone sign-in/sign-out log maintained?			
6. Are only employees with current training and physicals permitted in exclusion zone?			

HEAVY EQUIPMENT

1. Is heavy equipment inspected as prescribed by the manufacturer?			
2. Is defective heavy equipment tagged and taken out of service?			
3. Are project roads and structures inspected for load capacities and proper clearances?			
4. Is heavy equipment shut down for fueling and maintenance?			
5. Are backup alarms installed and working on mobile equipment?			
6. Have qualified equipment operators been designated?			
7. Are riders prohibited on heavy equipment?			
8. Are guards and safety appliances in place and used?			
9. Are operators using the "three point" system when mounting/dismounting equipment?			

EXCAVATION

PROJECT SAFETY INSPECTION REPORT

PROJECT _____ DATE _____

	YES	NO	N/A
1. Has a "competent person" been designated to oversee excavation activities?			
2. Prior to opening excavations, are utilities located and marked?			
3. Has a professional engineer evaluated all excavations greater than 20 feet deep?			
4. Is there rescue equipment on site and accessible to the excavation area?			
5. Is excavated material placed a minimum of 24 inches from the excavation?			
6. Are the sides of excavations sloped or shored to prevent cave ins?			
7. Have excavations greater than 4 feet deep been monitored for hazardous atmospheres (i.e., LEL/O_2 deficiency)?			
8. Are ladders or ramps used in excavations over 4 feet deep?			
9. Are means of egress available so as to require no more than 25 feet of lateral travel?			
10. Are barriers, i.e., guardrails or fences, placed around excavations near pedestrian or vehicle thoroughfares?			
11. Is excavation inspected daily by competent persons and documented?			
CONFINED SPACES			
1. Have employees been trained in the hazards of confined spaces?			
2. Are confined space permits posted at entrance to confined space?			
3. Is a copy of the confined space entry procedure available?			
4. Has a rescue plan been established?			
5. Is an entry supervisor present at each permit-required entry?			
6. Are required extraction/fall protection devices being used?			
DECONTAMINATION			
1. Are decontamination stations set up on site?			
2. Is decontamination water properly contained and disposed of?			
3. Are all pieces of equipment inspected for proper decontamination before leaving the site?			
4. Are shin/metatarsal guards being used during power washing activities?			
HAZARD COMMUNICATION			
1. Is there a copy of the HAZCOM procedure on site?			
2. Are there MSDSs for required materials/chemicals present on site?			
3. Are all containers properly labeled, as to content, hazard?			
4. Have employees been trained in accordance with the HAZCOM procedure?			
5. Do employees (including subcontractors) know and understand the effects of exposure from the chemicals on site?			
6. Have all personnel signed the HAZCOM acknowledgment form?			
7. Is there an updated list of chemicals maintained on site?			
TRAINING			
1. Are tailgate safety meetings being conducted daily?			
2. Are current training/medical records maintained on site?			
DOCUMENTATION			
1. Is an OSHA 300 Log maintained on site and posted during February 1, to April 30,?			
2. Are accident report forms available?			
3. Is a copy of health and safety policy and procedures available on site?			

PROJECT SAFETY INSPECTION REPORT

PROJECT _____ DATE _____

ALL NEGATIVE RESPONSES	CORRECTIVE ACTION	ASSIGNED TO	DATE ASSIGNED	DATE COMPLETED	VERIFIED BY

DESCRIBE POSITIVE SAFETY OBSERVATIONS

ATTACHMENT 3

OFFICE SAFETY INSPECTION REPORT

OFFICE _____ DATE _____

DATE: _____ OFFICE NAME:
OFFICE MANAGER:
AREA(S) OF OFFICE INSPECTED:

INTERVIEWED EMPLOYEE:
SAFETY ISSUE:
CORRECTIVE ACTION:

ASSIGNED TO: _____ FOLLOW-UP DATE:
CORRECTION VERIFIED BY: _____ DATE:

INTERVIEWED EMPLOYEE:
SAFETY ISSUE:
CORRECTIVE ACTION:

ASSIGNED TO: _____ FOLLOW-UP DATE:
CORRECTION VERIFIED BY: _____ DATE:

INSPECTION COMPLETED BY: _____ DATE:

HEALTH AND SAFETY REVIEW BY: _____ DATE:

OFFICE SAFETY INSPECTION REPORT

OFFICE _____ DATE _____

	YES	NO	N/A
FIRST AID			
1. Are first aid kits accessible and identified?			
2. Are emergency eye wash/safety showers available where needed and inspected?			
3. Are first aid kits inspected weekly?			
FIRE PREVENTION			
1. Are employees smoking only in designated outdoor areas?			
2. Are fire lanes/evacuation routes established and maintained?			
3. Are approved safety cans/cabinets available for storage of flammable liquids?			
4. Are fire exits clearly identified and unobstructed?			
FURNITURE AND EQUIPMENT			
1. Are desks, file cabinets, etc. arranged so that drawers do not open into aisles or walkways?			
2. Are desk and file drawers closed after use?			
3. Is weight distributed in file cabinets so that upper drawer contents does not create a top-heavy condition?			
4. Are cabinets, bookcases, and shelves secured to prevent their falling over?			
5. Are faulty desks, chairs, or other office equipment repaired or taken out of service?			
6. Is adequate and sufficient lighting provided in all work areas?			
7. Are paper cutter blades in fully down and locked position when not in use?			
8. Are work stations arranged to be comfortable without unnecessary strains on backs, arms, necks, etc.?			
9. Do machines with exposed moving parts have appropriate guards?			
AISLES AND FLOORS			
1. Is aisle clearance adequate for two-way traffic and for unobstructed access to all parts of the office and building?			
2. Does office arrangement allow easy egress under emergency conditions?			
3. Are wastebaskets, briefcases, or other objects placed where they are not a tripping hazard?			
4. Are floors clear of pencils, bottles, and other loose objects?			
5. Are tripping hazards from electrical cords, phone outlets, or other protrusions on the floor prevented by arrangement of furniture or other means?			
6. Are floors free of loose tiles and projections that can create a tripping hazard?			
7. Is carpeting in good condition and not badly worn or torn?			
HAND AND POWER TOOLS			
1. Are defective hand and power tools tagged and taken out of service?			
2. Is eye protection available and used when operating power tools?			
3. Are guards and safety devices in place on power tools?			
4. Are power tools inspected before each use?			
5. Is the correct tool being used for the job?			
6. Do knife blades have guards when not in use?			
MOTOR VEHICLES			
1. Are vehicles regularly inspected?			
2. Are personnel licensed for the vehicles they operate?			
3. Are unsafe vehicles reported to supervision?			

OFFICE SAFETY INSPECTION REPORT

OFFICE _____ DATE _____

	YES	NO	N/A
4. Is safety equipment on vehicles?			
5. Are loads secure on vehicles?			
6. Are vehicle occupants using safety belts?			
7. Are current insurance cards and blank accident report forms located in vehicles?			
EMERGENCY PLANS			
1. Are emergency telephone numbers posted?			
2. Have emergency escape routes been designated?			
3. Are employees familiar with the emergency signal?			
4. Has an emergency route to the hospital been established and posted?			
MATERIALS HANDLING			
1. Are materials stacked and stored to prevent sliding or collapsing?			
2. Are flammables and combustibles stored in approved containers?			
3. Are tripping hazards identified?			
4. Are riders prohibited on material handling equipment?			
FIRE PROTECTION			
1. Has a fire alarm system been established?			
2. Do employees know the location and use of all fire extinguishers?			
3. Are fire extinguisher locations marked?			
4. Have fire extinguishers been professionally inspected during the last year?			
5. Are fire extinguishers visually inspected monthly?			
6. Is there an operating fire detection system?			
ELECTRICAL			
1. Are extension cords kept out of wet areas?			
2. Are certified electricians used for electrical work?			
3. Are GFCIs being used as needed?			
4. Are extension cords not being used in lieu of permanent wiring?			
5. Are warning signs exhibited on high voltage equipment (250V or greater)?			
6. Are switches, circuit breakers, and switchboards installed in wet locations enclosed in weatherproof enclosures?			
7. Are electric fans protected with guards of not over one-half inch mesh, which prevents fingers getting inside guard?			
8. Are cords, panels, receptacles, and plugs in good condition?			
9. Are multi-outlet strips not plugged into other multi-outlet strips?			
10. Are extension cords not plugged into other extension cords?			
11. Are circuit breakers or fuse panels properly labeled, kept closed, and accessible?			
12. Are extension cords arranged so that they are not placed over radiators, steam pipes, through doorways, or under carpets?			
13. Do space heaters have automatic shut-offs that will actuate if the heater tips over?			
14. Are space heaters UL listed and plugged directly into a wall receptacle?			
15. Are space heaters located at least 3 feet from combustible material?			
WALKING AND WORKING SURFACES			
1. Are cords, cables, and other items not placed in walkways?			
2. Are ladders regularly inspected?			
3. Are access ways, stairways, ramps, and ladders clean of ice, mud, snow, or debris?			

OFFICE SAFETY INSPECTION REPORT

OFFICE _____ DATE _____

	YES	NO	N/A
4. Are ladders being used in a safe manner?			
5. Are ladders kept out of passageways, doors, or driveways?			
6. Are broken or damaged ladders tagged and taken out of service?			
7. Are metal ladders prohibited in electrical service?			
8. Are stairways and floor openings guarded?			
9. Are safety feet installed on straight and extension ladders?			
10. Are employees walking instead of running?			
11. Are handrails and side rails installed along the unprotected sides of stairways having 4 or more risers or rising more than 30 inches?			
12. Are there torn, loose, or curled carpets?			
HOUSEKEEPING			
1. Is good housekeeping maintained?			
2. Are paper and materials stored properly?			
3. Are cleaning fluids used only in small quantities and stored in closed containers that are kept in well-ventilated areas?			
4. If cleaning fluids are flammable, are they not used near a flame or an open heating element?			
5. Are wastebaskets emptied on a daily basis?			
SITE POSTERS			
1. Are the following posters displayed in a prominent and accessible area?			
A. Minimum Wage			
B. OSHA Job Protection			
C. Equal Employment Opportunity			
2. Are all required state-specific posters displayed?			
HAZARD COMMUNICATION			
1. Is the written HAZCOM program available?			
2. Is there a MSDS FOR EACH HAZARDOUS CHEMICAL present in the office?			
3. Are all containers properly labeled, as to content, hazard?			
4. Have employees been trained on chemical hazards?			
5. Have all employees signed the HAZCOM acknowledgment form?			
6. Is there a list of chemicals maintained on site?			
DOCUMENTATION			
1. Is an OSHA 300 Log maintained and posted during February1, to April 30?			
2. Are accident report forms available?			
3. Is a copy of health and safety policy and procedures available?			

OFFICE SAFETY INSPECTION REPORT

OFFICE _____ DATE _____

ALL NEGATIVE RESPONSES	CORRECTIVE ACTION	ASSIGNED TO	DATE ASSIGNED	DATE COMPLETED	VERIFIED BY

DESCRIBE POSITIVE SAFETY OBSERVATIONS

ATTACHMENT 4
LABORATORY SAFETY INSPECTION REPORT

LOCATION _____ DATE _____

		YES	NO	N/A
I.	FIRST AID			
1.	Are first aid kit locations identified and accessible?			
2.	Are emergency eye wash/safety showers available and inspected monthly?			
3.	Is access to eye wash units and safety showers unimpeded?			
II.	PERSONAL PROTECTIVE EQUIPMENT			
1.	Are employees wearing safety glasses in the laboratory?			
2.	Are laboratory coats worn by all employees and visitors when working with chemicals and/or samples?			
3.	Are gloves worn when chemicals and samples are handled?			
III.	FIRE PREVENTION/FIRE PROTECTION			
1.	Are employees smoking only in designated outdoor areas?			
2.	Are flammable storage cabinets available and used when needed?			
3.	Has a fire alarm system been established?			
4.	Are fire extinguishers available and inspected monthly?			
5.	Do employees know the location and use of fire extinguishers?			
6.	Are fire extinguisher locations posted?			
7.	Have fire extinguishers been professionally inspected during the last year?			
IV.	EMERGENCY PLANS			
1.	Are emergency telephone numbers posted?			
2.	Have emergency escape routes been designated?			
3.	Are employees familiar with the emergency signal?			
4.	Are appropriate spill kit supplies available?			
5.	Are emergency exits marked?			
6.	Are sprinkler heads unobstructed?			
V.	ELECTRICAL			
1.	Are extension cords kept out of wet areas?			
2.	Are extension cords arranged so that they are not placed over radiators, steam pipes, through doorways, or under carpets?			
3.	Are cords, panels, receptacles, and plugs in good condition?			
4.	Are extension cords not being used in lieu of permanent wiring?			
5.	Are extension cords not plugged into other extension cords?			
6.	Are multi-outlet strips not plugged into other multi-outlet strips?			
7.	Has a lockout/tagout system been established?			
8.	Are GFCIs being used on all temporary electrical systems and as needed?			
9.	Are warning signs exhibited on high voltage equipment (250V or greater)?			
10.	Are circuit breakers or fuse panels properly labeled, kept closed, and accessible?			
VI.	COMPRESSED GAS CYLINDERS			
1.	Are like cylinders segregated and stored in well ventilated areas?			
2.	Is smoking prohibited in cylinder storage areas?			
3.	Are cylinders stored secure and upright?			
4.	Are cylinders protected from snow, rain, etc.?			

ATTACHMENT 4
LABORATORY SAFETY INSPECTION REPORT

LOCATION _____ DATE _____

		YES	NO	N/A
5.	Are cylinder caps in place for storage and movement?			
VIII.	WALKING AND WORKING SURFACES			
1.	Are accessways, stairways, and ramps clean of ice, mud, snow, or debris?			
2.	Are stairways and floor openings guarded?			
3.	Are handrails and siderails installed along the unprotected sides of stairways having 4 or more risers or rising more than 30 inches?			
4.	Are tripping hazards from electrical cords, phone outlets, or other protrusions on the floor prevented by arrangement of furniture or equipment?			
5.	Are floors free of loose tiles and projections that can create a tripping hazard?			
VIII.	HAZARD COMMUNICATION			
1.	Is there a copy of the Chemical Hygiene Plan (CHP) on site?			
2.	Have employees been trained in accordance with the CHP?			
3.	Are all containers properly labeled as to content, hazard, etc.?			
4.	Is there an updated list of chemicals maintained at the laboratory?			
5.	Are there MSDSs for the chemicals present in the laboratory?			
6.	Do employees know and understand the effects of exposure from the chemicals they work with?			
IX.	DOCUMENTATION			
1.	Is an OSHA 300A Log maintained on site and posted between February 1and May 1?			
2.	Are accident report forms available?			
X.	FURNITURE AND EQUIPMENT			
1.	Are desks, file cabinets, etc. arranged so that drawers do not open into aisles or walkways?			
2.	Are desk and file drawers closed after use?			
3.	Are cabinets, bookcases, and shelves secured to prevent their falling over?			
4.	Is adequate and sufficient lighting provided in all work areas?			
5.	Are work stations arranged to be comfortable without unnecessary strains on backs, arms, necks, etc.?			
6.	Do machines with exposed moving parts have guards?			
XI.	LABORATORY FUME HOODS			
1.	Are face velocities posted on each hood?			
2.	Is the average face velocity at least 100 ft/min.?			
3.	Is the sash position marked or otherwise indicated to show the acceptable position for achieving the desired airflow rate?			
4.	Has the hood face velocity been measured with a calibrated instrument in the last 6 months?			
5.	Are signs posted on hoods that are not working correctly?			
6.	Does the hood contain visual indicators that it is working properly (e.g., manometer, magneheilic guage, etc.)?			

ATTACHMENT 4
LABORATORY SAFETY INSPECTION REPORT

LOCATION _____ DATE _____

	YES	NO	N/A
XII. GENERAL LABORATORY RULES			
1. Are open-toed shoes and sandals prohibited in the laboratory?	_____	_____	_____
2. Are eating, drinking, chewing gum or tobacco products prohibited in the laboratory?	_____	_____	_____
3. Are food refrigerators labeled such as to prevent chemical storage or vice versa?	_____	_____	_____
XIII. HOUSEKEEPING			
1. Are lab benches orderly?	_____	_____	_____
2. Are laboratories free of liquid spills?	_____	_____	_____
3. Are sinks free of accumulated glassware?	_____	_____	_____
4. Are waste disposal containers available and labeled?	_____	_____	_____

PROCEDURE

Subject: JOB SAFETY ANALYSIS (JSA)

1.0 PURPOSE AND SUMMARY

This procedure provides the guidelines to perform a Job Safety Analysis.

The (JSA) is an effective management technique for identifying hazardous conditions and unsafe acts in the workplace. A JSA is intended to analyze the individual steps or activities, which together create a job or specific work duty, and to detect any actual or potential hazards that may be present. This process can identify less obvious potential hazards that may go undetected during routine management observations or audits. **A new JSA must be completed every day, before commencement of any work activity and updated in the event of changing conditions. It should be understood that changing conditions that a work crew encounters during a work period (inclement weather, another contractor began work in area, etc.) requires that the JSA be modified to address the new hazards. The JSA should be changed to reflect new conditions in the task being performed or new hazards not identified previously.**

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- 5.1 General Requirements
- 5.2 Methods of Conducting JSA's
- 5.3 Analyzing The Job
- 5.4 Common Errors
- 5.5 Identifying the Hazards and Potential Accidents
- 5.6 Accident Types
- 5.7 Writing Instructions
- 5.8 Develop Solutions

6.0 Specific Requirements
- 6.1 Sequence of Basic Job Steps
- 6.2 Potential Hazards
- 6.3 Recommended Action Procedure

7.0 References
8.0 Attachments

3.0 Responsibility Matrix

3.1 Procedure Responsibility

The Manager/Supervisor is responsible for implementing and enforcing this procedure.

The Safety Representative is responsible for monitoring compliance with this procedure.

Each Employee is responsible for complying with the project safety program, along with the rules and regulations as stipulated in this procedure and instructions issued by the employee's supervisor.

It is the responsibility of management and supervision to ensure that this policy is followed. Accordingly, should the project / site requirements stipulate the use of another method of job safety analysis, it is the responsibility of management and supervision to ensure that the proposed method either meets or exceeds this JSA policy and the accompanying JSA form. Any policy or JSA form that does not cover the items contained herein shall not be used.

3.2 Action/Approval Responsibilities

The Responsibility Matrix is Attachment 1

4.0 DEFINITIONS

HAZARD - A potential danger. Oil on the floor is a hazard.
ACCIDENT - An unintended happening that may result in injury, loss or damage.
EXAMPLE - Slipping on the oil is an accident.
INJURY - The result of an accident. A sprained wrist from the fall would be an injury.

5.0 TEXT

5.1 General Requirements

The first page of the JSA form is a checklist that should be used for reference purposes and serves to assist the work crew and supervisor in completing the second page of the JSA. The first page of the JSA form is used to write out the various tasks involved, potential hazards, recommended actions, etc.

Job Safety Analysis is a procedure used to review job methods and uncover hazards:

- That may have been overlooked in a Hazard Analysis, project layout or design of the

equipment, tools processes or work area.

- That may have developed after production started.

- That may have resulted from changes in work procedures or personnel

The three basic steps in performing a job safety analysis are

- (Job Task) Break the job down into successive steps or activities and observe how these actions are performed.
- (Potential Hazards) Identify the hazards and potential accidents. This is the critical step because only an identified problem can be corrected or eliminated.
- (Recommended Actions) Develop safe job procedures to eliminate the hazards and prevent potential accidents.

5.2 Methods of Conducting JSA's

There are two basic methods for conducting the Job Safety Analysis:

— Direct observation

— Group discussion

A fast and efficient method of conducting a JSA is through direct observations of job performance. In many instances, however, this method may not be practical. However, through direct observation, one can gain knowledge concerning an activity and use it on a future JSA.

For instance, new jobs and those that are done infrequently do not lend themselves to direct observation. When this is the case, the JSA can be made through discussions with persons familiar with the job. Individuals often involved in the process include, but are not limited to, first line supervisors, safety specialists, engineers, experienced employees and outside contractors.

5.3 Analyzing The Job

When analyzing the job, most people start with the worst first. You should be guided by the following factors:

- **Frequency of Accidents** (Including "near misses"):
  An element of a job that repeatedly produces accidents is a candidate for starting a JSA. The greater the number of incidents associated with a job element, the greater its priority claim for a JSA.

- **New or Revised Jobs**:
  Jobs created by changes in equipment or in processes obviously have no history of accidents, but their accident potential may not be fully appreciated. Analysis should not be delayed until accidents or near misses occur.
  Any changes from the original task/job shall be noted on the form as a revision. Once this has occurred the new found hazards must be reviewed with the crew.

- **Multiple Employee Exposure**
  Jobs that expose more than one individual to potential hazards should also be analyzed.

5.4 Common Errors

Five common errors that are often made when performing a job analysis are:

- Making the breakdown so detailed that an unnecessarily large number of steps are listed.
- Making the job so general that basic steps are not recorded.
- Failure to identify the education and experience level of the target audience.
- Failure to identify end use(s). (i.e., training, actual procedure, basis for procedure, etc.)
- Always relying on the Supervisor for completing the JSA. Supervisor should describe work scope to the crew. The crew should then assist in identifying hazards and controls at the job site with active involvement from the Supervisor. Ultimately, the supervisor is responsible, however, crew members and the Supervisor should be actively involved in each JSA.

5.5 Identifying the Hazards and Potential Accidents

The purpose is to identify all hazards, both **physical** and **environmental**. To do this, ask yourself these questions about each step:

- Is there a danger of striking against, being struck by, or otherwise making harmful contact with an object?
- Can the employee be caught in, on, by or between objects?
- Is there a potential for a slip, trip or fall? If so, will it be on the same elevation or to a different elevation?
- Can he strain himself by pushing, pulling, lifting, bending or twisting?
- Is the Environment hazardous to one's safety or health? Has the weather been considered as a factor? Has the work product of others, as it pertains to the environment, been considered???

5.7 Accident Types

- Struck by
  - moving or flying object
  - falling material
- Struck against
  - stationary or moving object
  - protruding object
  - sharp or jagged edge
- Contact with
  - acid
  - electricity
  - heat
  - caustic
  - cold
  - radiation
  - toxic and noxious substances
- Overexertion / repetitive
  - Lifting
  - pulling
  - pushing
  - reaching
  - twisting
- Caught
  - in
  - on
  - between
- Fall to
  - same level
  - lower level
- Bodily reaction from
  - voluntary motion
  - involuntary motion
- Rubbed or abraded by
  - friction
  - pressure
  - vibration

5.8 Writing Instructions

- Put any qualifying statements first, not last.
- Start each instruction with an action word.
- Each instruction should be observable.
- Each instruction should be measurable.

When evaluating a given procedure, ask the following question.

"What should the employee do -- or not do -- to eliminate this particular hazard or prevent this potential accident?"
Answer must be specific and concrete to be beneficial. General precautions such as "be careful"; "use caution" or "be alert" are useless. Answers should state what to do and how to do it.

This recommendation, "Make certain the wrench does not slip or cause loss of balance" is incomplete. It does not tell how to prevent the wrench from slipping. Here is a more complete recommendation. "Set the wrench properly and securely. Test its grip by exerting a slight pressure on it. Brace yourself against something immovable, or take a stance with feet wide apart before exerting full pressure. This prevents loss of balance if

the wrench slips."

Job Safety Analyses can be very beneficial if they are performed correctly. They not only result in a safer job, but also increase productivity and eliminate waste. Take the time to do them correctly; **and more importantly, use them.**

5.9 Develop Solutions

The final step in conducting a JSA is to develop a recommended safe job procedure to prevent the occurrence of potential accidents. The principle solutions are:

- Find a new way to do the job.
- Change the physical conditions that create the hazard.
- Try to eliminate remaining hazards by changing work methods or procedures.
- Try to reduce the necessity of doing a job, or at least the frequency that it must be performed.

6.0 Specific Requirements

Instructions for Completing Job Safety Analysis Form

Job Safety Analysis (JSA) is an important accident prevention tool that works by finding hazards and eliminating or minimizing them before the job is performed, and before they have a chance to become accidents.

- Use your JSA for job clarification and hazard awareness
- as a guide in new employee training
- for periodic contacts and for retraining of senior employees
- as a reference tool to be used prior to commencing a job which is performed infrequently
- as an accident investigation tool
- Informing employees of specific job hazards and protective measures.

6.1 Sequence of Basic Job Steps

Break the job down into steps. Each of the steps of a job should accomplish some major task. The task will consist of a set of movements used to perform a task, and then determine the next logical set of movements.
For example, the job might be to move a box from a conveyor in the receiving area to a shelf in the storage area. How does that break down into job steps? Picking up the box from the conveyor and putting it onto a hand truck is one logical set of movements, so it is one job step.

Everything related to that one logical set of movements is part of that job step. The next logical set of movements might be pushing the loaded hand truck to the storeroom. Removing the boxes from the truck and placing them on the shelf is another logical set of movements. Finally, returning the hand truck to the receiving area might be the final step in this type of job.

Be sure to list all the steps in a job. Some steps might not be done each time -- checking the casters on a hand truck, for example. However, that task is part of the job as a whole, and should be listed and analyzed.

6.2 Potential Hazards

Identify the hazards associated with each step. Examine each step to find and identify hazards -- actions, conditions and possibilities that could lead to an accident. It is not enough to look at the obvious hazards. It is also important to look at the entire work environment and discover every conceivable hazard that might exist.

- Be sure to list health hazards as well, even though the harmful effect may not be immediate. A good example is the harmful effect of inhaling a solvent or chemical dust over a long period of time.
- Hazards contribute to accidents, injuries and occupational illnesses. In order to do part three of a JSA effectively, you must identify potential and existing hazards. That's why it's important to distinguish between a hazard, an accident and an injury. Each of these terms has a specific meaning:

Some people find it easier to identify possible accidents, illnesses, and work back from them to the hazards. If you do that, you can list the accident and illness types in parentheses following the hazard. However, be sure you focus on the hazard for developing recommended actions and safe work procedures.

6.3 Recommended Action Procedure

Decide what actions are necessary to eliminate or minimize the hazards that could lead to an accident, injury or occupational illness. Among the actions that can be taken are:

1) engineering the hazard out

2) administrative controls

   - job instruction training

   - good housekeeping

- good ergonomics
  (Positioning the person in relation to the machine or other elements in the Environmental in such a way as to eliminate stresses and strains)

3) providing personal protective equipment

- List recommended safe operating procedures on the form, and list required or recommended personal protective equipment for each step of the job.
- Be specific. Say exactly what needs to be done to correct the hazard, such as "lift, using your leg muscles." Avoid general statements like "be careful."
- Give a recommended action or procedure for every hazard.
- If the hazard is a serious one, it shall be corrected immediately.

The JSA should be changed to reflect new conditions in the task being performed or new hazards not identified previously.

7.0 REFERENCES

"Job Hazard Analysis", U.S. Dept. of Labor -- OSHA Publication No. 3071

"Job Safety Analysis" - Safety Manual No. 5, U.S. Dept. of Interior, Mining Enforcement and Safety Administration

8.0 ATTACHMENTS

1. Responsibility Matrix
2. Job Safety Analysis Form

ATTACHMENT 1
EMPLOYEE AND SUBCONTRACTOR TRAINING REQUIREMENTS

Responsibility Matrix

Action	Procedure Section	*Responsible Party*		
		Manager/ Supervisor	H&S Representative	Employee
Responsible for implementing and enforcing procedure	3.1	X		
Monitoring for compliance with the procedure.	3.1		X	
Complying with the project JSA program, along with the rules and regulations as stipulated in this procedure	3.1			X
Review completed JSA forms for any errors and communicate to the originator of the changes.	5.5		X	

Shaw The Shaw Group Inc

JOB SAFETY ANALYSIS

DATE:
JOB#:
PERMIT#:
ISSUED BY:

SUPERVISION/FOREMAN _____ _____

Consider the following and check the items which apply to the job, then review with the work crew.

PERMITS

- ____ Required
- ____ Cold Work
- ____ Hot Work
- ____ Entry Permit
- ____ All Conditions Met
- ____ Signed Off When Complete
- ____ Other _____

PERSONAL PROTECTIVE EQUIP. (PPE)

- ____ Type of Gloves
- ____ Composition of Gloves
- ____ Special Purpose Gloves
- ____ Tyvek Suit
- ____ Acid Suit /Slicker Suit
- ____ Rubber Boots
- ____ Mono Goggles (vented/non-vented)
- ____ Face Shield
- ____ Respirator
- ____ Fresh Air
- ____ Ear Protection
- ____ Safety Harness
- ____ Burning Goggles
- ____ Other _____

TOOLS

- ____ Current Inspection
- ____ Proper Tools for the Job
- ____ Good Tool Condition
- ____ Qualifications
- ____ Other _____

EMERGENCY EQUIPMENT

- ____ Fire Extinguishers
- ____ Safety Shower
- ____ Evacuation Route
- ____ Other _____

ACCESS

- ____ Scaffold (properly inspected)
- ____ Ladder (Tied off)
- ____ Manlift
- ____ Personnel Basket (inspected & approved)
- ____ Operator Training
- ____ Special Provisions
- ____ Other

WELDING

- ____ Flashburns
- ____ Combustibles
- ____ Spark Containment
- ____ Shields
- ____ Grounding
- ____ Water Hose
- ____ Fire Extinguisher
- ____ Fire Blanket
- ____ Fire Watch
- ____ Sewer Covers
- ____ Other _____

OVERHEAD WORK

- ____ Barricades
- ____ Signs
- ____ Hole Cover
- ____ Handrail
- ____ Other _____

ELECTRICAL

- ____ Locked & Tagged out
- ____ Try Start/Stop Switch
- ____ GFCI Test
- ____ Assured Grounding
- ____ Extension Cord Inspection
- ____ Other _____

LIFTING

- ____ Forklift
- ____ Cherry Picker
- ____ Load Chart
- ____ Angle
- ____ Crane
- ____ Chainfall
- ____ Proper Rigging Practices
- ____ Manual Lifting
- ____ Condition of Equipment
- ____ Operator Certificate

HAZARDS (ENVIRONMENTAL)

- ____ Electrical Shock
- ____ Heat Stress
- ____ Heavy Objects
- ____ Hot/Cold Surf. Or Mat.
- ____ Inadequate Lighting
- ____ Line Breaking
- ____ Noise
- ____ Poor Access/Egress
- ____ Sharp Objects
- ____ Other _____

HAZARDS/CHEMICALS

- ____ Chemical Burn Shin/Eyes
- ____ Flammable
- ____ Ingestion
- ____ Inhalation
- ____ Skin Contamination

HAZARDS/BODY

- ____ Fall Potential
- ____ Pinch Points
- ____ Slip-Trip Potential
- ____ Other _____

OTHER WORK IN AREA

- ____ Others Working Overhead
- ____ Type Work Others Doing
- ____ PPE Due to Other Work
- ____ Other _____

Confined Space

Know the Following:

- Possible hazards within the confined space
- First signs of exposure
- How to summons help
- How to track personnel
- Entering and exiting the confined space
- Maintain contact with all entrants by voice or visual
- Do not attempt to rescue unless you are a part of a coordinated effort
- Remain at entry point assume no duties with take you from there.

SUPERVISOR/FOREMAN RECOMMENDATION: _____

Shaw The Shaw Group Inc.

JOB SAFETY ANALYSIS

DATE:
JOB#:
PERMIT#:
ISSUED BY:

Location of Job
(Unit/Location on Project):

Required PPE:	Safety Access/ Location	Supervisor of Work:
	Safe Haven:	JSA Prepared By:
	Wind Direction:	Are other crews in area?
Pre-Job Preparation	Evacuation Route:	
1. Fill out JSA 2. Review JSA (EVERYONE) 3. Sign JSA (EVERYONE)	Assembly Point:	New: / Revised:

Job Task (What are You Doing)	Audit the Job Audit Time:

Potential Hazards	Supervisors Comments

Recommended Action or Procedure	Supervisor's Initials:

Crew Name Signatures:		

PROCEDURE

Subject: TAILGATE SAFETY MEETINGS

1.0 PURPOSE AND SUMMARY

This procedure establishes the requirement for the conductance of tailgate safety meetings. These meetings are to be conducted at each company project site, on a daily basis, prior to the start of any work activities.

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7.0 Cross References
8.0 Attachments

3.0 RESPONSIBILITY MATRIX

3.1 Procedure Responsibility

The Vice President, Health and Safety is responsible for the issuance, revision, and maintenance of this procedure.

3.2 Action/Approval Responsibilities

The Responsibility Matrix is Attachment 1.

4.0 DEFINITIONS

Company - All wholly-owned subsidiaries of Shaw Environmental & Infrastructure, Inc. (Shaw E & I).

Tailgate Safety Meeting - A short training or informative session that provides safety guidelines for the planned work activities for the day or shift.

5.0 TEXT

The project supervisor or his/her designee conducts a tailgate safety meeting at the beginning of each shift or whenever new employees arrive at the work site. The topics discussed at the tailgate safety meeting should cover the work assignments for the day, the expected hazard(s) presented by the work, and an explanation on how employees will protect themselves from those hazards.

The meetings are to be documented by the completion of a Tailgate Safety Meeting Form. The project supervisor will assure that the form is properly completed and signed by all attendees. Completed forms will be maintained in the project files.

The following sections provide guidance for the completion of the form:

A. **Project Name/Number** - Specific project name and number assigned to the project.

B. **Date** - Date of meeting.

C. **Time** - Time at which meeting is held.

D. **Client** - Identification, name, etc. of entity for whom work is to be performed.

E. **Work Activities** - Detailed description of the work activities to be performed that day.

F. **Hospital Name/Address** - Hospital name and address designated to be used for the project.

G. **Phone Number** - Designated hospital non-emergency phone number.

H. **Ambulance** - Phone number for medical emergency transportation.

I. **Safety Topics Presented:**

1. **Chemical Hazards** - Specific chemical name and adverse properties of all chemicals to be encountered on the job that day. A Material Safety Data Sheet (MSDS) for each should be available and discussed in accordance with Procedure HS060.

2. **Physical Hazards** - Address physical hazards associated with the work site, such as slipping/tripping/falling hazards, pinch points, overhead hazards, and nearby operations that could pose a hazard.

3. **Personal Protective Equipment** - Specify levels of protective clothing and protective devices to be used by employees for each of the day's activities.

4. **New Equipment** - Indicate proper work techniques and any hazards associated with new or unfamiliar equipment.

5. **Other Safety Topic(s)** - List any remaining safety topics pertinent to the potential hazards of the job for that day. This is an area where different, unique subjects can be introduced to make the tailgate safety meeting more interesting.

J. **Attendees** - Printed name and signature of all persons in attendance. (Also, list affiliation if not employed by the company.)

K. **Meeting Conducted By** - Printed name and signature of individual conducting the tailgate safety meeting.

6.0 EXCEPTION PROVISIONS

Variances and exceptions may be requested pursuant to the provisions of Procedure HS013, Health and Safety Procedure Variances

7.0 CROSS REFERENCES

HS013 Health and Safety Procedure Variances
HS060 Hazard Communication Program

8.0 ATTACHMENTS

1. Responsibility Matrix
2. Tailgate Safety Meeting Form

ATTACHMENT 1
TAILGATE SAFETY MEETINGS

Responsibility Matrix

Action	Procedure Section	*Responsible Party*	
		Vice President of Health and Safety	Project Supervisor
Issuance, Revision, and Maintenance of Procedure	3.1	X	
Conduct Meeting	5.0		X

ATTACHMENT 2

TAILGATE SAFETY MEETING FORM

Project Name/Number: _____ Date: _____ Time: _____

Client: _____

Work Activities: _____

Hospital Name/Address: _____

Hospital Phone No.: _____ Ambulance Phone No.: _____

Safety Topics Presented

Chemical Hazards: _____

_____

Physical Hazards: _____

_____

Personal Protective Equipment:

Activity: _____ PPE Level: _____

Activity: _____ PPE Level: _____

Activity: _____ PPE Level: _____

Activity: _____ PPE Level: _____

Activity: _____ PPE Level: _____

New Equipment: _____

Other Safety Topic(s): _____

_____

Attendees

NAME PRINTED	SIGNATURE

Meeting conducted by:

_____

PROCEDURE

Subject: HAZARD COMMUNICATION PROGRAM

1.0 PURPOSE AND SUMMARY

This procedure has been developed to ensure that all affected company employees are provided with current information on the hazardous chemicals that they may encounter during their work. The basic principle of Hazard Communication (HAZCOM) is that anyone that works with hazardous chemicals has both a need and a right to know the identities and the hazards of any chemical to which they may be occupationally exposed. This principle has been propagated by the Occupational Safety and Health Administration (OSHA) in 29 Code of Federal Regulations (CFR) 1910.1200 *Hazard Communication.*

Some company activities are likely to occur in states or localities that either have or will have requirements that differ from those contained within the federal standard. In such circumstances, the local health and safety representative will be responsible for ensuring that these requirements are included in either a site health and safety plan or a similar document and conveyed to all affected employees. If federal, state, or local regulations vary or conflict, the more protective requirements and practices will be followed.

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- 5.4 Material Safety Data Sheets (MSDS)
- 5.5 Training
- 5.6 Trade Secrets
- 5.7 Contractors

6.0 Exception Provisions
7.0 Cross References
8.0 Attachments

3.0 RESPONSIBILITY MATRIX

3.1 Procedure Responsibility

The EH&S Operations Manager is responsible for the issuance, revision, and maintenance of this procedure.

3.2 Action/Approval Responsibilities

The Responsibility Matrix is Attachment 1.

4.0 DEFINITIONS

Article - A manufactured item other than a fluid or particle which is formed to a specific shape or design during manufacture, has end use function dependent in whole or in part upon its shape or design during end use, which under normal conditions of use does not release more than trace amounts of a hazardous substance and does not pose a physical hazard or health risk to employees.

Affected Employee - Any company employee who may be exposed to hazardous chemicals under normal operating conditions or in foreseeable emergencies.

Company - All wholly-owned subsidiaries of Shaw Environmental & Infrastructure, Inc. (Shaw E & I)

Hazardous Chemical - Any chemical which poses a physical or health hazard.

Health Hazard - A chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. Health hazards include chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes.

Immediate Use - When hazardous chemicals will be under the control of and used only by the person who transfers it from a labeled container and only within the work shift in which it is transferred.

Label - Any written, printed, or graphic material displayed on or affixed to containers of hazardous chemicals.

Local Health and Safety Representative - The person who is responsible for the management and/or oversight of health and safety activities at a particular workplace. He/she may be assigned as a site health and safety officer or act as a home office health and safety manager who is responsible for multiple workplaces. This person does not necessarily need to be physically

located at a workplace in which they are responsible for ensuring that the requirements of this procedure are fulfilled. The local health and safety representative may designate another qualified individual to assume some or all of the responsibilities delineated in this procedure.

Physical Hazard - A chemical for which there is scientifically valid evidence that it is a combustible liquid, compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable, or reactive.

Responsible Party - The entity responsible for preparation or distribution of Material Safety Data Sheets (MSDS) that can provide additional information on the hazardous chemical and appropriate emergency procedures.

Trade Secret - Any confidential formula, pattern, process, device, information, or compilation of information that is used in an employer=s business, and that gives the employer an opportunity to obtain an advantage over competitors who do not currently know or use it.

Workplace - An establishment, job site, laboratory, office, or project at one geographic location containing one or more work areas.

5.0 TEXT

In accordance with the requirements established in 29 CFR 1910.1200, employers are required to develop, implement, and maintain at each workplace a HAZCOM program. The program contained herein is intended to ensure that the hazards of all chemicals used by employees are evaluated and that information concerning the hazards of each chemical are conveyed to affected employees. The company program generally consists of five provisions, including hazardous chemical inventories, procurement of hazardous chemicals, container labeling, MSDSs, and the development and implementation of employee training programs. Since the company does not typically produce, distribute, or import hazardous chemicals, the focus of this procedure is on establishing an effective consumer/handler type HAZCOM program and the communication of information to our affected employees.

There are some types of chemicals that are specifically exempt from this procedure. These materials include:

- Any hazardous waste as defined by the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1967, as amended (42 U.S.C. 6901 *et seq.*), when subject to regulations issued under that Act by the U.S. Environmental Protection Agency.

- Any hazardous chemical as defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) when the hazardous chemical is the focus of remedial or removal actions being conducted under CERCLA in accordance with U.S. Environmental Protection Agency regulations.

- Tobacco or tobacco products.

- Wood or wood products, including lumber which will not be processed, where the manufacturer or importer can establish that the only hazard they pose to employees is the potential for flammability or combustibility. Wood or wood products which have been treated with a hazardous chemical are covered by this procedure, and wood which may be subsequently sawed or cut, generating dust.

- Articles.

- Food or alcoholic beverages which are sold, used, or prepared in a retail establishment, or foods intended for personal consumption by employees while in the workplace.

- Any drug, as defined by the Federal Food, Drug, and Cosmetic Act, when it is in solid, final form for direct administration to patient; drugs which are packaged by the manufacturer for sale to consumers in a retail establishment; and drugs intended for personal consumption by employees while in the workplace.

- Cosmetics which are packaged for sale to consumers in a retail establishment, and cosmetics intended for personal consumption by employees while in the workplace.

- Any consumer product or hazardous chemical, as defined by Consumer Product Safety Act and Federal Hazardous Chemicals Act, where the employer can show that it is used in the workplace for the purpose intended by the manufacturer or importer of the product, and the use results in a duration and frequency of exposure which is not greater than the range of exposures that could reasonably be experienced by consumers when used for the purpose intended.

- Nuisance particulates where the manufacturer, distributor, or importer can establish that they do not pose any physical or health hazard covered under this procedure.

- Ionizing and nonionizing radiation.

- Biological hazards.

5.1 Hazardous Chemical Inventories

A complete list of all hazardous chemicals known to be present in the workplace that may expose an employee to a physical or health hazard will be maintained at each office location and project site. This list will be placed in the front section of the MSDS binder discussed in Section 5.4. The local health and safety representative/site safety officer will be responsible for maintaining the list and revising it as new chemicals are procured or when chemicals are no longer used and have been removed from the workplace. The identity of the hazardous chemical maintained on the list will be consistent with that

which appears on the MSDS. All affected employees will be made aware of the location of the MSDS binder.

5.2 Procurement of Hazardous Chemicals

Since the company does not typically manufacture, distribute, or import hazardous chemicals, procurement is the primary method of obtaining hazardous chemicals. The person initiating the procurement of a hazardous chemical will be responsible for requesting a MSDS from the manufacturer or distributor. This MSDS is to be provided either prior to or at the time of receipt of the chemical. Hazardous chemicals are strictly forbidden to be accepted without an accompanying MSDS. Upon receipt of a hazardous chemical, the person receiving the shipment will notify the local health and safety representative so that a review of the MSDS can be conducted. Also, note that the supplier is only required to submit a MSDS with the initial shipment of a hazardous chemical to a specific location.

In the unlikely event that a hazardous chemical is either manufactured, imported, or distributed by the company, the Vice President, Health and Safety will be notified so that required actions, as dictated by OSHA, can be implemented.

5.3 Container Labeling

Labeling on hazardous chemical containers is meant to provide immediate information to affected employees about the hazards of chemicals they will be expected to handle during the course of their job duties. It is the responsibility of the manufacturer, importer, or distributor of the chemical to ensure that each hazardous chemical leaving their place of business is labeled, tagged, or marked with the following information:

- Identity of the hazardous chemical (must be common to the label, the MSDS, and the chemical inventory list);
- Appropriate warnings of the hazardous effects of a chemical (words, pictures, symbols, or any combination that appears on the label and convey the specific physical or health hazards including target organ effects); and
- Name and address of the chemical manufacturer, importer, or other responsible party.

The person receiving the shipment is responsible to ensure that each container of hazardous chemical(s) has been provided with this labeling information. Hazardous chemicals that do not contain adequate labeling will not be accepted by the receiving person. In the event that hazardous chemicals that do not contain adequate labeling are inadvertently received, they are not to be handled until the identity of the material and appropriate hazard warnings are provided. If the hazardous chemical is regulated by a chemical-specific health standard, then it must be labeled in accordance with the requirements of that standard.

As long as the hazardous chemicals are maintained in their original, properly labeled container and their composition is not altered, there is no need for additional labeling. In the event that the chemical is transferred from a labeled container to an unlabeled portable container, the user must label this secondary container unless the container is intended for immediate use of the employee who performs the transfer. In this case, the container must be labeled with the identity of the chemical and the appropriate hazard warnings, as described above.

In locations where employees are present who only communicate in languages other than English, all labeling information must be presented in their language as well as in English.

5.4 Material Safety Data Sheets (MSDS)

MSDSs are written documents that convey specific, detailed information about the hazards associated with a specific chemical. It is the responsibility of the manufacturer, importer, or distributor to either provide MSDSs prior to shipment or with the shipped materials. The employee receiving the shipment of materials is responsible to ensure that a MSDS has been supplied. As described in Section 5.2, the employee initiating the procurement is responsible for requesting a MSDS from the manufacturer or distributor. In the event that a MSDS has not been provided, it is the responsibility of the receiving person to obtain one from the manufacturer or distributor as soon as possible. The material will not be handled prior to the receipt of a MSDS.

Each MSDS will be forwarded to the local health and safety representative/site safety officer or a designee who will then place a copy into a MSDS binder. This binder will be maintained in the workplace and updated as new materials arrive. The local health and safety representative/site safety officer will ensure that this binder is reviewed with all affected employees and is readily accessible during each work shift. A designated area for the storage of the binder will be established and all employees are to be informed of its location. Employees can request a personal copy of a MSDS by completing the Employee Request for MSDS form provided in Attachment 2. Where employees travel between workplaces during a work shift, the MSDSs may be kept at the primary workplace. Affected employees must be able to immediately obtain information from the MSDSs in the event of an emergency.

MSDSs will be in English and other languages, as necessary, for the particular employees in which the MSDSs will be used. MSDSs are to include the following information:

- Name, address, and telephone number of the responsible party;
- Identity of the chemical as it appears on the label;
- Hazardous ingredients;
- Physical and chemical characteristics;
- Physical and health hazards;
- Primary route(s) of entry;

- OSHA permissible exposure limit (PEL) or other applicable exposure limits;
- Carcinogen information;
- Safe handling and use information;
- Control measures;
- Emergency and first aid procedures; and
- Date of preparation and latest revision date.

5.5 Training

All affected employees will be provided with information and training on the hazardous chemicals in their work area at the time of their initial assignment, when new information about the hazards of a chemical is discovered, and whenever a new physical or health hazard that the employees have not previously been informed of is introduced into the workplace. The HAZCOM training record has been provided as Attachment 3.

Information provided in this training will include:

1. Requirements of the HAZCOM program.
2. Any operations in the work area where hazardous chemicals are present.
3. Location of written hazard communication program, listing of hazardous chemicals present and MSDS.
4. Methods and observations that may be used to detect the presence or release of hazardous chemicals by use of monitoring devices, visual appearance or odor.
5. The physical and health hazards of chemicals in the work area.
6. Protection measures to be utilized to prevent exposure, appropriate work practices, emergency procedures and proper PPE to be used.
7. Explanation of the labeling system and the MSDS and how employees can obtain and use the appropriate hazard information.

Training on this HAZCOM program may be satisfied by the use of two different types of training sessions. These sessions include:

- **Tailgate Safety Meetings** - These meetings will be used to convey the methods and observations that may be used to detect the presence or release of a hazardous chemical in the workplace, the physical and health hazards of the chemicals in the workplace, and the measures that can be taken to protect affected employees from these hazards. The guidelines for this meeting are described in Procedure HS051, Tailgate Safety Meetings.

- **Workplace-Specific or Annual Refresher Training** - Either of these training sessions can be used to convey the details of this HAZCOM program. These details include an explanation of labeling systems, the use of MSDSs, and how employees can obtain and use the appropriate hazard information. These training sessions are discussed further in Procedure HS050, Training Requirements.

Workplace-specific and tailgate safety meetings will be facilitated by the local health and safety representative or another individual who is knowledgeable on the requirements of the HAZCOM program and the specific chemicals that are being discussed. Annual refresher training can only be conducted by personnel previously approved by the company Training Department.

5.6 Trade Secrets

Some hazardous chemical manufacturers, importers, and distributors may withhold proprietary information required to be present on a MSDS. In such instances, the name and telephone number of the manufacturer, importer, or distributor will be forwarded to the Vice President of Health and Safety for further action. It will be the responsibility of the Vice President of Health and Safety to either obtain the necessary information or to decide to reject the chemical for use in company workplaces.

5.7 Contractors

During the execution of our work, there will be situations when the company will be at locations where employees of other entities may be exposed to chemicals being used by the company. It will be the responsibility of the local health and safety representative or designee to provide the other entities= site representative(s) with copies of all MSDSs in which their employees may be exposed, as well as the labeling system in place, the protective measures to be taken, safe handling procedures to be used, and the location and availability of the MSDS binder.

Periodically, company work areas will be located on or adjacent to a facility operated by another entity. In these situations, the local health and safety representative or designee will contact the other entity to obtain applicable MSDS(s) for hazardous chemicals that company employees may be exposed to.

6.0 EXCEPTION PROVISIONS

Variances and exceptions may be requested pursuant to the provisions of Procedure HS013, Health and Safety Procedure Variances.

7.0 CROSS REFERENCES

HS013 Health and Safety Procedure Variances
HS050 Training Requirements
HS051 Tailgate Safety Meetings
HS500 OSHA Regulated Toxic and Hazardous Chemicals
OSHA 29 CFR 1910.1200

8.0 ATTACHMENTS

1. Responsibility Matrix
2. Employee Request for MSDS

3. HAZCOM and Right-to-Know Standards Employee Training Record

ATTACHMENT 1
HAZARD COMMUNICATION PROGRAM

Responsibility Matrix

Action	Procedure Section	*Responsible Party*				
		Purchaser	Receiver	Affected Employee	Local Health and Safety Representative	EH&S Operations Manager
Understand and Comply With State and/or Local Regulations	1.0				X	
Issuance, Revision, and Maintenance of Procedure	3.1					X
Review and Understand This Procedure	5.0	X	X	X	X	
Establish, Update, and Revise MSDS Binder	5.1				X	
Request MSDSs for Procured Chemicals	5.2	X				
Initial Review of MSDSs	5.2				X	
Implement Requirements For Company Manufactured, Imported, or Distributed Chemicals	5.2					X
Review Incoming Shipments for Hazard Labeling/MSDS	5.3		X			
Request Missing MSDSs From Manufacturer or Distributor	5.4		X			
Provide HAZCOM Training	5.5				X	
Receive HAZCOM Training	5.5			X		
Obtain Information on Proprietary Chemicals	5.6					X
Transmit MSDSs to Contractors	5.7				X	
Obtain MSDSs From Other Entities	5.7				X	

ATTACHMENT 2

EMPLOYEE REQUEST FOR MATERIAL SAFETY DATA SHEET (MSDS)

Employee Name: (Please print) _____

Employee Number: _____

Job Title/Location: _____

Department/Work Area: _____

I am requesting a copy of the MSDS(s) for the following chemical(s):

(Chemical name, Common name, Trade name)

1. _____

2. _____

3. _____

_____

Signature Date

I have received a copy of the above MSDS(s) I requested.

_____

Signature Date

cc: Local Health and Safety Representative

ATTACHMENT 3

HAZARD COMMUNICATION AND RIGHT-TO-KNOW STANDARDS EMPLOYEE TRAINING RECORD

	INITIAL:
1. I have been informed about the Hazard Communication Program, Material Safety Data Sheets (MSDS), their use and location, and the procedures to obtain copies.	
2. I have been informed that some of my work may involve exposure to toxic substances, the hazards of which will be reviewed with me in tailgate safety meetings or site-specific training.	
3. I have been informed about the right of employees to have access to relevant exposure and medical records, and the procedures for requesting access.	
4. I understand that the company must act upon a request in a reasonable amount of time so as to avoid interruption of normal work operations.	
5. I have been provided access to the applicable regulations governing hazard communication, and access to employee exposure and medical records.	

PRINT NAME: _____

SIGNATURE: _____

EMPLOYEE NUMBER: _____

DATE: _____

PROCEDURE

Subject: MEDICAL POLICIES AND PROCEDURES

1.0 PURPOSE AND SUMMARY

An effective medical surveillance program is a key element in the company's overall program to protect the health and safety of all employees and personnel working with us. Provisions are made for the following:

- Baseline exams;
- Annual exams;
- Exit exams;
- Disability/Medical Limitation Follow-up;
- Re-hiring former employees; and
- Temporary, contractor, and subcontractor personnel.

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  5.6 Re-hiring Former Employees
6.0 Exception Provisions
7.0 Cross References
8.0 Attachments

3.0 RESPONSIBILITY MATRIX

3.1 Procedure Responsibility

The Director of Health & Safety is responsible for the issuance, revision, and maintenance of this procedure.

3.2 Action/Approval Responsibilities

The Responsibility Matrix can be found as Attachment 1 in Section 8.0.

4.0 DEFINITIONS

Company – all wholly-owned subsidiaries of Shaw Environmental & Infrastructure, Inc. (Shaw E & I)

5.0 TEXT

The purpose of a medical surveillance program is to protect the health of the employee, by working in conjunction with an effective hazard recognition and control program. The medical surveillance exam focuses on health effects related to the workplace. Employees covered are all of those who are or may be exposed to hazardous substances or health hazards at or above the Permissible Exposure Limit (PEL) or above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year. As well as all employees who wear a respirator for 30 days or more a year and any employees who are injured, become ill or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation.

Health Resources (800-350-4511) has been selected to manage the delivery of medical surveillance services. Jerry Berke, M.D., M.P.H. has been designated as the company's consulting Medical Director.

5.1 Medical Protocols

The company's Medical Surveillance Program consists of various examination modules which differ based upon the employees' job duties and whether it is for baseline, annual update, or exit examination purposes. (See Tabular Protocol, Attachment 2).

The company's examination modules include Pre-placement, Laboratory, Field Exposure, Field Exposure (Trans.) - for DOT Drivers, Field Exposure/Asbestos, and Asbestos. All employees are subject to the specified Baseline examination based on their duties. Baseline examinations are administered on a post offer of employment/pre - placement basis. All incumbent employees whose duties involve potential exposure to safety or health hazards are subject to the specified Annual Update examination, and to the specified Exit examination. (Note: The Exit exam may be waived if the most recent exam on file is less than 6 months old.). Medical exam clearances can be extended for one year pending Health Resources review of the medical extension form.

All employees entering the asbestos-monitoring program must remain in the program while employed by the company, or until such time as an HS professional has documented the employee was never exposed to asbestos in excess of the Permissible Exposure Limit (PEL) during his/her employment with the company.

All employees are subject to drug/alcohol testing required by law, for pre-hire, whenever "reasonable suspicion" of substance abuse exists, when they consent to participate in client-specific programs, for post accident/incident cases and wherever random testing is required either by client-specific programs, company policy, or federal programs. (See Procedure HS101 for more information.)

5.1.1 Temporary, Contractor, and Subcontractor Personnel. All employees in this category are subject to the same medical and drug and alcohol testing requirements that would be applicable if a company employee were doing the work.

5.2 Local Administration

The local management of the medical surveillance program is the responsibility of the HS Assistant serving each region. This person will work at the direction of the HS professional for purposes of medical surveillance administration. They are responsible for scheduling medical examinations requested by either the HR department or identified on the Health Resources notification lists, receiving medical clearances, communicating medical status information to management, and obtaining management and employee signatures on each medical clearance which identifies restrictions.

5.3 Scheduling

5.3.1 Baseline. All baseline examinations are conducted strictly upon a post-offer of employment/pre-placement basis. In order to verify that Human Resources have made a formal offer of employment, the HS Assistant is to accept requests for baseline examinations only from Human Resources. Note: The offer letter from Human Resources must be conditional upon a negative drug and alcohol test and being found medically fit for the offered position.)

Baseline examinations done at the inception of employment with the company which result in a positive drug and alcohol test, shall result in the immediate withdrawal of the conditional offer of employment.

HS Assistants are required to keep a supply of examination forms appropriate for the type(s) of employee classifications at their location. Health Resources can be contacted at 800-350-4511 to replenish supplies.

5.3.2 Annual Updates. Each month, Health Resources will provide each HS Assistant with a "notification" list of employees due for annual update exams during the coming month, and those employees due from previous periods who have not yet completed their examination.

5.3.3 Exit. Exit examinations are required for all employees leaving the company, except those classified "administrative", unless their most recent exam is less than six months old.

5.3.4 Examinations Conducted Away from the Employees Home Base. Health Resources Customer Service Department must be contacted to identify the nearest available clinic in their network to service our needs. If no nearby clinic is available, Health Resources can be asked to locate and prepare a nearer clinic to serve the company (there may be an added charge for this service).

5.4 Medical Clearance

Clearances will be issued by Health Resources within approximately five business days post exam. It will be sent directly to the local HS Assistant. The HS Assistant is responsible for coordinating requests for retests or additional tests, for obtaining the signatures of the manager and employee on the clearance, and placing the document in the employee's Medical/Exposure Monitoring file.

It is important to note that medical clearances are not confidential medical records. They are designed and intended to communicate employee medical status to management.

5.4.1 Medical Restrictions Issued. Whenever a restricted medical clearance is issued, the HS Assistant shall advise the location HS professional and Human Resources representative. The HS and HR representatives will meet with the manager to determine if the medical restriction will have an impact on the employee's ability to perform the essential duties of the intended job.

5.4.1.1 No Impact on Job Duties. If the medical limitation is found not to have an impact on the ability to meet essential job functions, the procedures in section 5.4.1 are followed.

5.4.1.2 Job Duties Impacted. If a preliminary review indicates that the individual's medical status, as reflected in prescribed medical limitations, will negatively impact their ability to perform the intended job, then the steps listed below must be taken:

1. Consult with Dr. Jerry Berke (the company's Consulting Medical Director) regarding the individual's specific medical status and the essential functions of their job (reference the company's job description).

   If it appears initially that the individual is medically not fit to perform the essential functions of the job, an evaluation of whether the person can perform the essential functions with a reasonable accommodation, pursuant to step 2 shall be made.

   If after evaluation of reasonable accommodations/alternatives, the individual cannot perform the essential functions of the job, placement or continued work in that position is prohibited. Go to step 3.

2. Reasonable Accommodation Evaluation

When an individual is qualified to perform the essential functions of the job, but requires an accommodation (e.g. job restructure, facility changes, provide special equipment, provision of interpreters, etc.) to safely enter the workplace and perform, the manager with the HS and HR representatives will meet with the individual to discuss their specific physical and/or mental limitations and abilities. The purpose is to identify specific potential accommodations that could be made.

Once potential accommodations have been identified, they must be evaluated to determine whether they enable the individual to perform essential job functions, without requiring the company to incur an undue hardship. Following this evaluation, the most promising accommodation(s) must be subjected to a safety review. **Before implementation of any accommodation it must be determined that it will not create a current specific threat of substantial harm to any employee or other work associate.** The safety review shall include reasonable medical judgement that relies on the most current medical knowledge and/or the best objective evidence.

3. Alternate Position Evaluation
When an acceptable reasonable accommodation cannot be identified for the individual to perform the essential functions of their job, the Human Resources Department will seek to identify alternate available positions for which the individual is qualified. The HS staff will be responsible for reviewing the essential functions of any new position with the company's Medical Director to verify that the individual is capable of performing them, and to verify that safety requirements can be met.

5.5 Disability Confirmation

When an individual claims to have a disability and requests accommodation, the company is entitled to have the individual examined by a physician to confirm the disability and to evaluate its impact on the ability to perform essential job functions. This examination shall be coordinated by the company's Medical Director to verify that authorized scope is not exceeded.

5.6 Re-hiring Former Employee

When a former employee is being re-hired, if the most current company medical examination is less than six months old *and* the location HS professional can confirm that the individual was not subject to hazardous exposures during the non-company employment, the HS professional can choose to waive a new Baseline exam. Annual update will be based on the most recent exam date, <u>not</u> hire date.

All returning former employees shall be subject to drug and alcohol testing at the time of re-hire.

6.0 EXCEPTION PROVISIONS

(None Permitted)

7.0 CROSS REFERENCES

HS101: Drug and Alcohol Testing
HS102: Access to Employee's Exposure and Medical Records
HS105: Occupational Injuries/Illnesses Procedures

Technical Assistance Manual for the Americans With Disabilities Act by the Equal Opportunity Employment Commission.

8.0 ATTACHMENTS

1. Responsibility Matrix
2. Health Resources Tabular Protocol
3. Request for Extension of Medical Surveillance Requirements

ATTACHMENT 1
Responsibility Matrix

Action	Procedure Section	*Responsible Party*						
		Employee	HS Professional	HS Asst.	Medical Director	Health Resources	HR	Mgr.
Submit to required medical evaluations	5.1	X						
Require temporary, contractor, subcontractor personnel to meet company's medical requirements	5.1.1							X
Local medical surveillance coordination/ Administration	5.2		X	X				
Schedule examinations	5.3 - 5.4			X				
Issue medical clearances	5.4					X		
Obtain management/ associate signatures	5.4			X				
Investigate disability claims, medical restrictions, transfers, accomodations	5.4.2	X	X		X		X	X
Confirm disabilities (medically)	5.5		X		X			
Decide on exam waiver for re-hires	5.6		X					

ATTACHMENT 2
TABULAR PROTOCOL - EXIBIT A

MODULE	Hyst. & Phys w/ Dipstick UA, Vision Vital Signs	Spiro	Audio	EKG	Chest X-Ray	Bio Chem	Bio Tox	Drug Screen
BASELINE								
Laboratory	X					X		DS 10
Laboratory (Neg. Pres. Respirator)	!	!				!		DS 10
Field Exposure	X	X	X	X	X	X		
Field Exposure (Trans)	X	X	X	X	X	X		N
Field Exposure/Asbestos	X	X	X	X	X#	X		DS 10
Field Exposure (Trans) Asbestos/Lead	X	X	X	X	X#	X	6014	DS 10
Asbestos	X	X	X	X	X#	X		DS 10
Six Months								
Blood Lead							6014	
Annual								
Laboratory	X		2Y	X	5Y	X		
Laboratory (Neg. Pres. Respirator)	!	!				!		
Manufacturing (no respirator use)					5Y	X		
Field Exposure	X	X	X	X	5Y	X		N/R
Field Exposure (Trans)	X	X	X	X	5Y	X		
Field Exposure (Asbestos)	X	X	X	X	#	X	6014	
Field Exposure (Trans) Asbestos/Lead	X	X	X	X	#	X		
Asbestos	X	X	X	X	#	X		
Exit								
Laboratory	X	X			1Y	X		
Manufacturing	X	X	X		1Y	X		
Field Exposure	X	X	X		1Y	X		
Field Exposure (Trans)	X	X	X		1Y	X		
Field Exposure/Asbestos	X	X	X		1Y#	X	6014	
Field Exposure/Asbestos/Lead	X	X	X		1Y#	X	6014	
Asbestos	X	X	X		1Y#	X		

TABULAR PROTOCOL
Exhibit A-2

Tabular Protocol Legend

.	At MD discretion
#	X-Ray film sent to Health Resources for ILO reading
Y	Yearly frequency
N	NIDA drug screen
NL	NIDA-Like drug screen (5 drugs only)
N/R	NIDA Random drug screen
DS 10	10 drugs

NOTE: All non-NIDA drug and alcohol tests shall follow the protocols in Shaw E & I procedure HS 101 (Exhibit E).

ASBESTOS CXR SCHEDULE

	Years of Exposure	Employee Age 15-35	Employee Age 35-45	Employee Age 45+
Frequency of Testing (Y) years	0-10	5Y	5Y	5Y
	10+	5Y	2Y	1Y

CALOSHA ASBESTOS CXR SCHEDULE

	Years of Exposure	Employee Age < 40	Employee Age > 40
Years of Exposure (Y) years	0-10	3Y	1Y
	10+	1Y [X]	1Y [X]

NOTE: CALOSHA requires a three (3) view CXR for asbestos clearance
[X] Oblique view every three years

TABULAR PROTOCOL
EXHIBIT A-3
DRUG SCREENS

NIDA-LIKE DRUG SCREEN	
Marijuana	Cocaine
Amphetamines	Opiates
PCP	
Includes the NIDA chain of custody procedures and all of the guidelines of the Department of Health and Human Services. The Medical Review Officer (MRO) services are included.	

DS 10 DRUG SCREEN	
Amphetamines	Marijuana metabolites
Barbiturates	Methadone
Benzodiazepines	Methaqualone
Cocaine Metabolites	Opiates
	Phencyclidine
	Propoxyphene

REASONABLE CAUSE DRUG SCREEN	
Amphetamines	Marijuana metabolites
	Methadone
	Methaqualone
	Opiates
	Phencyclidine

BIOTOX PANEL 6014	
Lead	Zinc Protoporphyrin

ATTACHMENT 3
REQUEST FOR EXTENSION OF MEDICAL REQUIREMENTS

Employee Name: (print) _____

Social Security Number: _____

Date of Last Physical: _____

Health & Safety Assistant: _____

Please answer each question below and obtain the indicated signatures. The completed form MUST be faxed to Health Resources, Shaw E&I's medial service provider, at 781-938-4678 prior to your next scheduled annual physical exam.

	Yes	No	Unsure
1. I have spent 30 days or more in the field within the past year on hazardous waste contaminated sites or in a laboratory with exposure, with potential exposure above permissible exposure limits. (PEL's)			
2. I expect to work 30 days or more in the field in the upcoming year on hazardous waste contaminated sites or in the laboratory.			
3. As a result of work activities in the last twelve months, I was required to wear a respirator for 30 days or more.			
4. As a result of scheduled work activities, I anticipate being required to wear a respirator for 30 days or more during the next twelve months.			
5. I have worked on a project site during the lat year where the health and safety plan required the use of hearing protection.			
6. I have had a change in my medical status in the last year (e.g. surgery, medical treatment, medical diagnosis, etc.)			

If you have answered YES to any of the above, please explain, in detail, below and/or on the back of this page (i.e. chemical, physical, biological, or ergonomic exposures.)

_____

_____

_____

_____

_____

_____ _____

Employee Signature Date

_____ _____

Health & Safety or Supervisor Signature Date

_____

Health & Safety or Supervisor Name (print)

PROCEDURE

Subject: DRUG AND ALCOHOL TESTING

1.0 PURPOSE AND SUMMARY

Shaw Environmental & Infrastructure, Inc. and its affiliates, subsidiaries and related entities (hereinafter referred to as collectively as the "Company") has established this Drug and Alcohol Policy to maintain a work environment free from substance abuse; provide a safe and healthy environment for our employees and the general public; maintain the quality and integrity of the Company's products and services; preserve the Company's reputation in the communities where the Company operates; and protect and secure our property and information.

This document is the foundation of Shaw E&I's Drug and Alcohol Policy. The purpose of this Policy is to provide guidelines for all applicants/prospective employees, existing employees, subcontractors, and sub-subcontractors regarding substance use and abuse and to provide supervisors with practical procedures for its administration. Subcontractors and sub-subcontractors are required to document that they maintain a substance abuse prevention program with effectiveness comparable to the Company program. The Company reserves the right to modify this Policy at any time consistent with changes in medical procedures, technologies, the law or the Company's operational needs. This policy shall not, in any event, alter the basic "at will" status of any Company employee, nor shall it create any expressed or implied contractual rights relative to employment with the Company.

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  - 4.2 Illegal Drugs
  - 4.3 Alcohol
  - 4.4 Prescribed Medications
- 5.0 Drug / Alcohol Screen
  - 5.1 Post offer, Pre-Employment Drug Testing (Prior to an employee commencing work activities) (Applicable to all states except Montana)
  - 5.2 Random Drug Testing (Applicable to all states, except Connecticut; Maine; Minnesota; Montana; Rhode Island; Vermont; San Francisco, California; and Boulder, Colorado)
    - 5.2.1 Alcohol Misuse Prevention Policy

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5.3 Post-Accident Drug / Alcohol Testing (Applicable to all states, except Rhode Island and Vermont.
5.4 Reasonable Cause Drug/alcohol Testing
5.5 Post-Rehabilitation Drug / Alcohol Testing (Applicable to all states, except Maine and Vermont)
6.0 Drug / Alcohol Testing Procedures
6.1 Collection Sites / Laboratories
6.2 Medical Review Officer (MRO)
6.3 Cost of Testing
6.4 Time of Testing
6.5 Inability to Provide Drug Screen Sample
6.6 Pending Test
6.7 Medications Which Cause a Positive Result
7.0 Results of Drug / Alcohol Screen
7.1 Compliance with the Drug and Alcohol Policy is a condition of employment
7.2 Positive Tests
7.2.1 Positive Drug Test
7.3.1 Positive Alcohol Test
7.3 Adulterated, Unsuitable or Diluted Samples
8.0 Privacy and Confidentiality
8.1 General Policy
8.2 Searches and Inspections
8.3 Criminal Drug Conviction
9.0 Drug Alcohol Education / Employee Assistance Program (EAP)
10.0 Attachments

3.0 RESPONSIBILITY MATRIX

3.1 Procedure Responsibility

The Director Health & Safety is responsible for the issuance, revision, and maintenance of this procedure.

3.2 Action/Approval Responsibilities

Responsibility Matrix is Attachment 1

4.0 GENERAL PROVISIONS AND DEFINITIONS

4.1 Application of the Policy

This Drug and Alcohol Policy applies to: all applicants or prospective employees of the Company; all Company employees, including officers, directors, and supervisors; and all Company subcontractors and sub-subcontractors.

An applicant or prospective employee of the Company who refuses a post-offer, pre-employment drug test will not be considered for a position with the Company.
An existing employee of the Company, subcontractor or sub-subcontractor who

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refuses to submit to a Drug / Alcohol test is subject to disciplinary action, up to and

including termination, pursuant to the Company's guidelines and applicable Federal and State laws. "Company or Host Employer's" premises are defined as: all areas or locations in which work is performed, including, but not limited to employee's lockers, lunch boxes, personal bags and effects, clothing, furniture, desks, drawers, containers, tool boxes, storage facilities, work areas, and vehicles parked on Company property or job site locations and equipment, either owned, borrowed, leased or operated by the Company or Host Employer.

4.2 Illegal Drugs

The use, possession, concealment, manufacture, promotion, transportation, distribution or sale of illegal drugs by any employee of the Company or any employee of any subcontractor or sub-subcontractor of the Company is strictly prohibited on all Company and "Host Employer" premises and during Company working hours.

Illegal drugs are defined as drugs, or the synthetic or generic equivalents of drugs, which are illegal under Federal, state, or local laws, including, but not limited to marijuana, heroin, hashish, cocaine, hallucinogens, depressants, and stimulants not prescribed for current medical treatment by an accredited physician.

4.3 Alcohol

Possession or consumption of alcohol on Company or Host Employer's premises or unauthorized consumption while on the job is a violation of Company policy. Alcohol or alcoholic beverages means any beverage that may be consumed which has an alcoholic content and which is subject to state regulatory control for distribution as an alcoholic beverage.

4.4 Prescribed Medications

Any employee undergoing medical treatment prescribed by a physician, dentist or other medical professional that includes the use of any drug or medication capable of affecting the employee's mental or physical abilities must notify his/her supervisor. Should there be any doubt as to the effect of the drug / medication; the Company should be notified immediately.

Any employee's failure to notify his / her supervisor, the Company's Human Resources Department or the Company's Substance Abuse Program Administrator that he / she is undergoing medical treatment which includes the use of any drug or medication capable of affecting his / her mental and physical abilities is a violation of Company policy.

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5.0 DRUG / ALCOHOL SCREEN

The Company may utilize any type of Drug/Alcohol test allowed by both Federal laws and the laws of the state in which an employee is employed to help in the control of or detection of drug or alcohol usage in violation of this policy. Drug/Alcohol tests will be for a job related purpose and consistent with business necessity.

Drug tests may be utilized in, but are not limited to, the following circumstances, as may be allowed under the laws of the jurisdiction in which you are employed:

- Post-offer, pre-employment examinations
- Random sampling
- Post-accident
- Reasonable cause or suspicion
- Post rehabilitation.
- When otherwise requested or required by the client and pursuant to applicable law.

Alcohol tests may be utilized in, but are not limited to, the following circumstances, as may be allowed under the laws of the jurisdiction in which you are employed:

- Post-accident.
- Reasonable cause or suspicion
- Post rehabilitation.
- When requested or required by the client and pursuant to applicable law.

Employees assigned to U.S. Department of Energy (DOE) sites may be required to participate in facility-specific drug and alcohol screening pools meeting the requirements of 10CFR707.

5.1 Post offer, Pre-Employment Drug Testing (Prior to an employee commencing work activities) (Applicable to all states except Montana)

Following an employment offer and prior to becoming an active employee, the applicant/prospective employee will be tested for illegal drugs. No Company employee, subcontractor, or sub-subcontractor will begin work on any project without submitting to and successfully passing an approved, pre-employment drug testing method pursuant to the requirements set forth in this procedure.

In circumstances where a Company employee has been laid-off or terminated from the Company and subsequently re-hired with the Company within a thirty (30) day period, the employee will not be required to submit to a post-offer, pre-employment drug test before beginning work on a project as long as the employee has submitted to a drug test with the Company within one calendar year. In cases where the employee

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is re-hired within thirty (30) days and has not been drug tested with the Company within one calendar year, the employee will be required to submit to a post-offer, pre-employment drug test before the beginning work on a project.

In circumstances where a Company employee has been laid-off or terminated from the Company and subsequently rehired with the Company after a thirty (30) day time period, the employee will be required to submit to a post-offer, pre-employment drug test before beginning work on a project.

5.2 Random Drug Testing (Applicable to all states, except Connecticut; Maine; Minnesota; Montana; Rhode Island; Vermont; San Francisco, California; and Boulder, Colorado)

A mandatory random testing program is in effect and all Company employees are subject to the program unless state law prohibits. Employees will be selected for random drug testing on a quarterly basis by using a computer based random number generator that is matched with the employee's I.D. number. These random tests shall be unannounced and conducted concurrent with the quarterly random selection process. The goal of the program shall be to randomly test a minimum of ten (10) percent of the entire work force, not covered by DOT, on a quarterly basis.

Employees assigned to U.S. Department of Energy (DOE) sites may be required to participate in facility-specific drug and alcohol screening pools meeting the requirements of 10CFR707. Employees assigned to other client projects and sites may also be required to comply with client specific programs that may exceed the company requirements for testing.

5.3 Post-Accident Drug / Alcohol Testing (Applicable to all states, except Rhode Island and Vermont)

Subject to Federal and state laws, the Company will conduct post accident/injury drug and/or alcohol tests on any employee receiving medical care for a work related injury. This post accident testing shall be performed as soon as practicable following work related accidents or incidents. Additionally, the company shall require a drug / alcohol test for any employee the Company reasonably believes contributed or caused the accident or incident. A Drug/Alcohol test may be performed in the following situations:

1. Any incident or accident that causes the employee to seek medical care for work related injuries.
2. Any incident or accident resulting in serious personal injury or death.
3. Any property or equipment damage equal to or exceeding $2,500.00.
4. Any Chargeable Vehicle Accident (see HS800).

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5.4 Reasonable Cause Drug / Alcohol Testing

Reasonable cause Drug/Alcohol testing will be performed when an employee is observed, by at least two Company representatives, displaying symptoms or behavior that he/she is using or is under the influence of a substance prohibited by this policy. The two Company representatives shall provide written and signed statements

describing their observations. Such symptoms or behavior include, but is not limited to the following:

- Extreme drowsiness, respiratory depression, large pupils, and slurred speech;
- Disorientation;
- Drunken behavior with or without the use of alcohol;
- Admission by employee of hallucinations, admission by employee of drug/alcohol use on the job;
- Unexplained tremors, convulsions, or violent behavior;
- Excessive absenteeism/tardiness, including established absentee patterns;
- Significant decline in job performance;
- Significant change in personality (misconduct, insubordination);
- Unexplained absences from workstation;
- Information from credible source(s) indicating possible substance abuse;
- Changes in personal hygiene;
- Difficulty in motor coordination.

The individual suspected will not be allowed to operate any equipment, and, if an on-site collection is not available, will be driven by a Company representative for testing, and will not be allowed to return to work until receipt of a negative test.

5.5 Post-Rehabilitation Drug / Alcohol Testing (Applicable to all states, except Maine and Vermont)

Subject to applicable Federal and state laws, any employee who is eligible to return to work after receiving counseling / rehabilitation will be required to sign a return to work agreement, pass a drug and/or alcohol test before returning to duty, and is subject to periodic drug and/or alcohol tests.

6.0 DRUG / ALCOHOL TESTING PROCEDURES

The Company has in place specific written procedures for specimen collection, testing, storage, and laboratory urinalysis. These procedures are available for your review and can be requested from your supervisor, the Company's Human Resources Department, or the Company's Substance Abuse Program Administrator.

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6.1 Collection Sites / Laboratories

The Company will select collection sites and/or laboratories, certified by the U.S. Department of Health and Human Services and/or appropriate state agencies, to conduct Drug/Alcohol tests. The collection sites and/or laboratories will agree to conduct tests in accordance with applicable state and Federal laws and regulations.

6.2 Medical Review Officer (MRO)

The Medical Review Officer is a licensed physician with knowledge of substance abuse disorders. The MRO will receive all dilute specimen reports and all positive drug test results, except pre-employment tests, from the laboratory, and will verify the test result. Pre-employment test results that are reported as positive will not be reviewed by the MRO except in situations where it is required by local or state law.

6.3 Cost of Testing

All costs of Drug/Alcohol tests required by the Company are paid for by the Company. In some circumstances and in accordance with Federal and state laws, an applicant/prospective employee or employee of the Company may be required to reimburse the Company the cost of the Drug/Alcohol Screen.

6.4 Time of Testing

Applicants/prospective employees and employees of the Company are required to submit to a Drug/Alcohol test immediately after notification from the Company. Generally, Drug/Alcohol tests are scheduled immediately before, during, or immediately after an employee's work hours and employees will be given two hours after notification to submit to a Drug/Alcohol test., unless he or she can demonstrate why additional time is required, provide such reason and receive prior approval from the company's Substance Abuse Program Administrator, to allow for an extension of the two (2) hour requirement.

6.5 Inability to Provide Drug Screen Sample

Should any applicant / prospective employee or employee be unable to provide a specimen sample within three hours of the first attempt to provide such specimen for a Drug / Alcohol test, or such other time as may be required by state law, will be treated as refusing to cooperate with the Company's policy and will be subject to disciplinary action, up to and including termination pursuant to the Company's guidelines and applicable Federal and State laws. However, an applicant/prospective employee or employee of the Company who is unable or cannot provide a sample specimen and submit to a Drug/Alcohol test within three hours due to a medical condition or illness must notify the Company's Substance Abuse Program Administrator immediately.

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6.6 Pending Test

Any employee whose test result is pending final analysis confirmation will immediately be removed from the work site until final results are available.

6.7 Medications Which Cause a Positive Result

Some over the counter and prescription medications may result in a positive test. The following over the counter or prescription medication may result in a positive drug test:

Amphetamine	Methylene diozymethamphetamine – MDMA
Methamphetamine	OTC / Naturally occurring products
Codeine	Poppy Seeds
Morphine	Paregoric
Phencyclidine	Hydrocodone
Marijuana-tetrahydrocannabionids	Hydromorphone
Cocaine	Oxydodone

7.0 Results of Drug / Alcohol Screen

7.1 Compliance with the Drug and Alcohol Policy is a condition of Employment

Applicants/prospective employees or employees of the Company who violate any provision in this Policy are subject to disciplinary action, up to and including termination, pursuant to the Company's guidelines and applicable Federal and state laws.

7.2 Positive Drug and Alcohol Tests

Any applicant/prospective employee or existing employee who has a positive Drug/Alcohol test result (pursuant to the minimum cutoffs designated by the Company, Client or otherwise provided by applicable state law) will be notified of a positive Drug / Alcohol test, the consequences of the Drug / Alcohol test and the procedures for a challenging or explaining the Drug / Alcohol test within seventy-two (72) hours of the test result or before any disciplinary or adverse action is taken. Every applicant / employee has the right to inspect and/or obtain a copy of the positive Drug/Alcohol test.

If, after a conditional offer of employment, an applicant / prospective employee tests positive, that individual will not be considered for a position with the Company.

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7.2.1 Positive Drug Tests

Any existing employee of the Company, subcontractor or sub-subcontractor who tests positive is subject to disciplinary action, up to and including termination, pursuant to the company's guidelines and applicable Federal and State laws. An applicant / prospective employee denied employment or an employee of the Company whose employment has been terminated as a result of a positive drug test may re-apply for employment within the Company after waiting at least thirty (30) days after the date of the positive drug test if he/she demonstrates he/she successfully completed or is participating in a supervised drug rehabilitation program (or has otherwise rehabilitated successfully) and is no longer engaging in the illegal use of drugs. The Company will require any such individual to comply with the provisions of this policy and to be subject to periodic Drug testing as is allowed under Federal and/or State laws.

7.2.2 Positive Alcohol Tests

Any existing employee of the Company, subcontractor or sub-subcontractor who has a blood alcohol level of .02 through .039 will be immediately suspended from any work duties with the Company; employee may return to work at his or her next scheduled shift as long as his or her blood alcohol level is below .02.

Any existing employee of the Company, subcontractor or sub-subcontractor who has a blood / alcohol level of .04 or higher will be subject to disciplinary action, up to and including termination, pursuant to the company's guidelines and applicable Federal and State laws. An applicant / prospective employee denied employment or an employee of the Company whose employment has been terminated as a result of a positive alcohol test of 0.04 or higher may re-apply for employment within the Company after waiting at least thirty (30) days after the date of the positive alcohol test if he/she demonstrates he/she successfully completed or is participating in a supervised alcohol rehabilitation program (or has otherwise rehabilitated successfully) and is no longer engaging in the abusive use of alcohol. The Company will require any such individual to comply with the provisions of this policy and to be subject to periodic Alcohol testing as is allowed under Federal and/or State laws.

7.3 Adulterated, Unsuitable or Diluted Samples

Employees:

Adulterated, unsuitable or diluted urine samples, as determined by the MRO and in accordance with State and Federal guidelines, will be treated as positive samples. Employees who furnish adulterated, unsuitable or diluted urine samples may be required to submit to a second drug screen and/or are subject to disciplinary action, up to and including termination pursuant to the Company's guidelines and applicable Federal and State laws. Any retesting of an employee, because of an adulterated, unsuitable or diluted urine sample submission, shall be done in accordance with Section 6.4 of this policy.

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Applicants:
If, after a conditional offer of employment, it is determined that an applicant / prospective employee provided an adulterated or unsuitable urine sample, as determined by the MRO and in accordance with State and Federal guidelines, that individual will not be considered for a position with the Company and the applicant may re-apply for employment with the Company after waiting at least thirty (30) days after the date of the adulterated or unsuitable.

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If an applicant provides a diluted urine sample, as determined by the testing laboratory, the sample will be analyzed and measured to level of detection as to determine if the sample contains any trace amounts of illegal drugs (as described in Section 4.2). If then determined that the dilute sample contains any trace amounts of illegal drugs, the employment process will be terminated and the applicant will not be allowed to re-apply for employment until after thirty (30) days following the date of the test. However, if it is determined that the original dilute sample does not contain any trace amounts of illegal drugs, the applicant will be asked to provide a second specimen in accordance with the time of submission requirements outlined in Section 6.4 of this policy. Should it be determined that the second test specimen is dilute, as determined by the MRO and in accordance with State and Federal guidelines, the individual will not be considered for a position with the Company and the applicant may re-apply for employment with the Company after waiting at least thirty (30) days after the date of the dilute test.

8.0 PRIVACY AND CONFIDENTIALITY

8.1 General Policy

Individual privacy and confidentiality will be carefully respected in maintaining a record retention program. Any information obtained through Drug/Alcohol testing unrelated to the use of illegal drugs and/or alcohol will be held in strict confidence by the MRO and not released to the Company. With the exception of the testing laboratory, Medical Review Officer and Drug Program Manager (or other individuals designed by the Company to receive and evaluate test results), the results of individual drug tests will not be released to anyone without the express written authorization of the tested individual, except as ordered by a Court or governmental agency.

Written records will be stored in locked containers or in a secured location. Such records will not be made a part of individual personnel files.

Unless an employee gives his or her written consent, the employee's or Drug/Alcohol test records will not be released to a subsequent employer, absent a court order or federal or state law.

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8.2 Searches and Inspections

The Company may at any time conduct searches and inspections where there is reason to believe that an employee may be in possession of substances which are prohibited under the Company's policies. The Company has the right to inspect an employee's personal property on Company of "Host Employer" premises, including, but not limited to, employee's lockers, lunch boxes, personal bags and effects, clothing, furniture, desks, drawers, containers, tool boxes, storage facilities, work areas, and vehicles parked on Company property or job site locations and equipment, either owned, borrowed, leased, or operated by the Company or Host Employee. This search will be for the purpose of determining if such employees or other persons are in possession, use, transportation, or concealment of any prohibited items or substances. Searches and inspections may be conducted without prior announcement. Submission to a search or inspection is a condition of employment. Failure to cooperate shall result in immediate suspension and is grounds for disciplinary action up to and including termination. Employees acknowledge and agree that they have no expectation of privacy in any space, item, locker, property, or equipment located on premises or equipment owned, operated, leased, provided or controlled by the Company or a Host Employer.

8.3 Criminal Drug Conviction

Any applicant / perspective employee or existing employee who has had a criminal drug conviction for a workplace drug offense must notify the Company within five (5) days of that conviction. When an employee has been convicted (meaning a finding of guilt or imposition of sentence, including a plea of *nolo contendre*) of a workplace drug offense or fails to notify the Company of such conviction, the Company will either pose a sanction on the employee up to and including termination or require the employee to satisfactorily complete a drug-abuse rehabilitation program before returning to work

9.0 DRUG AND ALCOHOL EDUCATION / EMPLOYEE ASSISTANCE PROGRAM (EAP)

Alcohol and drug use awareness education will assist Company representatives and employees to recognize individuals who may be abusing drugs or alcohol. The purpose of alcohol/drug awareness education is to:

- Provide Company employees with an awareness of alcohol and drug use problems concerning the safety and health aspects of such use. To help Company employees recognize symptoms of abuse.
- To help Company employees recognize drugs and drug paraphernalia.
- To help Company employees understand the Company's policy and penalties for violating the policy and to outline procedures for handling situations related to that policy.

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- To reinforce employee awareness of the Company's work rules on this subject.
- To reinforce the dangers of alcohol and drug abuse in the workplace.
- Provide information on the availability of drug counseling, rehabilitation, and employee assistance.

Any covered employee wishing information on substance use and abuse or a list of Employee Assistance Programs available in your area should contact the Company's Human Resources Department, or the Company's Substance Abuse Program Administrator.

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ATTACHMENT 1

Action	Procedure Section	*Responsible Party*					
		Employee	MRO	Regional Director of Human Resources	Project/ Office Manager	Health and Safety Representative	Director of Health & Safety
Issue, Revise, and Maintain Procedure	3.1						X
Provide a copy of HS101 to covered Non-DOT Employees	Att. 2			X	X	X	
Provide Specimen	5.0	X					
Cortact with collection facilities, approved lab, MRO	Att. 3						X
Handle positive (failed) test	Att. 3		X	X	X		
Verify subcontractor programs	1.0				X	X	
Evaluate Test Results	Att. 3		X	X			X
Coordinate Local Testing Program	Att. 3				X	X	

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ATTACHMENT 2

THE SHAW E&I DRUG AND ALCOHOL POLICY

Acknowledgment

I have read, understand and am responsible for the Drug and Alcohol Policy presented to me by The Shaw Group Inc. I understand that the Drug and Alcohol policy that has been provided to me is a summary of Shaw's policy and does not include the specimen collection and laboratory analysis procedures; however, the complete policy and procedures are available to me for review by requesting same from my supervisor, Human Resources or Shaw's Substance Abuse Program Administrator. I agree to submit to all of its requirements of this Policy and I understand the disciplinary action that will be taken if I am found in violation of this policy. **I understand that compliance with this policy is a condition of my employment with this company. Additionally, I understand that compliance with this policy does not guarantee continued employment and shall not alter the basic "at will" status of my employment.**

Employment Consent Form

Laboratory Testing: I hereby give my voluntary consent for a urine and/or blood sample to be collected from me and submitted for alcohol and/or drug testing. The Shaw Group Inc. may be required to provide test results to other companies with whom The Shaw Group Inc. has contracts to undertake certain work. I hereby further consent to the release of testing results to any such company or companies, or their agents or designees, where release of this information has been requested by said companies of their agents with respect to work undertaken by The Shaw Group Inc. I hereby understand and agree that the companies and agents to whom this information may be provided are designated as agent of The Shaw Group Inc. with respect to receipt of this information, only.

Search: I hereby give my consent for The Shaw Group Inc. to search my personal effects, locker, lunch box, purses, parcels, and other property located on Company premises, work areas, parking lot, or storage area.

I understand that my consent to this procedure is a condition of employment and that refusal to consent will result in my discharge from employment. I further agree to hold The Shaw Group Inc., its agents, directors, officers, and employees harmless from any and all liability in connection with search and investigation.

Do not sign below if you have not received the Drug and Alcohol Policy that has been provided to you.

_____ _____

Employee Signature Date Company Representative Signature

_____

Please Print Your Name Here

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ATTACHMENT 3

SPECIMEN COLLECTION PROCEDURES

Subject to laws and regulations of the jurisdiction in which the employee may be employed, the specimen collection shall be conducted in the following manner. Specimens used in testing shall be collected by a certified laboratory or their agents in a manner in compliance with applicable state and federal laws and regulations.

Drug Screen Specimen Collection

A. Scope

1. The drug testing custody and control form is to be used as a permanent record on which identifying data on the employee and on the specimen collection and transfer process are retained. The drug-testing plan requires testing for at least marijuana, cocaine, opiates, amphetamines, and phencyclidine.

2. Urine Drug Screen specimens collected under this plan may be used only to test for controlled substances designated or approved for testing as described in this policy and shall not be used to conduct any other analysis or test.

3. This plan does not prohibit procedures reasonably incident to the analysis of the specimen for controlled substances (e.g., determination of pH or tests for specific gravity, creatinine concentration, or presence of adulterants).

B. Procedures

1. The collection site person shall utilize the drug testing custody and control form (COC) provided by company; this form must address the requirements as contained in § 40.23. The COC form must comply with the provisions as contained in 49 CFR Part 40 with regard to the information that must be contained on the form. (Standard Form #DOT, 3900.0 or equivalent).

2. The drug testing custody and control form may include such additional information as may be required for billing or other legitimate purposes necessary to the collection.
3. A clean, single-use specimen bottle that is securely wrapped until filled with the specimen, and use of a tamper proof sealing system, designed in a manner such to ensure against undetected opening shall be utilized.

4. Written procedures, instructions and training shall be provided as follows:

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a. The Company may contract for and utilize when possible, an independent Collection Site. The independent collection site shall abide by all procedures, techniques, and methods outlined in 49 CFR Part 40, Part 199, and any DOT agency regulation, as well as those outlined in this document.

b. Company collection procedures and training shall clearly emphasize that the collection site person is responsible for maintaining the integrity of the specimen collection and transfer process, carefully ensuring the modesty and privacy of the donor, and is to avoid any conduct or remarks that might be construed as accusatorial or otherwise offensive or inappropriate.

c. The collection site person shall have successfully completed training to carry out this function, or shall be a licensed medical professional, or a technician who has been provided instructions for collection and certifies completion as required in this policy.

d. Unless it is impracticable for any other individual to perform this function, a direct supervisor of an employee shall not serve as the collection site person for a test of the employee.

5. The collection individual shall use a shipping container in which the specimen and associated paper work may be transferred and which can be sealed and initialed to prevent undetected tampering.

C. Security

1. The purpose of this section is to prevent unauthorized access, which could compromise the integrity of the collection process of the specimen.

2. The designated collection site is to be secure. If a collection site facility is dedicated solely to urine collection, it shall be secure at all times. If a facility cannot be dedicated solely to drug testing, the portion of the facility used for testing shall be secure during drug testing.

3. A facility normally used for other purposes, such as a public rest room or hospital examining room, may be secured by visual inspection to ensure other persons are not present and undetected access (e.g., through a rear door not in the view of the collection site person) is not possible. Security during collection may be maintained by effective restriction of access to collection materials and specimens. In the case of a public rest room the facility must be posted against access during the entire collection procedure to avoid embarrassment to the employee or distraction of the collection site person.

4. If it is impractical to maintain continuous physical security of a collection site from the time the specimen is presented until the sealed mailer is transferred for shipment, the following minimum procedures shall apply:

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a. The specimen shall remain under the direct control of the collection site person from delivery to its being sealed in the mailer.
b. the mailer shall be immediately mailed, maintained in secure storage, or remain until mailed under the personal control of the collection site person.

D. Chain-of-Custody

1. The chain-of-custody block of the drug testing custody and control form shall be properly executed by authorized collection site personnel upon receipt of specimens.

2. Handling the transportation of urine specimens from one authorized individual or place to another shall always be accomplished through chain-of-custody procedures. Every effort shall be made to minimize the number of persons handling specimens.

E. Access to Authorized Personnel Only

1. No unauthorized personnel shall be permitted in any part of the designated collection site when urine specimens are collected or stored. Only the collection site person may handle specimens prior to their securement in the mailing container or monitor or observe a specimen collection (under the conditions specified in this section).

2. To promote security of specimens, avoid distraction of the collection site person, and ensure against any confusion in the identification of specimens, the collection site person shall have only one donor under supervision at anytime.

3 For this purpose, a collection procedure is complete when the urine bottle has been sealed and initialed, the drug testing custody and control form has been executed, and the employee has departed the site (or, in the case of an employee who was unable to provide a complete specimen, has entered a waiting area).

F. Privacy

1. Procedures for collecting urine specimens shall allow individual privacy unless there is a reason to believe that a particular individual may alter or substitute the specimen to be provided, as further described in this section.
2. For purposes of this procedure, the following circumstances are the exclusive grounds constituting a reason to believe that the individual may alter or substitute the specimen:

   a. The employee has presented a urine specimen that falls outside the normal temperature range (32.0_C/90_F – 38_C/100_F), and
      (1) the employee declines to provide a measurement of oral body temperature, as provided in paragraph G.14. of this section; or
      (2) oral body temperature varies by more than 1_C/1.8_F from the temperature of the specimen.

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b. The last urine specimen provided by the employee (i.e., on a previous occasion) was determined by the laboratory to have a specific gravity of less than 1.003 and a creatinine concentration below .2g/L.

c. The collection site person observes conduct clearly and unequivocally indicating an attempt to substitute or adulterate the sample (e.g., substitute urine in plain view, blue dye in specimen presented); or

d. The employee has previously been determined to use a controlled substance without medical authorization or the particular test was being conducted under a DOT regulation providing for follow-up testing upon or after return to service.

3. A higher-level supervisor of the collection site person, or a designated employer representative, shall review and concur in advance with any decision by a collection site person to obtain a specimen under the direct observation of a same gender collection site person based upon the circumstances described in paragraph 2 above.

G. Integrity and Identity of the Specimen

The collection site person shall take precautions to ensure that a urine specimen is not adulterated or diluted during the collection procedure and that information on the urine bottle and on the urine custody and control form can identify the individual from whom the specimen was collected. The following minimum precautions shall be taken to ensure that unadulterated specimens are obtained and correctly identified:

1. To deter the dilution of specimens at the collection site, toilet-bluing agents shall be placed in toilet tanks wherever possible, so that reservoir of water in the toilet bowl always remains blue. Where practicable, there shall be no other source of water (e.g., no shower or sink) in the enclosure where urination occurs. If there is another source of water in the enclosure, it shall be effectively secured or monitored to ensure it is not used as a source for diluting the specimen.

2. When an individual arrives at the collection site, the collection site person shall ensure that the individual is positively identified as the employee selected for testing (e.g., through presentation of photo identification or identification by the employer's representative). If the individual's identity cannot be established, the collection site person shall not proceed with the collection. If the employee requests, the collection site person shall show proper identification to the employee. The employee shall complete any required registration/consent form at collection site.

3. If the individual fails to arrive at the assigned time, the collection site person shall contact the appropriate authority to obtain guidance on the action to be taken.

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4. The collection site person shall ask the individual to remove any unnecessary outer garments such as a coat or jacket that might conceal items or substances that could be used to tamper with or adulterate the individual's urine specimen. The collection site person shall ensure that all personal belongings such as a purse or briefcase remain with the outer garments. The individual may retain his or her wallet. If the employee requests it, the collection site person shall provide the employee a receipt for any personal belongings.

5. The individual shall be instructed to wash and dry his or her hands prior to urination.

6. After washing hands, the individual shall remain in the presence of the collection site person and shall not have access to any water fountain, faucet, soap dispenser, cleaning agent, or any other materials which could be used to adulterate the specimen.

7. The individual may provide their specimen in the privacy of a stall or otherwise partitioned area that allows for individual privacy. The collection site person shall provide the individual with a specimen bottle or collection container, if applicable, for this purpose.

8. The collection site person shall note any unusual behavior or appearance on the urine custody and control form.

9. In the exceptional event that an employer-designated collection site is not accessible and there is an immediate requirement for specimen collection (e.g., circumstances require a post-accident test), a public restroom may be used according to the following procedures: A collection site person of the same gender as the individual shall accompany the individual into the public restroom which shall be made secure during the collection procedure. If possible, a toilet-bluing agent shall be placed in the bowl and any accessible toilet tank. The collection site person shall remain in the restroom, but outside the stall, until the specimen is collected. If no bluing agent is available to deter specimen dilutions the collection site person shall instruct the individual not to flush the toilet until the specimen is delivered to the collection site person. After the collection site person has possession of the specimen, the individual will be instructed to slush the toilet and to participate with the collection site person in completing the chain-of-custody procedures.

10. If the company is using the single collection method then the following procedures shall be used:
    a. The collector may choose to direct the employee to urinate either directly into a specimen bottle or into a separate collection container.
    b. If a separate collection container is used, the collection site person or the employee shall pour at least 30 ml of the urine from the collection container into the specimen bottle in the presence of the employee.

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11. Collection Methodology.
    a. In either collection methodology, upon receiving the specimen from the individual the collection site person shall determine if it has at least 30 ml of urine for a single specimen collection or 45 ml of urine for a split specimen collection.
    b. If the individual has not provided the required quantity of urine, the specimen shall be discarded. The collection site person shall direct the individual to drink up to 40 ounces of fluid, distributed reasonably through a period of up to three hours, or until the individual has provided a new urine specimen, whichever occurs first. If the employee refuses to drink fluids as directed or to provide a new urine specimen, the collection site person shall terminate the collection and notify the employer that the employee has refused to submit to testing.
    If the employee has not provided a sufficient specimen within three hours of the first unsuccessful attempt to provide the specimen, the collection site person shall discontinue the collection and notify the employer.

12. After the specimen has been provided and submitted to the collection site person, the individual shall be allowed to wash his or her hands.

13. Immediately after the specimen is collected, the collection site person shall measure the temperature of the specimen. The temperature-measuring device used must accurately reflect the temperature of the specimen and not contaminate the specimen. The time from urination to temperature measure is critical and in no case shall exceed 4 minutes.

14. A specimen temperature outside the range of 32.0_C90_F - 38_C/100_F, constitutes a reason to believe that the individual has altered or substituted the specimen (See Section F.2.a.). In such cases, the individual supplying the specimen may volunteer to have their temperature taken to provide evidence to counter the reason to believe the individual may have altered or substituted the specimen.

15. Immediately after the specimen is collected, the collection site person shall also inspect the specimen to determine its color and look for any signs of contaminants. Any unusual findings shall be noted on the urine custody and control form.

16. All specimens suspected of being adulterated shall be forwarded to the laboratory for testing.

17. Whenever there is reason to believe that a particular individual has altered or substituted the specimen as described in Section F.2.a. and c., a second specimen shall be obtained as soon as possible under the direct observation of a same gender collection site person.

18. Both the individual being tested and the collection site person shall keep the specimen in view at all times prior to its being sealed and labeled. As provided below, the specimen shall be sealed by placement of a tamper-proof seal over the

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bottle cap and down the sides of the bottle and labeled in the presence of the employee. If the specimen is transferred to a second bottle, the collection site person shall request the individual to observe the transfer of the specimen and the placement of the tamper-proof seal over the bottle cap and down the sides of the bottle.

19. The collection site person and the employee shall be present at the same time during procedures outlined in items 20 through 24 of this section.

20. The collection site person or employee shall place securely on the bottle an identification label, which contains the date, the individual's specimen number, and any other identifying information provided or required by the employer. If separate from the label, the tamper-proof seal shall also be applied.

21. The specimen donor shall initial the identification label on the specimen bottle for the purpose of certifying that it is the specimen collection from the donor.

22. The collection site person shall enter on the drug testing custody and control form all information identifying the specimen. The collection site person shall sign the drug testing custody and control form certifying that the collection was accomplished according to the applicable Federal requirements.

23. The individual shall be asked to read and sign a statement on the drug testing custody and control form that the specimen collected from him/her is in fact that specimen he/she provided.

24. The collection site person shall complete the chain-of-custody portion of the drug testing custody and control form to indicate receipt of the specimen from the employee and shall certify proper completion of the collection.

25. The urine specimen and chain-of-custody form are now ready for shipment. If the specimen is not immediately prepared for shipment, the collection site person shall ensure that it is appropriately safeguarded during temporary storage.

26. Control of Specimen

    a. While any part of the above chain-of-custody procedures is being performed, it is essential that the urine specimen and custody documents be under the control of the involved collection site person.

    b. If the involved collection site person leaves their workstation momentarily, the collection site person shall take the specimen and drug testing custody and control form with them or shall secure them. After the collection site person returns to the workstation, the custody process will continue. If the collection site person is leaving for an extended period of time, they shall package the specimen for mailing before leaving the site.

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d. The collection site person shall not leave the collection site in the interval between presentation of the specimen by the employee and securement of the sample with an identifying label bearing the employee's specimen identification number and seal initialed by the employee. If it becomes necessary for the collection site person to leave the site during this interval, the collection shall be nullified and at the election of the company a new collection may be begun.

27. Collection Control.

To the maximum extent possible, collection site personnel shall keep the individual's specimen bottle within sight both before and after the individual has urinated. After the specimen is collected, it shall be properly sealed and labeled.

28. Transportation to Laboratory

Collection site personnel shall arrange to ship the collected specimens to the drug-testing laboratory. The specimens shall be placed in shipping containers designed to minimize the possibility of damage during shipment (e.g., specimen boxes and/or padded mailers); and those containers shall be securely sealed to eliminate the possibility of undetected tampering. On the tape sealing the container, the collection site person shall sign and enter the date specimens were sealed in the containers for shipment. The collection site person shall ensure that the chain-of-custody documentation is attached to each container sealed for shipment to the drug-testing laboratory.

29. Failure to Cooperate

If the employee refuses to cooperate with the collection process, the collection site person shall inform the designated company representative and shall document the non-cooperation on the drug testing custody and control form.

30. Employee Requiring Medical Attention

If the sample is being collected from an employee in need of medical attention part of a post-accident test given in an emergency medical facility, necessary medical attention shall not be delayed in order to collect the specimen.

31. Use of Chain-of-Custody Forms

A chain-of-custody form shall be used for maintaining control and accountability of each specimen form the point of collection to final disposition of the specimen. The date and purpose shall be documented on the form each time a specimen is handled or transferred and every individual in the chain shall be identified. Every effort shall be made to minimize the number of persons handling specimens.

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Evidential Breath Testing (EBT) for Alcohol

A. Scope

1. The evidential and non-evidential testing procedures set forth in this section was developed from utilizing, as a guidance document, the requirements as set forth in 49 CFR Part 40 and specifies the required form and disposition of such testing forms.

B. Alcohol Testing Form

1. The Company may utilize a form similar to that of a DOT Breath Alcohol Testing form or a form that is directly generated by an EBT and may omit the space for affixing a separate printed result to the testing form. In all cases, the form shall provide triplicate or three consecutive identical copies with copy 1 being retained by the company, copy 2 shall be provided to the employee, and copy 3 shall be retained by the BAT/STT.

2. The breath alcohol testing form may include such additional information as may be required for billing or other legitimate purposes necessary to the testing, provided that personal identifying information on the individual (other than the social security number or employee identification number) may not be provided.

C. Breath Testing Locations

1. The Company shall ensure that there are sufficient breath testing sites or the availability of BATs/STTs located within a reasonable proximity to each of the company's work locations.

2. The Company shall conduct the testing in a location that affords visual and aural privacy to the employee being tested. All necessary equipment, personnel, and materials for conducting the alcohol testing shall be provided at the testing site.

3. A mobile collection facility, such as a van that is equipped for alcohol testing, that meets the requirements set forth in this procedure may be utilized.

4. No unauthorized persons shall be permitted access to the testing site when the EBT remains unsecured, or to prevent such individuals from seeing or hearing a test result.

5. In some circumstances the company may have to conduct such alcohol testing outdoors at the scene of an accident that does not meet the requirements as specified in post-accident provisions of the procedure. In these situations the BAT/STT shall provide the necessary visual and aural privacy to the employee to the greatest extent practicable.

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6. The BAT/STT shall supervise only one employee's use of the EBT at a time. The BAT/STT shall not leave the alcohol testing site while the testing process is in progress.

D. Alcohol Testing Equipment

1. General.

   The company shall use only approved evidential breath testing (EBT) devices and non-evidential devices for conducting the alcohol testing provisions required in the program. These devices are listed on NHTSA's conforming products list (CPL).

2. Screening Devices.

   The company shall utilize either non-evidential devices or EBTs listed on the CPL for screening tests.

3. Confirmation Devices.

   The company shall utilize an EBT listed on the CPL for confirmation testing.

4. NHTSA Conforming Products List (CPL).

   All devices that will be used by the company for alcohol testing are NHTSA approved evidential breath alcohol testing devices. NHTSA has model specifications for evidential breath testing devices. NHTSA periodically publishes an updated Conforming Products List, which states which devices have met NHTSA standards.

5. Quality Assurance Plans for Evidential Breath Testing Devices. Each EBT used shall have an approved quality assurance plan (QAP) to include the following:

   a. Methods for conducting external calibration.

   b. Minimum intervals for performing external calibrations

   c. Tolerance on an external calibration check.

   d. Inspection, maintenance, and calibration requirements.

   Each QAP is submitted to NHTSA for approval. Records demonstrating that the EBTs are subject to required external calibration checks will be maintained. An EBT will be taken out of service if any external calibration check results in a reading outside the tolerance for the EBT set forth in the QAP. The EBT will not be used again until it has been serviced and has had an external calibration check resulting in a reading within the tolerance for the EBT.

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This company will ensure that required inspections, maintenance and calibration checks are conducted. When the EBT is not being used it will be stored in a secure location.

6. Quality Assurance Plans for Non-Evidential Screening Devices. Each Non-Evidential Screening Device used shall have an approved quality assurance plan (QAP) to including the following:

   a. The plan shall designate the method or methods to be used to perform quality control checks; the temperatures at which the non-evidential screening device shall be stored and used, as well as other environmental conditions (e.g., altitude, humidity) that may affect the performance of the device; and, where relevant, the shelf life of the device.

   b. The QAP shall prohibit the use of any device that does not pass the specified quality control checks or that has passed its expiration date.

   The manufacturers' instructions on or included in the package for each saliva testing device shall include directions on the proper use of the device, the time frame within which the device must be read and the manner in which the reading is made.

   The employer and its agents shall comply with the QAP and manufacturer's instructions for each non-evidential screening device it uses for alcohol screening tests.

E. Breath Alcohol Testing Preparations

1. When an employee arrives at the alcohol testing site, the BAT/STT shall ensure that the individual is positively identified as the employee selected for alcohol testing (e.g., through presentation of photo identification or identification by the company's representative). If the employee's identity cannot be established, the BAT/STT shall not proceed with the alcohol test. If the employee requests, the BAT/STT shall show proper identification to the employee.

2. The BAT/STT shall explain the alcohol testing process to the employee.

3. If the employee fails to arrive at the assigned time, the BAT/STT should contact the appropriate company authority to obtain guidance on any action to be taken.

F. Screening Test Procedures for Evidential Breath Testing and Non-Evidential Breath Testing Devices.

1. The BAT shall begin the alcohol testing process by completing Step 1 on the Alcohol Breath Testing form. The employee shall then complete Step 2 by signing the certification. Refusal by the employee to sign the certification shall be regarded as a refusal to take the alcohol test.

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2. The BAT shall select an individually sealed mouthpiece, it shall be opened in full view of the employee and attached to the EBT in accordance with the manufacturer's instructions.

3. The BAT shall instruct the employee to blow forcefully into the mouthpiece for at least 6 seconds or until the EBT instrument indicates that an adequate amount of breath has been obtained.

4. The BAT shall show the employee the result displayed on the EBT. The BAT shall record the displayed result, testing device, serial number of the testing device, time and quantified result in Step 3 of the form.

5. If the EBT prints the test result directly onto the alcohol form, then the BAT shall show the employee the result displayed on the EBT.

6. If the EBT does not provide a printed result, the BAT shall show the employee the result displayed on the EBT. The BAT shall then record the test result onto the breath alcohol test form in the designated space and the employee will sign the form as to acknowledge the results. The result shall be entered in such a manner that will provide clear evidence as to the results that were displayed by the EBT.

7. If the result of the screening alcohol test is a breath alcohol concentration of less than 0.04, the BAT shall date the form and sign the certification in Step 3 of the form. The employee shall then sign the certification and fill in the date in Step 4 of the form. If the employee does not sign the certification in Step 4, it shall not be considered a refusal to be tested. In this event, the BAT shall note the employee's failure to sign in the "Remarks" section of the form.

8. If the EBT has printing capabilities, and the test result printed by the EBT does not match the displayed result, the BAT shall note the disparity in the "Remarks" section. Both the BAT and the employee shall initial or sign the notation. The alcohol test is invalid and the company representative and the employee shall be so advised.

9. At this point, no further testing is authorized. The BAT shall transmit the result of less than 0.04 to the appropriate company representative in a confidential manner. The company shall receive and store the information so as to ensure that confidentiality is maintained as required in the procedure.

10. If the result of the screening test is an alcohol concentration of 0.04 or greater, then the BAT shall perform a confirmation test. If a different BAT will conduct the confirmation test, then the BAT who conducts the screening test shall complete and sign the form and log entry. The BAT will upon completion of the alcohol test provide the employee with Copy 2 of the breath alcohol testing form.

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G. Confirmation Test Procedures.

1. When a BAT other than the one who conducted the screening test is required to conduct the confirmation test, the new BAT will require the employee to provide positive identification such as photo ID card or identification by a company representative. The BAT will, upon request of the employee being tested, provide such identification.

2. The BAT shall instruct the employee not to eat, drink, put any object or substance in his/she mouth and, to the extent possible, not belch during the waiting period just prior to the confirmation test being conducted. This waiting period shall begin with the completion of the screening test and shall not be less than 15 minutes, but must be within 30 minutes of the completion of the screening test. The time the employee spends in transit between the screening test and confirmation test, the employee is under direct observation, counts toward the mandatory 15 minute deprivation period. If the BAT conducts the confirmation test more than 30 minutes after the result of the screening test has been obtained the BAT shall note in the "Remarks" section of the form the time that elapsed between the screening and the confirmation test and the reason why the confirmation test could not be conducted within 30 minutes of the screening test. The BAT shall explain to the employee that the reason for this is to prevent any accumulation of mouth alcohol leading to an artificially high reading and that it is for the benefit of the employee to comply with these instructions. The BAT shall also explain that the test will be conducted at the end of the required waiting period, even if the employee has disregarded the instructions. Should the BAT become aware that the employee has not complied with the instructions as provided, the BAT shall note the observations in the "Remarks" section of the form.

3. When a BAT other than the one who conducted the screening test is required to conduct the confirmation test, the new BAT shall initiate a new Breath Alcohol Testing form. The BAT shall then complete step 1 on the form and the employee shall then complete Step 2 by signing the certification. If the employee should choose not to sign the certification, the BAT shall then make an appropriate notation in the "Remarks" section indicating the employee's refusal to take the alcohol test. The BAT shall note in the "Remarks" section that a different BAT conducted the screening test.

4. The BAT shall open, in the presence of the employee, a new individually-sealed mouthpiece and attach the mouthpiece to the EBT in accordance with the manufacturer's instructions. The BAT will then instruct the employee to blow forcefully into the mouthpiece for at least 6 seconds or until the EBT indicates that an adequate amount of breath has been obtained.

5. In the event that the screening and confirmation test results are not identical, the confirmation test result shall be deemed to be the final result on which any action by the company may be taken in order to comply with the requirements of the AMPP and any applicable federal requirements.

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6. If the EBT prints the test result directly onto the alcohol form, then the BAT shall show the employee the result displayed on the EBT.

7. If the EBT does not provide a printed result, the BAT shall show the employee the result displayed on the EBT. The BAT shall then record the test result onto the breath alcohol test form in the designated space and the employee will sign the form as to acknowledge the results. The result shall be entered in such a manner that will provide clear evidence as to the results that were displayed by the EBT.

8. After the confirmation test is completed, the BAT shall date the form and sign the certification in Step 3 of the form. The employee shall then be instructed to sign the certification and fill in the date in Step 4. If the employee should elect to not sign the certification or to provide his/her initials in the log book entry for the test conducted, it shall not be considered as a refusal to be tested. The BAT shall then note the employee's failure to sign or initial the log book entry in the "Remarks" section of the testing form.

9. The BAT shall transmit all alcohol testing results to the APM (Alcohol Program Manager) or other designated company representative in a confidential manner. All communications by BATs shall be to the APM or designee only and may be provided in writing, in person, or by telephone or electronic means. The BAT shall ensure that immediate transmission of test results to the company is conducted in order for the company to prevent the employee from performing any covered functions.

10. Should the initial transmission not be accomplished in writing, but via telephone notification, the company designee shall establish a mechanism to verify the identity of the BAT providing the information. The BAT shall follow the initial transmission by providing to the company designee the company's copy of the breath alcohol testing form. The test results shall be stored in such a manner so as to protect the confidentiality of the results and to eliminate the disclosure of information to unauthorized persons.

H. Refusals to Test and Uncompleted Tests.

1. Refusal by an employee to complete and sign Step 2 of the breath alcohol testing form, to provide breath, to provide an adequate amount of breath, or otherwise to cooperate with the testing process in a way that prevents the completion of the test shall be noted by the BAT in the "Remarks" section of the form. The testing process shall be terminated and the BAT shall immediately notify the company representative/designee.

2. If a screening or confirmation test cannot be completed or if an event occurs to invalidate the test, the BAT/STT shall, if practicable, begin a new screening or confirmation test using a new breath alcohol testing form with a new sequential test number.

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I. Inadequate Amount of Breath for EBT Devices

1. If the employee is unable, or alleges that he/she is unable, to provide a sufficient amount of breath to permit a valid breath test because of a medical condition, the BAT or STT shall again instruct the employee to attempt to provide an adequate amount. If the employee refuses to make the attempt, the BAT or STT shall immediately inform the company.

2. If the employee attempts and fails to provide an adequate amount of breath, the BAT or STT shall so note in the "Remarks" section of the testing form and shall immediately inform the company. The company shall direct the employee to obtain, as soon as practical after the attempt, an evaluation from a licensed physician who is acceptable to the company concerning the employee's medical ability to provide an adequate amount of breath.

3. If the physician determines, in his/her reasonable medical judgment, that a medical condition has or could have precluded the employee from providing an adequate amount of breath, the employee's failure to provide an adequate amount of breath shall not be deemed as a refusal to take an alcohol test. The physician shall provide to the company representative a written statement of the basis of his/her conclusion.

4 If the physician, in his/her reasonable medical judgment, is unable to make the determination that a medical condition has precluded the employee from providing an adequate amount of breath, the employee's failure to provide an adequate amount of breath shall be regarded as a refusal to take a test. The physician shall provide a written statement of the basis for his/her conclusion to the company.

J. Invalid Tests

1. An evidential breath alcohol test shall be invalid under the following circumstances:

   a. The EBT does not pass its next external calibration check. This invalidates all test results of 0.04 or greater on tests conducted since the last valid external calibration test. This would not invalidate any negative tests conducted.

   b. The BAT does not observe the minimum 15-minute waiting period prior to conducting the confirmation test.

   c. The BAT does not sign the breath alcohol testing form.

   d. The BAT fails to note in the remarks section of the form that the employee has failed or refused to sign the form following the recording or printing on or attachment to the form of the test results.

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ATTACHMENT 4

Re-Hire Certification and Agreement
Employees Returning from a Substance Abuse Counseling / Rehabilitation Program

I have completed a substance abuse counseling or rehabilitation program since _____ [date of policy violation at issue]. I seek re-employment with Shaw E&I, Inc. I agree that if I am re-hired, I will be subject to periodic unannounced testing for a period of twenty-four (24) months as a condition of my employment.

_____
Print Name Date

_____
Employee's Signature Date

_____
Employee's Social Security Number

_____
Shaw E&I, Inc., Personnel Date

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ATTACHMENT 5

Shaw E&I, Inc. Drug and Alcohol Non-DOT Policy
Puerto Rico Addendum

I. Puerto Rico Law

A. Possession

Under Puerto Rico law, **24 L.P.R.A. § 2404,** it is unlawful for any person knowingly or intentionally, to possess any controlled substance, unless such substance was obtained directly, or pursuant to a valid prescription or order from a practitioner, while acting in the course of his professional practice.

Any person who violates Puerto Rico law shall be guilty of a felony, and upon conviction thereof, shall be punished by imprisonment for a fixed term of three (3) years. Should there be aggravating circumstances, the fixed penalty established may be increased to a maximum of five (5) years; if there should be extenuating circumstances, it may be reduced to a minimum of two (2) years. The court, in its discretion, in addition to imprisonment, may impose a fine that shall not exceed five thousand (5,000) dollars and an administrative fee.

If such person commits said offense after one or more previous convictions under this subsection are final, he shall be guilty of a felony and, upon conviction thereof, shall be sentenced to imprisonment for a fixed term of six (6) years. Should there be aggravating circumstances, the fixed penalty established may be increased to a maximum of ten (10) years; if there should be extenuating circumstances, it may be reduced to a minimum of four (4) years.

If any person who has not been previously convicted of violating Puerto Rico law or any other law of the United States, related to narcotic drugs, marijuana, or stimulant or depressant substances, is found guilty of violating subsection (a) of this section, be it after a trial or entering a plea of guilty, the court, without entering a verdict of guilty, and with the consent of said person, may defer further proceedings and place said person on probation under such reasonable terms and conditions as it may require and for a fixed term of three (3) years. Should there be aggravating circumstances, the fixed penalty established may be increased to a maximum of five (5) years; should extenuating circumstances exist, it may be reduced to a minimum of two (2) years. The court shall advise the defendant that should he/she abandon the treatment and rehabilitation program, he/she shall be sanctioned pursuant to the provisions of § 4428 of Title 33.

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B. Manufacture and Distribution

Under Puerto Rico law it is unlawful for any person knowingly or intentionally:

(1) To manufacture, distribute, dispense, transport or conceal, or possess with the intent to manufacture, distribute, dispense, transport or conceal a controlled substance; or

(2) To produce, distribute, or dispense, transport or conceal, or possess with the intent to distribute or dispense, transport or conceal an adulterated substance.

Any person who violates this Puerto Rico law will be convicted of a felony and punished in accordance with the type of drug involved. Such punishment ranges from a sentence of a minimum of a fixed term of ten years to a maximum of a fixed term fifty years in prison. In addition, the court, in its discretion, may impose a fine, not to exceed fifty thousand (50,000) dollars and an administrative fee.

II. United States Law

Under the laws of the United States of America, it is unlawful for any person knowingly or intentionally:

(1) To manufacture, distribute, or dispense, or possess with intent to manufacture, distribute, or dispense, a controlled substance; or

(2) To import or export a controlled substance.

Any person who violates this law will be sentenced to a term of imprisonment ranging from 5 years to 40 years, and a fine of up to $20,000,000, depending on the type and quantity of the controlled substance or drug involved.

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PROCEDURE

Subject: **EXCAVATION AND TRENCHING**

1.0 PURPOSE AND SUMMARY

The purpose of this procedure is to describe the company requirements for excavation and trenching safety. These requirements are based on the federal Occupational Safety and Health Administration (OSHA) excavation standard found in 29 Code of Federal Regulations (CFR) 1926, Subpart P.

Some company activities are likely to occur in states or localities that either currently have or will have requirements that differ from those contained within the federal standard. In such circumstances, the local health and safety representative will be responsible for ensuring that these requirements are included in either a site health and safety plan or a similar document and conveyed to all affected employees. If federal, state, or local regulations vary or conflict, the more protective requirements and practices will be followed.

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3.0 RESPONSIBILITY MATRIX

3.1 Procedure Responsibility

The Vice President of Health & Safety is responsible for the issuance, revision, and maintenance of this procedure.

3.2 Action/Approval Responsibilities

The Responsibility Matrix is Attachment 1.

4.0 DEFINITIONS

Accepted Engineering Practices
Those requirements or practices which are compatible with standards required by a registered professional engineer.

Angle of Repose
The greatest angle above the horizontal plane at which a material will lie without sliding.

Benching
A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels of steps, usually with vertical or near-vertical surfaces between levels.

Competent Person
An employee 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 the authority to take prompt corrective measures to eliminate them.

Company
All wholly-owned subsidiaries of Shaw Environmental & Infrastructure, Inc. (Shaw E & I).

Excavation
Any man-made cut, cavity, trench or depression in an earth surface, including its sides, walls, or faces, formed by earth removal.

Registered Professional Engineer
An individual currently registered as a professional engineer (preferably civil) in the state where work is to be performed.

Sheeting
Members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

Shield
A structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Shields may be pre-manufactured or job-built in accordance with 1926.652(c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields".

Shoring
Structure such as a metal hydraulic, mechanical, or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

Sloping
A method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

Support System
A structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

Tabulated Data
Tables and charts approved by a registered professional engineer and used to design and construct a protective system.

Trench
A narrow (in relation to its length) excavation made below the surface of the ground. In general, the depth is greater than the width at the bottom, but the width of a trench at the bottom is not greater than 15 feet.

Type A Soil
Cohesive soils with an unconfined compressive strength of 1.5 ton per square foot (tsf) (144kPa) 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, soil is NOT Type A if:

- The soil is fissured;
- The soil is subject to vibration from heavy traffic, pile driving, or similar effects;

- The soil has been previously disturbed;
- 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
- The material is subjected to other factors that would require it to be classified as a less stable material.

Type B Soil
This classification refers to:

- Cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa)
- 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.
- Previously disturbed soils except those which would otherwise be classified Type C soil;
- Soil that meets the unconfined compressive strength or cementation requirements for Type A, but is fissured or subjected to vibration;
- Dry rock that is not stable; or
- 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:1V), but only if the material would otherwise be classified as Type B.

Type C Soil
This classification refers to:

- Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less;
- Granular soils including gravel, sand, and loamy sand;
- Submerged soil or soil from which water is freely seeping;
- Submerged rock that is not stable; or
- 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.

5.0 TEXT

5.1 Pre-Excavation Requirements

5.1.1 Underground Utilities. Prior to opening an excavation, the estimated location of underground utilities such as sewer, telephone, fuel, electric, water, or any other underground installation that may be reasonably expected to be encountered during the excavation work shall be determined.

Utility companies or a utility location service shall be contacted within the established pre-notification time, advised of the proposed work, and asked to deliniate the location of all underground utilities. Employees should be careful to protect and preserve the utility markings until they are no longer required for safe excavation. At least 3 feet of clearance between any underground utility and the cutting edge or point of powered excavation equipment will be maintained until the precise location of the utility is determined. Initial excavation within this 3 foot area will be conducted manually.

5.1.2 **Surface Encumbrances.** All surface encumbrances (trees, poles, boulders, etc.) that may create a hazard to employees shall be removed or supported.

5.1.3 **Vehicular Traffic.** Employees exposed to 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. Traffic control devices (i.e., barricades, signs, cones, flagpersons, etc.) shall be specified and used in accordance with regulations applicable to the roadway or area in which excavation activities are occurring.

5.1.4 **Training.** Those who supervise the entry of personnel into an excavation must have completed a training course that included instruction in:

- Types of hazards associated with excavation operations;
- Safe work practices and techniques;
- A review of applicable Federal, state and local regulations; and
- A review of this procedure.

Employees who enter excavations are required to complete a site-specific training session to enable them to recognize unsafe conditions in and around the excavation. This training can be conducted during a tailgate safety meeting that emphasizes the specific excavation hazards that may be encountered.

Training documentation shall be maintained in the project file with a copy forwarded to the Knoxville Training Department.

As part of standard employee supervision process, training shall be complemented with on-the-job instruction and reinforcement of accepted practices to the extent necessary to assure compliance with this procedure and all other applicable regulations.

5.2 Excavation Work Practices

5.2.1 **General.** Each employee working within an excavation shall be protected from cave-ins by an adequate protective system designed in accordance with 29 CFR 1926 Subpart P, except when the excavation is made entirely in stable rock or when the excavation is less that 5 feet deep and examination of the ground by a competent person provides no indication of a potential cave-in. A competent person shall ensure that protective systems, when required, are installed and maintained per the design specifications.

No employees shall be permitted to enter an excavation unless it is absolutely essential to do so and all requirements of this procedure are met.

5.2.2 **Supervision.** Work in an excavation shall at all times be supervised by a competent person. This individual will remain outside of the excavation at all times, and will be responsible for identifying any unusual developments above ground which may warn of impending earth movement.

5.2.3 **Soil Classification.** Based on the results of tests described in Attachment 3, the competent person will classify each soil/rock deposit as stable rock, Type A, Type B, or Type C. When layers of soil/rock exist, the weakest layer will be classified; however, each layer may be classified individually when a more stable layer lies under a less stable layer. If the properties or conditions of a soil/rock deposit change in any way, re-evaluation will be required.

5.2.4 **Access and Egress.** 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.

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

5.2.5 **Protective Systems.** Protective systems shall be designed in accordance with 29 CFR 1926.652(b) or (c) and shall have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied or transmitted to the system.

5.2.6 **Exposure to Falling Loads.** No employees 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 spillage or falling materials. Operators may remain in the cabs of vehicles being

loaded or unloaded provided the vehicles are equipped with a cab shield and/or canopy adequate to protect the operator from shifting or falling materials.

5.2.7 **Warning System for Mobil Equipment.** When mobile equipment is operated adjacent to 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.

5.2.8 **Hazardous Atmospheres.** Where an oxygen deficient (less that 19.5% O_2) or hazardous atmosphere exists, or could reasonably be expected to exist, the excavation shall be tested before employees enter. Testing shall be conducted as often as necessary to ensure that the atmosphere remains safe. Some excavations may be considered confined spaces which require compliance with Shaw E & I Procedure HS300.

Adequate precautions shall be taken to prevent employee exposure to oxygen deficient or hazardous atmospheres. As appropriate, ventilation and/or respiratory protective devices shall be used.

5.2.9 **Water Accumulation Hazards.** 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. If water is controlled or prevented from accumulating by the use of water removal equipment, the process shall be monitored by a competent person to ensure proper operation.

If the excavation work interrupts the natural drainage of surface water (streams, run-off channels), 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 shall be regularly inspected by a competent person.

5.2.10 **Stability of Adjacent Structures.** Structures adjoining an excavation shall be evaluated to assess their stability. Excavation below the level of the base or footing of any foundation or retaining wall that could reasonably be expected to pose a hazard to employees shall only be permitted when:

- A support system (underpinning) is provided to ensure the safety of employees and the stability of the structure;
- The excavation is in stable rock;
- A registered professional engineer has determined that the structure will be unaffected by the excavation; or
- A registered professional engineer has determined that such excavation will not pose a hazard to employees.

Sidewalks, pavements and other surface 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.

5.2.11 **Protection from Loose Rock or Soil.** Employees shall be protected from loose rock or soil which could fall or roll from the excavation face or edge. Such protection could consist of scaling to remove loose materials, or the installation of protective barriers. All spoil shall be placed at least 2 feet from the edge of the excavation. It is strongly recommended that spoil be placed 4 or more feet from the excavation edge so as not to cover surface indicators of subsidence (such as fissures or cracks).

5.2.12 **Inspections.** The competent person shall make daily inspections of excavations, adjacent areas, and protective systems for evidence of conditions that could result in a cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. The inspection shall be made prior to start of work, and as needed throughout the shift. Inspections shall be made after each rainstorm or other hazard-increasing event and will be documented using Attachment (2).

Where the inspection finds evidence of any hazardous condition, exposed employees shall be immediately removed from the hazardous area until necessary precautions have been taken.

5.2.13 **Fall Protection.** Where employees or equipment are permitted to cross over excavations, walkways or bridges shall be provided. Standard guardrails shall be provided where walkways are 6 feet or more above lower levels.

Adequate barriers or other types of physical protection shall be provided at all remotely located excavations. All wells, pits, shafts, etc., shall be barricaded or covered and shall be backfilled as soon as possible.

6.0 EXCEPTION PROVISIONS

Variances and exceptions may be requested pursuant to the provisions of procedure HS013, Health and Safety Procedure Variances.

7.0 CROSS REFERENCES

HS013 Health and Safety Procedure Variances
HS050 Training Requirements
HS051 Tailgate Safety Meetings
HS300 Confined Spaces
29 CFR 1926 Subpart P - Excavations

8.0 ATTACHMENTS

1. Responsibility Matrix
2. Excavation Inspection
3. Soil Classification Worksheet
4. Selection of Protective Systems for Excavations 20 Feet or Less in Depth
5. Sloping Options
6. Shoring or Shielding Options

ATTACHMENT 1
EXCAVATION AND TRENCHING

Responsibility Matrix

Action	Procedure Section	*Responsible Party*					
		Employee	Supervisor	Registered Professional Engineer	VP Health and Safety	Local H&S Representative	Competent Person
Incorporate state, local, or client-specific excavation requirements into project plans.	1.0					X	
Issue, revise, and maintain procedure	3.1				X		
Coordinate identification of underground utilities.	5.1.1		X				
Determine need for traffic control devices.	5.1.3		X				
Participate in excavation training.	5.1.4	X	X			X	X
Ensure that protective systems are installed and maintained.	5.2.1						X
Classify Soil Type	5.2.3						X
Design Structural Ramps	5.2.4						X
Selection and design of protective system(s)	5.2.5			X			
Determine stability of adjacent structures.	5.2.10			X			
Inspecting excavation for hazardous conditions	5.2.12	X	X				X

ATTACHMENT 2
EXCAVATION INSPECTION

THIS INSPECTION IS TO BE COMPLETED BY THE COMPETENT PERSON EACH DAY THAT EMPLOYEES WILL BE ENTERING AN EXCAVATION.

Project Name: _____ Project No.: _____

Date: _____ Time: _____ Competent Person: _____

Soil Classification (see Soil Classification Worksheet): _____

Excavation Depth: _____ Excavation Width: _____

Type of Protective System Used: _____

	☒		
	YES	NO	N/A
1 GENERAL:			
Surface encumbrances removed or supported			
Employees protected from loose rock or soil that could pose a hazard by falling or rolling into the			
Hard hats, steel-toed boots, and safety glasses worn by all employees.			
Spoils, materials, and equipment set back at least 2 feet from the edge of the excavation.			
Walkways over excavations 6 feet or more above lower levels are equipped with standard guardrails.			
Warning vest or other highly visible clothing provided and worn by all employees exposed to public			
Employees required to stand away from vehicles being loaded or unloaded.			
Warning system established and utilized when mobile equipment is operating near excavation edge.			
Employees prohibited from going under suspended loads.			
2 UTILITIES:			
Utility companies contacted and/or utility locations delineated.			
Underground installations protected, supported, or removed while excavation is open.			
3. MEANS OF ACCESS AND EGRESS:			
Lateral travel to means of egress no greater that 25 feet in trench excavations 4 feet or more in depth.			
Ladders used in excavations secured and extended 3 feet above the edge of the trench.			
Structural ramps used by employees designed by a competent person.			
Structural ramps used for equipment designed by a registered professional engineer.			
4. WET CONDITIONS:			
Precautions taken to protect from the accumulation of water.			

Water removal equipment monitored by a competent person.			
Surface water or runoff diverted or controlled to prevent accumulation in the excavation.			
Inspections made after every rainstorm or other hazard-increasing occurrence.			
5. HAZARDOUS ATMOSPHERE:			
Atmosphere within the excavation tested where there is a reasonable possibility of an oxygen deficient, combustible, or otherwise hazardous atmosphere.			
Adequate precautions taken to protect employee from exposure to a hazardous atmosphere.			
Testing conducted to ensure that the atmosphere remains safe.			
Emergency equipment, such as breathing apparatus, safety harness and line, and basket stretcher readily available where hazardous atmosphere does exist.			
6. SUPPORT SYSTEMS:			
Materials and/or equipment for support systems selected based on soil analysis, trench depth, and expected loads.			
Materials and equipment used for protective systems inspected and in good condition.			
Damaged materials and equipment used for protective systems inspected by a Registered Professional Engineer after repairs and before being placed back into service.			
Protective systems installed without exposing employees to the hazards of cave-ins, collapses, or from being struck by materials or equipment.			
Members of support systems securely fastened to prevent failure.			
Support systems provided to insure stability of adjacent structures, buildings, roadways, sidewalks, walls, etc.			
Excavations below the level of the base or footings approved by a registered professional engineer.			
Removal of support systems progresses from the bottom, and members are released slowly as to note any indication of possible failure.			
Excavation of material to a level of greater that 2 feet below the bottom of the support system and only if the system is designed to support the loads calculated for the full depth.			
Shield system placed to prevent lateral movement.			
Employees are prohibited from remaining in shield system during vertical movement.			

7. REMARKS:

_____

_____

ATTACHMENT 3
SOILS CLASSIFICATION WORKSHEET

The following worksheet outlines the visual and manual tests that the competent person must perform at least once, and each time soil conditions change. At least one visual and one manual test must be performed; however, performing several tests is recommended so that the condition of the excavation is thoroughly examined.

Project Name:_____ Project Number: _____

Date: _____ Time: _____

Where was the sample taken from? _____

I.	VISUAL TESTS: *One or more visual tests are required for each classification and each time conditions change.*		
1.	Estimate range of particle sizes:	a. primarily fine-grained = cohesive material b. primarily coarse-grained = granular material	
2.	Observe excavated soil:	a. clumps = cohesive material b. breaks up easily = granular material	
3.	Observe sides and adjacent surface area of opened excavation:	a. crack like openings = fissured material b. soil spalls off vertical sides = possible fissured material	
4.	Previous excavation activities:	a. previously disturbed soil	b. not previously disturbed soil
5.	Observe opened side of excavation:	a. layered systems c. estimate degree of slope of layers:	b. layers sloped towards excavation _____
6.	Water condition:	a. evidence of surface water c. depth of water table :	b. water seeping from sides _____
7.	Vibration present:	a. area adjacent to excavation	b. area within excavation

II.	MANUAL TESTS- *One or more manual tests are required for classification and each time soil conditions change.*	
1.	Plastically- soil is cohesive if following is true:	a. mold soil samples into a small ball b. roll ball into thread ☞ diameter c. pick up 2" length of ☞ thread by one end without breaking
2.	Dry Soil Strength:	a. crumbles on its own or with moderate pressure = granular b. falls into clumps which break into smaller clumps that are only broken with difficulty = clay with gravel, sand, or silt. c. breaks into clumps which do not break into smaller clumps and can only be broken with difficulty with no visual indication of fissures = unfissured.
3.	Thumb penetration test: *(These tests are to be run on a large clump of material as soon as it is excavated.)*	a. can be easily indented by the thumb but penetrated by thumb only with great effortType A b. easily penetrated several inches by thumb and molded by light finger pressure = Type C
4.	Unconfined Compressive Strength: *(Saturated Soil Needed)*	a. Pocket Penetrometer reading (take 10 readings and average) 0 - 0.5 = Type C, 0.5 - 1.5 = Type B, 1.5 - 2.0 = Type A b. Shear Vane reading X2: 0 - 0.5 = Type C, 0.5 - 1.5 = Type B,1.5 - 2.0 = Type A
5.	Drying Test: *(A dry soil sample 1" thick X 6' diameter is needed)*	a. develops cracks = fissured material b. dries without cracks and breaks by hand with considerable force significant cohesive content = unfissured cohesive material. c. sample breaks easily by hand = fissured cohesive or granular material d. easily pulverize dry clumps by hand or by stepping on them = granular e. don't pulverize easily = fissured cohesive.

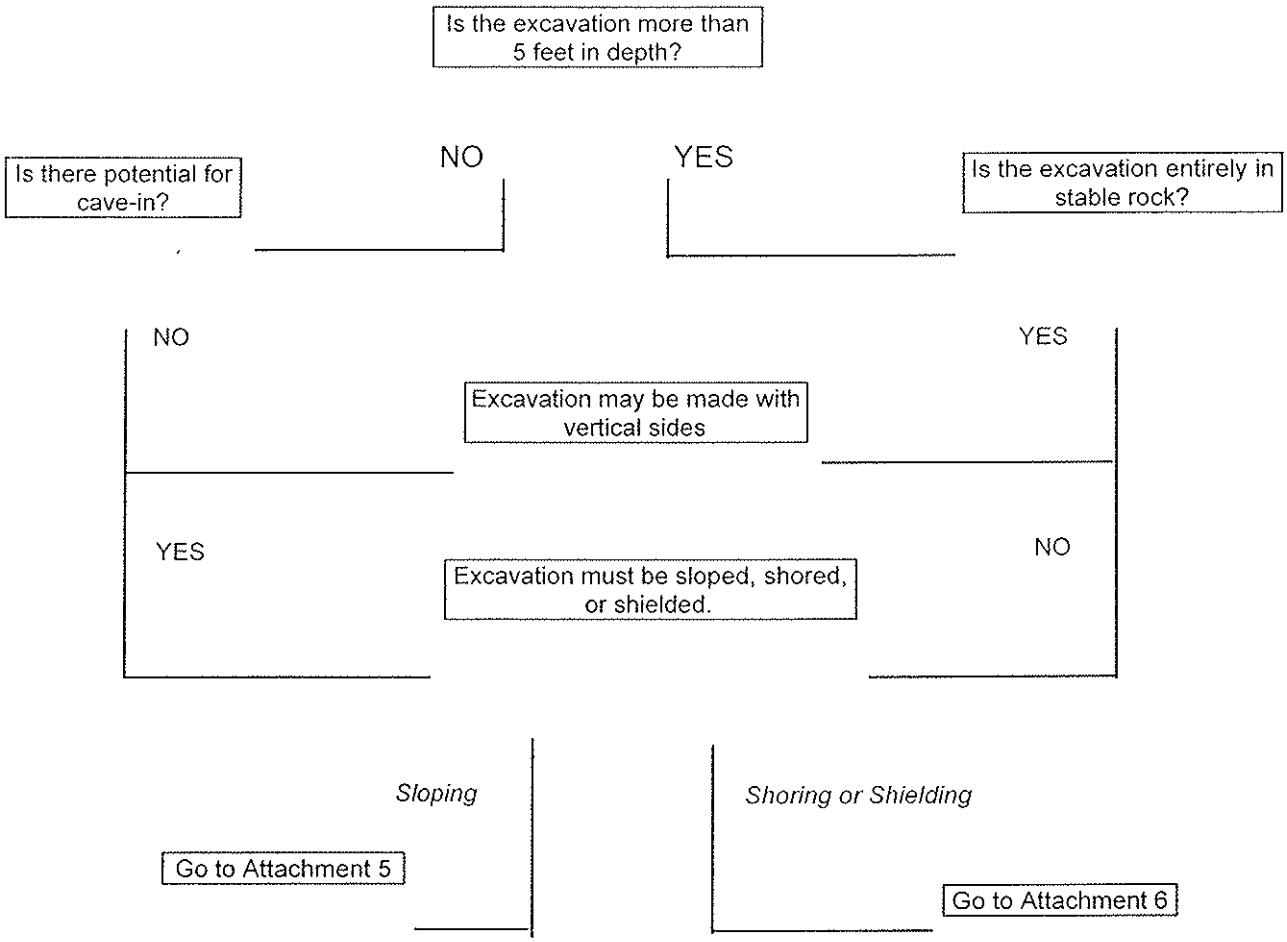
SOIL CLASSIFICATION: Type A Type B Type C Stable Rock Other _____

COMPETENT PERSON: _____ _____ _____

Print Name Signature Date

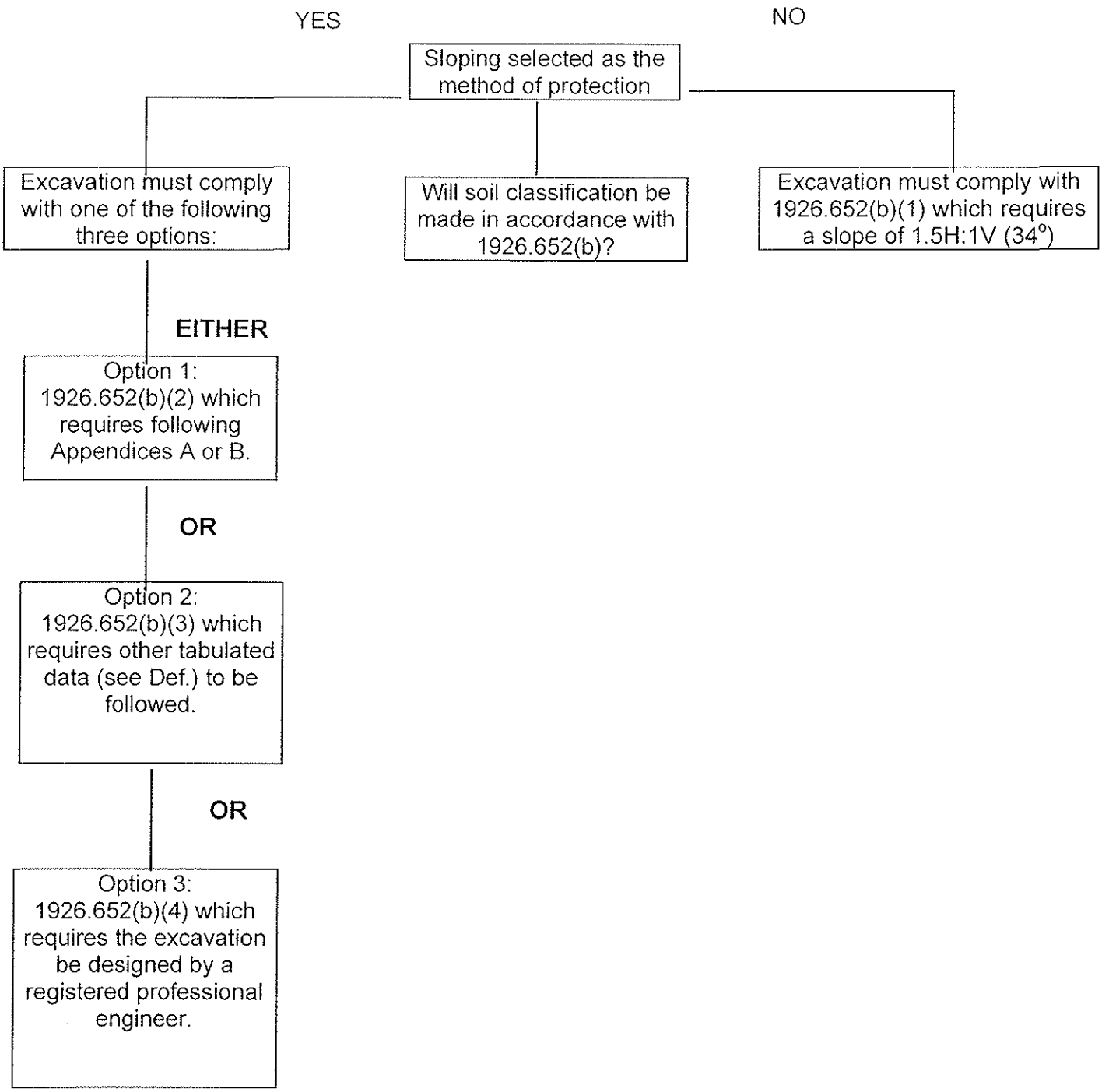
ATTACHMENT 4

SELECTION OF PROTECTIVE SYSTEMS FOR EXCAVATIONS 20 FEET OR LESS IN DEPTH



For excavations greater than 20 feet in depth, design by a registered professional engineer in compliance with 1926.652 (b) and (c) is required.

ATTACHMENT 5
SLOPING OPTIONS



ATTACHMENT 6
SHORING OR SHIELDING OPTIONS

Shoring or shielding selected as the method of protection.

Soil Classification is required. The excavation must comply with one of the four options below.

EITHER

Option 1:
1926.652(c)(1) which requires Appendices A and C to be followed (Timber Shoring).

OR

Option 2:
1926.652(c)(2) which requires manufacturer's data to be followed (trench jacks, etc.).

OR

Option 3:
1926.652(c)(3) which requires tabulated data (see Def.) to be followed.

OR

Option 4:
1926.652(c)(4) which requires the excavation be designed by a registered professional engineer.

PROCEDURE

Subject: UNDERGROUND/OVERHEAD UTILITY CONTACT PREVENTION

1.0 PURPOSE AND SUMMARY

This procedure prescribes the steps to be followed in order to prevent accidents involving the contact with or damage of underground/overhead utilities. The company provides the operational and training practices required to safely execute work where underground/overhead utility hazards may exist.

2.0 TABLE OF CONTENTS

1.0 Purpose and Summary
2.0 Table of Contents
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- 5.3 Training Requirements
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- 5.5 Local Jurisdiction Requirements

6.0 Exception Provisions
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3.0 RESPONSIBILITY MATRIX

3.1 Procedure Responsibility

The Director of Health and Safety is responsible for the issuance, revision, and maintenance of this procedure. Also, see Attachment 1 for matrix of responsibilities.

3.2 Action/Approval Responsibilities

The Responsibility Matrix is Attachment 1.

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4.0 DEFINITIONS

Company

All wholly-owned subsidiaries of Shaw Environmental & Infrastructure, Inc. (Shaw E & I).

Competent Person – Drilling Oversight (CPDO) Training

When drilling activity is to take place the Shaw's Field Team Leader (FTL) must have successfully completed Shaw's in-house training pertinent to competent person drilling oversight (CPDO Training). The FTL is required not only to have successfully completed CPDO training but to have an appropriate educational background, coupled with field experience and, the authority to make changes to correct deficiencies, or to stop the job if need be.

NOTE: The CPDO training requirement will become effective September 1st 2006. This means that every FTL will have successfully completed CPDO Training prior to August 31, 2006.

Competent Person - Excavation and Trenching

A person who is capable of identifying existing and predictable hazards in the excavation/trenching work area and who has the authority to take prompt corrective measures to eliminate them. NOTE: Excavation/Trenching training is required when trenching/excavation hazards are present/anticipated (i.e. spoil piles, use of three foot (3') or larger diameter augers, or other circumstances) but only recommended when trenching/excavation hazards are not present/anticipated.

Excavation

Any manmade cut, cavity, trench or depression in an earth surface formed by earth removal.

Underground Utility

Any active or inactive subsurface or buried structure that is or was designed to service a public or private facility. These may include, but are not limited, to the following:

- Electric power lines
- Natural gas lines
- Telephone lines
- Telephone cables and fiber optic lines
- Water lines
- Steam and pneumatic lines
- Sewer lines
- Drain lines
- Underground storage tanks
- Septic tanks
- Process or product lines

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Overhead Utility
Any active or inactive overhead structure that is or was designed to service a public or private facility. These may include, but are not limited, to the following:

- Overhead power lines
- Overhead telephone lines
- Overhead fiber optic lines
- Overhead cables
- Overhead supports
- Overhead piping
- Traffic lights
- Utility Bridges

One Call Center
Each state has a One Call, Dig Safe, Miss Dig, etc. dial-in number for requesting mark-out of buried public utilities, such as gas lines, electrical lines, telephone/cable lines, sewer lines, and water lines. This number is typically called a minimum of 72 hours prior to subsurface activities depending on the particular state the work will be conducted. The One Call Center will notify the local public utilities for a line location mark-out for the particular location. The individual public utilities must locate and mark-out the utilities upon request. In most cases, the markouts will not be performed on private property. A confirmation number is established and confirmation report generated and submitted to the requester.

As-Built Drawings
As-built drawings are blueprints that are usually obtained from the facility owner or client. They show original buried utilities and any modifications which have been made.

Private Utility Locating Service
A private utility locating service is a firm established to locate underground utilities using specialized locating equipment, such as ground penetrating radar location devices or radio transmitter type utility locating equipment.

Fiber Optic Service Lines
Fiber optic service lines are communication lines that are buried underground. When damaged, these lines are very expensive to replace. Fiber optic companies routinely provide on-site supervision, if requested. The company encourages this practice.

Field Team Leader (FTL)
The FTL is the person with whom the responsibility of the execution of the field work resides. This person may be the project manager, senior geologist, staff geologist, etc. This individual must have the sufficient experience, training and, field knowledge to ensure all site configuration information is collected and analyzed.

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Site Survey

A site survey is an inspection of the work site to look for signs of other buried utilities that may not be indicated through as-built drawings or through utility locating services. The survey typically involves inspection of overhead electrical services, inspection of basements, utility rooms, garages, etc., for signs of old electrical conduits or fuel/water/septic lines. The FTL must contact the appropriate site representative to provide any additional information that may be marked on the as-builts.

5.0 TEXT

Underground/overhead utilities may be encountered at any job site. The guidelines established in this procedure were developed to help identify and mitigate the potential hazards associated with this type of work.

Any subsurface activity is subject to the underground utility locating regulations for the state where the work will be conducted. This procedure authorizes the use of state, local or other required practices, but requires that the practice which most limits the liability to Shaw for damaged utilities is utilized. No variance is required under these circumstances, but the project-specific Health and Safety Plan (HASP) or work plan shall fully document these more protective procedures.

5.1 Preliminary Requirements

The Project Manager or designee must visit the site to mark the boring/excavation locations so they can be clearly identified and then contact the One Call Center for the state in which the work is to be performed in to formally request a utility mark out at the particular work location(s).

Prior to assignment of work the Field Team Leader (FTL) will assure that all affected employees receive an overview of the hazards of encountering underground/overhead utilities. The FTL is responsible to review this procedure, the work practices to control these hazards, and the roles and responsibilities of each worker with the work crew. This procedure and other requirements that may be contained in the site specific HASP shall be reinforced during daily tailgate safety meetings.

5.2 Operating Requirements

5.2.1 Underground Utilities Requirements

Prior to conducting any project site activities, the FTL must ensure that all existing underground/overhead utilities in the work area are located per the state or local mark-out protocols. Documentation of utility mark-out must be completed using the Utility Mark-out Documentation form (Attachment 3). No boring/excavation work is to be performed until all utility mark-outs are verified.

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While on-site, the FTL must conduct a site survey to search for signs of other buried or overhead utilities. This will include areas such as garages, basements, etc. The results of such surveys must be documented on the Utility Markout Documentation form (Attachment 3). The property owner, client, or facility operator must be consulted on the issue of underground utilities. All knowledge of past and present utilities must be evaluated prior to conducting work..

After all mark outs have been completed, and the boring locations have been accepted by the FTL prior to drilling, each borehole location must be hand dug to a minimum of five feet bgs.

If the investigation requires boreholes in an area not covered by a municipal one call system (on private property), then the FTL must utilize appropriate geophysical techniques, hand held utility locating devices, a private utility locating firm, or other approved method to determine the locations of underground utilities. The current accepted geophysical methods for the investigation and location of buried utilities include: Ground Penetrating Radar (GPR), Time Domain and/or Frequency Domain Electromagnetic methods, Magnetometer, and Inductive/Conductive Radio-Magnetic methods. The geophysical methods can be very useful for locating buried utility lines in areas where hand digging is not possible or practical. However, it must be noted that these methods do have limitations that are a function of soil conditions, depth of investigation, imaging resolution, or other factors.

If it is determined that a non-invasive geophysical investigation may be needed, assistance with selecting the appropriate method(s) can be obtained from the Shaw E & I Science and Technology Division, Geophysics & Mapping Group, and a variance request must be submitted and approved prior to the inception of intrusive field activity.

Should the local geology be prone to refusal or should there be any other reason the boring location cannot be cleared to a minimum of 5' bgs then the appropriate aforementioned alternative methods should be utilized to ensure the boring location is clear of utilities 5' bgs, and a variance request must be submitted for review.

5.2.2 Overhead Utilities Requirements

Overhead utility locations must be marked (warning tape, flags, etc.) where heavy equipment, or other equipment, has the potential for contacting overhead utilities. Conduct a site inspection on a daily basis to determine where activities will take place and the location of overhead utilities and overhead obstructions. Once they have been identified, place warning tape on poles and/or guy wires and attempt to plan the work so that no contact will be made with the overhead utilities or obstructions. Share the information with all site personnel during the tailgate safety meeting.

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Maintain at least 10 feet from overhead power lines, up to 50 kV. For voltages over 50 kV, add 0.4 inches per kV to obtain the safe distance between equipment and power lines. If voltage is unknown, remain at least 20 feet from overhead power lines.

As a precaution, a spotter must be used at all times when it is possible to violate the minimum distance requirements for overhead utilities. If contact is deemed unavoidable, consult with the client and the respective health and safety representative to evaluate the area to determine if the particular overhead utility can be removed prior to engaging in the activity.

5.2.3 Other Requirements

Only hand digging is permitted within 3 feet of underground high voltage, product or gas lines. Once the line is exposed heavy equipment can be used but must remain at least 3 feet from the exposed line.

Only experienced, demonstrably proficient equipment operators will be used to operate such heavy equipment as drill rigs, backhoes, front-end loaders, cranes, etc.

Due the sensitivity and costs associated with damage to fiber optic cables the FTL must have documented verbal contact and an agreement with the fiber optic company for all work within 50' of the fiber optic cables. Subsurface investigations near fiber optic cables are more fully discussed in site specific HASP's. Contact your division Health and Safety Professional for specific information on this subject.

5.3 Training Requirements

Competent Person Drilling Oversight (CPDO) Training

The FTL (at least one onsite Shaw person will be performing the drilling oversight) will be required to have successfully completed the approved internal Competent Person Drilling Oversight (CPDO) training.

Prior to assignment of work the Field Team Leader (FTL) will assure that all affected employees receive an overview of the hazards of encountering underground/overhead utilities. The FTL is responsible to review this procedure, the work practices to control these hazards, and the roles and responsibilities of each worker with the work crew. This procedure and other requirements that may be contained in the site specific HASP shall be reinforced during daily tailgate safety meetings.

Trenching/Excavation Training

The Field Team Leader or at least one onsite Shaw employee will be required to have successfully completed Trenching/Excavation training prior to the inception of site work activity when trenching excavation hazards (i.e. spoil piles, use of 3' diameter augers, or anytime similar hazards are present) are present/anticipated. NOTE: This training is now recommended rather than required when trenching/excavation hazards are NOT anticipated/required

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5.4 Incident Reporting Requirements

Employees are required to immediately report to their direct supervisor any overhead or underground utility contact incident, or near miss incidents. Any supervisor (but preferably the supervisor directly responsible for the involved employees) with first-hand knowledge of an incident is required to investigate the incident. The Project Manager and respective Health and Safety Manager or Representative shall be informed of the incident immediately.

At a minimum, the incident investigation will require completion of the incident investigation report and General Liability Property Damage and Loss Report form found in H&S Procedure HS020.

In addition, Attachment 5 provides a "Tip Sheet" to help properly assess and investigate the incident causes and recommendations or requirements.

5.5 Local Jurisdiction Requirements

Where local jurisdictions or clients have established requirements different from those in this procedure, the practice which most limits the liability to Shaw for damaged utilities shall be utilized. No variance is required under these circumstances but the project-specific Health and Safety Plan or work plan shall fully document the alternate procedures.

6.0 EXCEPTION PROVISIONS

Anytime a minimum of a 5' clearance cannot be obtained by either hand digging or by using geophysical means, the FTL must obtain a variance from the Regional VP (or equivalent level such as Operations Director for Federal Business Line) or designee to proceed with drilling operations in that area. This would include an initial verbal variance documented in the field log followed up by a written (email) approval from either the Regional VP (or equivalent level or title) or designee. The record of communication will be noted in the field log for the project and, a record of the approval or denial will be placed in the project file.

A variance form can be obtained in HS 013. A flowchart to assist one in determining how and when a variance should be obtained can be found immediately following this section.

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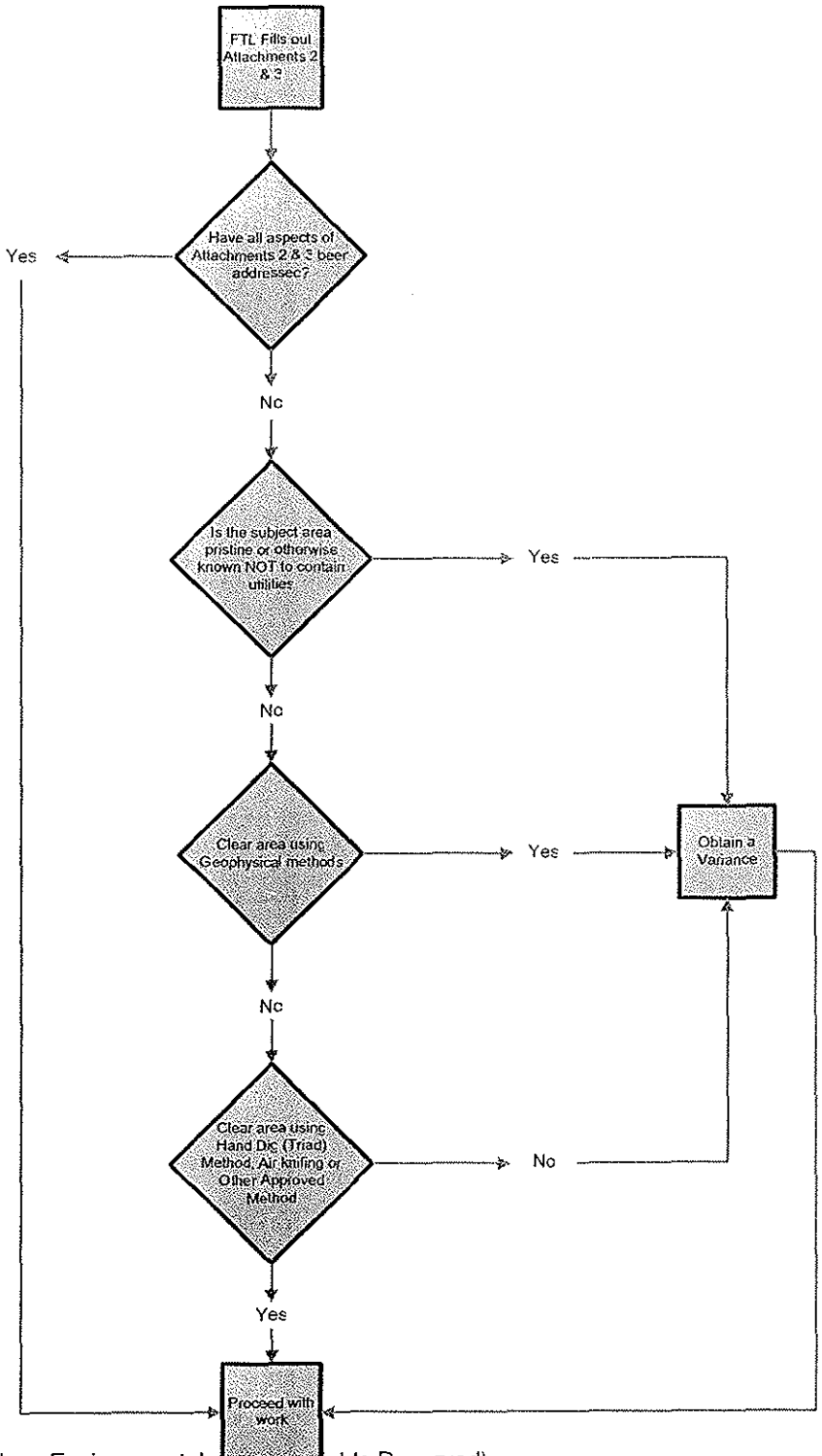
HS 308 Flow Chart



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7.0 CROSS REFERENCES

HS013	Health and Safety Procedure Variances
HS020	Accident Prevention Program: Reporting, Investigation, and Review
HS050	Training Requirements
HS307	Excavation and Trenching

8.0 ATTACHMENTS

1. Responsibility Matrix
2. Pre Drilling Checklist
3. Utility Markout Documentation
4. Underground Utility Hits – Tip Sheet for Incident Investigations
5. Frequently Asked Questions

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ATTACHMENT 1 - UNDERGROUND/OVERHEAD UTILITY CONTACT PREVENTION
Responsibility Matrix

Action	Procedure Section	Vice President	Project Manager	Field Team Leader	HS Representative
Project-specific HASP or Work Plan shall document the practices to be used at a particular site.	1.0		X	X	X
Contact the One Call Center for mark out of utilities at the site	5.1		X		
Complete Utility Markout Documentation Form	5.2		X	X	
As-built drawings shall be reviewed	5.2			X	
Only experienced demonstrably proficient equipment operators will be used to operate such heavy equipment as backhoes, front-end loaders, cranes, etc.	5.3			X	
Provide training*	5.3				
Incident Investigation and Reporting	5.4		X	X	X
Exceptions to Procedure	6.0	X	X	X	X

*Provided by Shaw's Training Department

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ATTACHMENT 2 - PRE - DRILLING/BORING/GEOPROBE Checklist

Purpose: This form is designed to help the FTL make decisions drilling/boreholing/geoprobing around underground/overhead utilities.

DATE_____ PROJECT NAME/NUMBER_____
Field Team Leader Name: _____
DURATION/SUMMARY OF WORK TO BE PERFORMED: _____

Consideration	Check	Check	Explanation	Initial
Has the state one-call been contacted?	□ Yes	□ No		
Are any as-built drawings available? If so, do they show any utilities?	□ Yes	□ No		
Has a visual inspection of the work area(s) been completed?	□ Yes	□ No		
If one-call not available has a private locating service or Shaw S&T group been contacted?	□ Yes	□ No		
Were any utilities identified through private locating service? If so, indicate on site drawings.	□ Yes	□ No		
Are there any fiber optic cables within 50 feet of hole locations?	□ Yes	□ No		
If fiber optic cables are within 50 feet has an agreement with the fiber optic company been established?	□ Yes	□ No		
Can a test borehole be advanced by hand digging, probing, post hole digging, and/or air knifed to 5 feet bgs?	□ Yes	□ No		
If hand digging, probing, post hole digging, and or air knifing to 5 feet bgs is not possible, can a non-invasive geophysical investigation be conducted? If not, why?	□ Yes	□ No		
Are you comfortable with approving this authorization?	□ Yes	□ No		
Other considerations:				

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ATTACHMENT 3 - UTILITY MARK-OUT DOCUMENTATION

Project Name:_____ Location:_____
FTL Name: _____ Date:_____
Utility Called:_____ Confirmation #:_____
Subcontractor:_____ Task/Activity:_____
County of work:_____ Municipality of work:_____
_____

Before work is done on any site, contact the appropriate local utility locating service (One Call, Miss Dig, Uloco, etc.) or a local utility contractor to have sub grade utilities marked. NOTE: Boring locations to be placed not in the public right of way are typically not marked out by the public utility mark out, and a private utility locate service must be engaged. Indicate to the utility locator the nearest intersecting street for the site: _____ Confirmation No:_____.

List utility firms (public and private) and the utility they will mark.

Utility Marker Emergency Telephone Numbers Major Utilities Marked by Color Code			
Name of Utility Company	**Utility**	**Color Code**	**Emergency Telephone Number**
	Water	Blue	
	Gas	Yellow	
	Electric	Red	
	Telephone/ Cable/ Communication	Orange	
	Sewer	Green	
"ALL UNDERGROUND UTILITIES MAY NOT BE LOCATED BY THE LOCAL UTILITY SERVICE". Accordingly, you must list other known utilities in the area that the "One Call" service will not contact:			

Attach photos of the area prior to placing boreholes.
Take photos of the area indicating minimum 5' hand dig, post hole dig, probe, GPR or other:
NOTE: For any borehole, should 5' minimum clearance not be obtained, you must contact Business Line VP or equivalent (Operations Director or other on the Federal Business Line) and obtain a variance.

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Completed by:_____ _____ _____
Name Signature Date

ATTACHMENT 3 – UNDERGROUND UTILITY HITS TIP SHEET FOR INCIDENT INVESTIGATIONS

1. Location of the incident.
2. The time of day the incident occurred.
3. What type of utility was hit?
4. How deep was the line hit (in feet)?
5. Who called Designated Locator Service?
6. Note the "One Call" number on the Incident Investigation Follow-up report.
7. Attach the "One Call" record keeping documentation.
8. Were mark-outs completed by the utilities? If so, please identify.
9. Were mark-outs legible at the site?
10. Was the mark-out of the line that was hit accurate?
11. Was the mark-out misinterpreted?
12. Is there a utility damage sheet attached to the Incident Investigation Follow-up Report?
13. Have there been any faults or oversights by any 3rd party? If so, is it documented on the Incident Investigation Follow-up Report?
14. Did the FTL interview the property owner/manager prior to the incident?
15. Was pre-screened by hand digging 5 feet?
16. Were any supplemental utility locator devices used? If so, did we obtain them? If so, were they used on site?
17. Were there blueprints/as built plans available? If so, did we obtain them? If so, were they used on site?
18. Who is paying for the repairs?
19. Please define the total hours and cost estimate/impact to address the utility damage incident:

    _____ Site time in hours (not billed to the job)
    _____ PM time hours (not billed to the job)
    _____ H&S time in hours (not billed to the job)
    _____ BLM Time in hours (not billed to the job)
    _____ Rework/non-billable time (estimate)
    _____ Subcontractor rework/non-billable costs (estimate)
    _____ Repair costs to company (estimate)
    _____ Repair cost to customer (estimate)

20. Has the FTL completed Shaw's in-house CPDO training?
21. Has the FTL completed trenching/excavation training?
22. Is he/she current with the OSHA 40 hour and 8 hour refresher? If so, what are the dates of the training?
23. Who was the Site Safety Officer on the job site?
24. Does he/she have OSHA 8 hour supervisor training? If so, what are the dates of the training?
25. What was the name of the drilling subcontractor that was on site?
26. Have we researched the training background for this vendor?
27. Was a JSA performed at least once during the day that covered utility contacts and associated hazards?
28. Does this vendor have approved status?
29. Was there a tailgate safety meeting that took place?
30. Were utility mark-outs addressed at the tailgate safety meeting?
31. Were there any markings nearby the "hit" area?

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ATTACHMENT 5 – Frequently Asked Questions (FAQs)

During the roll-out of this revision of HS 308 a variety of questions/comments/concerns arose. These concerns have been put in the form of most frequently asked questions (FAQs) and their respective responses. These FAQs will clear up misunderstanding pertaining to this procedure, and provide valuable information that will help our workforce have a better understanding of how this procedure should be implemented. Please review the FAQs below:

1. *No other competitor of Shaw has felt the need to do anything as extreme as this procedure to ensure minimization of utility hits. Instituting this procedure will put us out of business.*

Response: After thorough review of claims and incidents involving drilling activities and underground utilities, the committee believes that our business/client needs are best served by adopting this policy. And that the likelihood of being put out of business is much greater from continuing to do business the way we currently do it than by adopting this improved policy. The committee realized that 100% adherence to this procedure at all work sites is likely not possible. For those cases where legitimate reasons exist for non-compliance, the committee realized that an effective responsive (variance) system must be in place. The committee believes that the variance procedure, as stated in the policy, should address the exceptions as they occur.

The Committee is not aware of any specific ASTM or true "industry standard". However, the committee is aware that best practices can vary tremendously and many times are client dependent. For example one extremely large Shaw client requires that we continuously probe. On the other end of the spectrum some clients look completely to Shaw for guidance in these matters.

2. *Our clients want us to do the work but do not wish to pay the additional fees involved with this new procedure. Could we offer them a two tiered pricing, one to do it the old way, and one to do it the new way?*

Response: The committee believes that contacting an underground utility of any type, no matter who is at fault or who ultimately pays for fixing, the outcome is a "black eye" for all involved. When these events occur, even if Shaw is not at fault, the committee believes that continued good client relations, and the potential for obtaining future business lessens as utility hits/incidents occur. This procedure is designed to minimize health and safety risks to our workers AND to mitigate liability to Shaw. Receiving the necessary compensation for the precautionary measures outlined in the procedure would be expected, and should be itemized in the initial proposal including a statement as to what will specifically be done in the field to mitigate risks relative to underground utilities and WHY Shaw believes these steps are necessary. However, if the client is willing to assume the entire liability resulting from "hitting" an underground utility, the contract should be written to reflect this

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and a variance would be in order. Keep in mind that Shaw cannot allow a client's desires to take on liability to affect the health and safety of workers. No matter what the client desires might be, Shaw would still expect the basic procedures to be followed for health and safety purposes. The training though yet to be finalized will provide project manager's examples of wording to be used in proposals and contracts.

3. Hand digging to 5' is impossible during frost conditions in Minnesota, Wisconsin and many northern areas. How should this be addressed?

Response: When conditions present themselves that do not allow for hand digging each borehole, other methods must be used for clearance and a variance must be obtained. The alternative methods include a range of non-invasive geophysical survey techniques designed specifically for locating buried utilities, pipelines, tank (UST), and other buried objects that can interfere with drilling. These non-invasive geophysical methods are suggested and mentioned in the procedure.

4. What if the field crew runs into refusal during hand dig clearance?

Response: If refusal occurs and moving to an alternate spot presents the same problem, hand digging may not be possible as mentioned in #2 above. When conditions present themselves that do not allow for hand digging each borehole, other methods must be used for clearance and/or a variance must be obtained. Of course, we expect that the dig safe folks to be contacted, and that a private locating service be utilized if available. Should a private locating service not be available, we can use trained internal sources.
The alternative methods include a range of non-invasive geophysical survey techniques designed specifically for locating buried utilities, pipelines, tank (UST), and other buried objects that can interfere with drilling. The current accepted geophysical methods for the investigation and location of buried utilities include: Ground Penetrating Radar (GPR), Time Domain and/or Frequency Domain Electromagnetic methods, Magnetometer, and Inductive/Conductive Radio-Magnetic methods. These non-invasive geophysical methods are suggested and discussed in the procedures. The geophysical methods can be very useful for locating buried utility lines in areas where drilling and digging are not possible or practical, but these methods do have some limitations that are a function of soil conditions, depth of investigation, and imaging resolution.
If it is determined that a non-invasive geophysical investigation may be needed, assistance with selecting the appropriate method(s) can be obtained from the Shaw E & I Science and Technology Division, Geophysics & Mapping Group. Of course, it is expected that the "dig safe" folks will be contacted, and that a private utility locating service be utilized when appropriate (utility location method is known to be feasible), and if available. Should a private locating service not be available, we can use trained internal Shaw E & I personnel resources to perform utility line location work. Finally, if the Project Manager has determined that a variance to the procedure is justified, a variance request should be submitted for review.

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5. *Why is trenching/excavation training required for putting in Geoprobe® boreholes? This seems like tremendous overkill.*

Response: The committee believes that, in general, trenching/excavation training is a good educational tool that promotes overall health and safety awareness and provides important information/techniques for our field staff. Trenching/excavation training provides insights into fall hazards, spoil pile placement, and many other related safety issues. Many of our drilling jobs have involved oversized auger bits (3' in diameter) where a large deep borehole is created. The committee agrees that when the diameter of the borehole lessens (i.e. use of a Geoprobe®), the impact of trenching/excavation training decreases. Trenching excavation training is now a requirement only when large boreholes are created or other hazards as mentioned above are present, but only recommended training when Geoprobe ® or similar equipment is being used and the result is trenching excavation type hazards do NOT exist. NOTE: Specific training pertinent to drilling/ Geoprobing ®/boring (CPDO training) will be provided and will be mandatory. Additionally, CPDO and trenching / excavation training are both required on projects where 3' or larger diameter boreholes are to be drilled.

6. *Are there any training requirements besides trenching/excavation training?*

Response: The committee evaluated a need for training specific to the HS 308 policy (drilling) and solicited the assistance of the training department and certain operations employees to develop CPDO training. This CPDO training includes basic steps needed to be taken from call the dig-safe number, private utility searches, geo-physical capabilities, probing, hand augering, air knifing, water pumping/knifing, hand digging and others.

7. *Hand diggings creates heat stress, tripping hazards, back injuries, and other hazards and is unnecessary.*

Response: The committee did not envision using a spade and a strong back to dig various 5' holes at the field site. The committee does envision using an air knife, water knife, probe, or other method rather than a hand shovel. The committee understands that not all methods may be acceptable in all states, municipalities or to all clients. The committee was also aware that when all else fails one could consider using a 1" diameter stainless steel auger placing 5' bgs hand borings in a triangular pattern where the auger bit could be placed in between these small hand borings. The committee envisions this theme and methodology to be expanded within the upcoming training. Additional information on augering techniques will be provided in the specific training (CPDO) mentioned above.

8. *I need to put borings in pristine farmland next door to a contamination zone. There are no and have never been any utilities in this area. What should I do?*

Response: Once you go through the proper utility locate procedure and are confident that no utilities

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exist in the subject area, you need to obtain a variance. This would also hold true for pristine forest preserves, wildlife refuges, or other areas not affected by utilities.

9. Who needs to sign off on a variance?

Response: Variances are signed by the Area Vice President (or designee, which may be delegated to the BLM for each office) along with the Project/Program Manager/Director. When we know in advance that HS308 cannot be adhered to, one should make plans to get a formal variance approval and appropriate paperwork developed two weeks prior to field activity. Variances can also be obtained when field conditions arise that make adherence to HS308 impossible. The variance can be obtained via cell phone in the field with the PM and appropriate management with the outcome noted in the field logbook followed up by an appropriate e-mail. This e-mail should be kept in the project file as proof of variance approval. It is recommended that variances be obtained as soon as it is known that they will be required.

10. What constitutes a "probe"? I assume a Geoprobe® is not valid?

Response: A Geoprobe® is NOT a valid probe in that Geoprobes® have caused damage to sewer lines and other utilities. Probes are typically made of a fiberglass-like material that have a pointed end but will not damage subsurface utilities and allows for the field staff to sense if underground items are encountered.

11. Under 5.1, is a subcontractor a designee?

Response: Although a subcontractor can make arrangements to contact dig safe and more, Shaw must ensure that the sub has, in fact, done what they had agreed to do. It should be remembered that typically on drilling projects, from many of our customer's perspective, the liability remains with Shaw, and they will look to Shaw, not our subs, for resolution of any events that occur. Hence, it is incumbent on Shaw to insure that our procedures are followed by Shaw and Shaw subs.

12. Does ground surface include concrete, asphalt or other man-made coverings?

Response: A simple NO. Some of our projects include drilling through airport runways or tarmacs which can be up to 15" in depth. Manmade surfaces do NOT count in the 5' hand dig clearance specification. If we are attempting to advance boreholes below existing concrete surfaces, the geology below the concrete will be exposed by cutting the concrete and removal of the concrete. After the concrete is removed and the geology is exposed, a hand auger can then be used. Hopefully, the twelve concerns above and the responses to these comments will have helped users understand the implementation of this HS 308 policy. More importantly the committee realizes that information on this subject will be provided during the training mentioned above. It is the committee's belief that once this program has been completely rolled out the need for variances will be minimal and the interactions of the safety department with operations management with this entire process will make ensure success.

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PROCEDURE

Subject: CONTROL OF HAZARDOUS ENERGY AND HAZARDOUS MATERIAL SOURCES (LOCKOUT/TAGOUT)

1.0 PURPOSE AND SUMMARY

This procedure establishes the minimum requirements for the lockout and tagout of energy and hazardous material sources and must be used to:

- Ensure that all machinery, equipment, or confined spaces are isolated from all potential hazard sources (mechanical, electric, chemical hazards, etc.) and are locked out and tagged out prior to employees performing any servicing, maintenance, or entry activities.
- Ensure that field projects where hazardous energy/material sources are present develop a site-specific Lockout/Tagout procedure.
- Ensure that equipment can accommodate locks. Additional means such as a tagout program may be used to ensure safety when locks are not used.
- Establish procedures for release of the Lockout/Tagout that include machine inspections, notification and safe positioning of workers, and removal of the Lock/Tag.
- Ensure the use of standardized locks and tags that identify the worker using them, making sure that locks and tags are of sufficient quality and durability to ensure their effectiveness.
- Provide the necessary employee training.

For a basic overview of the Lockout/Tagout System refer to the "Flow Diagram - Overview: Lockout/Tagout System" (Attachment 2).

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3.0 RESPONSIBILITY MATRIX

3.1 Procedures Responsibility

The Corporate Director of Health & Safety is responsible for the issuance, revision and maintenance of this procedure.

3.2 Action/Approval Responsibilities

The Responsibility Matrix is Attachment 1.

4.0 DEFINITIONS

Affected Employee - An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout and tagout, or whose job requires the employee to work in an area in which isolation of hazards is necessary to provide a safe workplace.

Authorized Employee - A person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance.

Blanking or Blinding - The absolute closure of a pipe, line, or duct by the fastening of a solid plate (such as a spectacle blind or skillet blind) that completely covers the bore, and that is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

Capable of Being Locked Out - An energy/hazard isolating device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it. Other energy isolating devices are capable of being locked out, if lockout can be achieved without the need to dismantle, rebuild, or replace the energy/hazard isolating device or permanently alter its energy control capability.

Double Valve and Vent - A valve arrangement in a piping system in which three valves are arranged in conjunction with a vent line. One valve is upstream of the vent, another downstream, and one is on the vent itself. To isolate the downstream system, the vent valve is opened, the other two are closed, and all three valves are locked in this position.

Energized - Connected to an energy source or containing residual or stored energy.

Energy Isolating Device - A mechanical device that physically prevents the transmission or release or energy, including but not limited to the following: A manually operated electrical circuit breaker, a disconnect switch, a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors and, in addition, no pole can be operated independently; a line valve; a block; and any similar device used to block or isolate energy. Push buttons, selector switches and other control circuit type devices are not energy isolating devices.

Energy Source - Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

Group Lock Box - A device capable of holding and securing the key or other release mechanism for a group lock, which can accomodate the individual locks from all members of the work crew.

Hot Tap - A procedure used in repair, maintenance, and service activities which involves welding on a piece of equipment (pipeline, vessel or tank) under pressure, in order to install connections or appurtenances. It is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.

Lockout - The placement of an energy/hazard isolating device, in accordance with an established procedure, which ensures that the equipment being controlled cannot be operated until the device is removed.

Lockout Device - A device that utilizes a positive means such as a lock, either key or combination type, to hold an energy/hazard isolating device in the safe position and prevent the energization of a machine or equipment. This includes blank flanges and bolted slip blinds.

Normal Production Operations - The utilization of a machine or equipment to perform its intended production function.

Qualified Employee - An employee whose skills and training meet or exceed 29 CFR 1910.332(b)(3) for work on or near exposed energized parts must, at a minimum, be trained in and familiar with the skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment; to determine the nominal voltage of exposed lines; and the clearance distances to which the qualified persons will be exposed.

Servicing and/or Maintenance - Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or unjamming machines or equipment, making adjustments or tool changes, where the employee may be exposed to an unexpected energization or start-up of the equipment, or release of hazardous energy/or material.

Setting-up - Any work performed to prepare a machine or equipment to perform its normal production operation.

Tagout - The placement of a tagout device on an energy/hazard isolation device, in accordance with an established procedure, to indicate that the device and the equipment being controlled may not be operated until the tagout device is removed.

Tagout Device - A prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy isolation device in accordance with an established procedure, that indicates that the device and the equipment being controlled may not be operated until the tagout device is removed.

5.0 TEXT

5.1 Scope/Application

This procedure covers any activity which requires isolation of a source of energy or hazardous material, such as, the servicing and maintenance of equipment and confined space entry. It outlines methods to prevent the unexpected energization or start-up of the equipment, or release of stored energy or material that could cause injury to employees. For any projects planned for more than 30 days with lockout/tagout planned for more than seven calendar days or when locking/tagging out specialized equipment having its own lockout requirements, a site-specific/equipment specific plan must be developed and incorporated as part of the Site-Specific Health and Safety Plan. Otherwise Attachments 4-7 (discussed later in text) must be utilized to document lockout/tagout.

In situations where our client has specific lockout/tagout requirements, Shaw Environmental & Infrastructure, Inc. (Shaw E & I) personnel can follow client procedures after an Shaw E & I health and safety professional has approved them as being at least as protective as Shaw E & I procedures. In such cases, the client procedures shall be incorporated into the Shaw E & I health and safety plan and all affected employees trained on these procedures.

5.1.1 **Exclusions.** Normal operations including repetitive, routine minor adjustments that do not require removal of equipment guarding.

When work is conducted on equipment where an employee has direct control over the cord(s) or plug(s) connected to the associated equipment.

5.1.2 **References.** OSHA General Industry Standard, 29 CFR 1910.147, The Control of Hazardous Energy (Lockout/Tagout), 29 CFR 1910.146, Permit-Required Confined Spaces, and 29 CFR1910.331-335, Safety-Related Work Practices.

5.2 Responsibility

Each new, transferred, authorized or affected employee and other employees whose work operations are or may be in an area where lockout/tagout procedures are utilized must be instructed in the purpose and use of this lockout/tagout procedure.

- **All Personnel**
  All site personnel will be responsible for continuous adherence to the health and safety procedures during the performance of assigned work. In no case may work be performed in a manner that conflicts with the intent of this procedure.

- **Authorized Employee**
  The authorized employee, or his/her designee, is responsible for reviewing the planned activities prior to commencement of work and confirming that the maintenance manager or his designee of the particular facility where the work is to be accomplished is made aware of the nature and extent of the work and when it is to commence.

- **Site Supervisor**
  The site supervisor is responsible for verifying that all proper lockout/tagout procedures have been followed. The site supervisor must ensure that the power disconnects, appropriate attachment of locks and tags, and proper documentation of the procedure are implemented. He/she is also the designated custodian and controller for all locks, tags, and group lock boxes issued to authorized employees.

- **Subcontractors, Visitors and Other On-Site Personnel**
  Subcontractors are responsible for the health and safety of their employees and for complying with the requirements established by the site Health & Safety Plan. All Shaw E & I subcontractors and visitors are responsible to the Shaw E & I site supervisor.

- **Site Health and Safety Coordinator**
  The health and safety coordinator will assist in compliance with the other applicable company policies and procedures, and the Health and Safety Plan.

5.3 Procedures for Lockout/Tagout

Lockout and tagout devices must be capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.

Locks are to be used when a machine, equipment, or piping system is capable of being locked out. All locks must be accompanied by a tag to indicate the name of the employee applying the lockout device and warn against the hazard if the valve is opened, or the machine/equipment is energized. A legend such as "This lock and tag to be removed only by authorized personnel" with an additional message: "Do Not Start," "Do Not Open," "Do Not Close," "Do Not Energize," or "Do Not Operate" must be utilized.

All tags and their means of attachment must be sturdy enough to prevent inadvertent removal. The tag attachment will be attachable by hand, self-locking, non-releasable, and non-reusable, with a minimum unlocking strength of not less than 50 pounds. Tags must be durable and not deteriorate from exposure to weather conditions and corrosive environments or cause the message on the tag (hand-written or pre-existing) to become illegible. Lockout and tagout devices must be singularly identified; must be the only device(s) used for controlling energy; and must not be used for other purposes.

All equipment must be designed with a hazardous energy/material isolating device as a means of protection for the employee against injury during repairs. **All new equipment installed must be designed to accept a lockout device.**

Authorized padlocks will be assigned to each authorized employee. Each group's lock will be individually keyed and the supervisor on each shift will maintain possession of the master key for these padlocks. The specific project must provide a sufficient number of locks for each employee on site.

All tags must contain the authorized employee name, date of application of the lock, equipment name or number and the reason for lockout. The tag must be attached to the lockout device.

On any equipment that can start automatically, the main disconnect must be switched to the "off" position, locked, and tagged by the authorized employee. This switch must be turned off before opening the main power disconnect and remain off until the disconnect is closed. Locking out 220v, 440v and other equipment must always be done at the main feed or starter panel.

All hazardous material lines must be blanked, blinded, or double valve and vent locked to prevent release of hazardous material.

Blanking or blinding of hazardous material lines are preferable to the double valve and vent technique. All blanks and blinds must be identified with tags in the same manner as locks.

A "Lockout Log" (Attachment 3) must be maintained by the site supervisor. This log must be included in the Health and Safety Plan.

5.3.1 Lockout/Tagout Overview

- Check equipment file for specific lockout/tagout procedures.
- Determine the requirements for lockout. If there is more than one energy source to the equipment, document each source.
- Conduct a survey to locate and identify all energy isolation devices that apply to the equipment.
- Use the equipment type-specific procedures as outlined in Attachments 4-7, if applicable. Complete the "Lockout/Tagout Procedure for Specific Equipment" form (Attachment 8) logging all data and return to the site-supervisor.
- Shut off energy source(s) to affected equipment.
- Affix lock(s) and tag(s) to each energy source controlling device.
- Identify work on process lines or vessels and determine isolation requirements.
- Blind, blank, disconnect, or double valve and vent all hazardous material lines, including steam, and identify the isolation points with tags.
- When only tag is used because machine or equipment can't be locked out, the following steps must be taken: Remove fuses, block machine, etc. and complete the "Lockout/Tagout Procedure for Specific Equipment" form (Attachment 8) and give to the site supervisor for the record.
- Stored energy - Relieve all stored energy from capacitor banks, springs, compressed air, hydraulic, steam, etc.
- Verify isolation of energy has occurred by attempting to activate equipment by using the on/off switch.
- Return control switch to "off" position before proceeding with work.

5.3.2 Removal of Lockout/Tagout

- Ensure that nonessential items, such as tools, etc., are removed from equipment.
- Ensure that equipment components are intact.
- Check work area to ensure that all employees are safely positioned or removed from the area.
- Notify all affected employees and site supervisor before re-energizing the equipment.
- Remove lockout/tagout device.
- Re-energize equipment or open valves and restore flow in process line, place back in into service.

5.3.3 Preparation for Confined Space Entry

1. Refer to Shaw E & I Procedures HS300, HS301, or HS302 for Confined Space Entry.
2. Blank or blind piping, identify with tags.
3. Misalign or remove sections of lines, pipes, or ducts, identify with tags.
4. Double valve and vent system, identify with tags.
5. Lockout or tagout all sources of energy.
6. Block or disconnect all mechanical linkages.

If it is impossible or impractical to lockout a piece of equipment, the site supervisor, H&S Professional, and the Maintenance Engineer of the facility must approve a method to make the equipment safe before any activities beyond normal operations of the equipment are performed. This can be done by disconnecting wiring, removing fuses, disconnecting or blanking supply lines, etc. "Danger - Do Not Operate" tags must be used to describe the condition.

The practice of permitting a person to place or remove a lock for someone else is prohibited. No employee can be sure he/she is safe until he/she places their own lock correctly.

5.4 Safety Audit

5.4.1 Verification Audit. A periodic audit of the lockout/tagout system must be performed to ensure that the requirements of this procedure are being implemented. The audit will be conducted by authorized and qualified employees other than the ones(s) utilizing the procedurebeing inspected. Any deficiencies that are observed must be corrected immediately. For each project, the site-supervisor will be responsible for daily audits of lockout/tagout systems to

ensure proper installation of locks and tags to the equipment and adherence to the appropriate procedures.

Where lockout or tagout is used for energy control, the periodic inspection must include a review, between the inspector and each authorized employee, of that employee's responsibilities under the energy control procedure being inspected.

5.4.2 **Follow-up Audit.** A follow-up audit must be conducted to ensure that all deficiencies noted have been corrected.

5.4.3 **Documentation.** Audit documentation must identify the machine or equipment on which the lockout procedure is being utilized, the date of the inspection, employees interviewed and employee(s) performing the inspection. The audit results must be provided to the Health & Safety Department to be documented as being performed.

5.5 Training

Training must be provided to ensure that the purpose and function of the energy control program are understood by employees, and that the knowledge and skills required for the safe application, usage, and removal of the energy controls are acquired by employees.

- Each authorized employee must receive training in the recognition of applicable hazardous energy/material sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for isolation and control.

- All affected employees must be instructed in the purpose and use of the lock and tag system.

- All other employees (including new hires) whose work operations are or may be in an area where lockout/tagout may be utilized, must be instructed about the procedure, and the prohibition relating to attempts to restart or re-energize machines or equipment that are locked out or tagged out.

- Retraining must be conducted for all authorized and affected employees whenever there is a change in job assignment, change in equipment, changes in a process that presents a new hazard or there is a change in the lockout/tagout procedure. Retraining must also be conducted whenever there is significant evidence, based on the periodic audits, indicating employee deviation from, or lack of understanding of, the lockout/tagout procedure.

- Employee site-specific training must be documented to ensure that it has been accomplished and is being kept up to date. The documentation must contain each employee's name and dates of training.

Documentation of employee training and retraining must be maintained and kept up to date by the Shaw E & I H&S representative and forwarded to the Shaw E & I Training Department.

5.6 Shift or Personnel Changes

Specific procedures must be utilized during shift or personnel changes to ensure the continuity of lockout or tagout protection. These must include provision for the orderly transfer of lockout or tagout device protection between off-going and oncoming employees to minimize exposure to hazards from the unexpected energization or start-up of the machine or equipment or the release of stored energy. All site-specific locks in place must be covered in the tailgate safety meetings on each shift.

All individual lock(s) of the outgoing shift working on equipment will be removed and replaced by the on-coming shift's individual lock(s). The authorized employees of the on-coming shift must inspect and "try" the system to ensure de-energization.

The site supervisor must re-audit the system as necessary.

5.7 Troubleshooting

Special precautions must be observed when the authorized employee must perform maintenance troubleshooting tasks with energized equipment. This function requires added caution and communications between all other affected employees to ensure employee protection.

An authorized employee must identify all start-stop locations and circuit breakers for disconnecting equipment. All other affected employees must be kept informed throughout the testing and troubleshooting. If the job is left incomplete, the authorized employee must install his/her individual lock and tag before leaving the job.

The following sequence must be followed when troubleshooting any equipment:

1. Written approval including detailed work plan, must be obtained from the site supervisor and H&S Professional to ensure that troubleshooting can be performed safely.

2. Inspect and clear machine or equipment of all tools and unnecessary materials.

3. Ensure that all affected employees are positioned out of the way of machine activation. Instruct all affected employees in the procedures that must be followed, the potential hazards that may exist, and the safety precautions that have been taken. Document this training on the Tailgate Safety meeting form.
4. Remove the lockout and tagout devices.

5. Energize and proceed with the troubleshooting, testing or positioning of the machine or equipment.

6. De-energize, reapply all lockout and tagout devices and "try" the system to ensure de-energization or place machine back into service.

5.8 Group Lockout/Tagout

When servicing and/or maintenance is performed by a crew, craft, department or other group, the work crew must use a procedure which affords the employees a level of protection equivalent to that provided by the implementation of a personal lockout or tagout device.

- Primary responsibility is vested in an authorized employee for a set number of employees working under the protection of a group lockout or tagout device.

- Provision for the authorized employee to ascertain the exposure status of individual group members with regard to the lockout or tagout of the machine or equipment; and

- When more than one crew, craft, department, etc. is involved, assignment of overall job-associated lockout or tagout control responsibility to an authorized employee to coordinate affected work forces and ensure continuity of protection; and

- Each authorized employee must affix a personal lockout or tagout device to the group lockout device, group lockbox, or comparable mechanism when he or she begins work, and must remove those devices when he or she stops working on the machine or equipment being serviced or maintained.

The following procedure applies to distribution and utilities systems. The employee authorized to "Group Lockout" will lock and tag out the system. Using the "group lockout" locks and tags. The "Group Lockout" must be signed by the authorized employee.

1. Use of personal tags and locks on the "Group Lock Box" must follow the normal lockout/tagout procedure.

2. The authorized employee must verify that all energy sources are in a neutral state.

3. The authorized employee places the group lock and tags on the hazard isolation device.

4. The authorized employee then places the "Group Lock Key" in the "Group Lock Box", and tag the box with a "DANGER DO NOT OPERATE" tag stating which system is locked out and why.

5. Each employee, prior to working on the "Group Lockout" system, must attach his/her personal tag and lock to the "Group Lockout Box."

6. Upon completion of work, all employees must remove their personal lock and tag.

7. The authorized employee must them remove the "Group Lock" locks and tags and follow normal procedures for restoring energy.

8. If repairs take more than the initiating shift, and the authorized employee is not remaining on the job for the completion, he/she may transfer "Authorization" to another employee by stating so on the "DANGER DO NOT OPERATE" tag. The employee identified then becomes the authorized employee. He/she is now authorized to remove the "Group Lockout" locks and tags installed by the original authorized employee if the work is completed on that shift. The follow-up shift must them follow normal procedures for "Group Lock/Tagout."

5.9 Outside Personnel (Contractors, etc.)

Whenever outside servicing personnel are to be engaged in activities covered by the scope and application of this standard, the on-site employer and the outside employer must inform each other of their respective lockout or tagout procedures.

All subcontractor's lockout/tagout procedures must be reviewed and approved by Shaw E & I prior to the project.

5.10 Special Situations

If lockout/tagout lasts for more than one shift, the appropriate protection must not be interrupted. No lock is to be removed until the next shift is ready to lockout the equipment.

When the employee(s) who originally applied a lock(s) is not at the site to remove it, the lock can be removed only in an emergency and only under the direction of an authorized employee, the site-supervisor, and if applicable the site-safety and health coordinator. Such actions and associated personnel safeguards shall be documented on the Field Activity Daily Log and the Lockout Log.

6.0 EXCEPTION PROVISIONS

Variances to this procedure shall be requested in accordance with procedure HS013 Health and Safety Procedure Variances.

7.0 CROSS REFERENCE

HS050 Training Requirements
HS052 Health and Safety Plans
HS300 Confined Spaces
HS301 Confined Spaces, Marine
HS302 Confined Spaces, Leaded Product
HS310 Hazardous Waste Operations
HS311 Emergency Response Operations
HS312 Hazardous Waste Operations at TSD Facilities

8.0 ATTACHMENTS

1. Responsibility Matrix
2. Flow Diagram - Overview: Lockout/Tagout System
3. Lockout Log
4. Lockout/Tagout for Electrical Equipment
5. Lockout/Tagout for Compressed Air and Gases
6. Lockout/Tagout for Steam, Water, and Fluid Lines
7. Lockout/Tagout for Hydraulic Equipment
8. Lockout/Tagout Procedure for Specific Equipment

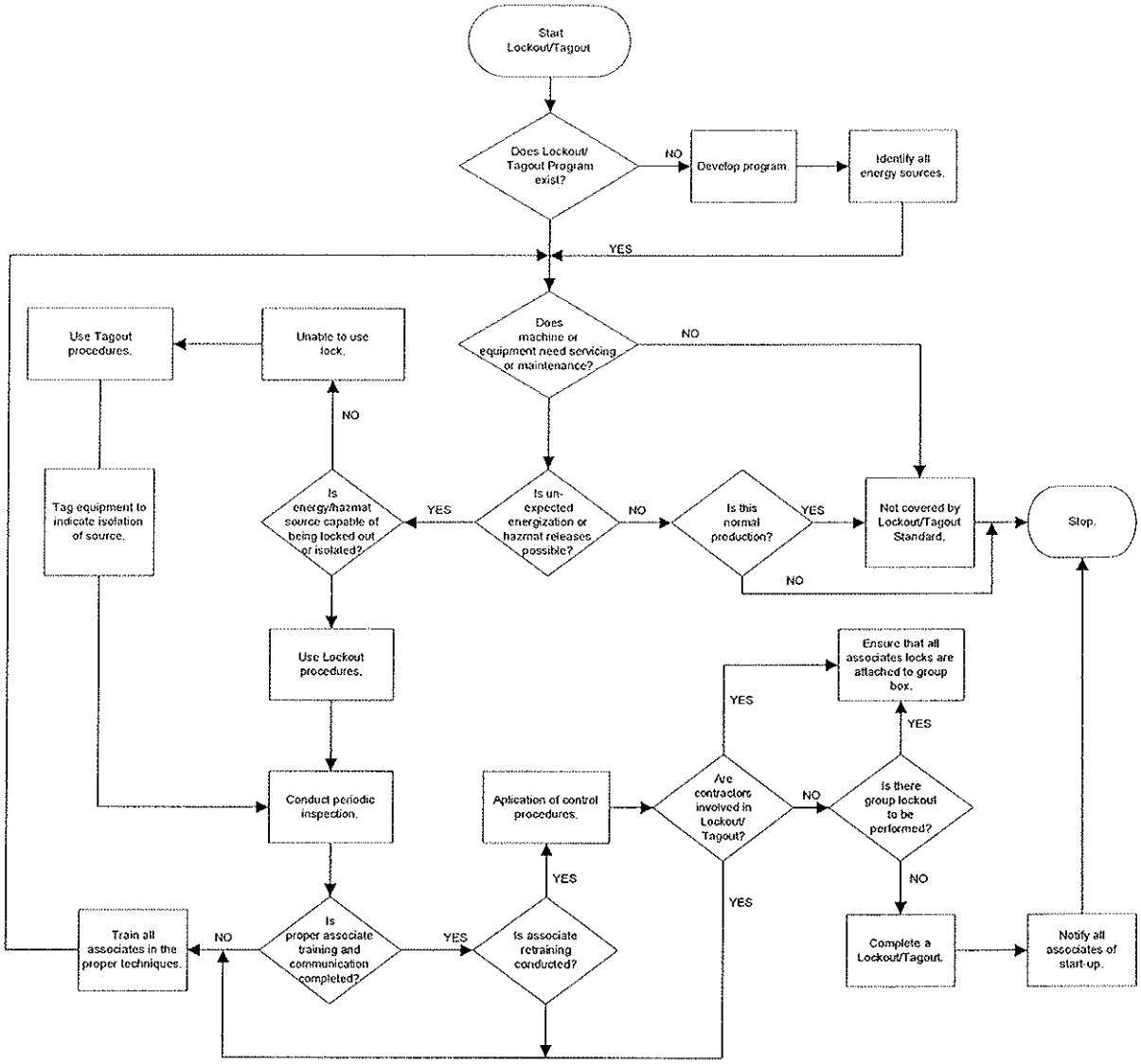
ATTACHMENT 1
CONTROL OF HAZARDOUS ENERGY SOURCE (LOCKOUT/TAGOUT)

Responsibility Matrix

Action	Procedure Section	*Responsible Party*						
		Location Mgr.	Authorized Associate	Site Supervisor	Sub-contractor	HS	All	Training Dept.
Comply with procedure	5.2				X		X	
Review plan & notify maintenance	5.2		X					
Verify proper procedures followed	5.2`	X		X		X		
Verification audit - daily	5.4.1			X				
Provide training to associates	5.5	X						
Attend appropriate training	5.5						X	
Maintain training records	5.5							X
Write/approve location lockout plan, if required	5.1		X			X		

ATTACHMENT 2

FLO DIAGRAM:
OVERVIEW of the LOCKOUT/TAGOUT SYSTEM



HS3152/VISIO

ATTACHMENT 3

LOCKOUT LOG

AUTHORIZED EMPLOYEE	DATE	EQUIPMENT NAME	EQUIPMENT NUMBER	REASON FOR LOCKOUT

ATTACHMENT 4
LOCKOUT/TAGOUT FOR ELECTRICAL EQUIPMENT

Job:_____

Device:_____

Location:_____

Authorized Person:_____

Site Supervisor:

PREPARATION FOR SHUTDOWN

1. Determine power type and shutoff location
2. Determine if there is more than one energy source
3. Determine magnitude of power (voltage)
4. Notify affected employees in the area that equipment will be under lockout for maintenance.
5. Shutoff power sources to machine.

LOCKOUT/TAGOUT

6. Lock and tag main power switches in the OFF position, remove fuses.
7. Verify that no power is available to the equipment using a voltmeter, if necessary.
8. Drain devices such as capacitor banks.
9. Verify that these devices have no stored energy by use of the voltmeter.
10. Repair equipment.

RETURN TO SERVICE

11. Be sure all connections are made and any unused tools and equipment are removed.
12. Remove lock if necessary to verify machine is repaired. The maintenance employee, while verifying the machine is repaired cannot leave the immediate area.
13. Remove tag from machine.
14. Notify employees in the area that the equipment is available.

Signature:

Authorized Person:_____

Site Supervisor: _____

ATTACHMENT 5
LOCKOUT/TAGOUT FOR COMPRESSED AIR AND GASES

Job:_____

Device:_____

Location:_____

Authorized Person:_____

Site Supervisor:

PREPARATION FOR SHUTDOWN

1. Determine types and shutoff location
2. Determine if there is more than one energy source
3. Determine magnitude of compressed air, gas, steam, water, or fluids.
4. Notify affected employees in the area that equipment will be locked out for maintenance.
5. Shutoff main supply to machine.

LOCKOUT/TAGOUT

6. Lock and tag main supply in the OFF position.
7. Bleed line and verify that no air or gases remain in the equipment.
8. Repair equipment.

RETURN TO SERVICE

9. Be sure all connections are made and any unused tools and equipment are removed.
10. Remove lock if necessary to verify proper operation.
12. Remove tag.
13. Notify employees in the area that the equipment is available.

Signature:

Authorized Person:_____

Site Supervisor: _____

ATTACHMENT 6
LOCKOUT/TAGOUT FOR STEAM, WATER, AND FLUID LINES

Job:_____

Device:_____

Location:_____

Authorized Person:_____

Site Supervisor:_____

PREPARATION FOR SHUTDOWN

1. Determine types and shutoff location
2. Determine if there is more than one energy source
3. Determine magnitude of compressed air or gas.
4. Notify affected employees in the area that equipment will be under lockout for maintenance.
5. Disconnect/shutoff main steam, water or fluid lines to equipment.

LOCKOUT/TAGOUT

6. Lock and tag main supply (i.e. chaining through valve handle with lock) in the OFF position with a bleeder open on the load side.
7. Drain fluids from shutoff valves to equipment.
8. Repair equipment.

RETURN TO SERVICE

9. Be sure all connections are made and any unused tools and equipment are removed.
10. Remove lock if necessary to verify machine is repaired. The maintenance employee cannot leave the immediate area, while verifying the machine is repaired.
11. Remove tag from machine.
12. Notify employees in the area that the equipment is available.

Signature:

Authorized Person:_____

Site Supervisor: _____

ATTACHMENT 7
LOCKOUT/TAGOUT FOR HYDRAULIC EQUIPMENT

Job:_____

Device:_____

Location:_____

Authorized Person:_____

Site Supervisor: _____

PREPARATION FOR SHUTDOWN

1. Determine types and shutoff location
2. Determine if there is more than one energy source
3. Determine magnitude of energy (pressure).
4. Notify affected employees in the area that equipment will be under lockout for maintenance.
5. Shutoff main hydraulic to equipment.

LOCKOUT/TAGOUT

6. Lock and tag main supply in the OFF position.
7. Drain fluids from shutoff valves to equipment.
8. Verify that the hydraulic fluid is disconnected.
9. Block ram or items controlled by the hydraulic system using the appropriate blocking.
10. Repair equipment.

RETURN TO SERVICE

11. Be sure all connections are made and any unused tools and equipment are removed.
12. Remove lock if necessary to verify machine is repaired. Maintenance employee cannot leave the immediate area, while verifying the machine is repaired.
13. Remove tag from machine.
14. Notify employees in the area that the equipment is available.

Signature:

Authorized Person:_____

Site Supervisor:_____

ATTACHMENT 8
LOCKOUT/TAGOUT PROCEDURE FOR SPECIFIC EQUIPMENT

Equipment:

Cat. No. and Location:

Serial Number (if available):

Electrical: Voltage: Location:

Describe:

Air (Type): Location:

Describe:

Gases (Type): Location:

Describe:

Steam (Type): Location:

Describe:

Water: Location:

Describe:

Fluids: Location:

Describe:

Hydraulic: Location:

Describe:

Stored Energy- Capacitors, Springs, Etc.:

Describe:

LOG DATA AND RETURN TO SITE-SUPERVISOR

PROCEDURE

Subject: HEAT STRESS

1.0 PURPOSE AND SUMMARY

This procedure establishes the guidelines to protect employees from the effects of heat related illness. It describes the four major types of heat-induced illnesses, methods of prevention, types of treatment, and includes discussions on the monitoring of heat stress situations.

Some clients may have monitoring requirements that differ from those contained in this procedure. In such circumstances, the more protective monitoring requirements will be followed.

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- 3.1 Procedure Responsibility
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- 5.1 Signs, Symptoms, and Treatment
  - 5.1.1 Heat Rash
  - 5.1.2 Heat Cramps
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  - 5.1.4 Heat Stroke
- 5.2 Prevention
- 5.3 Monitoring
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- 5.4 Training

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3.0 RESPONSIBILITY MATRIX

3.1 Procedure Responsibility

The Vice President, Health and Safety is responsible for the issuance, revision, and maintenance of this procedure.

3.2 Action/Approval Responsibilities

The Responsibility Matrix is Attachment 1.

4.0 DEFINITIONS

Acclimatization - Series of physiological and psychological adjustments that occur in an employee during initial exposures to hot environmental conditions that increase the employee's tolerance to elevated work environment temperature.

Company - All wholly-owned subsidiaries of Shaw Environmental & Infrastructure, Inc. (Shaw E & I).

Maximum Heart Rate - Amount of work (beats) per minute a healthy person's heart can be expected to safely deliver. Maximum heart rate (MHR) is calculated by subtracting an employee's age from 200.

5.0 TEXT

Adverse climatic conditions are important considerations in planning and conducting site operations. High ambient temperature can result in deleterious health effects ranging from transient heat fatigue, physical discomfort, reduced efficiency, personal illness, increased accident probability, etc., to serious illness or death. Heat stress is of particular concern when chemical protective garments are worn, since these garments prevent evaporative body cooling. Wearing personal protective equipment places employees at considerably higher risk of developing heat stress.

Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, workload, and the individual characteristics of the worker. Because heat stress is probably one of the most common (and potentially serious) illnesses, regular monitoring and other preventive precautions are vital.

5.1 Signs, Symptoms, and Treatment

5.1.1 Heat Rash

Heat rash can be caused by continuous exposure to hot and humid air and skin abrasion from sweat soaked clothing.

Signs and Symptoms: The condition is characterized by a localized red skin rash and reduced sweating. Aside from being a nuisance, the ability to tolerate heat is reduced.

Treatment: Keep skin hygienically clean and allow it to dry thoroughly after using chemical protective clothing.

5.1.2 Heat Cramps

Heat cramps are caused by profuse perspiration with inadequate electrolytic fluid replacement. This often robs the larger muscle groups (stomach and quadriceps) of blood which can cause painful muscle spasms and pain.

Signs and Symptoms: Muscle spasms and pain in the extremities and abdomen.

Treatment: Remove employee to a cool place and give sips of water or an electrolytic drink. Watch for signs of heat exhaustion or stroke.

5.1.3 Heat Exhaustion

Heat exhaustion is a mild form of shock caused by increased stress on various organs to meet increased demand to cool the body. Onset is gradual and symptoms should subside within one hour.

Signs and Symptoms: Weak pulse; shallow breathing; pale, cool, moist skin; profuse sweating; dizziness; fatigue.

Treatment: Remove employee to a cool place and remove as much clothing as possible. Give sips of water or electrolytic solution and fan the person continually to remove heat by convection. CAUTION: Do not allow the affected person to become chilled ☞ treat for shock if necessary.

5.1.4 Heat Stroke

Heat stroke is the most severe form of heat stress; the body must be cooled immediately to prevent severe injury and/or death. **THIS IS A MEDICAL EMERGENCY!**

Signs and Symptoms: Red, hot, dry skin (skin may be wet from previous perspiration particularly when evaporation-preventing clothing is worn); body temperature of 105 degrees Fahrenheit (☛F) or higher; no perspiration; nausea; dizziness and confusion; strong, rapid pulse.

Treatment: Heat stroke is a true medical emergency. Transportation of the victim to a medical facility must not be delayed. Prior to transport, remove as much clothing as possible and wrap the victim in a sheet soaked with water. Fan vigorously while transporting to help reduce body temperature. Apply cold packs, if available; place under the arms, around the neck, or any other place where they can cool large surface blood vessels. If transportation to a medical facility is delayed, reduce body temperature by immersing victim in a cool water bath (however, be careful not to over-chill the victim once body temperature is reduced below 102☛F). If this is not possible, keep victim wrapped in a sheet and continuously douse with water and fan.

5.2 Prevention

The implementation of preventative measures is the most effective way to limit the effects of heat-related illnesses. During periods of high heat, adequate liquids must be provided to replace lost body fluids. Replacement fluids can be a 0.1 percent salt water solution, a commercial mix such as Gatorade, or a combination of these with fresh water. The replacement fluid temperature should be kept cool, 50 degrees F to 60 degree F, and should be placed close to the work area. Employees must be encouraged to drink more than the amount required to satisfy thirst. Employees should also be encouraged to salt their foods more heavily during hot times of the year.

Cooling devices such as vortex tubes or cooling vests can be worn beneath impermeable clothing. If cooling devices are worn, only physiological monitoring will be used to determine work activity.

All workers are to rest when any symptoms of heat stress are noticed. Rest breaks are to be taken in a cool, shaded rest area. Employees shall remove chemical protective garments during rest periods and will not be assigned other tasks.

All employees shall be informed of the importance of adequate rest and proper diet in the prevention of heat stress and the harmful effects of excessive alcohol and caffeine consumption.

5.3 Monitoring

The initiation of heat stress monitoring will be required when employees are working in environments exceeding 90 degree F ambient air temperature. If employees are wearing impermeable clothing, this monitoring will begin at 78 degree F. There are two general types of monitoring that the health and safety representative can designate to be used: wet bulb globe temperature (WBGT) and physiological. Attachment 2 will be used to record the results of heat stress monitoring.

5.3.1 Wet Bulb Globe Temperature

The WBGT index is the simplest and most suitable technique to measure the environmental factors which most nearly correlate with core body temperature and other physiological responses to heat. When WBGT exceeds 25.9 degree C (78 degree F), the work regiment in Table 2 of the section "Heat Stress" in the latest edition of the American Conference of Governmental Industrial Hygiene (ACGIH) Threshold Limit Value (TLV) Booklet should be followed.

5.3.2 Physiological

Physiological monitoring can be used in lieu of or in addition to WBGT. It is anticipated that this monitoring can be self-performed once the health and safety representative demonstrates appropriate techniques to affected employees. Since individuals vary in their susceptibility to heat, this type of monitoring has its advantages. The two parameters that are to be monitored at the beginning of each rest period are:

- Heart Rate - Each individual will count his/her radial (wrist) pulse as early as possible during each rest period. If the heart rate of any individual exceeds 75 percent of their calculated maximum heart rate (MHR = 200 - age) at the beginning of the rest period, then the work cycle will be decreased by one-third. The rest period will remain the same. An individual is not permitted to return to work until his/her sustained heart rate is below 75 percent of their calculated maximum heart rate.

- Temperature - Each individual will measure his/her oral temperature with a disposable thermometer for one minute as early as possible in the first rest period. If the temperature exceeds 99.6 degrees F at the beginning of the rest period, then the work cycle will be decreased by one-third. The rest period will remain the same.

- An individual is not permitted to return to work if his/her temperature exceeds 100.4 degrees F

5.4 Training

Employees potentially exposed to heat stress conditions will be instructed on the contents of this procedure. This training can be conducted during daily tailgate safety meetings.

6.0 EXCEPTION PROVISIONS

Variances and exceptions may be requested pursuant to the provisions of Procedure HS013, Health and Safety Procedure Variances

7.0 CROSS REFERENCES

HS013 Health and Safety Procedure Variances
HS051 Tailgate Safety Meetings

8.0 ATTACHMENTS

1. Responsibility Matrix
2. Heat Stress Monitoring Record

ATTACHMENT 1
HEAT STRESS

Responsibility Matrix

Action	Procedure Section	*Responsible Party*		
		Vice President, Health and Safety	**Project Supervisor**	**Health and Safety Representative**
Issuance, Revision, and Maintenance of Procedure	3.1	X		
Conduct Monitoring	5.3			X
Inform Employees About Procedure	5.4		X	X

ATTACHMENT 2
HEAT STRESS MONITORING RECORD

Project/Location _____ Date _____

Employee Name	Initial Reading Time	First Work Period Time		Second Work Period Time		Third Work Period Time		Fourth Work Period Time		Fifth Work Period Time		Sixth Work Period Time	
	WBGT (°F)	WBGT (°F)		WBGT (°F)		WBGT (°F)		WBGT (°F)		WBGT (°F)		WBGT (°F)	
	Air Temp. (°F)	Air Temp. (°F)		Air Temp. (°F)		Air Temp. (°F)		Air Temp. (°F)		Air Temp. (°F)		Air Temp. (°F)	
	Initial Temp.	Initial Temp.	Final Temp.	Initial Temp.	Final Temp.	Initial Temp.	Final Temp.	Initial Temp.	Final Temp.	Initial Temp.	Final Temp.	Initial Temp.	Final Temp.
	Initial H.R.	Initial H.R.	Final H.R.	Initial H.R.	Final H.R.	Initial H.R.	Final H.R.	Initial H.R.	Final H.R.	Initial H.R.	Final H.R.	Initial H.R.	Final H.R.
	Initial Temp.	Initial Temp.	Final Temp.	Initial Temp.	Final Temp.	Initial Temp.	Final Temp.	Initial Temp.	Final Temp.	Initial Temp.	Final Temp.	Initial Temp.	Final Temp.
	Initial H.R.	Initial H.R.	Final H.R.	Initial H.R.	Final H.R.	Initial H.R.	Final H.R.	Initial H.R.	Final H.R.	Initial H.R.	Final H.R.	Initial H.R.	Final H.R.
	Initial Temp.	Initial Temp.	Final Temp.	Initial Temp.	Final Temp.	Initial Temp.	Final Temp.	Initial Temp.	Final Temp.	Initial Temp.	Final Temp.	Initial Temp.	Final Temp.
	Initial H.R.	Initial H.R.	Final H.R.	Initial H.R.	Final H.R.	Initial H.R.	Final H.R.	Initial H.R.	Final H.R.	Initial H.R.	Final H.R.	Initial H.R.	Final H.R.
	Initial Temp.	Initial Temp.	Final Temp.	Initial Temp.	Final Temp.	Initial Temp.	Final Temp.	Initial Temp.	Final Temp.	Initial Temp.	Final Temp.	Initial Temp.	Final Temp.
	Initial H.R.	Initial H.R.	Final H.R.	Initial H.R.	Final H.R.	Initial H.R.	Final H.R.	Initial H.R.	Final H.R.	Initial H.R.	Final H.R.	Initial H.R.	Final H.R.

PROCEDURE

Subject: COLD STRESS

1.0 PURPOSE AND SUMMARY

The purpose of this procedure is to establish the guidelines necessary to protect employees from the adverse health effects caused by exposure to low temperature environments.

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    4.1.2 Hypothermia
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3.0 RESPONSIBILITY MATRIX

3.1 Procedure Responsibility

The Vice President, Health and Safety is responsible for the issuance, revision, and maintenance of this procedure.

3.2 Action/Approval Responsibilities

The responsibility matrix is Attachment 1.

4.0 TEXT

Most cold related worker fatalities have resulted from failure to escape low air temperatures, or from immersion in low temperature water. Employees should be protected from exposure to cold so that their deep core temperature does not fall below 96.8 degrees Fahrenheit. Core body temperatures below this level will likely result in reduced mental alertness, reduction in rational decision making, or loss of consciousness with the threat of fatal consequences.

4.1 Signs and Symptoms of Cold Stress

Several factors increase the harmful effects of cold including, being very young or old, wet clothing, having wounds or fractures, smoking, drinking alcoholic beverages, fatigue, emotional stress and certain diseases and medications. The two most prominent adverse effects from exposure to cold temperatures are frostbite and hypothermia. Treatment for cold related injuries should be administered by a person qualified in first aid or a professional medical provider.

4.1.1 Frostbite. Frostbite is the most common injury caused by exposure to cold temperatures. It occurs when cells of the body freeze restricting blood flow and causing tissue damage. The first sign of frostbite is slightly flushed skin which then changes to white or grayish yellow and finally grayish blue. Pain is sometimes initially felt but is often followed by a cold numb feeling.

4.1.2 Hypothermia. Hypothermia is the most severe form of cold stress and results from a drop in the body's core temperature. The initial signs include; shivering, numbness, confusion, weakness, impaired judgement, impaired vision, and drowsiness. Hypothermia victims typically progress through five stages of the condition including; (1) shivering, (2) apathy, (3) loss of consciousness, (4) decreasing pulse and breathing rate, and (5)death.

4.2 Precautionary Measures

It is recommended that employees wear insulated clothing to maintain core temperatures above 96.8 degrees F when working in air temperatures below 40 degrees F. This protective clothing may include but is not limited to:

- Insulated suits, such as whole-body thermal underwear
- Wool or polypropylene socks
- Insulated gloves and boots
- Insulated head cover, such as knit caps, hard hat liners, etc.

When conducting work in air temperatures below 35 degrees F, the following practices shall be followed:

- If the clothing of an employee is expected to become wet, the outer layers of clothing must be impermeable to water.

- If an employees underclothing becomes wet it must be changed immediately. If the clothing becomes wet from sweating, the employee may finish the task which caused the sweating before changing into dry clothing.

- Employees will be provided a warm area (65 degrees F or above) to change from work clothing into street clothing and for breaks.
- Hot liquids, such as soups, warm drinks, etc. shall be provided in the break area. The intake of caffeine containing products shall be discouraged due to their diuretic and circulatory effects.

- If appropriate, approved space heaters may be provided in the work area to warm the hands, feet, etc.

- The buddy system shall be practiced. Any employee observed with signs of cold stress shall immediately proceed to the break area.

- Employees will be reminded to layer their clothing, i.e., wear thinner, lighter clothing next to the body with heavier clothing layered outside the inner clothing.

- Avoid overdressing when going into warm areas or when performing activities which are strenuous. This could potentially lead to heat stress situations.

- Auxiliary heated versions of handwear, footwear, etc., can be used in lieu of mittens, insulated socks, etc. if extremely cold conditions exist.

- Employees handling liquids with high evaporation rates (gasoline, hexane, alcohol, etc.) shall take special precautions to avoid soaking of clothing with the liquids because of the added danger of cold injury caused by evaporative cooling.

- Work shall be arranged in such a way that sitting still or standing for long periods is minimized.

- If the air temperature is 20 degrees F or below the hands shall be protected by mittens or gloves prior to contact with cold surfaces such as metal, etc.

Air temperature is not the only factor to be considered while evaluating cold stress situations. Wind chill cooling rate and the cooling power of air are critical factors. The higher the wind speed the greater the risk of experiencing cold related injuries. For exposed skin, continuous exposure should not be permitted when the air speed and temperature result in an equivalent chill temperature of –25 degrees F of less. The wind chill table provided in attachment two can be used to help assess hazardous conditions attributable to wind chill effects.

4.3 Training

Training on the contents of this procedure will be conducted during tailgate safety meetings held at project or office locations where employees are exposed to cold temperatures. Topics to be discussed during this training will include:

- Proper rewarming procedures and first aid treatment of cold related cases
- Proper clothing practices
- Eating and drinking habits
- Recognition of signs and symptoms of cold stress
- Safe cold weather work practices.

5.0 EXCEPTION PROVISIONS

Variances may be requested as described in procedure HS013; Health and Safety Procedure Variances.

6.0 CROSS REFERENCES

Shaw Environmental & Infrastructure, Inc. (Shaw E & I) Procedure HS051-Tailgate Safety Meetings

Shaw E & I Procedure HS600-Personal Protective Equipment

Threshold Limit Values and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists.

Standard First Aid Workbook, American Red Cross

7.0 ATTACHMENTS

1. Responsibility Matrix
2. Windchill Table

ATTACHMENT 1
COLD STRESS

Responsibility Matrix

Action	Procedure Section	Employee	Local HS Representative	Vice President Health and Safety
Issuance, revision and maintenance of this procedure	3.1			X
Provide training	4.2		X	
Receive training	4.2	X		

ATTACHMENT 2

Windchill Table

	Actual Temperature Reading (°F)											
Estimated Wind Speed (mph)	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Chill Temperature (°F)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little additional effect.)	LITTLE DANGER In under an hour with dry skin. Maximum danger is false sense of security.				INCREASING DANGER Danger from freezing of exposed flesh within one minute.			GREAT DANGER Flesh may freeze within 30 seconds.				
	Trenchfoot and immersion foot may occur at any point on this chart.											

PROCEDURE

Subject: **HEARING CONSERVATION PROGRAM**

1.0 PURPOSE AND SUMMARY

The purpose of this procedure is to establish guidelines for the company hearing conservation program. Regulatory requirements mandate that the company administer a hearing conservation program whenever employee sound exposures equal or exceed an 8-hour time-weighted average (TWA) sound level of 85 decibels (dB).

Evidence is well established that worker exposure to sound of sufficient intensity and duration can result in hearing damage. This procedure prescribes the control measures required to prevent employee exposure to excessive sound levels and includes provisions for:

- Monitoring of the workplace to determine employee exposures.
- An audiometric testing program which includes baseline and annual audiograms.
- An employee training and information program.
- Description of various control measures that can be used to decrease exposures.
- Providing hearing protection to all affected employees when administrative or engineering controls fail to reduce sound levels to below the action level.
- Recordkeeping requirements.

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3.0 RESPONSIBILITY MATRIX

3.1 Procedure Responsibility

The Vice President, Health and Safety is responsible for the issuance, revision, and maintenance of this procedure.

3.2 Action/Approval Responsibilities

The Responsibility Matrix is Attachment 1.

4.0 DEFINITIONS

Action Level - An 8-hour TWA of 85 dB or a dose of 50 percent.

Company - All wholly-owned subsidiaries of Shaw Environmental & Infrastructure, Inc. (Shaw E & I).

Standard Threshold Shift (STS) - Change in hearing threshold relative to the baseline audiogram of 10 dB or more at 2,000, 3,000, and 4,000 hertz (Hz) in either ear.

5.0 TEXT

5.1 General

The company hearing conservation program will be implemented and protection against the effects of sound exposure will be provided whenever sound levels exceed the action level.

5.2 Monitoring

Monitoring of employee exposures to sound will be conducted whenever it is anticipated that exposure may exceed the action level. This monitoring will be conducted by a qualified individual who, through professional credentials, training, or experience, has the necessary qualifications to specify and use the type of monitoring equipment (area or personal) that will best represent employee exposures. This monitoring will be repeated whenever changes in the work environment lead to the possibility of additional exposures or inadequacy of selected hearing protection. Employees will be provided the opportunity to observe monitoring and will be notified when the results exceed the action level.

Sound level monitoring instrumentation will be operated on the A-weighted scale in slow response mode. Employee sound exposures will be computed in accordance with Attachment 2 and without regard to any attenuation provided by the use of hearing protection.

5.3 Audiometric Testing

Audiometric testing will be provided to all employees exposed at or above the action level. Testing will be in accordance with Procedure HS100, Medical Policies and Procedures.

5.3.1 Baseline Audiogram. Audiometric test results obtained from the pre-hire medical examination will be used as the baseline audiogram. Testing to establish a baseline audiogram shall be preceded by at least 14 hours without exposure to workplace sound. Employees will also be notified of the need to avoid high levels of non-occupational sound exposure during this 14-hour period.

5.3.2 Annual Audiograms. Annual audiograms will be conducted for all employees exposed at or above the action level during the preceding year. Each annual audiogram will be compared to that employee's baseline audiogram to determine if the audiogram is valid and if a STS has occurred.

5.4 Employee Training and Information

All employees who are exposed to sound levels above the action level are required to participate in a formal training program. This program will be presented by a health and safety representative and include, as a minimum, the following information:

- The effects of sound on hearing.
- The purpose of hearing protection; the advantages, disadvantages, and attenuation of various types; and instructions on selection, fitting, use, and care.
- The specific nature of operations which could result in exposure to excessive sound levels.
- The purpose of audiometric testing and an explanation of the test procedures.
- The engineering controls and administrative practices associated with the employee's job assignment.

This training program will be repeated annually. Participating employees are required to complete the Hearing Protection Training Completion Record (Attachment 3). This record will be maintained by the company Training Department in Knoxville. In addition, tailgate safety meetings will be periodically used to instruct employees on the need for hearing protection in designated areas.

The project/location manager will make available to affected employees or their authorized representatives a copy of 29 Code of Federal Regulations (CFR) 1910.95 and will also post a copy in the workplace.

5.5 Control Measures

A straightforward method of controlling sound exposure is to examine the problem in terms of its three basic elements including:

- Sound arises from a source;
- Travels over a path; and
- Affects a receiver or listener.

The solution to a given sound problem might require alteration or modification of any or all of these three basic elements including:

- Modifying the source to reduce its sound output;
- Altering or controlling the transmission path to reduce the sound level reaching the listener; or
- Providing the receiver with hearing protection (but only if the sound source or path cannot be controlled).

5.5.1 Sound Control at the Source. Perhaps the best method for controlling sound at its source is the initial equipment selection process. The following summarizes those features that the buyer should look for and steps to be taken in selecting equipment:

- Low-sound certification.
- Advertisement of "quiet" operation, evidence of sound control design.
- Evidence of "lower" and "slower" operating characteristics.
- Conductance of side-by-side sound tests of equipment.
- Request an "on-site" or "in operation" inspection of mechanical equipment before purchase.

Most mechanical devices are complex sound generators. Though it is impractical to discuss all possible solutions to all sound problems, some general control measures and methods have been provided below:

- Reduce impact or impulse sound by reducing the weight, size, or height of fall of impacting mass.

- Reduce speed in machines and flow velocities and pressure in fluid conveyance systems.

- Balance rotating parts to control machinery sound and vibration of fans, fly wheels, pulleys, cams, shafts, etc.

- Reduce frictional resistance between rotating, sliding, or moving parts by frequent lubrication and proper alignment; static and dynamic balancing of rotating parts; and/or correction of eccentricity or "out-of-roundness" of wheels, gears, rollers, pulleys, etc.

- Reduce resistance in air or fluid systems by use of low flow velocities, smooth surfaces of duct or pipe systems, and long-radius turns and flared sections in pipes, etc., to reduce turbulence.

- Isolate vibration elements in machinery; install motors, pumps, etc., on most massive part of machine; use belt or roller drives in place of gear trains; use flexible hoses and wiring instead of rigid piping and stiff wiring; etc.

- Apply vibration damping materials such as liquid mastics; pads of rubber, felt, foam, or fibrous blankets; or sheet metal viscoelastic laminates or composites to vibrating machine surface.

- Reduce sound leakage from the interior of machines such as compressors by sealing or covering all openings or applying acoustical materials to machine interiors.

5.5.2 **Sound Control in the Transmission Path.** Another effective way to limit employee exposure to sound is through the use of transmission path controls. These controls may include, but are not necessarily limited to:

- Separation of the sound source and receiver.

- Use of sound absorbing materials on ceiling, floor, or wall surfaces.

- Use of sound barriers and deflectors in the sound path.

- Use of acoustical lining on inside surfaces of passageways, ducts, pipe chases, or electrical channels.

- Use of mufflers or silencers on all gasoline or diesel engines, regardless of size, and particularly on equipment when large quantities of high-pressure, high-velocity gases, liquids, steam, or air are discharged.

- Use vibration isolators and flexible couplers where the sound transmission path is structural in character.

5.5.3 **Protection for the Receiver.** When engineering controls fail to reduce sound levels to below the action level, hearing protection will be provided. Hearing protection will be provided at no cost to employees and will be replaced as necessary.

Supervisors will ensure that hearing protection is worn by all employees who are exposed at or above the action level. Employees will be given the opportunity to select their hearing protection from a variety of suitable protection devices that attenuate their exposure to the action level or below. Attenuations are determined by subtracting 7 dB from the noise reduction rating (NRR) of the protector and subtracting the remainder from the TWA sound level.

5.6 Recordkeeping

The company will maintain records of all audiometric test records required by this procedure and retain them for at least the following periods:

- Sound exposure measurement records will be retained for two (2) years.

- Audiometric test records will be retained for the duration of the affected employee's employment.

All records required by this procedure will be provided upon request to employees, former employees, representatives designated by the individual employee, and any authorized government representative.

6.0 EXCEPTION PROVISIONS

Variances and exceptions may be requested pursuant to the provisions of Procedure HS013, Health and Safety Procedure Variances.

7.0 CROSS REFERENCES

HS013 Health and Safety Procedure Variances
HS100 Medical Policies and Procedures

8.0 ATTACHMENTS

1. Responsibility Matrix
2. Sound Exposure Computation
3. Hearing Protection Training Completion Record

ATTACHMENT 1
HEARING CONSERVATION PROGRAM

Responsibility Matrix

Action	Procedure Section	*Responsible Party*		
		Health and Safety Representative	**Project/Location Manager**	**Vice President, Health and Safety**
Issue, Revise, and Maintain Procedure	3.1			X
Monitor Employee Exposures	5.2	X		
Provide Training	5.4	X		
Make Available/Post 29 CFR 1910.95	5.4		X	

ATTACHMENT 2

SOUND EXPOSURE COMPUTATION

Computation of Employee Sound Exposure

A. Sound dose is computed using Table 1 as follows:

When the sound level is constant over the entire work shift, the sound dose (D), in percent, is given by:

$$D = 100\ C/T$$

Where C is the total length of the work day, in hours, and T is given in Table 1.

B. When the work shift sound exposure is composed of two or more periods of sound at different levels, the total sound dose over the work day is given by:

$$D = 100\ (C_1/T_1 + C_2/T_2 \ldots + C_n/T_n)$$

Where C_n indicates the total time of exposure at a specific sound level and T_n indicates the reference duration for that level as given by Table 1.

C. The eight-hour TWA sound level, in decibels, may be computed from the dose, in percent, by means of the formula:

$$TWA = 16.61\ \log_{10}(D/100) + 90$$

For an eight-hour work shift with the sound level constant over the entire shift, the TWA is equal to the measured sound level.

Conversion Between "Dose" and "8-Hour TWA" Sound Level

Sound exposure is usually measured with an audio dosimeter which gives a readout in terms of "dose." Dosimeter readings can be converted to an 8-hour TWA sound level.

In order to convert the reading of a dosimeter into TWA, use Table 2. This table applies to dosimeters that are set to calculate dose or percent exposure according to the relationships in Table 1. So, for example, a dose of 91 percent over an 8-hour day results in a TWA of 89.3 decibels and a dose of 50 percent corresponds to a TWA of 85 decibels.

If the dose as read on the dosimeter is less than or greater than the values found in Table 2, the TWA may be calculated by using the formula:

$$TWA = 16.61\ \log_{10}(D/100) + 90$$

Where TWA equals 8-hour TWA sound level and D equals accumulated dose in percent exposure.

Table 1
Permissible Sound Exposure

A-Weighted Sound Level (decibels)	Permitted Duration Per Workday (T) (hours)	A-Weighted Sound Level (decibels)	Permitted Duration Per Workday (T) (hours)
80	32.0	106	0.87
81	27.9	107	0.76
82	24.3	108	0.66
83	21.1	109	0.57
84	18.4	110	0.50
85	16.0	111	0.44
86	13.9	112	0.38
87	12.1	113	0.33
88	10.6	114	0.29
89	9.2	115	0.25
90	8.0	116	0.22
91	7.0	117	0.19
92	6.1	118	0.16
93	5.3	119	0.14
94	4.6	120	0.125
95	4.0	121	0.11
96	3.5	122	0.095
97	3.0	123	0.082
98	2.6	124	0.072
99	2.3	125	0.063
100	2.0	126	0.054
101	1.7	127	0.047
102	1.5	128	0.041
103	1.3	129	0.036
104	1.1	130	0.031
105	1.0		

Table 2
Conversion From ←Percent Sound Exposure→ or ←Dose→ To ←8-Hour TWA Sound Level→

Dose or Percent Sound Exposure (D)	TWA	Dose or Percent Sound Exposure (D)	TWA	Dose or Percent Sound Exposure (D)	TWA	Dose or Percent Sound Exposure (D)	TWA
10	73.4	104	90.3	260	96.9	640	103.4
15	76.3	105	90.4	270	97.2	650	103.5
20	78.4	106	90.4	280	97.4	660	103.6
25	80.0	107	90.5	290	97.7	670	103.7
30	81.3	108	90.6	300	97.9	680	103.8
35	82.4	109	90.6	310	98.2	690	103.9
40	83.4	110	90.7	320	98.4	700	104.0
45	84.2	111	90.8	330	98.6	710	104.1
50	85.0	112	90.8	340	98.8	720	104.2
55	85.7	113	90.9	350	99.0	730	104.3
60	86.3	114	90.9	360	99.2	740	104.4
65	86.9	115	91.1	370	99.4	750	104.5
70	87.4	116	91.1	380	99.6	760	104.6
75	87.9	117	91.1	390	99.8	770	104.7
80	88.4	118	91.2	400	100.0	780	104.8
81	88.5	119	91.3	410	100.2	790	104.9
82	88.6	120	91.3	420	100.4	800	105.0
83	88.7	125	91.6	430	100.5	810	105.1
84	88.7	130	91.9	440	100.7	820	105.2
85	88.8	135	92.2	450	100.8	830	105.3
86	88.9	140	92.4	460	101.0	840	105.4
87	89.0	145	92.7	470	101.2	850	105.4
88	89.1	150	92.9	480	101.3	860	105.5
89	89.2	155	93.2	490	101.5	870	105.6
90	89.2	160	93.2	500	101.6	880	105.7
91	89.3	165	93.6	510	101.8	890	105.8
92	89.4	170	93.8	520	101.9	900	105.8
93	89.5	175	94.0	530	102.0	910	105.9
94	89.6	180	94.2	540	102.2	920	106.0
95	89.6	185	94.4	550	102.3	930	106.1
96	89.7	190	94.6	560	102.4	940	106.2
97	89.8	195	94.8	570	102.6	950	106.2
98	89.9	200	95.0	580	102.7	960	106.3
99	89.9	210	95.4	590	102.8	970	106.4
100	90.0	220	95.7	600	102.9	980	106.5
101	90.1	230	96.0	610	103.0	990	106.5
102	90.1	240	96.3	620	103.2	999	106.6
103	90.2	250	96.6	630	103.3		

ATTACHMENT 3

HEARING PROTECTION TRAINING COMPLETION RECORD

	INITIAL
1. I have been informed about the health hazards associated with exposure to excessive sound levels and its potential effect on hearing.	
2. I have been informed about the types of work that may result in exposure to excessive sound levels, and the necessary protective steps to prevent excessive exposure, including engineering controls and administrative practices.	
3. I understand the purpose for, proper use, and limitations of hearing protection devices, and I have received instructions on selection, fitting, use, and care of such devices.	
4. I have been informed about the purpose of audiometric testing and an explanation of the test procedures.	
5. Copies of the applicable regulations governing occupational exposure to excessive sound have been made available to me.	

PRINT NAME: _____

SIGNATURE: _____

EMPLOYEE NUMBER: _____

DATE: _____

Please File Completed Forms and Forward a Copy to the Knoxville Training Department

PROCEDURE

Subject: PERSONAL PROTECTIVE EQUIPMENT

1.0 PURPOSE AND SUMMARY

This procedure stipulates that the company will provide the personal protective equipment necessary for employees to perform their work safely, as established by the Health & Safety Department. Special purchasing programs for prescription safety glasses and safety shoes are also described. Head, eye, body, and foot protection are discussed in this procedure. Respiratory and hearing protection are cross referenced to the appropriate company procedures.

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- 5.8 Management Duties

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3.0 RESPONSIBILITY MATRIX

3.1 Procedure Responsibility

The EH&S Operations Manager, is responsible for the issuance, revision, and maintenance of this procedure.

3.2 Action/Approval Responsibilities

The Responsibility Matrix is Attachment 1.

4.0 DEFINITIONS

Company – All wholly-owned subsidiaries of Shaw Environmental & Infrastructure, Inc (Shaw E & I).

PROCEDURE

Subject: **HANDLING OF BLOOD OR OTHER POTENTIALLY INFECTIOUS MATERIAL**

1.0 PURPOSE AND SUMMARY

The potential for accidental transmission of infectious agents to persons handling infectious materials in the workplace has prompted various governmental agencies to adopt recommended work practices and regulations to govern this area. Shaw Environmental & Infrastructure, Inc. (Shaw E & I) encounters potentially infectious agents in various types of work, including:

- Packaging, handling, and disposal of biological wastes at clandestine and legal laboratory operations:
- Work in areas with exposed human or animal excrement, or where materials contaminated with body fluids are found; and
- Emergency response operations involving infectious wastes or other potentially infectious materials.

Exposure control programs must address at least the following:

- Exposure determination,
- Exposure control plan,
- Medical surveillance and prophylactic measures,
- Personal protective equipment,
- Training,
- Work practices, and
- Accidental exposure follow-up

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3.0 RESPONSIBILITY MATRIX

3.1 Procedure Responsibility

The Vice President of Health and Safety is responsible for the issuance, revision, and maintenance of this procedure.

3.2 Action/Approval Responsibilities

The Responsibility Matrix is Attachment 1 in Section 8.0.

4.0 DEFINITIONS

Blood- Human blood, human blood components and products made from human blood.

Blood-borne Pathogens- Pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV).

Disinfect- To inactivate all recognized pathogenic microorganisms but not necessarily all microbial forms (e.g. bacterial endospores) on inanimate objects.

Exposure Incident- A specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials that results from the performance of an employee's duties.

Infectious Waste- Blood and blood products, contaminated sharps, pathological wastes and microbiological wastes.

Occupational Exposure- Reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties. This definition excludes incidental exposures that may take place on the job, and that are neither reasonably nor routinely expected and that the worker is not required to incur in the normal course of employment.

Other Potentially Infectious Materials- (1) The following body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, and any body fluid that is visibly contaminated with blood. (2) Any unfixed tissue or organ (other than intact skin) from a human (living or dead). (3) HIV- or HBV-containing cell or tissue cultures, organ cultures, and culture medium or other solutions; and blood, organs or other tissues from experimental animals infected with HIV or HBV. (4) Any experimental animal tissue or cultures.

Parenteral- Exposure occurring as a result of piercing the skin barrier (e.g. subcutaneous, intramuscular, intravenous routes).

Patient- Any individual, living or dead, whose blood, body fluids, tissues, or organs may be a source of exposure to the employee. Examples include, but are not limited to, hospital and clinic patients; clients in institutions for the mentally impaired or mentally disabled; trauma victims; clients of drug and alcohol treatment facilities; residents of hospices and nursing homes; human remains prior to embalming; and individuals who donate or sell blood or blood components.

Personal Protective Equipment- Specialized clothing or equipment worn by an employee to protect him/her from a hazard.

Sharps- Any object that can penetrate the skin including, but not limited to, needles, scalpels, and broken capillary tubes.

Sterilize- The use of a physical or chemical procedure to destroy all microbial life including highly resistant bacterial endospores.

Universal Precautions- A method of infection control in which all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other blood-borne pathogens.

Work Practice Controls- Controls that reduce the likelihood of exposure by altering the manner in which a task is performed.

5.0 TEXT

5.1 Exposure Control Plan

Each project, including emergency response, involving potential for occupational exposure shall have, as part of the site-specific health and safety plan, a written exposure control plan designed to minimize or eliminate employee exposure. This plan shall be prepared prior to the commencement of work, and shall contain as a minimum:

5.1.1 Exposure Determination. Each task or procedure where occupational exposure may take place must be identified and documented. Such determination of potential exposure shall be made without regard to the use of personal protective equipment.

5.1.2 Schedule of Implementation. The schedule and method of implementation of the Exposure Control Plan must be specified.

5.1.3 Exposure Evaluation. Each plan shall reflect the requirements in 29CFR1910.1030(c)(2) and (f)(3), covering evaluations of an exposure incident.

5.1.4 Review and Update. Provision must be made for the review and update of the Exposure Control Plan.

5.1.5 Protective Measures. Work practices and personal protective equipment shall be specified for each task or procedure where an occupational exposure may occur.

5.2 Methods of Compliance

5.2.1 General. Universal Precautions as described below shall be observed to prevent contact with blood and other potentially infectious materials.

Universal Precautions

- All workers shall routinely use appropriate barrier precautions to prevent skin and mucous-membrane exposure when contact with blood or other body fluids is anticipated. Gloves should be worn for touching blood and body fluids, mucous membranes, or non-intact skin for handling items or surfaces soiled with blood or body fluids. Masks (as selected and approved by health and safety) and protective eye wear or face shields shall be worn during procedures that are likely to generate droplets of blood or other body fluids to prevent exposure of mucous membranes of the mouth, nose, and eyes. Protective suits shall be worn during procedures that are likely to generate splashes of blood or other body fluids.

- Hands and other skin surfaces shall be washed immediately and thoroughly if contaminated with blood or other body fluids. Hands shall be washed immediately after gloves are removed, using a disinfectant soap.

- All workers shall take precautions to prevent injuries caused by needles, scalpels, and other sharp instruments or devices during handling. To prevent needle stick injuries, needles should not be recapped, purposely bent or broken by hand, removed from disposable syringes, or otherwise manipulated by hand. Disposable syringes and needles, scalpels, blades, and other sharp items shall be placed in puncture-resistant containers for disposal.

- Mouthpieces, resuscitation bags, or other ventilation devices should be available for use in areas in which the need for resuscitation is foreseeable.

- Workers who have exudative lesions or weeping dermatitis shall be excluded from handling potentially infectious materials until the condition resolves.

- Pregnant workers should be especially familiar with and strictly adhere to precautions to minimize the risk of transmission.

5.2.2 **Engineering and Work Practice Controls.** Universal precautions shall be supplemented by the following work practice controls:

- All personal protective equipment shall be removed immediately upon leaving the work area, or as soon as possible if overtly contaminated, placed in an appropriately designed area or container for storage, decontamination or disposal.

- Eating, drinking, smoking, applying cosmetics or lip balm, and handling contact lenses are prohibited in work areas where there is a potential for occupational exposure.

- Food and drink shall not be stored in refrigerators, freezers, or cabinets where blood or other potentially infectious materials are stored or in other areas of possible contamination.

- All procedures involving blood or other potentially infectious materials shall be performed in such a manner as to minimize splashing, spraying, and aerosolization of these substances.

- Mouth pipetting is prohibited.

5.2.3 **Housekeeping**

- A written schedule of routine cleaning and disinfection shall be established, as appropriate, for each facility or operation.

- Work surfaces shall be decontaminated immediately after any spill of potentially infectious materials, and at the end of the work shift. An effective disinfection solution can be prepared by diluting household chlorine bleach with water to make a 10% bleach solution (1 part bleach + 9 parts water).

- Reusable items contaminated with potentially infectious materials shall be decontaminated prior to washing and/or reuse.

- All bins, pails, cans, and similar receptacles intended for reuse which have a potential for becoming contaminated with blood or other potentially infections materials shall be inspected, cleaned, and disinfected on a regularly scheduled basis and cleaned and disinfected immediately or as soon as possible upon visible contamination.

- Broken glassware which may be contaminated shall not be picked up directly with the hands. It shall be cleaned up using mechanical means.

5.2.4 Personal Protective Equipment

- Protection for the eyes, face, hands, body, feet, and against inhalation hazards shall be provided as appropriate for each job.

- Gloves shall be worn when employee has the potential for the hands to have direct skin contact with blood, other potentially infectious materials, mucous membranes, non-intact skin, and when handling items or surfaces soiled with blood or other potentially infectious materials.

- Disposable (single use) gloves, such as surgical or examination gloves, shall be replaced when visibly soiled, torn, punctured, or when their ability to function as a barrier is compromised. They shall not be washed or disinfected for re-use.

- Utility gloves may be disinfected for re-use if the integrity of the glove is not compromised; however, they must be discarded if they are cracked, peeling, discolored, torn, punctured, or exhibit other signs of deterioration.

- Masks and eye protection or chin-length face shields shall be worn whenever splashes, spray, splatter, droplets, or aerosols of blood or other potentially infectious materials may be generated and there is a potential for eye, nose, or mouth contamination.

- Fluid-resistant clothing (e.g. coated Tyvek suits) shall be worn if there is a potential for splashing or spraying of blood or potentially infectious materials.

- Surgical caps or hoods shall be worn if there is a potential for splashing or splattering of blood or potentially infectious materials on the head.

- Fluid-proof clothing (e.g. coated Tyvek suits) shall be worn if there is a potential for clothing becoming soaked with blood or other potentially infectious materials.

- Fluid-proof shoe covering shall be worn if there is a potential for shoes to become contaminated and/or soaked with blood or other potentially infectious materials.

- **Emergency Response.** During emergency operations involving potentially infectious materials 29CFR1910.120 is controlling. This regulation requires the use of NIOSH approved respirators for aerosol protection, not "masks".

5.2.5 Infectious Waste Disposal

- All infectious waste destined for disposal shall be placed in closable, leakproof containers or bags that are color coded or labeled as required by paragraph 5.2.7 of this procedure.

  If outside contamination of the container or bag is likely to occur then a second leakproof container or bag which is closable and labeled or color-coded as described in paragraph 5.2.7 shall be placed over the outside of the first and closed to prevent leakage during handling, storage, and transport.

  Disposal of all infectious waste shall be in accordance with applicable Federal, State and local regulations.

- Sharps shall be disposed of in closable, puncture resistant, disposable containers which are leakproof on the sides and bottom and that are labeled or color-coded according to paragraph 5.2.7.

  These containers shall be easily accessible to personnel and located in the immediate area of use.

  These containers shall be replaced and not allowed to overfill.

5.2.6 Laundry. Laundry from workplaces with employees covered under this policy that is contaminated with blood or other potentially infectious materials or may contain contaminated sharps shall be treated as if it were contaminated and shall be handled as little as possible and with minimum of agitation.

Contaminated laundry shall be bagged at the location where it is used and shall not be sorted or rinsed.

Contaminated laundry shall be placed and transported in bags that are labeled or color-coded as described in paragraph 5.2.7. Whenever this laundry is wet and presents the potential for soak-through or leakage from the bag, it shall be placed and transported in leakproof bags.

5.2.7 Communication of Hazards

5.2.7.1 Signs and Labels

- All work areas where potentially infectious agents are present shall be posted with signs bearing the following legend:

[Name of the Infectious Agent]
[Special requirements for entering area]
[Name, telephone number of the laboratory director or other responsible person]

- Warning labels shall be affixed to containers of infectious waste; refrigerators and freezers containing blood and other potentially infectious materials; and other containers used to store or transport blood or other potentially infectious materials.

Labels shall include the following legend:

These labels shall be fluorescent orange or orange-red or a similar predominant color, with lettering or symbols in a contrasting color.

Labels shall either be an integral part of the container or shall be affixed as close as safely possible to the container by string, wire, adhesive, or other method that prevents their loss or unintentional removal.

- Red bags or red containers may be substituted for labels on containers of infectious waste.

5.2.8 Training. All employees assigned to jobs with occupational exposure to potentially infectious materials shall receive specialized training prior to commencement of work and at least annually thereafter, covering the following elements:

- A copy of 29CFR1910.1030 and this procedure including an explanation of the contents;
- A general explanation of the epidemiology and symptoms of bloodborne diseases;
- An explanation of the modes of transmission of bloodborne pathogens;
- An explanation of the appropriate methods for recognizing tasks and other activities that may involve exposure to blood and other potentially infectious materials;
- An explanation of the use and limitations of practices that will prevent or reduce exposure including appropriate engineering controls, work practices, and personal protective equipment;
- Information of the types, proper use, location, removal, handling, decontamination and/or disposal of personal protective equipment;
- An explanation of the basis for selection of personal protective equipment;
- Information on the hepatitis B vaccine, including information on its efficacy, safety, and the benefits of being vaccinated;
- Information on the appropriate actions to take and persons to contact in an emergency;
- An explanation of the procedure to follow if an exposure incident occurs including the method of reporting the incident and the medical follow-up that will be made available. Also information on the medical counseling that is provided for exposed individuals; and
- An explanation of required signs and labels.

5.2.9 Training Records. Training records shall include the following information and be maintained for five (5) years:

- The date of the training sessions;
- The contents or a summary of the training sessions;
- The names of persons conducting the training; and
- The names of all persons attending the training sessions.

5.2.10 Medical Requirements

5.2.10.1 Medical Evaluations. All employees will receive medical evaluations in accordance with Shaw E & I Procedure HS100, and records will be maintained per Shaw E & I Procedure HS102.

5.2.10.2 Vaccinations. All employees with occupational exposure shall receive the hepatitis B vaccination (HBV) and tetanus vaccination prior to workplace exposure, unless they read and sign the Hepatitis B and Tetanus Vaccination Declination Form (Attachment 3).

- Hepatitis B Vaccination. Recombivax or Accelerated Recombivax vaccines shall be utilized. If the employee has received the HBV previously and/or antibody testing reveals that the employee is immune, a new vaccination is not required.

  Employees may be subjected to occupational exposure after receiving the first shot in the HBV series. Antibody testing shall be performed 30 days after completing the HBV series. Employees unable to develop immunity shall be precluded from further occupational exposure.

  Should a booster dose(s) be recommended by a physician, they shall be provided according to standard recommendations for medical practice.

- Tetanus Vaccination. Current status for tetanus vaccination is within 5 years. Documentation of current status shall be maintained for all employees subject to this policy.

- Post-exposure evaluation and follow-up. All exposure incidents shall be reported as an industrial injury. The Corporate Medical Director shall be advised immediately via the Corporate H&S office. Following a report of an exposure incident, the employer shall make available to each employee a confidential medical evaluation and follow-up including at least the following elements:

- Documentation of the route(s) of exposure, HBV and HIV antibody status of the source patient(s) (if known), and how the exposure occurred. The medical confidentiality rights of the source patient shall be preserved at all times.

- If the source patient can be determined and permission is obtained, collection of and testing of the source patient's blood to determine the presence of HIV or HBV infection shall be conducted under the direction of the attending physician.

- Collection of blood from the exposed employee as soon as possible after the exposure incident for the determination of HIV and/or HBV status. Actual core antibody and surface antigen testing of the blood or serum sample may be done at that time or at a later date if the employee so requests. If the test is deferred, arrangements shall be made through the attending physician to properly archive the specimen.

- Follow-up of the exposed employee including antibody and antigen testing, counseling, illness reporting, and safe and effective post-exposure prophylaxis, according to standard recommendations for medical practice as defined by the Corporate Medical Director.

5.2.10.3 Physician Information. Information provided to the physician. The employer shall provide the following information to the evaluating physician:

- A copy of 29CFR1910.1030 and its appendices, and

- A description of the affected employee's duties as they relate to the employee's occupational exposure.

5.2.10.4 Physician Opinion. Physician's written opinion. For each evaluation, obtain and provide the employee with a copy of the evaluating physician's written opinion within 15 working days of the completion of the evaluation. The written opinion shall be limited to the following information:

- The physician's recommended limitations upon the employee's ability to receive hepatitis B vaccination.

- A statement that the employee has been informed of the results of the medical evaluation and that the employee has been told about any medical conditions resulting from exposure to blood or other potentially infectious materials which require further evaluation or treatment.

- Specific findings or diagnoses, which are related to the employee's ability to receive HBV vaccination. Any other findings and diagnoses shall remain confidential.

5.3 First Aid/CPR Trained Personnel

This procedure is applicable to personnel designated as first aid/CPR providers when it is determined that the facility or project location cannot comply with the requirement to be in "close proximity" to professional medical aid under 29CFR1910.151. (NOTE: This requirement is generally met if a "911" paramedic response system or equivalent serves the area.)

Except where Shaw E & I is required to provide designated first aid/CPR providers under 29CFR1910.151, it is our policy to train a broad base of employees who render emergency assistance on a voluntary basis. Where designated responders are required, a minimum of two persons per shift shall be qualified in accordance with this procedure. Small locations or projects may reduce this number to one per shift with the prior approval of the regional or divisional HS Manager.

When voluntary or non-designated first aid/CPR providers are used, the special provisions listed below shall be followed.

- The Exposure Control Plan shall provide for offering the hepatitis B vaccination, within twenty-four hours, to any unvaccinated first aid/CPR provider rendering aid in an incident involving the presence of blood or other potentially infectious materials.

- A Supervisor's Employee Injury Report (SEIR) shall be completed for all first aid/CPR providers involved in an incident with blood or other potentially infectious materials. The manager or HS professional MUST specifically indicate whether an "exposure incident" as defined in section 4.4 of this procedure took place, and what protective equipment was used.

- Each location shall maintain a list of all such first aid incidents as an attachment to their OSHA Log of Occupational Injuries and Illnesses. The log and first aid incident list (or copies) shall be forwarded to the corporate HS office on February 1 of the following year.

- All associates who are first aid/CPR trained and may provide assistance, shall be trained in these requirements for voluntary providers and the general provisions of this procedure.

6.0 EXCEPTION PROVISIONS

All exceptions to established policy shall follow the provisions of Shaw E & I Procedure HS013: Health and Safety Procedure Variance.

7.0 CROSS REFERENCES

HS101 Management of Employee Exposure & Medical Records
HS102 Drug & Alcohol Testing

8.0 ATTACHMENTS

1. Responsibility Matrix
2. Personal Protection Equipment Matrix
3. Hepatitis B Vaccination Declination Form

ATTACHMENT 1
HANDLING OF BLOOD OR OTHER POTENTIALLY INFECTIOUS MATERIALS

Responsibility Matrix

Action	Procedure Section	*Responsible Party*		
		Manager	**HS**	**Associates**
Develop and implement Exposure Control Plans	5.1	X	X	X
Require use of work practices and other controls	5.2-5.6	X		
Use proper work practices and controls, as described	5.2-5.6, 5.8, 5.10			X
Post areas	5.7	X		
Provide and attend training	5.8	X	X	X
Maintain training and medical records	5.9-5.10		X	
Coordinate medical requirements	5.10		X	

ATTACHMENT 2

BIOWASTE PPE MATRIX

	Minimal[1] Exposure Potential	Slight[2] Exposure Potential	Moderate[3] Exposure Potential
Respirator Protection	None	Surgical mask or half mask with HEPA filters	Full facepiece APR with HEPA filters
Eye Protection	Glasses or safety glasses	Goggles	N/A
Face Protection	None	Face shield	N/A
Head Protection	Hardhat	Hardhat	Hardhat and fluid resistant hood
Hand Protection	Fluid resistant[4] gloves	Cut resistant[5] outer glove and fluid resistant inner glove	Cut resistant outer glove and fluid resistant inner glove
Body Protection	Work uniform or coveralls	Work uniform and Tyvek[6] coveralls	Work uniform and poly-Tyvek type coveralls
Footwear	PVC or Nitrile boots	PVC or Nitrile boots	PVC or Nitrile boots

1 Minimal Exposure: Handling boxed wastes, not cut or splash potential.

2 Slight Exposure: Handling bagged wastes, slight cut or splash potential.

3 Moderate Exposure: Handling loose wastes, slight cut and moderate to high splash potential.

4 Fluid resistant means able to prevent penetration of undamaged glove by liquids likely to be encountered. NOTE: Surgical or exam gloves alone **do not** meet this requirement.

5 Cut resistant means able to resist mechanical damage from accidental contact with sharps and from routing work activities. Leather or heavy canvas gloves will usually be acceptable; specialized gloves (Kelvar, knitted steel, etc.) may be required for specific tasks.

6 Mention of a specific trade name does not require the use of the product; it is intended only for illustrative reasons.

ATTACHMENT 3
HEPATITIS B AND TETANUS VACCINATION DECLINATION

Due to the potential for you to have occupational exposure to potentially infectious materials in your work, the company will provide and encourages you to accept, vaccination for Hepatitis B and Tetanus. Information to assist you in this decision is provided below.

Tetanus

- A bacterial disease causing muscle spasms, seizures, and "lockjaw".
- This single injection vaccination has few side effects.
- There is minimal loss in protection if the vaccination is given at the time of an exposure/injury rather than in advance.

Hepatitis B

- A viral infection of the liver.
- About 9,500 occupational cases occur annually, mostly in health care workers, with about 200 deaths.
- This three injection vaccination has few side effects.
- Vaccination is 90% effective for at least seven years when given prior to exposure.
- Vaccination is 70-88% effective when given within one week of exposure.
- Hepatitis B can survive in the environment for 24-48 hours after drying.
- Risk of infection from one cut or puncture wound from a contaminated object:
  - Hepatitis B Virus 6-30%
  - Human Immunodeficiency Virus (AIDS) 0.5%

If you wish to talk to a company doctor before making your decision, please ask the Health and Safety department to make arrangements for you. *If you choose to decline vaccination at this time, you must print and sign your name, and date the bottom of this form.*

Elayne Theriault, M.D.

Warren Houseman
Vice President, Health & Safety

I understand that due to my occupational exposure to blood or other potentially infectious materials I may be at risk of acquiring Hepatitis B Virus (HBV) infection.

I have been given the opportunity to be vaccinated by hepatitis B vaccine, at no charge to myself. However, I decline Hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring Hepatitis B, a serious disease.

If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with Hepatitis B vaccine, I can receive this vaccination series at no charge to me.

Name (print) _____

Signature _____ Date _____

5.0 TEXT

The company will provide suitable personal protective equipment as required for the nature of the job being performed, such as, but not limited to, boots, protective clothing, respirators, face shields, safety eyewear, respirator ophthalmic hanger devices, hard hats, and gloves. This personal protective equipment will be specified by the Health & Safety Department prior to use, subject to an assessment of the hazards to which employees will be potentially exposed. Documentation shall be in the project-specific Health and Safety Plan (HASP) or equivalent document.

Employees shall use HS-approved protective equipment on any task where there is potential exposure to: physical hazards such as equipment operation, objects dropping from above, or flying particles; or exposure to toxic or irritating gases, fumes, vapors, liquids, or other materials which might cause respiratory distress or skin irritation.

Employees shall be trained in the proper use, maintenance, and limitations of protective equipment. Safety equipment shall be replaced when it is damaged, contaminated, or has worn out. Training requirements are summarized in company Procedure HS050.

Employees shall wear hard hats, eye protection, and steel-toed foot protection (chemical resistant when required) at all job sites (excluding field offices) and industrial facilities, unless HASP/site rules provide exemption. It is the responsibility of all employees to report to any work site prepared to work in Level D PPE. All other protective equipment is the responsibility of the project.

5.1 Eye Protection

All employees engaged in or working in areas adjacent to eye-hazardous activities or operations shall wear appropriate eye protection.

- Safety glasses are required for impact protection, and shall meet ANSI Standard Z87.1 requirements.
- Chemical goggles are required for protection against chemical splash.
- Face shields are required for face protection from chemical splash and are not a substitute for eye protection.
- Full-face respirators can provide eye and face protection in lieu of safety glasses, goggles, or face shields.

5.1.1 Prescription Eye Protection. The company will provide prescription safety glasses (meeting ANSI Standard Z87.1) for field/shop/lab personnel, and computer glasses for computer users, as required by their individual vision status and job. Glasses will be provided every two years unless damaged on-the-job, or the employee exhibits a significant change of prescription.

Lenses shall be clear polycarbonate or plastic. Special tints or dark lenses can be obtained for special applications (e.g., extended outdoor work) with prior written approval from the Health & Safety Department.

Employees requiring corrective lenses inside of respirator face-pieces will be provided with safety lenses and frames sized for respirators and the respirator insert, in addition to conventional prescription safety glasses.

Employees will arrange and pay for the eye examination through the company-provided vision care program. The company will pay for fitting services and the safety glasses.

The company has established a national contract with a protective eyewear provider. Employees should contact the local HS representative (with current lens prescription), who will coordinate with the local purchasing representative to order eyewear. Employees choosing to use another provider will be reimbursed up to $65 for safety or computer glasses, after the Health & Safety Department has verified that the glasses meet the ANSI Standard requirements.

5.2 Foot Protection

Basic foot protection is required for all job sites and industrial locations. Specialized footwear shall be provided as required by the nature of the work. Special foot protection may include, but is not limited to, chemically resistant, thermally shielded, metatarsal guards, etc.

5.2.1 Leather Safety Shoes. Safety shoes may be used in place of chemical resistant footwear when an employee will be working in a clean or uncontaminated work areas. Generally, when the employee desires to use safety footwear other than standard chemical resistant footwear provided, the company considers it the responsibility of the employee to provide such footwear and ensure that it meets ANSI Standard Z41. Company supervision will enforce the use of appropriate protective footwear per the requirements of the site-specific Health and Safety Plan. Where state or local regulations require (i.e., California and Connecticut), the company will provide all necessary safety equipment.

Employees can purchase safety shoes through national purchasing agreements established by the company. Under the limited circumstances where the company will provide safety shoes, such purchases must be approved by the project or appropriate department/local manager. After the Health & Safety Department has verified that the safety shoes meet ANSI requirements, the employee will be reimbursed for the actual purchase price of the shoes up to a maximum of $90.00.

Athletic-style safety shoes ("safety sneakers") are <u>prohibited</u> for all field operations due to the difficulties created by these styles in supervising proper use of protective footwear. Employees in fixed laboratory operations may wear athletic-style safety shoes with the prior approval of the Lab Director or HS Coordinator.

5.3 Head Protection

Hard hats meeting ANSI Z89.1 shall be provided to protect employees from impact, penetration, falling objects, and/or limited electrical shock and burn, as appropriate for work site hazards.

5.4 Respiratory Protection

Respirators shall be provided, in accordance with Procedure HS601, Respiratory Protection Program.

5.5 Hearing Protection

Hearing protection shall be provided, in accordance with Procedure HS402, Hearing Conservation Program.

5.6 Body Protection

Protective clothing, gloves, boots, and other protective equipment shall be provided as appropriate for the hazards associated with the tasks being performed.

5.7 Providing Personal Protective Equipment to Non-Company Personnel

The following personal protective equipment may be provided to non-company personnel:

- Hard hats
- Chemical goggles
- Safety glasses (non-prescription)
- Face shields
- Chemical resistant boots
- Chemical resistant gloves
- Hearing protectors
- Disposable chemical resistant personal protective clothing

5.8 Management Duties

It is the responsibility of the Health & Safety Department to specify safety equipment requirements for each job.

It is the responsibility of project managers or location managers to provide adequate quantities of safety equipment required for their job(s) or project(s).

It is the responsibility of supervisors to verify that required safety equipment is properly used and to ensure that any employee provided protective equipment is adequate, properly maintained and in a sanitary condition.

6.0 EXCEPTION PROVISIONS

Variances and exceptions shall be permitted pursuant to the provisions of Procedure HS013, "Health & Safety Procedure Variances".

7.0 CROSS REFERENCES

HS050 Training Requirements
HS402 Hearing Conservation Program
HS601 Respiratory Protection Program
ANSI Standard Z41, *Personal Protection - Protective Footwear*
ANSI Standard Z87.0, *Practice for Occupational and Educational Eye and Face Protection*
ANSI Standard Z89.1, *Protective Headwear for Industrial Workers*

8.0 ATTACHMENTS

1. Responsibility Matrix

ATTACHMENT 1
PERSONAL PROTECTIVE EQUIPMENT

Responsibility Matrix

Action	Procedure Section	*Responsible Party*			
		EH&S Operations Manager	Local HS Department	Project/ Location Managers	Supervisors
Issue, revise, and maintain this procedure.	3.1	X			
Approve all personal protective equipment prior to use.	5.0		X		
Coordinate reimbursement to employee for PPE purchases.	5.1.1, 5.2.1		X		
Provide adequate quantities of safety equipment as required.	5.8			X	
Verify that required safety equipment is properly used.	5.8				X

PROCEDURE

Subject: RESPIRATORY PROTECTION PROGRAM

1.0 PURPOSE AND SUMMARY

The purpose of this procedure is to prescribe the requirements of the company Respiratory Protection Program (RPP). This procedure provides information and guidance on the proper selection, medical evaluation, training, use, and care of respiratory protective equipment and complies with the requirements of 29 CFR 1910.134 (1998).

All operations which require the use of respiratory protection are subject to the provisions of this procedure.

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3.0 RESPONSIBILITY MATRIX

3.1 Procedure Responsibility

The Vice President, Health and Safety is responsible for the issuance, revision, and maintenance of this procedure.

3.2 Action/Approval Responsibilities

Program responsibilities are detailed throughout this procedure. The Responsibility Matrix summarizes these items and can be found as Attachment 1.

4.0 DEFINITIONS

Action Level (AL) - Airborne contaminant concentration which is one-half of the Permissible Exposure Guideline (PEG).

Air Purifying Respirator (APR) - Negative pressure respirator (also referred to as a cartridge respirator) which filters contaminated air through chemical or mechanical filter elements. APRs include: cartridge, canister, gas masks, and single-use respirators (single-use respirators are not approved for use by the company).

Approved Respirator - Any respirator, identified by manufacturer and model, that has been approved by NIOSH 42 CFR Part 84 and has been incorporated into the List of Approved Respiratory Protective Equipment (Attachment 2).

Assigned Protection Factor (APF) - A term that is reserved in the OSHA Standard 1910.134 (January, 1998). Attachment 3 provided PFs for the respiratory protective equipment based upon type of device and method of fit testing. The company will continue to use the PFs established by NIOSH until OSHA issues their definition of APF.

Company - All wholly-owned subsidiaries of Shaw Environmental & Infrastructure, Inc. (Shaw E & I).

Contractor Personnel - A group of persons hired to perform a specific activity based on their expertise and ability to operate independent of direct supervision. Contractor personnel are supervised by their management group which reports to an employee of the company for project direction.

End-of-Service-Life Indicator (ESLI) - A system that warns the respirator user of the approach of the end of adequate respiratory protection, for example, that the sorbent is approaching saturation or is no longer effective.

Emergency - Emergency means any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that may or does result in an uncontrolled significant release of an airborne contaminant.

Exposure Limit - Several published airborne contaminant concentration values exist which are used in establishing acceptable personnel exposures to contaminants. OSHA publishes the Permissible Exposure Limit (PEL), NIOSH publishes the Recommended Exposure Limit (REL), and the ACGIH publishes the Threshold Limit Value (TLV). All of these exposure limits are based on an 8-hour work shift, 40-hour work week, and 40-year work life. The values may vary from contaminant to contaminant as well as between publishing bodies.

Field Office - Any office or satellite office performing field activities which may require the use of respiratory protection.

Filtering Facepiece (Dust Mask) - A negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.

Fit Factor (FF) - This term means a quantitative estimate of the fit of a particular respirator to a specific individual and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn. The FF incorporates a safety factor of 10 because protection factors in the workplace tend to be much lower than the fit factors achieved during fit testing. Acceptable fit factors are 100 for a tight-fitting half facepiece and 500 for a tight-fitting full facepiece respirators.

HASP - Health and Safety Plan.

Health and Safety Representative - A member of the company Health and Safety Functional Resource Group who, through credentials, training, or experience, has the necessary qualifications and authority to specify respiratory protection and evaluate respiratory protection program elements.

Immediately Dangerous to Life or Health (IDLH) - An atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.

Labor Pool Personnel - Temporary personnel hired for a given expertise or ability. Labor pool personnel report directly to an employee of the company.
Nuisance Level - Level of airborne contaminants which is below one-half the action level for that contaminant and presents no other health or safety hazard.

Permissible Exposure Guideline (PEG) - This term designates a specific exposure limit and is based on the best available information. The PEG will be the lower (more protective) of the values for the PEL and TLV. However, the REL shall take precedence for Hazardous Waste Operations (subject to 29 CFR 1910.120 or 1926.65) if no PEL exists, or for contaminants where no PEL or TLV exists. If there is no PEL, TLV, or REL, a Health and Safety Representative shall determine an appropriate permissible exposure guideline.

Permissible Exposure Limit (PEL) - An occupational exposure index promulgated by OSHA which carries the force of law. This value represents the allowable concentration to which it is believed an employee may be exposed to 8 hours a day, 40 days a week, for a 40-year working life without experiencing adverse health effects.

Positive Pressure Respirator - A respirator in which the pressure inside the respirator exceeds the ambient air pressure outside the respirator.

Powered Air Purifying Respirator (PAPR) - A positive pressure APR which incorporates a fan an battery pack unit. The system pulls contaminated air through the filter elements before delivery to the facepiece under positive pressure. Air pressure in the mask must remain above ambient pressure.

Qualitative Fit Test - A procedure for assuring that the respirator provides adequate protection based on a pass/fail fit test that relies on the individual's response to the test agent. Standard fit test protocol will utilize the irritant smoke methods as described in Attachment 4.

Quantitative Fit Test - A fit test that provides an assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.

Respiratory Protection Program Coordinator (RPP Coordinator) - A person designated by the Health and Safety Representative to administer and supervise the respiratory program at a local facility or project location. This person will have the necessary training or credentials to execute this task.

Recommended Exposure Limit (REL) - An occupational exposure index published by NIOSH which is a recommended guideline for employee protection. This value represents the allowable concentration to which it is believed an employee may be exposed to 10 hours a day, 40 hours a week, for a 40-year working life without experiencing health effects.

Supplied Air Respirator (SAR) - Positive pressure respirator which supplies an independent source of breathing air to the user. Two types of SARs are available: self-contained breathing apparatus (SCBA) and airline.

Threshold Limit Value (TLV) - An occupational exposure index published by ACGIH which is recognized as an industry guideline and represents the concentration to which it is believed that nearly all employees may be exposed to 8 hours a day, 40 hours a week without experiencing adverse health effects.

5.0 TEXT

The company will employ engineering controls (e.g., enclosure, ventilation, material substitution, etc.) as the primary method to limit employee exposure. However, for those situations where engineering and administrative controls are ineffective at controlling employee exposure, the use of respiratory protective equipment may be required.

This RPP provides specific requirements for selection, assignment, training, and medical evaluation for persons expected to wear respiratory protection.

5.1 Assignment of Equipment to Contractor/Labor Pool Personnel

Contractor personnel shall provide their own respiratory protective equipment and shall also confirm meeting all other requirements of their own RPP and that of the company's RPP (i.e., medical clearance, training, etc.).

The company may provide the following respiratory protective equipment to Contractor Personnel:

- Disposable equipment such as filter elements.
- Hardware for airline systems (up to, but not including, the airline and facepiece) which employees are sharing.

The company will not provide the following respiratory protective equipment to Contractor Personnel:

- APR or PAPR facepieces.
- SCBAs, SAR respirators, or airline.

The company may provide respiratory protective equipment to Labor Pool Personnel if the following have been established:

- The labor pool personnel have successfully completed training as required by 29 CFR 1910.134 and other applicable regulations.
- The labor pool personnel have been fit tested in relation to projected exposure levels and contaminants to be encountered.
- The labor pool personnel have been medically approved to wear respirators.
- All other RPP requirements have been met.

5.2 Approval, Selection, and Purchase of Respiratory Protective Equipment

The following requirements are designed to guide correct selection of respiratory protective equipment.

5.2.1 Approval. The Vice President, Health and Safety has approved respirators manufactured by Survivair as the primary respirators for use by employees. For employees who cannot achieve a satisfactory fit or comfort factor in Survivair respirator, Mine Safety Appliance (MSA) respirators will be selected. The list of approved model respirators is included in Attachment 2. Contractor personnel may select any respiratory protective equipment that has received approval from NIOSH.

5.2.2 **Selection.** The Health and Safety Representative shall base the selection of respiratory protective equipment upon an assessment of potential respiratory hazards that may be encountered. This assessment may utilize a variety of written information such as the NIOSH Pocket Guide to Chemical Hazards, Material Safety Data Sheets, analytical data, air monitoring results, or other applicable information. The selection process shall incorporate the following guidelines:

- Respiratory protection is to be selected by Health and Safety Representatives only. Full facepiece respirators are the usual preference because of superior protection factor and the face/eye protection afforded. Half facepiece respirators can only be used in situations where less than one-half the PEG is expected. The type of respirator selected will be documented in the Project HASP.

- Selection of the appropriate respiratory protective equipment shall include factors such as the chemical state and physical form of the chemical contaminant, atmospheric concentration during routine and emergency events, potential physical hazards, expected job task requirements, and the performance of the respirator in providing the appropriate level of protection against these hazards.

- Consideration shall be given to the nature of the hazardous operation, location of the hazardous area relative to nonhazardous breathing air supply, duration of wear, activities to be performed, and characteristics and function of the respiratory protective equipment to be worn.

- Selected respirators (i.e., Survivair or MSA) shall be NIOSH certified and used in compliance with the conditions of its certification when employees are exposed to toxic materials or other hazardous atmospheres.

- Respirators must provide adequate face and eye protection for the expected task.

- If an APR or PAPR is used, the respirator shall be equipped with an end-of-service life-indicator (ESLI) certified by NIOSH for the contaminant. If an ESLI is not available for the contaminant, a cartridge element change schedule shall be implemented which is based on objective information or data that will ensure that canisters and cartridges are changed before the end of their service life. This information will be described in the HASP.

- The PF for the respirator selected (Attachment 3) shall be used according to the following relationship with the PEG to establish justification for selection:

PF x PEG > Maximum anticipated contaminant concentration

If this equation is false, a respirator with a greater PF must be selected. Also review Attachment 3 to determine the required fit testing for the expected maximum anticipated contaminant concentration. The Health and Safety Representative may determine that a more conservative approach (e.g., 50 percent PF) may be needed. Decision to do so should be documented in the Project HASP.

- Manufacturer-established limitations of the APR filter elements relative to the contaminants of concern shall be used to establish further justification for the selected respirator should the APR's FF not disqualify its use (e.g., maximum anticipated contaminant concentration).

5.2.3 **Purchase.** The purchase request of respiratory protective equipment (including cartridges, airlines, compressed air) should be reviewed by a Health and Safety Representative to indicate that the ordered material meets established requirements. **Under no circumstances may anyone (purchasing, warehouse, project manager, etc.) purchase or provide other than the specific respiratory protection equipment selected by the Health and Safety Representative.**

5.3 Medical Evaluation

No employee shall be assigned to a task that requires the use of a respirator unless it has been determined that he/she is physically able to perform the work while using the required respirator. The medical evaluation must be conducted prior to fit testing and work requiring the use of respiratory equipment.

The medical evaluation shall be performed by a physician typically in conjunction with a physical examination meeting the requirements of 29 CFR 1910.120 (f) *Medical Surveillance*. The physician will be informed of the type of work expected of the employee, the types of respiratory protection and personal protective equipment required, and other information indicating the expected stresses of the task. The company medical director shall be given a copy of the company RPP and a copy of 1910.134 (e) *Medical Evaluation.*

The company medical director shall provide a written recommendation regarding the employee's ability to use respiratory protection. The company shall ensure that the company medical director supplies the employee with a copy of this recommendation.

Additional medical evaluations will be provided to the employee if:

- Any medical signs or symptoms due to respirator use are reported by the employee, supervisory, or health and safety personnel.

- A change in workplace conditions (e.g., physical work effort, protective clothing, temperature) that may result in a substantial increase in the physiological burden placed on an employee.

5.4 General Program Requirements

5.4.1 Responsibilities. The following information describes the responsibilities for the selection, use, and maintenance of respiratory protective equipment based upon job function:

Management

- Management shall take necessary and cost-effective measures to reduce, where possible, the need for respiratory protective equipment (e.g., enclosed cabs on heavy equipment to reduce airborne dust, operations performed upwind, etc.)

- Respiratory protective equipment shall be provided by management whenever it is determined that such equipment is necessary to protect the health of the employee or when requested by an employee and approved by the Health and Safety Representative.

- Management shall assign work tasks requiring the use of respiratory protective equipment to only those employees who are medically qualified to wear respiratory protective equipment.

- Management shall ensure that employees are trained in the use of respiratory protection prior to being assigned to an activity that requires its use.

- Management shall provide the means for the maintenance of respiratory protection as required.

Health and Safety Representative

- Health and Safety Representatives shall determine appropriate respiratory protection for each job. The decision logic for this selection shall be documented in the Project HASP.

- Health and Safety Representatives shall monitor compliance with the various aspects of this program, provide technical assistance regarding respirator selection and use, evaluate the effectiveness of the RPP, and support respirator training and fit testing at locations under their control.

- Health and Safety Representatives shall conduct regular audits to determine compliance with this procedure. This audit can include a review of maintenance, training, medical and air monitoring records, and review the status of this procedure with regard to current regulatory requirements.

- Health and Safety Representatives shall maintain or oversee maintenance of all other records required by this RPP and shall provide for the training and fit testing of personnel assigned respiratory protective equipment.

- Health and Safety Representatives shall appoint a RPP Coordinator for each location which uses or may have a need to use respiratory protection. The Health and Safety Representative must assure the RPP Coordinator has the necessary training to fulfill his/her responsibilities.

RPP Coordinator

- The RPP Coordinator shall be responsible for cleaning, maintenance, and storage of all respirators not routinely used or not individually assigned.

- The RPP Coordinator shall maintain respirator supplies, including spare parts; submit purchase requests for new equipment; and assure that sufficient quantities of cartridges are available for each field office/project.

- The RPP Coordinator shall assure that air supply and emergency respiratory protection is properly inspected and maintained.

- Respirators shall be repaired by either qualified personnel under the direction of the RPP Coordinator, or by contracted supplier.

- The RPP Coordinator shall maintain models and sizes of respirators available for selection and fitting.

- The RPP Coordinator shall conduct fit testing.

Training Department

- Records pertaining to training and fit testing will be maintained by the Training Department.

Employee

- The employee shall use the provided respiratory protective equipment when instructed to do so in accordance with training received.

- The employee shall clean, disinfect, and properly store the assigned respirator, unless other arrangements are made on a project level.

- The employee shall guard against damage to the assigned respirator.

- The employee shall inspect the respirator before each use and after cleaning.

- The employee shall report any malfunction of the respirator immediately to their supervisor and/or the RPP Coordinator.

- The employee shall report to their supervisor any change in their medical status that may impact their ability to wear a respirator safely.

5.4.2 **Use of Corrective Lens Eyewear.** In general, contact lenses are permitted to be worn when respiratory protection is used. Although in certain instances, client- or project-specific rules may not allow for their use.

If an employee chooses not to wear contact lenses, management shall assure that the appropriate frames or ophthalmic device attachments are obtained and provided at no cost to the employee.

5.4.3 **Obstruction of Face Seal.** Employees who wear respirators are required to be clean shaven to the extent that there is no obstruction between the wearer's skin and the facepiece. Trimmed mustaches and facial hair which does not interfere with the seal are allowable.

In addition, respirators shall not be worn when conditions prevent a good face-to-facepiece seal such as corrective lenses or goggles, or other personal protective equipment.

5.5 Instruction, Training, and Fit Test

5.5.1 **Instruction and Training.** The Training Department shall provide a standard respiratory protective equipment training program for use by qualified personnel such as the Health and Safety Representative or RPP Coordinator. The Training Department will support training at the project location if the project does not have the qualified personnel and/or the equipment to support its own program. As an alternative, the project location may use a respiratory manufacturer's training program if the program meets company requirements, a competent person conducts the training, adequate equipment is available for demonstration, and fit testing is conducted along guidelines established in this procedure. The Training Department must approve all alternative training methods.

The basic respirator training program shall include, as a minimum, the following:

- Training and annual retraining of employees in the selection, use, maintenance, and limitation of each respirator type used.

- Instruction on the nature of the respiratory hazards and potential health effects resulting from exposure.

- Opportunity for "hands on" experience with the respiratory protective equipment.

- Proper fitting, including demonstrations and practice in wearing, adjusting, and determining the fit of the respirator. A selection of respirators shall be available to determine the most comfortable respirator and the best fit.

- Instruction on how to test the face-to-facepiece seal.

- A familiarization period of wear in ambient air.

- For APRs, wearing the respirator in a test atmosphere (typically irritant smoke) for qualitative fit testing. The qualitative fit test shall follow the guidelines outlined in Section 5.5.2.

- Training to recognize and cope with emergency situations (including respirator failure)

- Training and fit testing shall be repeated annually, unless specific OSHA regulations require a more frequent time period (e.g., asbestos, lead operations). Each person receiving training shall complete the Respirator Fit Test Form (Attachment 5).

- Training records will be maintained by the Training Department and the location Health and Safety Representative. On-site records of training and fit testing will be maintained as required by specific regulation (e.g., asbestos work) (refer to Section 5.8).

- It is the responsibility of the RPP Coordinator to verify that all project personnel meet the requirements of this RPP.

5.5.2 **Fit Testing.** Prior to the use of any negative or positive pressure tight-fitting facepiece, the employee must be fit tested.

- All employees assigned to operations requiring the use of respiratory protective equipment shall have been fit tested within 12 months, or as required by specific regulations (e.g., asbestos, lead operations). Fit test and qualification cards (or a copy of the completed Attachment 5) must be available during operations.

- The employee shall be fit tested with the same size and model as they are expected to wear.

- Qualitative fit test (QLFT) shall be used when a protection factor of 10 or less is required for a negative pressure respirator.

- Quantitative fit test (QNFT) shall be used when a protection factor of greater than 10 is required for a negative pressure respirator. When

executing the QNFT, the acceptable test result is 100 for tight fitting half-facepiece respirators and 500 for full-facepiece respirators.

- Fit testing for tight-fitting atmosphere supplying respirators and tight-fitting APRs shall be in a negative pressure mode regardless of the mode of operation that is used for respiratory protection.

- Assessment of comfort shall be made after allowing adequate time for this evaluation. This evaluation shall include reviewing the following points with the employee: positioning of the mask on nose, room for eye protection if required, room to talk, and positioning of the mask on the face and cheeks.

- The following criteria shall be used to help determine the adequacy of the respirator fit: chin properly placed, strap tension, fit across the nose bridge, and tendency to slip.

- If physical obstruction (e.g., facial hair, eyeglasses) interferes with the face-to-facepiece seal, then it shall be altered or removed so as to eliminate any interference and allow for a satisfactory fit. If the employee refuses to alter the physical obstruction, then they shall be denied a satisfactory fit report and referred to his/her supervisor for consideration.

- The fit test protocol (Attachment 4) shall be followed. The Health and Safety Representative and Training Department shall determine which fit test protocol shall be followed depending upon the situation.

5.6 Maintenance Program

Each RPP Coordinator is responsible for verifying the respirator maintenance program is implemented in an effective manner for the facility or project site, the working conditions, and the potential hazards involved. As a minimum, the following aspects must be implemented:

- Inspection
- Cleaning and sanitizing
- Repair
- Respirator storage
- Inspection and repair documentation, as required
- Compliance with manufacturer recommendations.

Detailed information regarding cleaning, inspection, maintenance, and storage is found in Attachment 7. The RPP Coordinator shall verify compliance with the maintenance program by periodic inspections and field audits.

5.6.1 Inspection

- All respiratory protective equipment systems shall be inspected by the wearer for defects and/or deterioration immediately prior to and after each use.

- Any defects shall be reported to their supervisor immediately and the respirator removed from use until it can be repaired or replaced.

- Respiratory protective equipment systems not used routinely (including all SCBAs and equipment designated only for emergency use) shall be inspected before and after each use and at least every 30 days. Cylinders shall be recharged whenever the pressure falls below 90 percent of the manufacturer's recommended pressure level. This inspection shall be documented by some method on the unit (i.e., tag). Records of inspections shall be kept through appropriate documentation. Attachment 6 provides an example of inspection documentation for SCBAs. At a minimum, these records will include: date, inspector, and any unusual finding or condition. Any repairs or modifications shall be documented in detail.

- General field inspection shall include a check of the following: tightness of all connections, facepiece, valves, and any connecting tubes or filtering elements.

- Employees who are manufacturer-qualified repair technicians shall be used for all maintenance beyond field inspections, tests, and user-performed cleaning.

- Air supplied respiratory systems shall be inspected by a manufacturer's authorized representative at the manufacturer's recommended schedule. Manufacturers typically require an annual flow test and a complete overhaul every 5 to 7 years.

- **Specific inspection procedures are outlined in Attachment 7.**

5.6.2 **Cleaning and Sanitizing.** Employees maintaining their own respirators shall be thoroughly briefed on how to clean and disinfect them. On projects where employees clean their own respirator, the generally accepted procedure involves washing with detergent and warm water using a soft brush, submersion in sanitizing agent, thoroughly rinsing in clean water, drying in a clean place, and storage in sealed plastic bags or equivalent. Precautions to be taken to prevent damage from rough handling during this procedure are detailed in Attachment 7.

At locations where employees share respirators, a centralized cleaning and maintenance facility with specialized equipment and/or materials and personnel

trained in respirator maintenance must be established. Cleaning and inspection is primarily the responsibility of the user.

5.6.3 Repair. The company will only use respiratory protective equipment that is physically sound.

- If defects are found during any inspection, two remedies are possible. If parts and trained personnel are available, repair and/or adjustment may be made immediately. If parts or trained repair people are unavailable, the device shall be removed from service until it can be repaired. Under no circumstances shall a device that is known to be defective remain in service.

- Replacement or repair shall be done by adequately trained personnel. For negative pressure respirators, the Health and Safety Representative or RPP Coordinator may train or supervise personnel in the replacement of items such as inhalation/exhalation valves, head harness, cartridge adapters, and lenses. For air-supplied respirators, field repairs are limited to replacement of head harness and lenses. All other work must be completed by a factory-certified repair person.

Repair shall only be made with parts designed for the respirator. Substitution of parts from a different brand or type invalidates the respirator's approval and is prohibited.

5.6.4 Storage. Respirators must be stored to protect against dust, sunlight, heat, extreme cold, excessive moisture, damaging chemicals, and mechanical damage.

- Respirators shall be stored in such a manner that the facepiece, exhalation valve, and straps are not distorted.

- Respirators shall be stored in sealable containers (e.g., ziplock bags) after cleaning and disinfecting.

- The storage location of emergency respiratory protection shall be readily accessible and prominently identified.

- Respirators shall be stored in an area free of contamination.

5.7 Field Use

The following guidelines for the use of respirators (or equivalent) shall be incorporated into the Project HASP as appropriate. Additional guidelines may be required based on working conditions and hazards involved. Each location where respiratory protective equipment is required or worn shall include in the Project HASP justification for the selected respiratory protective equipment systems worn as outlined in Section 5.2 of this procedure.

5.7.1 **General Requirements.** The following general requirements shall be followed whenever respiratory protection is used:

- Employees shall be allowed to leave the regulated area to readjust the facepiece or to wash their faces and to wipe clean the facepieces of their respirators in order to minimize potential skin irritation associated with respirator use.

- Respiratory protective equipment shall not be passed on from one person to another until it has been cleaned and sanitized, per program requirements.

- Respirators will be inspected, and a positive/negative pressure test performed prior to each use.

- Entry into oxygen-deficient (< 19.5 percent O_2) atmospheres, Immediately Dangerous to Life and Health (IDLH) atmospheres, or areas requiring EPA Level A protection is prohibited without the prior approval of the Vice President, Health and Safety or the CIH assigned to the business line.

- Head coverings such as Tyvek hoods shall not be allowed to pass between the face-to-facepiece seal.

- The harness straps of tight-fitting respirators shall not be positioned or worn over hard hats.

5.7.2 **Specific Requirements.** The following information details specific requirements by respirator class:

<u>Air Purifying Systems</u>

- When APRs are worn, new filter elements shall be installed at the beginning of operations. The filter elements shall be changed whenever the ESLI (color indicators) indicates that cartridge life has expired (e.g., mercury cartridges). When no ESLIs are available, filter replacement will be based on the calculations performed by the Health and Safety Representative. Additionally, the cartridges will be replaced if "breakthrough" is perceived or whenever an increase in breathing resistance is detected. In most cases, the cartridges will be replaced a minimum of once daily, usually at the end of the work shift.

<u>Powered Air Purifying Systems</u>

- When PAPRs are worn, employees shall change filter elements after each day's activities. The filter elements shall be changed whenever the ESLI (color indicators) indicates that cartridge life has expired (e.g., mercury

cartridges). When no ESLIs are available, filter replacement will be based on the calculations performed by the Health and Safety Representative. Additionally, the cartridges will be replaced if "break-through" is perceived or when airflow through filter elements decreases to an unacceptable level as indicated by the manufacturer's test device.

Compressed Air

- Compressed air used for breathing shall meet at least the requirements of the specification for Grade D breathing air or better (D, E, or G; not A, K, or L) as described in the American National Standard Commodity Specification for Air, ANSI/CGA G-7.1-1989. Further information is provided in Attachment 7, Guide to Respiratory Protective Equipment Cleaning, Inspection, Maintenance, and Storage.

- Breathing air suppliers must provide certification of analysis stating conformance, as a minimum, to Grade D breathing air standards as previously referenced for each cylinder and/or air lot.

- Air delivered in bulk, e.g., tube trailers, shall have each tube or unit, or a representative number of tubes or units verified as to oxygen content prior to using that tube.

- Pure oxygen shall NOT be used at any time in open-circuit SCBAs or airline respirators.

- Breathing air cylinders shall be legibly identified with the word "AIR" by means of stenciling, stamping, or labeling as near to the valve end as practical.

- Breathing air cylinders may be stored on their sides provided the valve caps are in place.

Supplied Air Breathing Systems

- Airline couplings shall be incompatible with outlets for other gas systems to prevent inadvertent servicing of airline respirators with nonrespirable gases or oxygen.

- Standard airline couplings for breathing air systems are Foster quick connect fittings with locking dots. Hansen quick connect fitting may also be used, but must not be used where they can be inadvertently actuated and disconnected. For example, Hansen fittings could be used at the regulator connection, but not on the airline unless protected from disconnection by some other means.

- The hose line length shall not exceed 300 feet from the air bank regulator to the user.

- No more than three connections, excluding the connection to the regulator and final connection to the respirator, shall be between the breathing air cylinders and the user.

- Breathing air hose shall be protected from direct contact with chemical materials which may permeate the hose. Acceptable methods of protection include suspension of the hose from the surface or covering with a commercially available sleeve or visqueen. Breathing air hose which has become contaminated will be removed from service and disposed of properly.

- The breathing air regulator shall be adjusted to provide air pressure as per the manufacturer's recommendations. For Survivair units, this pressure shall be between 80 to 125 psi pressure.

- Cascade systems shall be equipped with low pressure warning alarms or similar warning devices to indicate air pressure in the manifold below 500 psi.

- When a cascade system is used to supply breathing air, a worker outside the Exclusion Zone shall be assigned as safety standby within audible range of the low pressure alarm.

- When a cascade system is used to recharge SCBA air cylinders, it shall be equipped with a high-pressure supply hose and coupling rated at a capacity of at least 3,000 psi. The supply hose and coupling shall be relatively short ($\leq$ 3 feet) and secured to prevent whipping when pressurized.

- Large supplied air cylinders shall be stored and handled to prevent damage to the cylinder or valve. Cylinders shall be stored upright with the protective valve cover in place and in such a way (e.g., supported with substantial rope or chain in the upper one-third of the cylinder, or in racks designed for the purpose) as to prevent the cylinder from falling. Cylinders shall not be dropped, dragged, rolled, or allowed to strike each other or to be struck violently. Cylinders shall never be exposed to temperatures exceeding 125 degrees F. Cylinders with visible external damage, evidence of corrosion, or exposure to fire shall not be accepted or used.

- Only cylinders within current hydrostatic test periods shall be used. For fiber wrapped bottles designated by the DOT-E label, hydrostatic testing shall be completed every 3 years. Maximum service life for these cylinders is 15 years. Steel or aluminum cylinders shall be

hydrostatically tested every 5 years. No maximum service life is established for steel or aluminum cylinders.

- SCBAs shall only be used in the positive pressure mode when in the Exclusion Zone.

- Standby SCBA equipment must be present when air supply systems are used in IDLH or potentially IDLH atmospheres.

Escape/Egress Units

- These respirators are intended for use in areas where escape with a short-term (5 minute) air supply is necessary. They may be used as adjuncts to airline respirators as a backup air supply, or as independent emergency devices in areas where respiratory protective equipment is not normally required.

- Appropriate training shall be accomplished and documented prior to assigning employees to tasks or locations subject to the use of these respirators.

- Escape/egress units (5-minute air supply) shall never be used as primary standby respirators for confined space entry.

- Escape/egress units shall never be used to enter, or continue working in, a hazardous atmosphere.

5.7.3 **IDLH Atmospheres.** For all IDLH atmospheres, the company shall ensure that:

- One employee or, when needed, more than one employee is located outside the IDLH atmosphere.

- Visual, voice, or signal line communication is maintained between the employee(s) in the IDLH atmosphere and the employee(s) located outside the IDLH atmosphere.

- The employee(s) located outside the IDLH atmosphere are trained and equipped to provide effective emergency rescue.

- The employer or designee is notified before the employee(s) located outside the IDLH atmosphere enter the IDLH atmosphere to provide emergency rescue.

- The employer or designee authorized to do so by the employer, once notified, provides necessary assistance appropriate to the situation.

- Employee(s) located outside the IDLH atmosphere are equipped with:

- Pressure demand or other positive pressure SCBAs, or a pressure demand or other positive pressure supplied air respirator with escape/egress unit.

- Appropriate retrieval equipment for removing the employee(s) who enter(s) these hazardous atmospheres where retrieval equipment would contribute to the rescue of the employee(s) and would not increase the overall risk resulting from entry. Equivalent means of rescue can be considered.

5.8 Recordkeeping

The following documents must be part of the site recordkeeping program:

- Employees' medical clearances for respirator use
- Respirator training and fit testing forms.

5.9 Program Evaluation

This RPP shall be reviewed annually at the direction of the Vice President, Health and Safety.

6.0 EXCEPTION PROVISIONS

Variances and exceptions may be requested pursuant to the provisions of Procedure HS013, Health and Safety Procedure Variances.

7.0 CROSS REFERENCES

Title 29, Code of Federal Regulations, Section 1910.134.

AIHA, ***Respiratory Protection, A Manual and Guideline***, 1980.

American National Standards Institute Practices for Respiratory Protection Z88.2-1992 (or most recent publication)

NIOSH, ***Certified Equipment List*** (most recent version)

Company Health and Safety Procedures:

HS013 Health and Safety Procedure Variances
HS040 Stop Work Authority
HS050 Training Requirement
HS052 Health and Safety Plans
HS102 Management of Employee Exposure and Medical Records
HS104 Employee Notification of Industrial Hygiene Monitoring Records
HS300 Confined Spaces
HS304 Compressed Gas Cylinders
HS600 Personal Protective Equipment

8.0 ATTACHMENTS

1. Responsibility Matrix
2. List of Approved Respiratory Protective Equipment
3. Respirator Type, Protection Factor, and Fit Testing Method
4. Mandatory Respirator Fit Test Protocol
5. Respirator Fit Test Form
6. Emergency Respiratory Protective Equipment Monthly Inspection Checklist
7. Guide to Respiratory Protective Equipment Cleaning, Inspection, Maintenance, and Storage

ATTACHMENT 1
RESPIRATORY PROTECTION PROGRAM

Responsibility Matrix

Action	Procedure Section	*Responsible Party*					
		Employee	Health and Safety Representative	Project/ Location Management	VP, Health and Safety	Training	RPP Coordinator
Issue, Revise, and Maintain Procedure	3.1				X		
Assure Proper Selection of Respirators	5.2.2		X				
Review Purchase Requests for Respiratory Equipment	5.2.3		X				
Conduct Fit Testing	5.4		X				X
Assure Compliance with RPP	5.4		X	X			X
Assure Training	5.4		X	X			X
Audit Program Compliance	5.4		X		X		X
Assist/Approve Local Training Program	5.4					X	
Maintenance Program	5.6	X	X	X			X
Field Use	5.7	X	X	X			X
Recordkeeping	5.8	X	X			X	X
Program Evaluation	5.9				X		

ATTACHMENT 2

LIST OF APPROVED RESPIRATORY PROTECTIVE EQUIPMENT

AIR PURIFYING RESPIRATORS (APR)					
Respirator Class	**Respirator Type**	**Respiratory Performance**	**Manufacturer**	**Model Name**	**Model Number**
Standard APR	Half-Face	Negative Pressure	Survivair	Blue 1	2100-10 S 2200-10 M 2300-10 L
			MSA	Comfo II	479529 S 479428 M 479530 L
	Full-Face	Negative Pressure	Survivair	20/20	202062 S 202072 M 202082 L
			MSA	Ultra Twin	480263 S 480259 M 480267 L
Powered APR	Hood	Continuous Positive Pressure	Survivair	PAPR	5200-15
			MSA	Optimair 6	480251 S 480247 M 480255 L

SUPPLIED AIR RESPIRATORS (SAR)					
Respirator Class	**Respirator Type**	**Respiratory Performance**	**Manufacturer**	**Model Name**	**Model Number**
Airline SAR	Full-Face	Positive Pressure Demand	Survivair	Panther	P968455
			MSA	Premaire	497291
SCBA SAR	Full-Face	Positive Pressure Demand	Survivair	Cougar	P 9643310
			MSA	MMR WorkMask 2216	Varies on Components
Emergency	Escape/Egress Unit	Continuous Flow	Survivair	5 min. EEGA	9750870
			MSA	Custom Air V	484353

ATTACHMENT 3

RESPIRATOR TYPE, PROTECTION FACTOR, AND FIT TESTING METHOD

Respirator Type	Protection Factor	QLFT	QNFT
Half-Face, Negative Pressure (<100 Fit Factor)[1]	10	Yes	Yes
Full-Face, Negative Pressure (<100 Fit Factor) Used in Atmosphere up to 10 Times the PEG	10	Yes	Yes
Full-Face, Negative Pressure (>100 Fit Factor) Used in Atmospheres Over 10 Times the PEG[2]	50	No	Yes
PAPR	100	Yes	Yes
SCBA/SAR Used in Positive Pressure (Pressure Demand Mode)	10,000	Yes	Yes

Footnotes:

1. If quantitatively fit tested, the device must demonstrate a fit factor of at least 100.
2. If quantitatively fit tested, the device must demonstrate a fit factor of at least 500.

ATTACHMENT 4

MANDATORY RESPIRATOR FIT TEST PROTOCOL

OSHA-Accepted Fit Test Protocols

A. Fit Testing Procedures - General Requirements

The company shall conduct fit testing using the following procedures. The requirements in this attachment apply to all OSHA-accepted fit test methods, both QLFT and QNFT. There are several OSHA-accepted fit test protocols for QLFT. This procedure includes only the irritant smoke protocol since it requires less equipment and is more practical for field use.

1. The test subject shall be allowed to pick the most acceptable respirator from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.

2. Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension, and how to determine an acceptable fit. A mirror shall be available to assist the subject in evaluating the fit and positioning of the respirator. This instruction may not constitute the subject's formal training on respirator use, because it is only a review.

3. The test subject shall be informed that he/she is being asked to select the respirator that provides the most acceptable fit. Each respirator represents a different size and shape, and if fitted and used properly, will provide adequate protection.

4. The test subject shall be instructed to hold each chosen facepiece up to the face and eliminate those that obviously do not give an acceptable fit.

5. The more acceptable facepieces are noted in case the one selected proves unacceptable; the most comfortable mask is donned and worn at least five minutes to assess comfort. Assistance in assessing comfort can be given by discussing the points in the following Item A.6. If the test subject is not familiar with using a particular respirator, the test subject shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.

6. Assessment of comfort shall include a review of the following points with the test subject and allowing the test subject adequate time to determine the comfort of the respirator:
   a. Position of the mask on the nose;
   b. Room for eye protection;
   c. Room to talk; and
   d. Position of mask on face and cheeks.

7. The following criteria shall be used to help determine the adequacy of the respirator fit:
   a. Chin properly placed;
   b. Adequate strap tension, not overly tightened;
   c. Fit across nose bridge;
   d. Respirator of proper size to span distance from nose to chin;
   e. Tendency of respirator to slip; and
   f. Self-observation in mirror to evaluate fit and respirator position.

8. The test subject shall conduct a user seal check, either the negative and positive pressure seal checks. Before conducting the negative and positive pressure checks, the subject shall be told to seat the mask on the face by moving the head from side-to side and up and down slowly while taking in a few slow deep breaths. Another facepiece shall be selected and retested if the test subject fails the user seal check tests.

9. The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface, such as stubble beard growth, beard, mustache, or sideburns which cross the respirator sealing surface. Any type of apparel which interferes with a satisfactory fit shall be altered or removed.

10. If a test subject exhibits difficulty in breathing during the tests, he/she shall be referred to a physician or other licensed health care professional, as appropriate, to determine whether the test subject can wear a respirator while performing his/her duties.

11. If the employee finds the fit of the respirator unacceptable, the test subject shall be given the opportunity to select a different respirator and to be retested.

12. *Exercise Regimen*: Prior to the commencement of the fit test, the test subject shall be given a description of the fit test and the test subject's responsibilities during the test procedure. The description of the process shall include a description of the test exercises that the subject will be performing. The respirator to be tested shall be worn for at least 5 minutes before the start of the fit test.

13. The fit test shall be performed while the test subject is wearing any applicable safety equipment that may be worn during actual respirator use which could interfere with respirator fit.

14. *Test Exercises*: The following test exercises are to be performed for all fit testing methods prescribed in this attachment, except for the controlled negative pressure (CNP) method. A separate fit testing exercise regimen is contained in the CNP protocol.

    Each test exercise shall be performed for one minute, except for the grimace exercise which shall be performed for 15 seconds. The test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried. The respirator shall not be adjusted once the fit test exercises begin. Any adjustment voids the test, and the fit test must be repeated.

    The test subject shall perform exercises, in the test environment, in the following manner:

    a. *Normal Breathing*: In a normal standing position, without talking, the subject shall breathe normally.

    b. *Deep Breathing*: In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as not to hyperventilate.

    c. *Turning Head Side to Side*: Standing in place, the subject shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.

d. *Moving Head Up and Down*: Standing in place, the subject shall slowly move his/her head up and down. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).

e. *Talking*: The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can count backward from 100, recite a memorized poem or song or read from a prepared text such as the Rainbow Passage.

> Rainbow Passage:
>
> When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

f. *Grimace*: The test subject shall grimace by smiling or frowning. (This applies only to QNFT testing; it is not performed for QLFT.)

g. *Bending Over*: The test subject shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in those test environments such as shroud type QNFT or QLFT units that do not permit bending over at the waist.

h. *Normal Breathing*: Same as Item A.14.a.

B. Qualitative Fit Test (QLFT) Protocols

1. General:

   a. The employer shall ensure that persons administering QLFT are able to perform tests properly, recognize invalid tests, and ensure that test equipment is in proper working order.

   b. The employer shall ensure that QLFT equipment is kept clean and well maintained so as to operate within the parameters for which it was designed.

2. Irritant Smoke (Stannic Chloride) Protocol: This qualitative fit test uses a person's response to the irritating chemicals released in the "smoke" produced by a stannic chloride ventilation smoke tube to detect leakage into the respirator.

   a. General Requirements and Precautions:

      1. The respirator to be tested shall be equipped with high efficiency particulate air (HEPA) or P100 series filter(s).

      2. Only stannic chloride smoke tubes shall be used for this protocol.

      3. No form of test enclosure or hood for the test subject shall be used.

4. The smoke take precautions to minimize the test subject's exposure to irritant smoke. Sensitivity varies, and certain individuals may respond to a greater degree to irritant smoke. Care shall be taken when performing the sensitivity screening checks that determine whether the test subject can detect irritant smoke to use only the minimum amount of smoke necessary to elicit a response from the test subject.

5. The fit test shall be performed in an area with adequate ventilation to prevent exposure of the person conducting the fit test or the buildup of irritant smoke in the general atmosphere.

b. Sensitivity Screening Check: The person to be tested must demonstrate his/her ability to detect a weak concentration of the irritant smoke.

1. The test operator shall break both ends of a ventilation smoke tube containing stannic chloride, and attach one end of the smoke tube to a low flow air pump set to deliver 200 milliliters per minute, or an aspirator squeeze bulb. The test operator shall cover the other end of the smoke tube with a short piece of tubing to prevent potential injury from the jagged end of the smoke tube.

2. The test operator shall advise the test subject that the smoke can be irritating to the eyes, lungs, and nasal passages and instruct the subject to keep his/her eyes closed while the test is performed.

3. The test subject shall be allowed to smell a weak concentration of the irritant smoke before the respirator is donned to become familiar with its irritating properties and to determine if he/she can detect the irritating properties of the smoke. The test operator shall carefully direct a small amount of the irritant smoke in the test subject's direction to determine that he/she can detect it.

c. Irritant Smoke Fit Test Procedure:

1. The person being fit tested shall don the respirator without assistance, and perform the required user seal check(s).

2. The test subject shall be instructed to keep his/her eyes closed.

3. The test operator shall direct the stream of irritant smoke from the smoke tube toward the face seal area of the test subject, using the low flow pump or the squeeze bulb. The test operator shall begin at least 12 inches from the facepiece and move the smoke stream around the whole perimeter of the mask. The operator shall gradually make two more passes around the perimeter of the mask, moving to within 6 inches of the respirator.

4. If the person being tested has not had an involuntary response and/or detected the irritant smoke, proceed with the test exercises.

5. The exercises identified in Item A.14 of this attachment shall be performed by the test subject while the respirator seal is being continually challenged by the smoke, directed around the perimeter of the respirator at a distance of six inches.

6. If the person being fit tested reports detecting the irritant smoke at any time, the test is failed. The person being retested must repeat the entire sensitivity check and fit test procedure.

7. Each test subject passing the irritant smoke test without evidence of a response (involuntary cough, irritation) shall be given a second sensitivity screening check, with the smoke from the same smoke tube used during the fit test, once the respirator has been removed, to determine whether he/she still reacts to the smoke. Failure to evoke a response shall void the fit test.

8. If a response is produced during this second sensitivity check, then the fit test is passed.

C. Quantitative Fit Test (QNFT) Protocols

The following quantitative fit testing procedures have been demonstrated to be acceptable: quantitative fit testing using a nonhazardous test aerosol (such as corn oil, polyethylene glycol 400 [PEG 400], di-2-ethyl hexyl sebacate [DEHS], or sodium chloride) generated in a test chamber, and employing instrumentation to quantify the fit of the respirator; quantitative fit testing using ambient aerosol as the test agent and appropriate instrumentation (condensation nuclei counter) to quantify the respirator fit; quantitative fit testing using controlled negative pressure and appropriate instrumentation to measure the volumetric leak rate of a facepiece to quantify the respirator fit.

1. General:

   a. The employer shall ensure that persons administering QNFT are able to calibrate equipment and perform tests properly, recognize invalid tests, calculate fit factors properly, and ensure that test equipment is in proper working order.

   b. The employer shall ensure that QNFT equipment is kept clean, and is maintained and calibrated according to the manufacturer's instructions so as to operate at the parameters for which it was designed.

2. Ambient Aerosol Condensation Nuclei Counter (CNC) Quantitative Fit Testing Protocol: The ambient aerosol CNC quantitative fit testing (Portacount®) protocol quantitatively fit tests respirators with the use of a probe. The probed respirator is only used for quantitative fit tests. A probed respirator has a special sampling device, installed on the respirator, that allows the probe to sample the air from inside the mask. A probed respirator is required for each make, style, model, and size that the employer uses and can be obtained from the respirator manufacturer or distributor. The CNC instrument manufacturer, TSI Inc., also provides probe attachments (TSI sampling adapters) that permit fit testing in an employee's own respirator. A minimum fit factor pass level of at least 100 is necessary for a half-mask respirator and a minimum fit factor pass level of at least 500 is required for a full facepiece negative pressure respirator. The entire screening and testing procedure shall be explained to the test subject prior to conducting the screening test.

   a. Portacount® Fit Test Requirements:

      1. Check the respirator to make sure the sampling probe and line are properly attached to the facepiece and that the respirator is fitted with a particulate filter capable of preventing significant penetration by the ambient particles used for the fit test (e.g., NIOSH 42 CFR 84 Series 100, Series 99, or Series 95 particulate filter) per manufacturer's instruction.

      2. Instruct the person to be tested to don the respirator for five minutes before the fit test starts. This purges the ambient particles trapped inside the respirator and permits the

wearer to make certain the respirator is comfortable. This individual shall already have been trained on how to wear the respirator properly.

3. Check the following conditions for the adequacy of the respirator fit: chin properly placed; adequate strap tension, not overly tightened; fit across nose bridge; respirator of proper size to span distance from nose to chin; tendency of the respirator to slip; and self-observation in a mirror to evaluate fit and respirator position.

4. Have the person wearing the respirator do a user seal check. If leakage is detected, determine the cause. If leakage is from a poorly fitting facepiece, try another size of the same model respirator, or another model of respirator.

5. Follow the manufacturer's instructions for operating the Portacount® and proceed with the test.

6. The test subject shall be instructed to perform the exercises in Item A.14 of this attachment.

7. After the test exercises, the test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried.

b. Portacount® Test Instrument:

1. The Portacount® will automatically stop and calculate the overall fit factor for the entire set of exercises. The overall fit factor is what counts. The Pass or Fail message will indicate whether or not the test was successful. If the test was a Pass, the fit test is over.

2. Since the pass or fail criterion of the Portacount® is user programmable, the test operator shall ensure that the pass or fail criterion meet the requirements for minimum respirator performance in this attachment.

3. A record of the test needs to be kept on file, assuming the fit test was successful. The record must contain the test subject's name; overall fit factor; make, model, style, and size of respirator used; and date tested.

3. Controlled Negative Pressure (CNP) Quantitative Fit Testing Protocol - The CNP protocol provides an alternative to aerosol fit test methods. The CNP fit test method technology is based on exhausting air from a temporarily sealed respirator facepiece to generate and then maintain a constant negative pressure inside the facepiece. The rate of air exhaust is controlled so that a constant negative pressure is maintained in the respirator during the fit test. The level of pressure is selected to replicate the mean inspiratory pressure that causes leakage into the respirator under normal use conditions. With pressure held constant, air flow out of the respirator is equal to air flow into the respirator. Therefore, measurement of the exhaust stream that is required to hold the pressure in the temporarily sealed respirator constant yields a direct measure of leakage air flow into the respirator. The CNP fit test method measures leak rates through the facepiece as a method for determining the facepiece fit for negative pressure respirators. The CNP instrument manufacturer, Dynatech Nevada, also provides attachments (sampling manifolds) that replace the filter cartridges to permit fit testing in an employee's own respirator. To perform the test, the test subject closes his/her mouth and holds his/her breath, after which an air pump removes air from the respirator facepiece at a pre-selected constant pressure. The facepiece fit is expressed as the leak rate through the facepiece, expressed as milliliters per minute. The quality and validity

of the CNP fit tests are determined by the degree to which the in-mask pressure tracks the test pressure during the system measurement time of approximately five seconds. Instantaneous feedback in the form of a real-time pressure trace of the in-mask pressure is provided and used to determine test validity and quality. A minimum fit factor pass level of 100 is necessary for a half-mask respirator and a minimum fit factor of at least 500 is required for a full facepiece respirator. The entire screening and testing procedure shall be explained to the test subject prior to conducting the screening test.

a. CNP Fit Test Requirements:

1. The instrument shall have a non-adjustable test pressure of 15.0 mm water pressure.

2. The CNP system defaults selected for test pressure shall be set at 15 mm of water (-0.58 inches of water) and the modeled inspiratory flow rate shall be 53.8 liters per minute for performing fit tests.

   (Note: CNP systems have built-in capability to conduct fit testing that is specific to unique work rate, mask, and gender situations that might apply in a specific workplace. Use of system default values, which were selected to represent respirator wear with medium cartridge resistance at a low-moderate work rate, will allow inter-test comparison of the respirator fit.)

3. The individual who conducts the CNP fit testing shall be thoroughly trained to perform the test.

4. The respirator filter or cartridge needs to be replaced with the CNP test manifold. The inhalation valve downstream from the manifold either needs to be temporarily removed or propped open.

5. The test subject shall be trained to hold his/her breath for at least 20 seconds.

6. The test subject shall don the test respirator without any assistance from the individual who conducts the CNP fit test.

7. The QNFT protocol shall be followed according to Item C.1 of this attachment with an exception for the CNP test exercises.

b. CNP Test Exercises:

1. Normal Breathing: In a normal standing position, without talking, the subject shall breathe normally for 1 minute. After the normal breathing exercise, the subject needs to hold head straight ahead and hold his/her breath for 10 seconds during the test measurement.

2. Deep Breathing: In a normal standing position, the subject shall breathe slowly and deeply for 1 minute, being careful not to hyperventilate. After the deep breathing exercise, the subject shall hold his/her head straight ahead and hold his/her breath for 10 seconds during test measurement.

3. Turning Head Side to Side: Standing in place, the subject shall slowly turn his/her head from side to side between the extreme positions on each side for 1 minute. The head shall be held at each extreme momentarily so the subject can inhale at each side. After the

turning head side to side exercise, the subject needs to hold head full left and hold his/her breath for 10 seconds during test measurement. Next, the subject needs to hold head full right and hold his/her breath for 10 seconds during test measurement.

4. Moving Head Up and Down: Standing in place, the subject shall slowly move his/her head up and down for 1 minute. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling). After the moving head up and down exercise, the subject shall hold his/her head full up and hold his/her breath for 10 seconds during test measurement. Next, the subject shall hold his/her head full down and hold his/her breath for 10 seconds during test measurement.

5. Talking: The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song for 1 minute. After the talking exercise, the subject shall hold his/her head straight ahead and hold his/her breath for 10 seconds during the test measurement.

6. Grimace: The test subject shall grimace by smiling or frowning for 15 seconds.

7. Bending Over: The test subject shall bend at the waist as if he/she were to touch his/her toes for 1 minute. Jogging in place shall be substituted for this exercise in those test environments such as shroud-type QNFT units that prohibit bending at the waist. After the bending over exercise, the subject shall hold his/her head straight ahead and hold his/her breath for 10 seconds during the test measurement.

8. Normal Breathing: The test subject shall remove and re-don the respirator within a one-minute period. Then, in a normal standing position, without talking, the subject shall breathe normally for 1 minute. After the normal breathing exercise, the subject shall hold his/her head straight ahead and hold his/her breath for 10 seconds during the test measurement. After the test exercises, the test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of a respirator shall be tried.

c. CNP Test Instrument:

1. The test instrument shall have an effective audio warning device when the test subject fails to hold his/her breath during the test. The test shall be terminated whenever the test subject failed to hold his/her breath. The test subject may be refitted and retested.

2. A record of the test shall be kept on file, assuming the fit test was successful. The record must contain the test subject's name; overall fit factor; make, model, style, and size of respirator used; and date tested.

ATTACHMENT 5
RESPIRATOR FIT TEST FORM

NAME (Please Print): _____ SIGNATURE: _____

SSN: _____-_____-_____ HOME DEPT: _____ DATE: _____

CONDUCTED BY: _____ LOCATION: _____

FIT TEST PROTOCOL	TYPE OF RESPIRATOR (Circle Appropriate One)
QUANTITATIVE:	APR/HF APR/FF SCBA
Fit Factor _____	SAR/EGS PAPR OTHER
QUALITATIVE:	Respirator Manufacturer: _____
Irritant Smoke:	Model: _____
Other (specify):	Size: _____

		INITIAL:
1.	I understand why respiratory protection is needed and where and when it should be used.	
2.	I know how to use this respirator properly.	
3.	I know how to clean and inspect this respirator.	
4.	I understand the limitations and restrictions of this respirator.	
5.	I wore this respirator in normal air and performed the user seal.	
6.	I wore this respirator equipment in a test atmosphere.	
7.	I understand that a good gas-tight face seal cannot be achieved with obstructions such as facial hair or glasses.	
8.	I understand that corrective lenses compatible with the full facepiece are available by my manager.	

ATTACHMENT 6

EMERGENCY RESPIRATORY PROTECTIVE EQUIPMENT MONTHLY INSPECTION CHECKLIST

INSPECTED BY (Print):_____ DATE:

BACKPACK#: _____ AIR CYLINDER#:

			PASS	FAIL
A. Backpack and Harness Assembly	1. Straps	Inspect for complete set	☐	☐
		Inspect for damaged straps	☐	☐
	2. Buckles	Inspect for mating ends	☐	☐
		Check locking function	☐	☐
	3. Backplage and Cylinder Lock	Inspect backplage for cracks, missing screws/rivets	☐	☐
		Inspect cylinder hold down strap	☐	☐
		Inspect strap tightener	☐	☐
B. Cylinder and Cylinder Valve Assembly	1. Cylinder	Cylinder tight to backplate	☐	☐
		Current Hydrostatic Test	☐	☐
		Inspect cylinder for dents, gouges	☐	☐
		Is cylinder at least 90% filled?	☐	☐
	2. Head and Valve Assembly	Inspect cylinder valve lock for presence	☐	☐
		Inspect cylinder gauge for condition	☐	☐
		Proper function of cylinder valve lock	☐	☐
		Test for cylinder leakage	☐	☐
C. Regulator and High Pressure Hose	1. High Pressure Hose and Connector	Leakage in hose	☐	☐
		Leakage in hose to cylinder connector	☐	☐
	2. Regulator and Low Pressure Alarm	Read regulator gauge (at least 1,000 psi)	☐	☐
		Low pressure alarm sounds at 500 psi	☐	☐
		Test integrity of diaphragm	☐	☐
		Test for positive pressure	☐	☐
		Test bypass system	☐	☐
D. Facepiece and Corrugated Breathing Tube	1. Facepiece	Inspect harness for deterioration	☐	☐
		Inspect facepiece body for deterioration	☐	☐
		Inspect lens	☐	☐
		Inspect exhalation valve	☐	☐
	2. Breathing Tube and Connector	Inspect breathing tube for deterioration	☐	☐
		Inspect connector for threads and gasket	☐	☐
	3. Leak Test and Cleaning	Perform negative pressure test on facepiece/ breathing tube	☐	☐
		Clean and sanitize facepiece	☐	☐

Note: Any item marked ☐Fail☐ will place the equipment out of service until repaired or replaced.

ATTACHMENT 7

GUIDE TO RESPIRATORY PROTECTIVE EQUIPMENT: CLEANING, INSPECTION, MAINTENANCE, AND STORAGE

A program for the maintenance of respirators shall include the following:

- Cleaning and sanitizing
- Inspection for defects
- Maintenance and repair
- Storage
- Assurance of breathing air quality.

The following maintenance, inspection, and storage program is recommended.

1. **Cleaning and Sanitizing**
   Respirators issued to an individual shall be cleaned and sanitized regularly. Each respirator shall be cleaned and sanitized before being worn by different individuals. Respirators intended for emergency use shall be cleaned and sanitized after being used. The following shall be completed in addition to the manufacturer's instruction for cleaning:

   a. Remove, when necessary, the following components of respiratory inlet covering assemblies before cleaning and sanitizing:

      1. Filters, cartridges, canisters
      2. Speaking diaphragms
      3. Valve assemblies
      4. Any components recommended by the respirator manufacturer.

   b. Wash respiratory inlet covering assemblies in warm (43 degrees C or 110 degrees F maximum temperature) cleaner sanitizer solution. A stiff bristle (not wire) brush may be used to facilitate removal of dirt or other foreign material.

   c. Rinse the respirator inlet covering assemblies in clean, warm (43 degrees C or 110 degrees F maximum temperature) water.

   d. Drain all water, and air dry the respiratory inlet covering assemblies.

   e. Clean and sanitize all parts removed from the respiratory inlet covering assemblies as recommended by the manufacturers

   f. If necessary to remove foreign material, hand wipe respiratory inlet covering assemblies, all parts, and all gasket- and valve-sealing surfaces with damp, lint-free cloth.

   g. Inspect parts and replace any that are defective.

h. Reassemble parts on respirator inlet covering assemblies.

i. Visually inspect and, where possible, test parts and respirator assemblies for proper function.

j. Place assembled respirators in appropriate containers for storage.

Machines may be used to expedite the cleaning, sanitizing, rinsing, and drying of large numbers of respirators. Extreme care shall be taken to ensure against tumbling, agitation, or exposure to temperatures above those recommended by the manufacturer (normally 43 degrees C or 100 degrees F maximum), as these conditions are likely to result in damage to the respirators.

Ultrasonic cleaners, clothes washing machines, dishwashers, and clothes dryers have been specially adapted and successfully used for cleaning and drying respirators.

Cleaner sanitizers that effectively clean the respirator and contain a bactericidal agent are commercially available. The bactericidal agent frequently used is a quaternary ammonium compound. Strong cleaning and sanitizing agents and many solvents can damage rubber or elastomeric respirator parts. These materials must be used with caution.

Alternatively, respirators may be washed in a detergent solution and then sanitized by immersion in a sanitizing solution. Some sanitizing solutions that have proven effective are: (a) a hypochlorite (bleach) solution (50 parts per million chlorine), 2-minute immersion; (b) an aqueous iodine solution (50 parts per million of iodine), 2-minute immersion; or (c) a quaternary ammonium solution (200 parts per million of quaternary ammonium compounds in water with less than 500 parts per million total hardness), 2-minute immersion.

Inflammation of the skin of the respirator user (dermatitis) may occur if the quaternary ammonium compounds are not completely rinsed from the respirator. The hypochlorite and iodine solutions are unstable and break down with time; they may cause deterioration of rubber or other elastomeric parts and may be corrosive to metallic parts. Immersion times should not be extended beyond the mentioned time periods, and the sanitizers shall be thoroughly rinsed from the respirator parts.

Respirators may become contaminated with toxic materials. If the contamination is light, normal cleaning procedures should provide satisfactory decontamination; otherwise, separate decontamination steps may be required before cleaning.

2. Inspection

The user shall inspect the respirator immediately prior to each use to ensure that it is in proper working condition. After cleaning and sanitizing, each respirator shall be inspected to determine if it is in proper working condition, if it needs replacement parts or repairs, or if it should be discarded. Each respirator stored for emergency or rescue use shall be inspected at least monthly.

Respirator inspection shall include a check for tightness of connections; for the condition of the respiratory inlet covering, head harness, valves, connecting tubes, harness assemblies, hoses, filters, cartridges, canisters, end-of-service indicators, electrical components, and shelf-life date(s); and for the proper function of regulators, alarms, and other warning systems. Each rubber or other elastomeric part shall be inspected for pliability and signs of deterioration. Each air and oxygen cylinder shall be inspected to ensure that it is fully charged according to the manufacturer's instructions.

A record of inspection dates shall be kept for each respirator maintained for emergency or rescue use. Respirators that do not meet applicable inspection criteria shall be immediately removed from service (a temporary replacement assigned) and repaired or permanently replaced.

Inspection of hoop-wrapped air cylinders will follow the recommendations set forth in the Compressed Gas Association, Inc. publication CGA C-6.2-1988, "Guidelines for Visual Inspection & Requalification of Fiber Reinforced High Pressure Cylinders," and will be examined for the following five types of damage:

- Abrasion is damage caused by wearing, grinding, or rubbing away by friction. Abrasions less than 0.005 inch (0.127 mm) deep are acceptable and should have no adverse effects on the safety of the cylinder. Abrasions with isolated groups of fibers exposed or flat spots with a depth greater than 0.005 inch (0.127 mm) but less than 0.0075 inch (0.191 mm) are acceptable if the damage is repaired. Cylinders abraded in excess of 0.0075 inch (0.191 mm) should be taken out of service until professionally inspected.

- Cuts are damage inflicted by a sharp object. Cuts or scratches less than 0.005 inch (0.127 mm) deep are acceptable regardless of length, number, or direction. For cuts greater than 0.005 inch (0.127 mm) deep and up to a depth of 0.015 inch (0.038 mm) with a maximum 1- or 2-inch (25.4 mm or 50.8 mm) length transverse to the fiber direction, the cylinder should be removed from service until repaired. Cylinders with cuts greater than 0.015 inch (0.038 mm) with a maximum greater than 2 inches (50.8 mm) length transverse to the fiber direction or with bare metal showing through must be condemned.

- Impact damage is caused by a cylinder striking or being struck by another object. Impact damage is considered slight if a frosted area is noted in the impact area. These cylinders may be returned to service. Impact damage is severe if evidence of fiber cutting, delamination, and possible structural damage is apparent. Cylinders sustaining severe impact damage should be evaluated using the guidelines for cuts and structural damage.

- Structural damage is damage which causes a visual change in original cylinder configuration. This change can include any evidence of bulges, a cocked end fitting, concave areas on the domes or on the cylinder section, or, if by visual inspection of the cylinder interior, there is evidence of damage involving deformation of the liner. Structurally damaged cylinders must be immediately removed from service and condemned.

- Heat or fire damage to a cylinder is evident by discoloration, charring, or burning of the composite, labels, paint, or plastic components of the valve. Such damage would cause a cylinder to be removed from service and condemned. Note: If the cylinder is only soiled from smoke or other debris and is found to be intact underneath, it may be returned to service.

3. **Maintenance and Repair**

Replacement of parts or repairs shall be done only be persons trained in proper respirator maintenance and assembly. Replacement parts shall be only those designated for the specific respirator repaired. Reducing or admission valves, regulators, and alarms shall be adjusted or repaired by the respirator manufacturer or a technician trained by the manufacturer. Instrumentation for valve, regulator, and alarm adjustments and tests should be calibrated to a standard traceable to the National Institute of Standards and Technology (NIST), at a minimum of every 3 years.

4. **Storage**

Respirators shall be stored in a manner that will protect them against physical and chemical agents such as vibration, shocks, sunlight, heat, extreme cold, excessive moisture, or damaging chemicals. Respirators shall be stored to prevent distortion of rubber or other elastomeric parts. Respirators shall not be stored in such places as lockers and tool boxes, unless they are protected from contamination, distortion, and damage. Emergency and rescue respirators that are placed in the work areas shall be quickly accessible at all times, and the storage cabinet or container in which they are stored shall be clearly marked.

5. **Assurance of Breathing Air Quality**

Compressed gaseous air, compressed gaseous oxygen, liquid air, and liquid oxygen used for respiration shall be of high purity. Compressed gaseous air shall meet at least the requirements of the specification for Type I-Grade D breathing air, and liquid air shall meet at least the requirements for Type II-Grade B breathing air as described in ANSI/CGA G-7.1-1989.

The CGA designation for Grade D and Grade E breathing air is as follows:

- Grade D breathing air, as per ANSI/CGA G-7.1-1989, shall contain between 19.5 and 23.5 percent oxygen with the balance predominantly nitrogen, a maximum of 5 mg/m^3 oil (condensed), a maximum of 10 ppm carbon monoxide, no pronounced odor, and a maximum of 1,000 ppm carbon dioxide.

- Grade E breathing air, as per ANSI/CGA G-7.1-1989, shall contain between 20 and 22 percent oxygen with the balance predominantly nitrogen, a maximum of 5 mg/m^3 oil (condensed), a maximum of 10 ppm carbon monoxide, no pronounced odor, a maximum of 500 ppm carbon dioxide, and 25 ppm total hydrocarbon content (as methane).

- Note: The quality verification for oil is not required for synthesized air whose oxygen and nitrogen components are produced by air liquefaction. Carbon monoxide quality verification is not required for Grade D breathing air if synthesized air when nitrogen component was previously analyzed and meets National Foundry (NF) specification and

when the oxygen component was produced by air liquefaction and meets United States Pharmacopeia (USP) specification.

Compressed gaseous air may contain low concentrations of oil introduced from equipment during processing or normal operation. If high-pressure oxygen passes through an oil- or grease-coated orifice, an explosion or fire may occur. Therefore, compressed gaseous oxygen shall not be used in supplied air respirators or in open-circuit type self-contained breathing apparatus that have previously used compressed air. Oxygen concentrations greater than 23.5 percent shall be used only in equipment designed for oxygen service or distribution.

The dew point of air used to recharge self-contained breathing apparatus shall be –65 degrees F or lower (less than 25 ppm water vapor). The driest air obtainable (dew point of –100 degrees F or lower) should be used for recharging SCBA cylinders to be used in environments with ambient temperatures below –25 degrees F. The dew point of breathing air used with supplied air respirators should be lower than the lowest ambient temperature to which any regulator or control valve on the respirator or air-supplied system will be exposed.

Breathing air couplings shall be incompatible with outlets for nonrespirable plant air or other gas systems to prevent inadvertent servicing of supplied air respirators with nonrespirable gases. **It is recommended that Foster or Hansen fittings be reserved for breathing air systems.** Breathing air outlets shall be labeled.

Breathing air may be supplied to supplied air respirators from cylinders or air compressors. Cylinders shall be tested and maintained in accordance with applicable DOT specifications for shipping containers (49 CFR 173 and 178). Breathing gas containers shall be marked in accordance with ANSI/CGA C-4-1990. Specific test recommendations for purchased breathing air are given in the following table.

Method of Preparation	Analysis Recommended
Compression: Supplier does not fill cylinders with any other gases.	Check 10% of cylinders from each lot for ppm CO and odor.
Compression: Supplier fills cylinders with gases other than air.	Analyze all cylinders for percent oxygen. Check 10% of cylinders from each lot for ppm CO and odor.
Reconstitution.	Analyze all cylinders for percent oxygen. Check 10% of cylinders from each lot for ppm CO and odor.

A compressor shall be constructed so as to avoid entry of contaminated air. For all air compressors, including portable types, the air intake location shall be carefully selected, and monitored closely to ensure continued quality of air supply to the compressor. The system shall be equipped as necessary with a suitable in-line air-purifying sorbent bed and filter to further assure breathing air quality. Maintenance and replacement/refurbishment of compressor and associated air-purifying/filter media shall be performed periodically, by trained personnel following manufacturer's recommendations and instructions.

As part of acceptance testing, and prior to initial use, representative sampling of the compressor air output shall be performed to ensure that it complies with the requirements in Paragraph 1 of this section. To ensure a continued high-quality air supply, and to account for any distribution system contaminant input, a representative sample should be taken at distribution supply points. Samples should be collected on a periodic basis, as directed by the Program Coordinator. Specific test recommendations are given in the following table.

Type/Sample	Oil Lubricated	Non-Oil Lubricated	Combustion Engine Powered
Water Vapor	☒	☒	☒
Carbon Monoxide	☒		☒
Condensed Hydrocarbon	☒		☒
Carbon Dioxide			☒
Odor	☒	☒	☒

NOTES:

1. When using air compressors, intake location shall be carefully selected and monitored closely to ensure air supplied to the compressor is of adequate quality.

2. No frequency for periodic checks of air quality is specified, due to wide variation in equipment types, use, working environments, and operating experience.

3. Continuous monitoring of temperature and carbon monoxide are not required.

4. For non-oil lubricated compressors that operate at less than 35 psi, no sampling for water is required.

5. These requirements apply to systems designed for breathing air, other air-supply systems need to be evaluated on a case-by-case basis for the type and frequency of testing.

Further details on sources of compressed air and its safe use can be found in CGA G-7-1988.

PROCEDURE

Subject: MOTOR VEHICLE OPERATION: GENERAL REQUIREMENTS

1.0 PURPOSE AND SUMMARY

This procedure prescribes the general requirements for the operation of motor vehicles on company business. All operators of company owned, leased, and rented vehicles, as well as personal vehicles used on company business, are covered by this procedure. U.S. Department of Transportation (DOT) regulated personnel must also comply with the guidelines contained in Procedure HS810. Key elements of this procedure include:

- All employees who drive or may drive on company business must be familiar with the requirements of this procedure and certify their acceptance of the Company Rules for Motor Vehicle Operation (Attachment 2). This certification will be evaluated via the established point system to determine driving privilege status.

- All new hire candidates shall complete and be familiar with the company Rules for Motor Vehicle Operation (Attachment 2). This certification will be evaluated via the established point system to determine driving privilege status.

- Employees must report all vehicular citations incurred while on company business to their supervisor as soon as possible, but not longer than 24 hours after the occurrence. Once reported, the established evaluation criteria in Section 5.4 will be used to determine corrective actions.

- Employees have the responsibility to keep track of their non-work related vehicular citations and utilize the established evaluation criteria found in Section 5.3 to determine if their overall MVR citations exceed the Overall Driving Record limits (See Section 5.3.2).

- Employees utilizing vehicles while on company business are required to review this procedure and attend a company-designated driver training class at least once every two years.

- Requests for the re-instatement of denied or revoked driving privileges can be made to the appropriate business line Vice-President and the Director of Health & Safety.

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3.0 RESPONSIBILITY MATRIX

3.1 Procedure Responsibility

The Director of Health and Safety is responsible for the issuance, revision, and maintenance of this procedure.

3.2 Action/Approval Responsibilities

The Responsibility Matrix is Attachment 1.

4.0 DEFINITIONS

Chargeable Vehicle Accident - Any at fault vehicle accident meeting any one of the following criteria:

- An individual other than an employee of the company is a party in the accident.
- Property owned by a person or entity other than the company is damaged.
- When only company employees, company owned or leased (not rented) vehicles and property is involved and damage exceeds $2,500.00.

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Company - Shaw Environmental & Infrastructure, Inc. (Shaw E & I) and its subsidiaries and affiliates.

Motor Vehicle - Any passenger vehicle, including trucks, used upon the highway or in private facilities for transporting passengers and/or property. This includes personal vehicles operated on company business. For the purpose of this procedure, off-road vehicles, such as ATV's (Four Wheelers) earthmoving equipment, forklifts, non-highway use trucks, etc., are not considered vehicles. The use of motorcycles on company business is prohibited

Project Assigned Employees – Any employee that is assigned to a field operations project position. This designation includes Project Managers, Site Managers/Supervisors, Foremen, Technicians, Scientists, Geologists, Project Business Accountants, etc. This does not include employees that are typically assigned to an office but are visiting a site for brief periods of time, such as to provide technical assistance, perform audits, perform program reviews, etc.

5.0 TEXT

5.1 Company Rules for Motor Vehicle Operation

All employees who will or may be required to operate a company owned, leased, or rented motor vehicle or a personal vehicle used on company business shall acknowledge acceptance of the Company Rules for Motor Vehicle Operation & Employee Driving Record Certification (Attachment 2) prior to such operation. The signed form shall be retained by the Baton Rouge, LA Health & Safety Records Department. Each year, the company shall reserve the right to require covered employees to sign a copy of the most current Company Rules for Motor Vehicle Operation.

FAILURE OF EMPLOYEES TO COMPY WITH COMPANY RULES FOR MOTOR VEHICLE OPERATION OR THIS POLICY SHALL BE SUBJECT TO DISCIPLINARY ACTION UP TO AND INCLUDING (BUT NOT LIMITED TO) REVOCATION OF DRIVING PRIVILEGES FOR COMPANY BUSINESS AND TERMINATION OF EMPLOYMENT.

Those employees who are assigned to use an Employer vehicle which they take home with them must meet the following conditions:

a) The Employee's supervisor signs an Authorization for Assignment Form (See Attachment 7)

b) The Employee signs and agrees to be bound to a Vehicle Usage Agreement (See Attachment 8)

c) The Employee provides proof of insurance on the Employee's personal vehicle which lists the Employee as an insured driver on the insurance and such insurance contains minimum coverage required by law and acknowledges that the Employee's personal insurance will provide primary coverage of the Employee's use of a Company owned vehicle when such use is not in the course and scope of employment. The

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authorizing supervisor shall attach a copy of the proof or personal insurance to Attachment 8 for future reference.

The Vehicle Usage Agreement is an agreement by the Employee that his own personal vehicle insurance will be primary as to any claims arising from the Employee's **NON COMPANY** use of Company Vehicles.

Employees operating Company Vehicles without compliance with these requirements, as well as any supervisor who allowed or granted such use, will be deemed to be in violation of Company policy and will be subject to discipline up to and including termination from employment.

5.1.1 Project Assigned Employee Vehicle Use Requirements

The following requirements are set forth as it pertains to Project Assigned Employees.

- Project-assigned employees are not permitted to operate company vehicle (owned, leased or rented) on non-company business after 10:00 p.m. without written authorization from the project manager or the appointed Site Manager/Supervisor with jurisdiction over the vehicle. In those cases where there is shift work, a non-traditional workday (i.e. 3PM to 11PM workday, etc.) or other non-typical circumstances, it is understood that the after 10:00 PM restriction would not be appropriate. However, even in these non-typical circumstances, the Project Manager or the appointed site manager/supervisor shall be required to execute the required written authorization for use of a company vehicle, including the time frame in which employees shall be permitted to use the vehicle after their non-traditional workday.

- Project assigned personnel that are residing in temporary housing / hotels are granted permission to drive to and from the temporary residence and work. Additionally, the Project Manager, or the appointed Site Manager/Supervisor his/her designee (Site Manager, Supervisor, etc.) is required to evaluate and optimize the potential of carpooling of project assigned personnel in an effort to reduce the number of company vehicles being driven to and from the project site.

- Project assigned employees shall not use company vehicles for sight seeing or any other personal/recreational activities.

- Vehicles may be used in support of "daily life activities" such as going to restaurants for dinner, laundromats, local retail stores, grocery stores, etc.

- A maximum distance for "daily life activity" driving shall be no further than 20-miles from the temporary housing in which an employee resides. In those cases where the maximum allowed distance does not permit daily

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life activities to be conducted, a written authorization, from the Project Manager or the appointed Site Manager/Supervisor, is required to travel further distances.

- For normal routine travel to and from work, employees shall utilize their own personal transportation.

- If an employee is assigned to a project site that is located within driving distance from the employee's permanent residence, but is too far away to allow for a daily commute, that employee shall utilize their own personal transportation to drive to and from their permanent residence and the project site. (i.e. for initial assignment arrival to the project, trips home on rotation, etc.) Upon arrival to the site, employees shall be allowed to use a company vehicle as required to perform project activities. In these cases, the employee will also be required to drive their personal vehicle to and from the project site from their temporary housing / hotel residence, for personal "daily life activities", etc.

- Employees may drive a Shaw-owned, leased or rented vehicle home during off hours only when authorized in writing by a business line manager, who must hold a position at least one level above the site / project manager to whom the authorized employee reports. In other words, the approval must be signed by the employee's, supervisor's, supervisor or a higher level manager.

- In making vehicle use decisions the authorizing manager shall consider the risk of vehicle accidents, Shaw's liability risks, client and project specific needs, distances to be traveled, employee driving history, and any other relevant factors. Attachments 7 and 8, (Authorization for Assignment and Vehicle Use Agreement forms), shall be used to facilitate this process.

5.2 Pre-employment Evaluation

Human Resources shall distribute a copy of this procedure to all new hire candidates for the completion of Attachment 2 & 3. Information provided should be evaluated via the point system in Section 5.3. Human Resources and the hiring manager will be advised regarding any hiring or driving privilege restrictions that may apply. Hiring of persons with regular driving duties (e.g., field technicians and leadmen, sales persons, or others with assigned company motor vehicles) may only proceed after the information contained in Attachment 3 is evaluated.

Once Attachment 3 is completed, it is to be faxed to the Baton Rouge, LA Corporate Health and Safety Records Department at (225) 987-3714. The driving status of the prospective employee will be reported to the appropriate Human Resources Department. Health & Safety will notify the appropriate Human Resources manager when the attachments are not returned.

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Discrepancies between the certified driving record report and Attachment 3 shall be reviewed with the prospective employee. Deliberate falsification of driving record information will disqualify prospective employees from being hired.

5.3 Driving Record Point System

The following point system will be used to evaluate the driving record of all existing employees and new hire candidates that can reasonably be expected to operate a motor vehicle during their employment. This data is to be collected through Motor Vehicle Records (MVR) search and by the employee completing Attachment 2 of this policy. Attachment 2 is to be completed by the new hire candidate and reviewed by the regional H&S Assistant to ensure compliance.

Driving Record Point System	
Description	**Assigned Point Value**
Overweight, loss of load, vehicular equipment infraction, etc.	1
Moving violation: speeding, failure to stop, failure to signal, etc.	2
At-fault accident, seatbelt violation	3
Major citation: reckless driving, tailgating, suspended license, speed contest, improper lane usage, Open Container (Non-Work Related), etc.	6
Driving under the influence, Hit and Run (leaving the scene)	8
Open Alcohol Container (Work Related)	8

5.3.1 Pre-Employment Driving Record Point System Evaluation

If a new hire candidate has accumulated three (3) points or less in the last twelve (12) months or five (5) points or less in the last twenty-four (24) months, they will be given the privilege to drive motor vehicles on company business without restrictions.

If a new hire has accumulated four (4) to six (6) points in the last twelve (12) months or six (6) to eight (8) points in the last twenty-four (24) months, they will be placed on probation for a period of twelve (12) months. They will be afforded the privilege to drive motor vehicles on company business during this probationary period. Any driving infractions (i.e., speeding tickets, at-fault accidents, citations, etc.) accumulated during this probationary period will result in termination of the privilege to drive a motor vehicle on company business.

If the new hire candidate has accumulated seven (7) to eleven (11) points in the last twelve (12) months or nine (9) to fifteen (15) points in the last twenty-four (24) months, they will not be eligible for company driving privileges. Employment can only be offered with the strict understanding of denial of the privilege to drive motor vehicles on company business. After the first twelve (12) months of employment, the employee can petition the appropriate business line Vice President and the Director of Safety and Health for reconsideration of driving privileges.

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If a new hire candidate is expected to drive a vehicle, to fulfill the responsibilities of his/her role, and there has been an accumulation of twelve (12) points or more in the last twelve (12) months or sixteen (16) points or more in the last twenty-four (24) months, the candidate shall not be hired. See Table below:

Candidate's Driving Privilege Status Description	Past 12 Months	Past 24 Months
Can drive without restriction.	0 to 3 points	0 to 5 points
Can drive with understanding of probationary status.	4 to 6 points	6 to 8 points
Not eligible for company driving privileges for first 12 months of employment.	7 to 11 points	9 to 15 points
Candidate not eligible for hire.	12 points or more	16 points or more

5.3.2 Existing Employee Driving Record Point System

An acceptable traffic record is one requirement for continued driving privileges. Accordingly, all affected employee's MVR traffic record is subject to periodic and annual review to ensure compliance with state and federal regulations, as well as company policy.

WORK RELATED TRAFFIC VIOLATIONS

It is the responsibility of all affected employees to provide verbal notice to their supervisor of any work related traffic violations that have occurred as soon as practicable but not longer than 24 hours after the occurrence. This verbal notice shall be followed by the employee completing an updated "Company Rules for Motor Vehicle Operation & Employee Driving Record Certification" (Attachment 2), and "Notification of Work Related Citation" form (Attachment 3). Both Attachment 2 and 3 shall then be immediately forwarded to the Baton Rouge, LA Health and Safety Records office.

NON-WORK RELATED TRAFFIC VIOLATIONS

Employees have the responsibility to keep track of their non-work related vehicular citations and utilize the established evaluation criteria, as described below, to determine if their overall traffic citations exceed acceptable company limits. It is not necessary for employees to report non-work related citations to their supervisor as they occur. However, if an employee's overall MVR record (work related or not) exceeds the company's established points system criteria, the employee must verbally inform their supervisor as soon as practicable but not longer than the following business day after the occurrence. This verbal notice shall be followed by the employee completing an updated Attachment 2 (Company Rules for Motor Vehicle Operation & Employee Driving Record Certification), and it shall then be immediately forwarded to the Baton Rouge, LA Health and Safety Records office.

OVERALL DRIVING RECORD EVALUATION

If it is determined that an employee has accumulated three (3) points or less in the last twelve (12) months or five (5) points or less in the last twenty-four (24)

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months, they will be allowed to continue with the privilege to drive motor vehicles on company business without restrictions.

If an employee has accumulated four (4) to six (6) points in the last twelve (12) months or six (6) to eight (8) points in the last twenty-four (24) months, the employee will be placed on probation for a period of twelve (12) months. The employee can continue to drive motor vehicles on company business during this probationary period.

If the employee has accumulated seven (7) to eleven (11) points in the last twelve (12) months or nine (9) to fifteen (15) points in the last twenty-four (24) months, they will not be eligible for company driving privileges. Continued employment may only be extended with the strict understanding of denial of the privilege to drive company owned, leased or rented motor vehicles on company business. After the first twelve (12) months following driving privilege revocation, the employee can petition their respective Business Line VP and the Director of Safety and Health for reconsideration of driving privileges. See Table below:

Employee's Driving Privilege Status Description	Past 12 Months	Past 24 Months
Can drive without restriction.	0 to 3 points	0 to 5 points
Can drive with understanding of probationary status.	4 to 6 points	6 to 8 points
Company driving privileges are revoked.	7 to 11 points	9 to 15 points

5.4 Employee Evaluation Criteria

All employees who may operate a motor vehicle on company business will become familiar with the requirements of this procedure, complete the currently-designated company driver training class, and complete Attachment 2 prior to such operation. The employee driving evaluation criteria is based upon all infractions including those incurred while on company business and during off-work hours. It is imperative that employees notify their supervisors immediately as possible and no later than 24 hours following a work-related citation/accident. Once notified, the supervisor will ensure the completion of Attachment 2 , forward it to the Baton Rouge, LA H&S Records Office, and initiate one of the following corrective actions as required. Additionally, as it relates to non-work related and work related traffic violations, it is the employee's responsibility to ensure that their overall driving record does not allow for the exceeding of the driving records points system. Should the employee's driving record points exceed the system limits, that they must notify their supervisor immediately, complete an updated "Company Rules for Motor Vehicle Operation & Employee Driving Record Certification" (Attachment 2 & 3) and forward it to the Baton Rouge, LA Health & Safety Records Department.

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5.4.1 Work-Related Minor Citation

When an employee is given a work related minor citation (i.e., speeding ticket, moving violation, failure to signal turn, loss of load, etc.), the employee's supervisor will meet with the employee to discuss the corrective action that must be taken so that further violations do not occur. At a minimum, the supervisor shall require the employee to attend a recognized course in defensive driving on his/her own time and the cost of this training will be borne by the employee. This course shall be pre-approved by the Division Health & Safety Manager. The supervisor will provide written direction to the employee regarding the assigned corrective action(s). The supervisor shall forward a copy of an updated Company Rules for Motor Vehicle Operation & Employee Driving Record Certification form (Attachment 2 & 3) and a form of verification showing the employee's successful completion of an approved defensive driving course to the appropriate regional Human Resources Department for inclusion in the employee's personnel file. These documents shall also be forwarded to the **Baton Rouge, LA Health & Safety Records Department.**

5.4.2 Work Related Major Citation

When an employee is given a work related major citation (i.e., reckless driving, tailgating, suspended license, speed contest, etc.), the supervisor will hold a meeting with the employee, at which time the supervisor will complete the company Disciplinary Action Form (Procedure HR207) thereby informing the employee that any additional infractions will lead to more severe disciplinary action. In addition, the employee will be required to attend a recognized defensive driving course on his/her own time, as described in section 5.4.1, and will be suspended from work for one day without pay. A copy of the Disciplinary Action Form shall be forwarded to the appropriate Human Resources Department for their information and inclusion in the employee's personnel file.

5.4.3 Failure to Notify

Should an employee fail to notify his/her supervisor of any work or non-work related citation or accident within the required reporting time, his/her company driving privilege may be revoked. The supervisor will also take disciplinary action that is appropriate for the unreported event. If the unreported event is work related and is either an at-fault accident, driving under the influence case or a hit and run violation, the termination process will be initiated. All disciplinary actions shall be documented to the employee by the supervisor. This copy, and any written response by the employee, shall be forwarded to the appropriate Human Resources Department for their information and inclusion in the employee's personnel file.

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5.4.4 At-Fault Accident

Whenever an employee is operating a company owned/leased/rented vehicle or their personal vehicle on company business and is involved in an at-fault vehicle accident, an Accident Review Board shall be convened and recommend the corrective action to be taken. At a minimum, the action shall include the completion of a recognized driver safety course on their time and at their expense, as described in section 5.4.1. All disciplinary actions resulting from at-fault vehicle accidents will be reviewed for consistency by the appropriate Safety Council.

Depending upon the circumstances and severity of the accident, termination of the employee can be considered. As above, this must be approved by the appropriate Human Resources Department. All communication to the employee regarding the accident and resulting action shall be in writing with a copy to the appropriate Human Resources Department for their information and inclusion in the employee's personnel file.

5.4.5 Driving Under the Influence, Hit & Run (Leaving The Scene) and Open Container

If an employee is charged with Driving Under the Influence, Hit and Run or an Open Alcohol Container violation, he/she will have their driving privileges temporarily suspended pending final resolution of the charge. If the charge is resolved in the employee's favor, with a final adjudication holding no penalty, driving privileges may be re-instated. However, if any penalty is attached, such as probation, license restrictions, etc., the employee may be considered unqualified to drive for the company. Whenever an employee is convicted or pleads no contest to a company-related driving under the influence, hit and run or open container charge, he/she will be immediately terminated.

In a case that is not work related, and an employee is convicted or pleads no contest to a hit and run or driving under the influence charge, the employee shall notify his supervisor. Accordingly, the employee's company driving privileges will then be revoked for twelve (12) months. After the first twelve (12) months following driving privilege revocation, the employee can petition their respective Business Line VP and the Director of Safety and Health for reconsideration of driving privileges.

5.5 Training

All employees who will, or may reasonably be expected to, drive a company owned/leased/rented vehicle or their personal vehicle on company business shall review this procedure and complete the currently-designated company driver training class prior to such operation. This class is designed to be taught either via the company's Web-based training program or by local Health and Safety personnel and must include the following elements: federal/state/local driving rules, company driving rules, emergency/accident procedures, and defensive driving techniques. Specific information

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on the vehicle to be operated will be provided locally. Personnel conducting this class shall provide the Knoxville Health and Safety Training Department with a copy of the course attendance sheet for inclusion in individual training records. All affected employees shall complete a driver safety training class at least once every two years.

5.6 Reinstatement of Driving Privilege

Any employee who has had his/her privilege to drive a motor vehicle on company business revoked or denied, and who desires to reinstate this privilege, must apply to the business line Vice President and the Director of Health and Safety for reinstatement. The Director of H&S, or his designee, shall specify rehabilitation program (if applicable), an external safe driving course, and any other requirements in which he/she deems appropriate. Once the employee completes the program, documentation of successful completion must be formally presented to the appropriate Vice President and the Director of H&S. If the documentation is accepted, the driving privilege may be reinstated. Copies of all documents shall then be forwarded, by the responsible H&S Manager, to Human Resources and to the Baton Rouge, LA Health & Safety Records Department.

Reinstatement of the driving privilege may occur one (1) time, at the discretion of the Director of Health & Safety and the responsible Business Line Vice President. If employee driving performance leads to a subsequent revocation of this privilege, such revocation shall be permanent.

5.7 Non-Shaw Employee Vehicle Use Requirements

Only approved non-Shaw employees (client, subcontractor or temporary/temp agency employees) who have completed and signed the "Non-Shaw Employee Driver Questionnaire" (HS800 Attachment 5) will be allowed to drive a Shaw owned, leased, or rented vehicle. Upon completing the questionaire and prior to the driver operating a Shaw vehicle, the subject questionnaire must be signed , dated and placed on file at the job site. The primary vehicle operator or the Shaw Project Management representative shall review the questionnaire and determine whether the non-Shaw employee satisfies the driver qualification requirements of HS800. The driver qualification point system can be found in section 5.3 of this policy.

In addition to the above requirement, it is also a requirement of the responsible Shaw Project Manager to forward a fully executed, company specific version of the correspondence that is found in Attachment 6, to the employer of the non-Shaw driver. This correspondence should not be modified except for the fields that specify the name and address of the subcontractor or client to which the letter is being written. This written correspondence will serve to notify that any employee that is assigned by their company to a Shaw project, and is required to operate/drive a Shaw owned, leased, or rented vehicle, will be subject to either meeting or exceeding the operator requirements for Shaw employees.

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As the employer of individuals who are assigned to a Shaw project, the authorized non-Shaw employer representative shall sign and return Attachment 6 to the respective Shaw Project Manager. By signing Attachment 6, the non-Shaw employer is acknowledging that they are either adopting the requirements set forth in this policy (HS800, Motor Vehicle Operation) or have developed a similar policy that meets or exceeds these requirements. Failure of a non-Shaw employer to comply with the requirements set forth in HS800 shall result in the prohibition of their employees driving any Shaw owned, leased or rented vehicles.

5.8 DRIVER SAFETY NOTIFICATION STICKER

A safety notification bumper sticker shall be applied to all Shaw owned / leased vehicles in an effort to ensure continued compliance with driving safety regulations. The notification service will be managed by a third party fleet safety management company and will serve as the recipient of all calls that are placed concerning unsafe driving behavior. The Findlay, OH equipment division will serve as the first point of contact as it pertains to notifications that are received from the third party company who administers the bumper sticker safety call in service. Upon receiving a report from the third party administrator, the equipment division shall determine what business line the vehicle / driver is located within and then contact the respective business line Divisional H&S Manager. The Divisional H&S Manager will then contact the affected employee and the employee's supervisor for a counseling/discussion meeting, concerning the complaint. Upon conclusion of the meeting, the information will be reviewed by the supervisor and the Divisional H&S Manager for determination of corrective or disciplinary action.

The company shall endeavor to ensure that all company owned/leased fleet vehicles shall have a safety notification bumper sticker applied to the rear of the vehicle. It is the responsibility of the driver, who is deemed the primary / responsible operator of the vehicle, to ensure that the sticker remains on the vehicle and remains legible and in no way defaced. If the vehicle is project or program assigned and there is no designated primary operator, then the Project Manager will be considered the primary / responsible operator. The primary / responsible operator shall contact the Equipment Division in Findlay, OH, at 1-800-225-6464 ext. 6051 or direct dial 419-425-6051, immediately upon recognizing that the sticker is defaced or removed such that a new one can be re-applied. Failure, on the part of the primary operator, to ensure that a legible sticker remains on the vehicle shall result in disciplinary action, up to and including vehicle usage being revoked, in addition to possible termination of employment.

6.0 EXCEPTION PROVISIONS

Variances and exceptions, not explained herein, may be requested pursuant to the provisions of Procedure HS013, Health and Safety Procedure Variances.

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7.0 CROSS REFERENCES

HR207 Employee Disciplinary Action
HS013 Health and Safety Procedure Variances
HS020 Accident Prevention Program: Reporting, Investigation, and Review
HS810 Motor Vehicle Operation: Federal Motor Carrier Safety Regulations for Driver Qualifications

8.0 ATTACHMENTS

1. Responsibility Matrix
2. Company Rules for Motor Vehicle Operation
3. Driving Record Certification
4. Notification of Work-Related Citation
5. Non-Shaw Employee Driver Questionnaire
6. Memo Template for Employers of Non-Shaw Drivers
7. Vehicle Use Authorization Form

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ATTACHMENT 1
MOTOR VEHICLE OPERATION: GENERAL REQUIREMENTS RESPONSIBILITY MATRIX

Action	Procedure Section	*Responsible Party*					
		Local Health & Safety Assistant	Business Line Health and Safety Manager	Supervisor	Accident Review Board	Corporate Human Resources	Director of H&S
Issue, Revise, and Maintain This Procedure	3.1						X
Ensure Employees Complete Attachment 2	5.1			X		X	
Distribute HS800 to New Hire Candidates for Completion of Attachment 2	5.2					X	
Request Evaluation of New Hire Driving Record	5.2	X		X		X	
Obtain Driving Record and Determine Driving Status	5.2	X					
Initiate Corrective Actions	5.4			X		X	
Ensure Completion and Distribution of Attachment 3	5.4	X					
Accident Review	5.4.4				X		
Ensure Drivers Meet Training Requirements	5.5		X	X			
Specify Program for Reinstatement of Driving Privilege	5.6						X
Reinstatement of Driving Privilege	5.6						X
Non-Shaw Employee Vehicle Use Requirements	5.7			X			
Contact Employee to discuss report from Safety Notification Sticker Service	5.8		X	X			

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ATTACHMENT 2
COMPANY RULES FOR MOTOR VEHICLE OPERATION

1. Prior to motor vehicle operation, all motor vehicle operators are required to provide the company with current documentation of licensing for the motor vehicle(s) to be operated. Supervisors shall review and approve said documentation.

2. The motor vehicle operator is responsible for the vehicle, and for conducting a pre-trip, walk around inspection prior to use (including load evaluation, if applicable). No vehicle with any mechanical defect, which endangers the safety of the driver, passengers, or the public, shall be used. The motor vehicle operator is also responsible for the Driver Safety Notification sticker (Sec. 5.8)

3. All company owned/leased trucks, should have small convex mirrors attached to the side mirrors.

4. The operator shall drive defensively at all times and is responsible for complying with all state and local traffic laws, as well as customer regulations concerning motor vehicle operation.

5. The operator and all passengers shall use seat belts at all times when the vehicle is in motion.

6. No employee shall operate a motor vehicle when abnormally tired, temporarily disabled, or under the influence of alcohol or drugs.

7. No employee shall allow a company owned, leased, or rented motor vehicle to be operated by an unauthorized employee or non-employee. (See also: unauthorized personal use of company vehicles) (Sec. 5.7)

8. The operator shall not allow for any open alcoholic beverage containers within a company vehicle or within a personal vehicle while it is being utilized for company business.

9. No employee shall drive beyond any barricades or into any area with designations such as HAZARDOUS, DO NOT ENTER, etc.

10. Use caution when driving through congested areas, or near where personnel and equipment are working.

11. Whenever possible, a spotter shall be used for backing all vehicles. This may be a fellow company employee, or a non-company employee who is willing to help.

12. Unless required, such as on a client's property, keys shall not be left in an unattended vehicle.

13. Employees shall not leave the driver's seat of a vehicle while the motor is running. Exemption: Vehicles equipped with a power take-off device with parking brake set and chocks in place.

14. No motorcycles are to be operated on company business.

15. Radar detectors are prohibited in all company owned, leased, or rented vehicles or in personal vehicles while being used for company business.

16. Analytical samples will be transported in accordance with 49 CFR regulations. Regulated hazardous substances shall not be transported in personal vehicles.

17. In case of an accident, the following steps shall be taken:
    A. Stop.
    B. Call for medical assistance in case of injuries.

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C. Notify police.
D. Complete Vehicle Accident Report and submit to your supervisor as soon as possible.

18. Whenever a vehicle is stopped upon the traveled portion of a highway or the shoulder of a highway, for any cause other than necessary traffic stops, the driver shall, as soon as possible, place or activate the warning devices with which the vehicle is equipped.

19. Employee must notify the supervisor as soon as possible, but not longer than 24 hours after occurrence, for work related citations, accidents, and license expiration, suspension, or revocation.

20. No employee is authorized to operate a company vehicle (including rentals) after having been on duty for a period of 16 hours. No employee may drive for more than 12 hours in any single on-duty period. Once either of these criteria has been met, a period of 8 consecutive hours off duty is required before driving duties may be resumed. These are maximum, not minimum, requirements and employees may be unfit to drive after shorter on-duty periods. Commercial DOT drivers are subject to the more restrictive hours of service regulations described in Procedure HS810.

21. Project-assigned employees are not permitted to operate company owned, leased, or rented vehicles after 10:00 p.m. without written authorization from their supervisor. (See section 5.1.1)

22. Employees shall not operate company vehicles for any type of personal use, no exceptions. Personal use includes any usage that is not directly related to company business. See section 5.1.1 for definitions concerning "daily life activities" for Project Assigned Employees.

23. Employees shall not use a company vehicle to visit an establishment that has a primary function of providing nighttime entertainment including the dispensing of alcoholic beverages.

24. Temporary or non-Shaw employees shall be allowed to utilize Shaw company vehicles only after the driver has completed Attachment 5 and has satisfied the point system requirements set forth in Section 5.3 of this policy. In addition, the employer of that driver shall have satisfied the requirement set forth in section 5.7 of this policy and signed a copy of the memo set forth in Attachment 6. This includes clients or subcontractors.

25. Employees shall not transport family members, friends or any other unauthorized guest passenger unless it is arising out of course and scope of company business.

26. Employees may not drive company owned, leased, or rented vehicles home when off of duty <u>except when authorized in writing</u> by a designated business line manager and in accordance with Sec. 5.1.1.

27. Employees needing to use a mobile phone or engage in other potentially distracting activity while operating a Motor Vehicle are advised to pull off the road when safe to do so for the duration of the activity.

I have read and understand company procedure HS800 and the company rules for Motor Vehicle Operation and agree to abide by all requirements

_____	_____	_____
Employee's Name (Printed)	Employee Signature	Date

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ATTACHMENT 3
DRIVING RECORD CERTIFICATION

Fair Credit Reporting Act Disclosure Statement

In accordance with the provisions of Section 604 (b)(2)(A) of the Fair Credit Reporting Act, Pubic Law 91-508, as amended by the Consumer Credit Reporting Act of 1996 (title II, Subtitle D, Chapter I, of Pubic Law 104-208), you are being informed that reports verifying your driving record may be obtained on you for employment purposes. These reports are required by Sections 382.413, 391.23 and 391.25 of Federal Motor Carrier Safety Regulations. You have the right to receive a copy of the reports and have the prescribed allotment of time by law to have any errors corrected and the reports obtained after corrections have been posted.

	Assigned Point Value
Overweight, loss of load, vehicular equipment infraction, etc.	1
Moving violation: speeding, failure to stop, failure to signal turn, etc.	2
At-fault accident, seatbelt violation	3
Major citation: reckless driving, tailgating, suspended license, speed contest, improper lane usage, open container (non-work related)	6
Driving under the influence or Hit and Run (Leaving the Scene)	8
Open Alcohol Container (Work Related)	8

In the space provided below, please list all violations and accidents currently listed on your driving record by the state issuing your driver's license (include all states for which you have held a driver's license during the last two [2] years). Determine the number of points assigned from the table above, and write in column labeled Points.≅ Finally, write the sum total of all points where indicated.

Violations/Accidents	Driver License #/State	Date (mo/yr)	Points

Total Points _____

I hereby certify that the information provided is a complete and accurate statement of my driving record for the previous twenty-four (24) months. I authorize the company to obtain a copy of my driving record from the state of issuance of my license(s). I understand that falsification of data will disqualify me from being hired or may result in revocation of my company driving privileges.

Driver's License No. _____ Driver's Lic. State of Issuance _____

Expiration Date _____ Date of Birth _____

Print Name _____ Social Security Number

Signature _____ Date

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PLEASE FAX THIS FORM TO THE BATON ROUGE H & S RECORDS DEPARTMENT AT (225) 987-3714

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ATTACHMENT 4
NOTIFICATION OF WORK-RELATED CITATION

This form is to be completed by employees incurring a work-related vehicular citation. Once complete, it is to be signed by the employee's supervisor and forwarded to the appropriate Human Resources Department for inclusion in the employee's personnel file.

Employee Name _____ Employee No. _____ Date _____

Nature of Citation _____

_____

Location of Citation (City, State) _____

Date/Time Citation Received _____

Is Citation Being Contested? ☐ No ☐ Yes Details _____

_____

_____

Employee Signature _____ Date _____

Corrective Action Being Taken _____

_____

_____

Supervisor Signature _____ Date _____

PLEASE FAX THIS FORM TO THE BATON ROUGE H & S RECORDS DEPARTMENT AT (225) 987-3714

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ATTACHMENT 5
Non-Shaw Employee Driver Questionnaire

_____ _____
Date *Time*

_____ _____
Vehicle is assigned to what Shaw Employee? *Signature of Shaw Employee*

_____
Non-Shaw Driver's Name

Do you have a valid driver's license? Yes No

State in which license was issued, DL Number and Exp Date_____

Have you had any citations or accidents in the past 24 months? Yes No

If yes, please list type of citations and the associated dates below:

_____

_____

_____

_____

(Refer to HS800, Section 5.3, to determine driver eligibility based on the points system provided)

By signing below, I, the temporary driver, am acknowledging that the above information is true and accurately represents my driving record. I understand and agree that any misrepresentation or omission of material fact on this questionnaire will constitute sufficient grounds for your removal from the project site and will restrict the future use of Shaw vehicles.

I have read and fully understand the above:

_____
Signature of Non-Shaw Driver

_____
Date

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ATTACHMENT 6

Address
Address
Phone
Fax:

Memorandum

Date:

To:

CC:

From: Project Manager

RE: Requirements for Motor Vehicle Operation

Attached is Shaw Environmental & Infrastructure, Inc. (Shaw) policy HS800 - Motor Vehicle Operation: General Requirements. As you can see, this policy applies to all operators of Shaw owned, leased, or rented vehicles, as well as personal vehicles used on Shaw business.

Accordingly, you are hereby notified that any employee that is assigned by your company to a Shaw Environmental & Infrastructure, Inc project and is required to operate/drive Shaw owned, leased, or rented vehicles, will be subject to either meeting or exceeding the operator requirements for Shaw employees. Please be aware that as the employer of individuals who are assigned to a Shaw project, you must ensure that your company either adopts the requirements set forth in policy HS800 (Motor Vehicle Operation) or develop a similar policy that meets or exceeds those requirements

Only approved non-Shaw employees, who have completed and signed the "Non-Shaw Employee Driver Questionnaire" (HS800 Attachment 5) will be allowed to drive a Shaw vehicle. Furthermore, prior to the driver operating a Shaw vehicle, the subject questionnaire must be completed and placed on file at the job site. The primary vehicle operator or responsible Shaw management representative shall review the questionnaire and determine whether the non-Shaw employee satisfies the driver qualification requirements of HS800.

Failure to comply with the requirements of this correspondence or the requirements set forth in HS800 shall result in disciplinary action up to and including driving privilege revocation or removal of an affected non-Shaw employee from a project site. If the duties of your employees are expected to include driving a Shaw owned, leased or rented vehicle, please complete Attachment 5, for all of your affected personnel, and provide these to Shaw's site management. Alternatively, please be aware and make your employees aware that they are not authorized to drive a Shaw owned, leased, or rented vehicle without such compliance.

By signing this document, I, an authorized employee and agent of the subject company/employer, am acknowledging acceptance of the above information and agree to my employer's compliance with the referenced requirements stated herein.

_____
Signature / Title

_____
Date

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ATTACHMENT 7
AUTHORIZATION FOR ASSIGNMENT FORM

I, the hereby undersigned Supervisor / Manager, give my consent and approval for the Employee listed below to be assigned a Company Owned and/or Rented vehicle ("Company Vehicle") as specified herein and in accordance with the Company Motor Vehicle Use Policy and the Company Rules for Motor Vehicle Operation. I have given a copy of the Rules and the Policy to the Employee listed below and the Employee has signed and agreed to be bound by the Vehicle Usage Agreement.

Employee Name_____
VIN Number of Vehicle_____
Company Vehicle ID Number_____
Period of Allowance_____
Phone:_____
Company by which employed:_____

I, the undersigned Supervisor, personally attest that the following things have been done and are in proper order: *(Please check off when complete and attach appropriate documents)*

- ☐ Employee Driving Record Complete within the last six months
- ☐ Employee Driving Record rating allows operation of motor vehicle in accordance with policy (*List Rating* _____ *Date Completed*_____)
- ☐ Employee has presented a valid driver's license (*attach a copy)*
- ☐ Employee has signed the Vehicle Use Agreement and a copy has been obtained by the Company (*attach a copy)*
- ☐ Employee has been given a copy of Motor Vehicle Use Policy and Company Rules for Motor Vehicle Operation
- ☐ Employee has provided sufficient Proof of Insurance as required by the Policy (*attach a copy)*

SUPERVISOR SIGNATURE: _____
Printed Name:_____
Date:_____
Phone Number:_____

FAX A COPY OF THIS FORM TO THE EQUIPMENT DIVISION IN FINDLAY, OHIO @ 419-425-6295. ALSO NOTE THAT THE AUTHORIZED EMPLOYEE AND THE AUTHORIZING MANAGER IS RESPONSIBLE FOR MAINTAINING COPIES OF THIS FORM FOR FUTURE REFERENCE AND AUDITING.

DO NOT FAX THIS FORM TO THE BATON ROUGE H & S RECORDS DEPARTMENT

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ATTACHMENT 8
VEHICLE USE AGREEMENT

THIS VEHICLE USE AGREEMENT made and entered into this _____day of _____, _____, between the undersigned Employee listed below ("Employee") and the undersigned Company below ("Company")

WITNESSETH:

WHEREAS, Employee has been granted permission to be assigned a Company owned/leased vehicle ("Company Vehicle") as is set forth and approved on the AUTHORIZATION FOR ASSIGNMENT FORM

In consideration of being assigned use of a Company Vehicle, Employee agrees to the following:

1. Employee will not use the Company Vehicle for personal use. .
2. Employee will follow all rules and requirements set forth in the Company's Motor Vehicle Use Policy, a copy of which Employee has received;
3. Employee certifies that Employee has automobile insurance on a personal vehicle of Employee, Employee has provided to Company a copy of such insurance, and a copy is attached to this agreement;
4. Employee agrees that for any claims for damage, injury or death related to Employee's operation of the Company Vehicle while operating the vehicle on non-company business (personal use), that Employee's own personal automobile liability insurance will be primary and will pay the claim **FIRST AND BEFORE** any insurance of Company. In the event that Employee fails to secure and maintain personal automobile insurance coverage and there is a claim for damage or injury related to Employee's operation of the vehicle for personal use, the Employee will then be responsible and accepts liability for any claims paid by Company up to the minimum limits of insurance required in the state of the Employee's permanent residence.
5. Employee understands that violation of this Agreement or any policy or provision or rule contained in the Motor Vehicle Use Policy or any other Policy of the Company will subject the Employee to discipline including the potential loss of driving privileges for the Company or suspension or termination.

I am a person who is able to read in English and I have read this document and agree to all of its terms and conditions. I understand that the privilege to be assigned a Company Vehicle to take home can be withdrawn by the Company at any time for any reason (and without cause) with notice to me. I agree to comply with return of the vehicle when requested by the Company.

Employee_____
Date:_____
Address:_____
Phone:_____

COMPANY Supervisor / Manager:
Name (Print & Sign):_____ Date:_____

FAX A COPY OF THIS FORM TO THE EQUIPMENT DIVISION IN FINDLAY, OHIO @ 419-425-6295. ALSO NOTE THAT THE AUTHORIZED EMPLOYEE AND THE AUTHORIZING MANAGER IS RESPONSIBLE FOR MAINTAINING COPIES OF THIS FORM FOR FUTURE REFERENCE AND AUDITING.

DO NOT FAX THIS FORM TO THE BATON ROUGE H & S RECORDS DEPARTMENT

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PROCEDURE

Subject: CRANE OPERATIONS

1.0 PURPOSE AND SUMMARY

Crane safety is a key issue at many Shaw Environmental & Infrastructure, Inc. (Shaw E & I) construction sites. Proper qualification of operators is arguably the key element in proper crane operation.

Since the majority of crane operations at Shaw E & I projects involve subcontracted or rental equipment, **Shaw E & I HAS ESTABLISHED A POLICY PREFERENCE TO OBTAIN A QUALIFIED OPERATOR WITH RENTED OR SUBCONTRACTED EQUIPMENT, WHENEVER POSSIBLE.** Requirements are also established for qualifying an Shaw E & I operator.

2.0 TABLE OF CONTENTS

1.0 Purpose and Summary
2.0 Table of Contents
3.0 Responsibility Matrix
  3.1 Procedure Responsibility
  3.2 Action/Approval Responsibilities
4.0 Definitions
5.0 Text
  5.1 Shaw E & I Requirements
  5.2 Qualifying an Shaw E & I Operator
6.0 Exception Provisions
7.0 Cross References
8.0 Attachments

3.0 RESPONSIBILITY MATRIX

3.1 Procedure Responsibility

The National Director, Health & Safety is responsible for the issuance, revision, and maintenance of this procedure.

3.2 Action/Approval Responsibilities

The Responsibility Matrix is Attachment 1.

4.0 DEFINITIONS

(None)

5.0 TEXT

Crane operations are a periodic part of many Shaw E & I projects. Generally, this involves hiring a qualified subcontractor, or renting a crane to be operated by Shaw E & I personnel. It is the responsibility of the project manager to verify that crane operations are conducted in accordance with applicable standards, using qualified personnel.

5.1 Shaw E & I Requirements

- All cranes operated on Shaw E & I-controlled sites shall meet applicable design standards (i.e., ANSI, Power Crane and Shovel Association, etc.).

- Cranes shall have a copy of the most recent annual and periodic inspections on-board.

- All cranes shall be inspected by a qualified person, prior to operation (see Attachment 5, Crane and Derrick Inspection Checklist), to verify proper working condition. If this inspection is not conducted by an Shaw E & I associate, a Shaw E & I supervisor shall verify that it is done.

- A copy of the manufacturer's operating manual shall be carried on all cranes. The manual shall include a load rating chart that indicates safe loads in various configurations, wire and cable minimums and maximums, and any special considerations.

- It is the strong preference of Shaw E & I that crane operations be subcontracted to qualified firms, or that rented cranes come with a qualified operator from the provider.

- The "Recognizing Unsafe Crane and Rigging Practices" (Attachment 2), or equivalent, and the "Hand Signals for Mobile Cranes" (Attachment 3) are to be reviewed at the Tailgate Safety Meeting prior to crane operation.

- All cranes rented, leased, or purchased by Shaw E & I shall be equipped with a load indicator where feasible. This is mandatory where load/lift conditions are not completely known.

5.2 Qualifying an Shaw E & I Operator

Shaw E & I will only operate cranes where it has been demonstrated that the Shaw E & I associate is qualified to operate the specific crane to be used. It is the responsibility of the project manager, working with the project HS professional, to identify a supervisor who is competent to qualify a crane operator, based on the supervisor's training and/or experience.

Key elements of qualifying an Shaw E & I operator are listed below.

- Documented training on specific, or type of crane, to be used (on-the-job training may be difficult to document).
- A competent supervisor evaluates the proposed operator's familiarity with, and ability to safely operate, the crane using the Mobile Crane Operator Proficiency Form (Attachment 4).
- The completed Mobile Crane Operator Proficiency Form is to be placed in the associate's training file.
- Verify that the operator has no physical/medical conditions that would inhibit safe operations (i.e., incorrect vision deficiency, disorders which could cause sudden loss of consciousness, etc.).

Except where qualifications and experience can be verified, it is recommended that Shaw E & I operators not be qualified to operate the types of equipment listed below.

- Lattice boom
- Crawlers
- Telescoping boom >2 lengths

6.0 EXCEPTION PROVISIONS

Exceptions shall be per the requirements of Shaw E & I Procedure HS013.

7.0 CROSS REFERENCES

29 CFR 1926.550

8.0 ATTACHMENTS

1. Matrix
2. "Recognizing Unsafe Crane and Rigging"
3. "Hand Signals for Mobile Cranes"
4. Mobile Crane Operator Proficiency Form
5. Crane and Derrick Inspection Checklist

ATTACHMENT 1
CRANE OPERATIONS

Responsibility Matrix

Action	Procedure Section	*Responsible Party*		
		Project Manager	Site Supervisor	HS Professional
Verify that crane operations are conducted in accordance with applicable standards, using qualified personnel.	5.0	X		
Inspect all cranes prior to operation, or ensure an inspection is performed before operations commence.	5.1	X		
Ensure a copy of the manufacturer's operating manual is carried on all cranes.	5.1	X		
Review "Recognizing Unsafe Crane and Rigging Practices" (or equivalent) and "Hand Signals for Mobile Cranes" at Tailgate Safety Meeting.	5.1		X	
Identify a competent supervisor to qualify crane operators.	5.2	X		X
Evaluate proposed operators' familiarity with, and ability to safely operate, the crane using the Mobile Crane Operators Proficiency Form.	5.2		X	
Place completed Mobile Crane Operator Proficiency Form in associates' training files.	5.2			X
Verify that operator has no physical/medical conditions that would inhibit safe operations.	5.2	X		X

ATTACHMENT 2

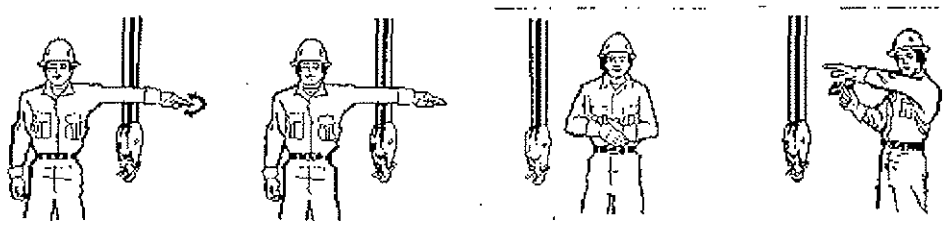
RECOGNIZING UNSAFE CRANE RIGGING PRACTICES

Be Alert For:

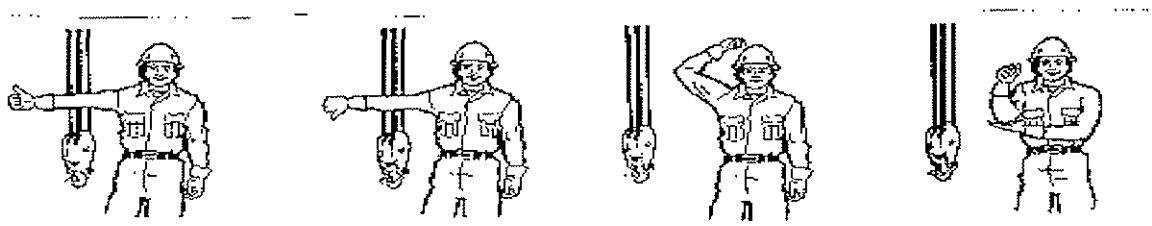
- Quick and sudden crane movements;
- Improper crane ground conditions;
- Improper crane support (mats, cribbing, etc.); - Mobile
- Horseplay with and around the crane;
- Unsecured crane swing radius; - Mobile
- Leaking hydraulic systems
- Maintenance being performed without proper mechanical/electrical Lock-Outs; -Overhead
- Repairs being performed on one of multiple cranes on the same runway without properly installed railstops, or the positioning of a signal person to warn of approaching cranes; - Overhead
- Unsecured crane load path;
- Loads being passed over the heads of personnel;
- Damaged wire rope on crane;
- Use of damaged rigging gear;
- Use of rigging gear without gloved hands;
- Improper use of Standard Hand Signs.

This list is not intended to be all-inclusive. The constant observance of crane and rigging operations is a must to obtain the safest environment possible. Always be on the lookout for acts which could lead to an accident.

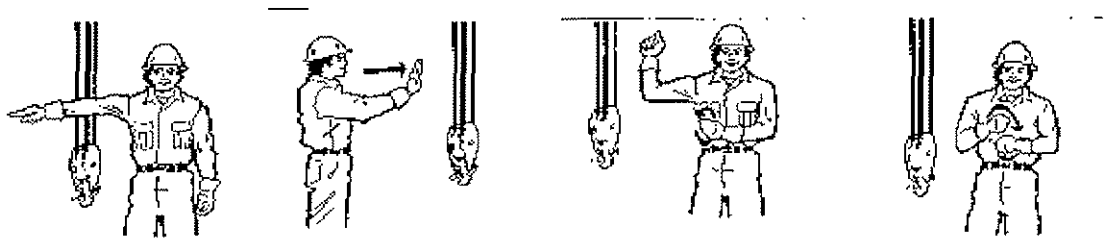
ATTACHMENT 3
HAND SIGNALS FOR MOBILE CRANES



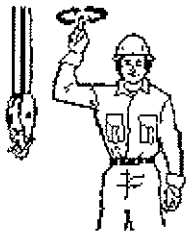
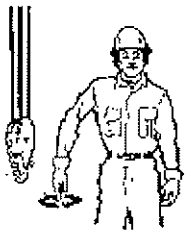
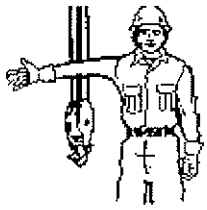
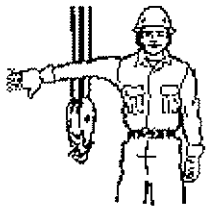
EMERGENCY STOP. Arm extended, palm down, move hand rapidly right and left.	STOP. Arm extended, palm down, hold position rigidly.	DOG EVERYTHING. Clasp hands in front of body.	MOVE SLOWLY. Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal. (Hoist Slowly shown as example.)



RAISE BOOM. Arm extended, fingers closed, thumb pointing upward.	LOWER BOOM. Arm extended, fingers closed, thumb pointing downward.	USE MAIN HOIST. Tap fist on head; then use regular signals.	USE WHIP LINE. (Auxiliary Hoist) Tap elbow with one hand; then use regular signals.

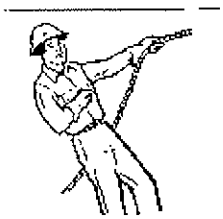
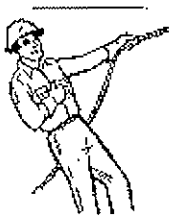
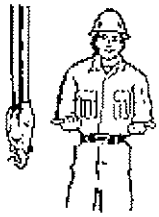
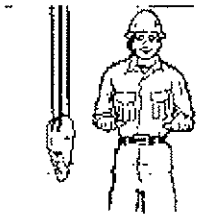


SWING. Arm extended, point with finger in direction of swing of boom.	TRAVEL. Arm extended forward, hand open and slightly raised, make pushing motion in direction of travel.	TRAVEL (One Track). Lock the track on side indicated by raised fist. Travel opposite track in direction indicated by circular motion of other fist rotated vertically in front of body. (For crawler cranes only.)	TRAVEL (Both Tracks). Use both fists, in front of body, making a circular motion, about each other, indicating direction of travel, forward or backward. (For crawler cranes only)

HOIST. With forearm vertical, forefinger pointing up, move hand in small horizontal circle.	LOWER. With arm extended downward, forefinger pointing down, move hand in small horizontal circles.	RAISE THE BOOM AND LOWER THE LOAD. With arm extended, thumb pointing up, flex fingers in and out as long as load movement is desired.	LOWER THE BOOM AND RAISE THE LOAD. With arm extended, thumb pointing down, flex fingers in and out as long as load movement is desired.

FOR HYDRAULIC MACHINES ONLY

RETRACT BOOM (Telescoping Boom). One Hand Signal. One fist in front of chest, thumb pointing outward and heel of fist tapping chest.	EXTEND BOOM (Telescoping Boom). One Hand Signal. One fist in front of chest with thumb tapping chest.	EXTEND BOOM (Telescoping Boom). Both fists in front of body with thumbs pointing outward.	RETRACT BOOM (Telescoping Boom). Both fists in front of body with thumbs pointing toward each other.

ATTACHMENT 4

MOBILE CRANE OPERATOR PROFICIENCY FORM

Name_____ SS#

Project Name_____ Project #

RESULTS: LEVEL	SCORE	DESCRIPTION
☒ 1	00-60	Not recommended to operate crane with load attached
☒ 2	61-70	Recommendation: Operate only under direct supervision
☒ 3	71-80	Recommendation: Operate only to 50% of crane capacity
☒ 4	81-90	Recommendation: Operate only to 75% of crane capacity
☒ 5	91-100	Recommendation: Operate to machine full capacity

DEDUCT	POINTS ARE TO BE DEDUCTED BASED ON SEVERITY OF INFRACTION.	Manuf.	Manuf.	Manuf.	Manuf
		Model	Model	Model	Model
		Cap.	Cap.	Cap.	Cap.
		---------- 100 ----------			
	PRE-START INSPECTION				
1-3	A. Assure that no repairs are in progress. A.				
1-3	B. Observe condition of rope and hook(s). B.				
1-3	C. Point out to examiner fittings needing lubrication every 8 hours. C.				
1-3	D. Check all fuel and levels. D.				
	STARTING THE ENGINE				
1-3	E. Observe gauges for correct readings. E.				
1-3	F. Allow sufficient warm-up time. F.				
1-3	G. Test operating controls. G.				
1-3	H. Test swing brake. H.				
	TRAVELING				
1-5	I. Travel with boom in line with carrier. I.				
1-5	J. Travel to test area. J.				
1-5	K. Spot machine to accomplish lift. K.				
1-5	L. Set-up and level machine. L.				
	OPERATION				
1-5	M. Failing to keep the proper distance from hazards. M.				
1-5	N. Striking the ground or any other object. N.				
1-5	O. Swinging abruptly causing dynamic loading. O.				
1-5	P. Snapping the load causing shock loading. P.				
	OPERATION (HAND SIGNALS)				
1-5	Q. Moving without signals. Q.				
1-5	R. Improper response to signal. R.				
1-5	S. Responding to go signal abruptly. S.				
1-5	T. Responding to stop signal too slowly. T.				

	MACHINE SHUT-DOWN					
1-3	U. Travel machine to designated parking area.	U.				
1-3	V. Engage swing, boom and hoist brakes (where applicable).	V.				
1-3	W. Idle engine one full minute before shut-down.	W.				
1-3	X. Close all doors, windows and skylight. X.					
	TOTAL POINTS DEDUCTED					

It is the ultimate responsibility of supervision to know and recognize the operator's current physical and mental capabilities.

☒ New Operator - Good coordination and understanding of equipment. Should operate only under direct supervision.

☒ Experienced Operator:

_Operator's Signature

Examiner's Signature

Project Manager's Signature

ATTACHMENT 5

CRANE AND DERRICK INSPECTION CHECKLIST

The following items shall be checked by the operator every time the crane is to be operated:

1. ☒ ☒ All control mechanisms for maladjustment interfering with proper operation.
2. ☒ ☒ All control mechanisms for excessive wear of components and contamination by lubricants or other foreign matter.
3. ☒ ☒ All operator aids, motion and load limiting devices, and other safety devices for malfunction and inaccuracy of settings.
4. ☒ ☒ All chords and lacing.
5. ☒ ☒ All hydraulic and pneumatic systems - with particular emphasis given to those which flex in normal operation of the crane.
6. ☒ ☒ Hooks and latches for deformation, chemical damage, cracks, and wear.
7. ☒ ☒ Rope for proper spooling onto the drum(s) and sheave(s) and rope reeving for compliance with crane manufacturer's specifications.
8. ☒ ☒ Electrical apparatus for malfunctioning, signs of excessive deterioration, dirt, and moisture accumulation.
9. ☒ ☒ Hydraulic system for proper oil level.
10. ☒ ☒ Tires for recommended inflation pressure (mobile cranes).
11. ☒ ☒ Wedges and supports for looseness or dislocation (climbing tower cranes).
12. ☒ ☒ Braces and guys supporting crane masts; anchor bolt base connections for looseness or loss of preload (tower cranes and derricks).
13. ☒ ☒ Derrick mast fittings and connections for compliance with manufacturer's recommendations.
14. ☒ ☒ Barge or pontoon ballast compartments for proper ballast; deckloads for proper securing; chain lockers, storage, fuel compartments, and battening of hatches; fire fighting and lifesaving equipment in place and functional; hull void compartments sounded for leakage (floating cranes and derricks).

Inspector's Signature Date

Inspector's Name (print)

Attachment 3
Activity Hazard Analyses

ACTIVITY HAZARD ANALYSIS FOR SITE PREPARATION				
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**	**Monitoring Devices**
Equipment/ Facility Setup	Slips, Trips, Falls	• Clear walkways work areas of equipment, tools, vegetation, and debris • Exit equipment slowly and maintain three point contact • Mark, identify, or barricade other obstructions		
	Spills	• Clean up spills before initiating maintenance • Review maintenance procedures for safety practices		
	Struck By/Against Heavy Equipment	• Wear reflective warning vests when exposed to vehicular traffic • Isolate equipment swing areas • Make eye contact with operators before approaching equipment • Understand and review hand signals • Follow hand signals of ground workers for equipment manipulation when placing/loading equipment into bucket • Step away from equipment when bucket adjustments are made • Do not attempt verbal communication in high noise backgrounds	Warning vests, hard hat, safety glasses, steel toe work boots	
	Pinch Points	• Review equipment adjustment procedures, identify pinch points • Isolate/block pinch points to limit motion when inserting pins, fasteners, closing tackles	Leather gloves	
	Equipment failure	• Perform daily maintenance inspections on operating equipment		

ACTIVITY HAZARD ANALYSIS FOR SITE PREPARATION				
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**	**Monitoring Devices**
Equipment/ Facility Setup (Cont.)	Electrical Shock	• De-energize or shut off utility lines at their source before work begins • Use double insulated or properly grounded electric power-operated tools • Maintain tools in a safe condition • Provide an equipment-grounding conductor program or employ ground-fault circuit interrupters • Use qualified electricians to hook up electrical circuits • Inspect all extension cords daily for structural integrity, ground continuity, and damaged insulation • Cover or elevate electric wire or flexible cord passing through work areas to protect from damage • Keep all plugs and receptacles out of water • Use approved water-proof, weather-proof type if exposure to moisture is likely • Inspect all electrical power circuits prior to commencing work • Follow Health and Safety SH315, Control of Hazardous Energy and the Site-Specific Lockout/ Tagout/Try Plan	Lockout/Tagout Devices	Voltage meter or 'Tic' tracer
	Handling Heavy Objects	• Observe proper lifting techniques • Obey sensible lifting limits (60 lb. Maximum per person manual lifting) • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads • Avoid carrying heavy objects above shoulder level • Avoid manual lifting/carrying tasks		

ACTIVITY HAZARD ANALYSIS FOR SITE PREPARATION				
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**	**Monitoring Devices**
Equipment/ Facility Setup (Cont.)	Sharp Objects	• 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	Leather gloves	
	Ladders	• Inspect ladders before use for mud buildup on treads • Clean mud from boots before climbing on ladders • Follow the three point of contact rule		
	High Noise Levels	• Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period)	Ear plugs	
	Burns Associated with Loading/ Unloading Equipment on Trucks	• Identify heavy objects for loading that may have hot surfaces • Allow objects to cool or cover hot surfaces with non-combustible material to protect workers from burns		
	Walking on Machine Tracks	• Avoid walking on machine tracks whenever possible; clean tracks for safe walking/working surfaces • Observe track surfaces when walking, move cautiously on uneven, slippery surfaces • Avoid sudden awkward motions (pulling/jerking fuel hoses)		
	High/Low Ambient Temperature	• Provide fluids to prevent worker dehydration • Monitor for Heat/Cold Stress in accordance with Health and Safety Procedures HS400 & HS401	Insulated clothing (subject to ambient temperature)	Meteorological Equipment

Equipment Required	**Inspection Requirements**	**Training Requirements**
Forklifts/hand carts Ladders Hand Tools	• Daily equipment inspections as per manufacturers' requirements • Inspection of all emergency equipment (i.e., first aid kits, fire extinguishers)	Review AHA with all task personnel Review SSHASP Review operations/safety manuals for all equipment utilized

ACTIVITY HAZARD ANALYSIS FOR CLEARING AND GRUBBING				
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**	**Monitoring Devices**
Clearing, Grubbing	Struck By/Against Heavy Equipment	• Isolate equipment swing areas • Make eye contact with operators before approaching equipment • Understand and review hand signals	Hard hat, safety glasses, steel toe work boots	
	Slips, Trips, Falls	• Clear walkways, work areas of equipment, tools, vegetation, and debris • Clean mud and grease from boots before mounting equipment; watch for slippery/unstable ground when dismounting equipment • Exit equipment slowly and maintain three point contact		
	Handling Heavy Objects	• Observe proper lifting techniques • Use dozer or trackhoe to move logs and brush		
	UXO	• UXO avoidance monitoring will be conducted by a UXO specialist prior to beginning activities • If UXO is encountered, cease all activities, mark the location, and notify the SS		
	Eye Injuries	• Wear face shield, goggles when operating powered clearing/grubbing equipment	Face shield, goggles	
	Sharp Objects	• 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 • Close doors, windows on heavy equipment to prevent injuries from tree branches and other vegetation	Leather gloves	
Clearing, Grubbing (Cont.)	Insect/Snake Bites	• Review injury potential and types of snakes with workers • Avoid insect nests areas, likely habitats of snakes outside work areas • Emphasize The Buddy System where such injury potential exists • Use insect repellent, wear PPE to protect against sting/bite injuries	Tyvek® coveralls, duct tape bottom of coveralls to boots	

ACTIVITY HAZARD ANALYSIS FOR CLEARING AND GRUBBING				
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**	**Monitoring Devices**
	Contact Dermatitis	• Wear PPE to avoid skin contact with contaminated soil, plants, or other skin irritants • Identify and review poisonous plants with workers • Apply protective cream/lotion to exposed skin to prevent poison ivy or similar reactions	Tyvek® coveralls, duct tape bottom of coveralls to boots	
	Operations of Power Clearing Tools (brush saws, weed whackers)	• Wear eye, face, hand, and hearing protection when operating power clearing equipment • Shut-off/idle power tools walking between work areas • Store flammable liquids in well ventilated areas, away from work areas • Shut off equipment during refueling • Prohibit smoking while operating clearing equipment • Provide ABC (or equivalent) fire extinguishers for all work	Face shield, goggles, cloth gloves, ear plugs, steel toe work boots	
	High Noise Levels	• Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period)	Ear plugs	
	High/Low Ambient Temperature	• Monitor for Heat/Cold Stress in accordance with Health and Safety Procedures HS400 & HS401 • Provide fluids to prevent worker dehydration	Insulated clothing (subject to ambient temperature)	Meteorological Equipment
	Unstable Ground; Rollover of Equipment	• Identify path of travel before moving dozer or trackhoe and inspect area for stable ground • Clearly mark any unstable areas		
Clearing, Grubbing (Cont.)	Walking on Machine Tracks	• Avoid walking on machine tracks whenever possible; clean tracks for safe walking/working surfaces • Observe track surfaces when walking, move cautiously on uneven, slippery surfaces • Avoid sudden awkward motions (pulling/jerking fuel hoses)		
	Adverse Weather Conditions: Lightning High winds Driving rain	• Monitor weather forecast • Shut down operations should severe weather conditions exist		
Equipment Required		**Inspection Requirements**	**Training Requirements**	

ACTIVITY HAZARD ANALYSIS FOR CLEARING AND GRUBBING				
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**	**Monitoring Devices**
Excavator/trackhoe and/or dozer Power clearing tools (brush saws, weed whackers)		• Daily equipment inspections as per manufacturers' requirements • Inspect all safety equipment (fire extinguishers, first aid kits and eye washes)	Review AHA with all task personnel Review any potential site contaminants Review operations/safety manuals for all equipment utilized Review potential hazardous plants and insects/animals	

ACTIVITY HAZARD ANALYSIS FOR REPAIR AND MAINTENANCE OF EXISTING GRAVEL ROAD				
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**	**Monitoring Devices**
Repairs and maintenance of existing gravel road	Struck By/ Against Heavy Equipment	• Wear reflective warning vests when exposed to vehicular traffic • Obey posted speed limits • Isolate equipment swing areas • Make eye contact with operators before approaching equipment • Understand and review hand signals • Exit equipment slowly and maintain three point contact • Report minor incidents to site supervision • Park equipment in areas where operator can see clearly to dismount equipment • Step away from equipment when bucket adjustments are made • Do not attempt verbal communication in high noise backgrounds • Follow hand signals of ground workers for equipment manipulation when placing/loading equipment into loader bucket.	Warning vests, Hard hat, Safety glasses, Steel toe work boots	
	Walking on machine tracks	• Avoid walking on machine tracks whenever possible; clean tracks for safe walking/working surfaces • Observe track surfaces when walking, move cautiously on uneven, slippery surfaces • Avoid sudden awkward motions (pulling/jerking fuel hoses)		
	High Noise Levels	• Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period) • Assess noise level with sound level meter if possibility exists that level may exceed 85dBA TWA	Ear plugs or muffs	

ACTIVITY HAZARD ANALYSIS FOR REPAIR AND MAINTENANCE OF EXISTING GRAVEL ROAD				
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**	**Monitoring Devices**
Repairs and maintenance of existing gravel road (cont)	Slips, Trips, Falls	– Clear walkways, work areas of equipment and tools – Mark, identify, or barricade other obstructions		
	Sharp Objects	• Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Use shears instead of a knife to cut the plastic sheeting.	Leather gloves	
	Allergic Reaction	• Review allergy hazards with work crew • Identify workers with allergies • Review work assignments PPE upgrades	Tyvek coveralls, duct tape bottom of coveralls to boots; latex gloves, if required	
	Insect Stings	• Avoid hand mowing/clearing in dense brush areas, suspected Areas of stinging insects	Leather gloves	
	Contact with Poison Ivy	• Identify workers who are known to contract poison ivy • Wear PPE and tape joints to keep poison ivy irritants/ plant matter away from skin • Use protective creams and wash with poison ivy preventing soaps when working in suspected exposure area	Long sleeve shirts, Tyvek coveralls, Leather gloves	
	Adverse weather conditions	• Monitor weather forecast • Shut down operations should severe weather conditions exist		

EQUIPMENT REQUIRED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
• Loader	• Daily equipment inspections as per manufacturers requirements • Inspection of all emergency equipment (i.e.: first aid kits, fire extinguishers)	• Review AHA with all task personnel • Review Site-Specific Health and Safety Plan

ACTIVITY HAZARD ANALYSIS FOR MATERIAL EXCAVATION AND HAULING				
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**	**Monitoring Devices**
Material excavation and hauling	Inhalation and Contact with Hazardous Substances	• Provide workers proper skin, eye and respiratory protection based on the exposure hazards present • Review hazardous properties of site contaminants with workers before operations begin	As prescribed by the Site-Specific Health and Safety Plan	
	Struck By/ Against Heavy Equipment	• Wear reflective warning vests when exposed to vehicular traffic • Obey posted speed limits • Isolate equipment swing areas • Make eye contact with operators before approaching equipment • Understand and review hand signals • Exit equipment slowly and maintain three point contact • Report minor incidents to site supervision • Park equipment in areas where operator can see clearly to dismount equipment • Step away from equipment when bucket adjustments are made • Do not attempt verbal communication in high noise backgrounds • Follow hand signals of ground workers for equipment manipulation when placing/loading equipment into loader bucket.	Warning vests, Hard hat, Safety glasses, Steel toe work boots	
	Sharp Objects	• 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	Leather gloves	
Material excavation and hauling (cont)	Handling Heavy Objects	• Observe proper lifting techniques • Obey sensible lifting limits (60 lb. maximum per person manual lifting)		

ACTIVITY HAZARD ANALYSIS FOR MATERIAL EXCAVATION AND HAULING				
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**	**Monitoring Devices**
		• Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads • Avoid handling debris that is awkward, over long, over weight limit • Get assistance and dry glove surfaces to improve grip		
	Slips, Trips, Falls	• Clear walkways, work areas of equipment, tools, construction debris, and other materials • Mark, identify, or barricade other obstructions • Evaluate fall hazards above 4 ft.; use fall protection equipment (harness/lanyard), standard guardrails or other fall protection systems when working on elevated platforms above 6 ft. • Anchorage points for fall arrest systems must support at least 5,400 pounds for each worker • Use heavy duty industrial (type IA) ladders		
	High Noise Levels	• Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period) • Assess noise level with sound level meter if possibility exists that level may exceed 85dBA TWA	Ear plugs	Sound Level Meter
Material excavation and hauling (cont)	Caught In/ Between Moving Parts	• Identify and understand parts of equipment which may cause crushing, pinching, rotating or similar motions • Assure guards are in place to protect from these parts of equipment during operation • Provide and use proper work gloves when the	Leather gloves	

ACTIVITY HAZARD ANALYSIS FOR MATERIAL EXCAVATION AND HAULING				
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**	**Monitoring Devices**
		possibility of pinching, or other injury may be caused by moving/ handling large or heavy 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		
	Strains and Sprains	• Maintain a safe stance and body position operating power saws • Avoid rushing, placing torque on objects being sawed • Avoid lifting long awkward objects, large distances between worker and power saws • Prohibit breaking of pipe pieces or objects that require extreme exertion		
EQUIPMENT REQUIRED		**INSPECTION REQUIREMENTS**	**TRAINING REQUIREMENTS**	
• Excavator • Dump trucks • PID, Mini-		• Daily equipment inspections as per manufacturers requirements • Inspection of all emergency equipment (i.e.: first aid kits, fire extinguishers) •	• Review AHA AND Site-Specific Health and Safety Plan • Review operations/safety manuals for all equipment utilized	

ACTIVITY HAZARD ANALYSIS FOR MATERIAL SCREENING AND LOAD-OUT				
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**	**Monitoring Devices**
Material screening and load-out	Inhalation and Contact with Hazardous Substances	• Provide workers proper skin, eye and respiratory protection based on the exposure hazards present • Review hazardous properties of site contaminants with workers before operations begin	As prescribed by the Site-Specific Health and Safety Plan	
	Struck By/ Against Heavy Equipment	• Wear reflective warning vests when exposed to vehicular traffic • Obey posted speed limits • Isolate equipment swing areas • Make eye contact with operators before approaching equipment • Understand and review hand signals • Exit equipment slowly and maintain three point contact • Report minor incidents to site supervision • Park equipment in areas where operator can see clearly to dismount equipment • Step away from equipment when bucket adjustments are made • Do not attempt verbal communication in high noise backgrounds • Follow hand signals of ground workers for equipment manipulation when placing/loading equipment into loader bucket.	Warning vests, Hard hat, Safety glasses, Steel toe work boots	
	Sharp Objects	• 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	Leather gloves	
Material screening and load-out	Handling Heavy Objects	• Observe proper lifting techniques • Obey sensible lifting limits (60 lb. maximum per person manual lifting)		

ACTIVITY HAZARD ANALYSIS FOR MATERIAL SCREENING AND LOAD-OUT				
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**	**Monitoring Devices**
(cont)		• Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads • Avoid handling debris that is awkward, over long, over weight limit • Get assistance and dry glove surfaces to improve grip		
	Slips, Trips, Falls	• Clear walkways, work areas of equipment, tools, construction debris, and other materials • Mark, identify, or barricade other obstructions • Evaluate fall hazards above 4 ft.; use fall protection equipment (harness/lanyard), standard guardrails or other fall protection systems when working on elevated platforms above 6 ft. • Anchorage points for fall arrest systems must support at least 5,400 pounds for each worker • Use heavy duty industrial (type IA) ladders		
	High Noise Levels	• Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period) • Assess noise level with sound level meter if possibility exists that level may exceed 85dBA TWA	Ear plugs	Sound Level Meter
Material excavation and hauling (cont)	Caught In/ Between Moving Parts	• Identify and understand parts of equipment which may cause crushing, pinching, rotating or similar motions • Assure guards are in place to protect from these parts of equipment during operation • Provide and use proper work gloves when the	Leather gloves	

ACTIVITY HAZARD ANALYSIS FOR MATERIAL SCREENING AND LOAD-OUT

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment	Monitoring Devices
		possibility of pinching, or other injury may be caused by moving/ handling large or heavy 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		
	Strains and Sprains	• Maintain a safe stance and body position operating power saws • Avoid rushing, placing torque on objects being sawed • Avoid lifting long awkward objects, large distances between worker and power saws • Prohibit breaking of pipe pieces or objects that require extreme exertion		

EQUIPMENT REQUIRED

- Excavator
- Screener
- Dump trucks
- PID, Mini-Ram

INSPECTION REQUIREMENTS

- Daily equipment inspections as per manufacturers requirements
- Inspection of all emergency equipment (i.e.: first aid kits, fire extinguishers)

TRAINING REQUIREMENTS

- Review AHA AND Site-Specific Health and Safety Plan
- Review operations/safety manuals for all equipment utilized

ACTIVITY HAZARD ANALYSIS FOR EQUIPMENT DECONTAMINATION				
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**	**Monitoring Devices**
Equipment Decontamination	Slips, Trips, Falls	• Clear walkways, work areas of equipment, vegetation, tools and debris • Mark, identify, or barricade other obstructions • Clean heavy objects of oil/grease or other slippery contamination before attempting to lift/remove • Wear gloves with grip improving surfaces for handling large, slippery objects • Clean up spills or water accumulation in walkways		
	Struck By/Against Heavy Equipment, Protruding Objects	• Wear reflective warning vests when exposed to vehicular traffic • Isolate equipment swing areas • Make eye contact with operators before approaching equipment • Understand and review hand signals • Step away from equipment when bucket adjustments are made • Do not attempt verbal communication in high noise backgrounds	Warning vests, hard hat, safety glasses, goggles and face shield, steel toe work boots	
	Inhalation and Contact with Hazardous Substances and Splashes	• Provide workers proper skin, eye and respiratory protection based on the exposure hazards present • Review hazardous properties of site contaminants with workers before operations begin • Wear hard hats, safety glasses with side shields, or goggles with splash shields and steel-toe safety boots	PVC rain suit or poly-coated Tyvek coveralls, inner sample gloves, outer nitrile gloves, latex boot covers, full face shield and goggles	
	Burns	• Wear 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) • Tape gloves to PPE sleeves to lessen the possibility of hat water entering gloves • Use hand tools to loosen connections and position body to avoid pressure discharge • Wear shin and toe guards to protect from burns, lacerations and similar injuries	Goggles and face shield, shin and toe guards	

ACTIVITY HAZARD ANALYSIS FOR EQUIPMENT DECONTAMINATION				
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**	**Monitoring Devices**
Equipment Decontamination (Cont.)	Handling Heavy Objects	• Observe proper lifting techniques • Obey sensible lifting limits (60 lb. Maximum per person manual lifting) • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads • Avoid actions/activities that contribute to overexertion • Warm up muscles before engaging in manual lifting activities • Review lifting posture/techniques regularly at safety meetings		
	Sharp Objects/Cuts and Punctures	• Wear cut resistant work gloves when the possibility of injury may be caused by sharp edges/objects or working with hand tools • Guard or pad metal edges of objects frequently used (access panels, etc.) or manipulated/ bypassed during maintenance • Position heavy objects to avoid manipulation while cleaning • Get assistance and dry glove surfaces to improve grip during object manipulation while cleaning	Leather gloves	
	High Noise Levels	• Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period)	Ear plugs	
	Repetitive Strains	• Rotate job tasks on high vibration equipment • Report equipment that produces high vibration for inspection and maintenance • Wear vibration reducing gloves		

ACTIVITY HAZARD ANALYSIS FOR EQUIPMENT DECONTAMINATION				
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**	**Monitoring Devices**
Equipment Decontamination (Cont.)	Strains and Sprains	• Maintain a safe stance and body position operating pressurized equipment • Avoid rushing		
	High/Low Ambient Temperature	• Monitor for Heat Stress in accordance with Health and Safety Procedure HS400 • Provide fluids to prevent worker dehydration		Meteorological Equipment

Equipment Required	Inspection Requirements	Training Requirements
Pressure washer	• Equipment inspections • Inspection of all emergency equipment (i.e., first aid kits, fire extinguishers)	Review SSHASP Review site-specific AHA with all task personnel Review operation manuals for the pumps and related equipment

ACTIVITY HAZARD ANALYSIS FOR SITE RESTORATION				
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**	**Monitoring Devices**
Site Restoration	Struck By/Against Heavy Equipment, Protruding Objects	• Wear 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 splash/face shields and goggles, and steel-toe safety boots at all times • Understand and review hand signals	Warning vests, hard hat, safety glasses, steel toe work boots	
	Slips, Trips, Falls	• Clear, walkways of equipment, tools, debris, other materials • Mark, identify, or barricade other obstructions		
	High Noise Levels	• Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period)	Ear plugs	
	Handling Heavy Objects	• Observe proper lifting techniques • Obey sensible lifting limits (60 lb. maximum per person for manual lifting) • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads		
	High/Low Ambient Temperature	• Provide fluids to prevent worker dehydration • Monitor for Heat/Cold Stress in accordance with Health and Safety Procedures HS400 & HS401	Insulated clothing (subject to ambient temperature)	Meteorological Equipment
Equipment Required		Inspection Requirements	**Training Requirements**	
Bobcat or forklift for moving bulky loads Grass seed		• Equipment inspections • Inspection of all emergency equipment (i.e., first aid kits, fire extinguishers)	• Review SSHASP • Review site-specific AHA with all task personnel • Review operation manuals for the pumps and related equipment	

ACTIVITY HAZARD ANALYSIS FOR DECONTAMINATION PAD CONSTRUCTION				
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**	**Monitoring Devices**
Decontamination Pad Construction	Handling Heavy Objects-(i.e. Wood structure)	• Observe proper lifting techniques • Obey sensible lifting limits (60 lb. maximum per person manual lifting) • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads • Warm up muscles before engaging in manual lifting activities • Avoid actions/activities that contribute to over exertion • Review lifting posture/techniques regularly at safety meetings		
	Slips, Trips, Falls	• Clear walkways, work areas of equipment and tools • Mark, identify, or barricade other obstructions • Place temporary weights (sand bags) on liner materials if wind conditions are present		
Decontamination Pad Construction (continued)	Sharp Objects	• Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Use shears instead of a knife to cut the plastic sheeting.	Leather gloves	
	Adverse weather conditions	• Monitor weather forecast • Shut down operations should severe weather conditions exist		

EQUIPMENT REQUIRED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
• Poly sheeting • Wood	• Daily equipment inspections as per manufacturers requirements • Inspection of all emergency equipment (i.e.: first aid kits, fire extinguishers)	• Review AHA with all task personnel • Review Site-Specific Health and Safety Plan

ACTIVITY HAZARD ANALYSIS

Activity: Fueling Diesel Powerplant (6.1.1)	**Date: July 8, 2003**
	Project: Demilitarization of Ordnance Shapes at the Former NSWC-WO Facility
Description of the work: Periodic refilling of the diesel powerplant with #2 diesel fuel.	**Site Supervisor: Paul L. Miller**
	Site Safety Officer:
	Review for latest use: Before the job is performed.

Work Activity Sequence (Identify the principal steps involved and the sequence of work activities)	**Potential Health and Safety Hazards** (Analyze each principal step for potential hazards)	**Hazard Controls** (Develop specific controls for each potential hazard)
Opening fueling cap	Residual liquid fuel Fuel vapor – toxicity Fuel vapor – fire	Chemical resistant gloves Administrative control: Refueling not allowing in enclosed areas or allowing personnel to be in close proximity to fueling filler opening. Administrative control: Smoking or open flame not permitted within 50 ft of refueling operation. Fire extinguisher rated at least 70:B on-hand. Grounding strap used for ESD control. Engine must be shut down and locked out prior to fueling.
Fueling operation	Residual liquid fuel Fuel vapor – toxicity Fuel vapor – fire Fuel Spill	Chemical resistant gloves Administrative control: Refueling not allowing in enclosed areas or allowing personnel to be in close proximity to fueling filler opening. Administrative control: Smoking or open flame not permitted within 50 ft of refueling operation. Fire extinguisher rated at least 70:B on-hand. Grounding strap used for ESD control. Engine must be shut down and locked out prior to fueling. Administrative control: Worker responsible for refueling must remain at fueling valve and pay close attention to amount of fuel being pumped into the powerplant. Secondary fuel resistant containment berm shall be used under the powerplant to contain any spills.
Closing fueling cap	Residual liquid fuel Fuel vapor – toxicity Fuel vapor – fire	Chemical resistant gloves Administrative control: Refueling not allowing in enclosed areas or allowing personnel to be in close proximity to fueling filler opening. Administrative control: Smoking or open flame not permitted within 50 ft of refueling operation. Fire extinguisher rated at least 70:B on-hand. Grounding strap used for ESD control. Engine must be shut down and locked out prior to fueling.

ACTIVITY HAZARD ANALYSIS

Work Task Sequence (Identify the principal steps involved and the sequence of work activities)	Identify & Analyze the Hazards (Analyze each principal step for potential hazards)	Hazard Controls (Develop specific controls for each potential hazard)
Spill cleanup operations	Residual liquid fuel Fuel vapor – toxicity Fuel vapor – fire	Chemical resistant gloves Full-face air purifying respirator with organic vapor cartridges. Administrative control: Refueling not allowing in enclosed areas or allowing personnel to be in close proximity to fueling filler opening. Administrative control: Smoking or open flame not permitted within 50 ft of refueling operation. Fire extinguisher rated at least 70:B on-hand. Grounding strap used for ESD control. Engine must be shut down and locked out prior to fueling.

ACTIVITY HAZARD ANALYSIS

Equipment to be used 2.2.1 (List equipment to be used in the work activity)	Inspection Requirements 2.2.2 (List inspection requirements for the work activity)	Training Requirements (List training requirements inclucing hazard communication)
Fire Extinguisher, 10:B minimum	Daily inspection of extinguishers being present and in working order. Monthly inspection that the pressure is within manufacturer's allowable tolerance. Annual professional inspection and recharge as required.	Incipient fuel fire fighting. Fire extinguisher inspection.
Ground Strap	Semi-annual inspection for continuity and ohmic resistance	Safe fueling procedures
Respirator, full face	Daily inspection for worn, loose, or missing parts	Respiratory protection training

ACTIVITY HAZARD ANALYSIS

Activity: Filling Abrasive Hopper (6.1.2)	**Date: July 8, 2003**
	Project: Demilitarization of Ordnance Shapes at the Former NSWC-WO Facility
Description of the work: Periodic refilling of the abrasive hopper with garnet abrasive	**Site Supervisor: Paul L. Miller**
	Site Safety Officer:
	Review for latest use: Before the job is performed.

Work Activity Sequence (Identify the principal steps involved and the sequence of work activities)	Potential Health and Safety Hazards (Analyze each principal step for potential hazards)	Hazard Controls (Develop specific controls for each potential hazard)
Acquire abrasive from storage and transport to waterjet abrasive hopper	Heavy weight	Safety goggles, leather gloves, safety shoes, and hardhat. Adminstrative control: Hand truck used to move heavy items and two man lift on items in excess of lifting limits.
Depressurize abrasive hopper	Residual air pressure Noise Dust – eye irritant Dust – toxicity	Safety goggles, leather gloves, safety shoes, and hardhat. Ear Plugs Adminstrative control: All equipment must be de-energized and locked out. Operator shall stand to one side during depressurization operations and avoid breathing in dust. In the event of excessive dust, a air purifying respirator with a P-95 dust filter shall be worn.
Loading abrasive	Residual air pressure Noise Dust – eye irritant Dust – toxicity Weight	Safety goggles, leather gloves, safety shoes, and hardhat. Ear Plugs Adminstrative control: All equipment must be de-energized and locked out. Operator shall stand to one side during depressurization operations and avoid breathing in dust. In the event of excessive dust, an air purifying respirator with a P-95 dust filter shall be worn. Abrasive shall be loaded by either using two people or using increments less than the weight lifting limits.

ACTIVITY HAZARD ANALYSIS

Work Task Sequence (Identify the principal steps involved and the sequence of work activities)	Identify & Analyze the Hazards (Analyze each principal step for potential hazards)	Hazard Controls (Develop specific controls for each potential hazard)
Pressurize abrasive hopper	Leaking air pressure Noise Dust – eye irritant Dust – toxicity	Safety goggles, leather gloves, safety shoes, and hardhat. Ear Plugs Administrative control: All equipment must be de-energized and locked out. Operator shall stand to one side during pressurization operations and avoid breathing in dust. In the event of excessive dust, an air purifying respirator with a P-95 dust filter shall be worn.

ACTIVITY HAZARD ANALYSIS

Equipment to be used 2.2.3 (List equipment to be used in the work activity)	Inspection Requirements 2.2.4 (List inspection requirements for the work activity)	Training Requirements (List training requirements including hazard communication)
Hand truck	Daily inspection for loose or damaged parts	Materials handling safety

ACTIVITY HAZARD ANALYSIS

Activity: Receiving and Placing Ordnance Shapes (6.1.3)	**Date: July 8, 2003**
	Project: Demilitarization of Ordnance Shapes at the Former NSWC-WO Facility
Description of the work: Receiving and placing the ordnance shapes on the fixture for high pressure abrasive waterjet cutting	**Site Supervisor: Paul L. Miller**
	Site Safety Officer:
	Review for latest use: Before the job is performed.

Work Activity Sequence (Identify the principal steps involved and the sequence of work activities)	**Potential Health and Safety Hazards** (Analyze each principal step for potential hazards)	**Hazard Controls** (Develop specific controls for each potential hazard)
Receiving ordnance shape from magazine	Material handling equipment (forklift) Heavy items Residual surface contamination Dust – toxicity Explosion hazard	Leather gloves, safety shoes, safety glasses, and hardhat. Administrative control: Workers are not allowed to work around moving forklift. Administrative control: All ordnance shapes must be treated as if containing explosives. Do not strike, drop, or impact ordnance shapes. Smoking or open flame not permitted within 50 ft of operation. Fire extinguishers rated at least 10lb each on-hand. All equipment must be de-energized and locked out. Operators shall avoid breathing dust. In the event of excessive dust, an air purifying respirator with a P-95 dust filter shall be worn.
Securing ordnance shape to fixture	Material handling equipment (forklift) Heavy items Residual surface contamination Dust – toxicity Explosion hazard	Leather gloves, safety shoes, safety glasses, and hardhat. Administrative control: Workers are not allowed to work around moving forklift. Administrative control: All ordnance shapes must be treated as if containing explosives. Do not strike, drop, or impact ordnance shapes. Smoking or open flame not permitted within 50 ft of operation. Fire extinguishers rated at least 10lb each on-hand. All equipment must be de-energized and locked out. Operators shall avoid breathing dust. In the event of excessive dust, an air purifying respirator with a P-95 dust filter shall be worn.
Attaching cutting track and cutting head to ordnance shape.	Hand tools Heavy items Residual surface contamination Dust – toxicity Explosion hazard	Leather gloves, safety shoes, safety glasses, and hardhat. Administrative control: All ordnance shapes must be treated as if containing explosives. Do not strike, drop, or impact ordnance shapes. Smoking or open flame not permitted within 50 ft of operation. Fire extinguishers rated at least 10lb each on-hand. All equipment must be de-energized and locked out. Operators shall avoid breathing dust. In the event of excessive dust, an air purifying respirator with a P-95 dust filter shall be worn.

ACTIVITY HAZARD ANALYSIS

Work Task Sequence (Identify the principal steps involved and the sequence of work activities)	Identify & Analyze the Hazards (Analyze each principal step for potential hazards)	Hazard Controls (Develop specific controls for each potential hazard)
Attaching abrasive feed and pressurized water hoses	Hand tools Heavy items Residual surface contamination Dust – toxicity Explosion hazard	Leather gloves, safety shoes, safety glasses, and hardhat. Administrative control: All ordnance shapes must be treated as if containing explosives. Do not strike, drop, or impact ordnance shapes. Smoking or open flame not permitted within 50 ft of operation. Fire extinguishers rated at least 10lb each on-hand. All equipment must be de-energized and locked out. Operators shall avoid breathing dust. In the event of excessive dust, an air purifying respirator with a P-95 dust filter shall be worn.

ACTIVITY HAZARD ANALYSIS

Equipment to be used 2.2.5 (List equipment to be used in the work activity)	Inspection Requirements 2.2.6 (List inspection requirements for the work activity)	Training Requirements (List training requirements including hazard communication)
Hand tools Waterjet cutting tools	Daily inspection for damaged or missing parts	Waterjet servicing training
Fire Extinguisher, 70:B minimum	Daily inspection of extinguishers being present and in working order. Monthly inspection that the pressure is within manufacturer's allowable tolerance. Annual professional inspection and recharge as required.	Incipient fire fighting. Fire extinguisher inspection.

ACTIVITY HAZARD ANALYSIS

Activity: Waterjet Cutting Operations (6.1.4)	Date: July 8, 2003
	Project: Demilitarization of Ordnance Shapes at the Former NSWC-WO Facility
Description of the work: Cutting ordnance shapes with high pressure abrasive waterjet.	Site Supervisor: Paul L. Miller
	Site Safety Officer:
	Review for latest use: Before the job is performed.

Work Activity Sequence (Identify the principal steps involved and the sequence of work activities)	Potential Health and Safety Hazards (Analyze each principal step for potential hazards)	Hazard Controls (Develop specific controls for each potential hazard)
Starting Diesel Waterjet Intensifier	Noise High pressure components Moving parts Exhaust vapor Fire Hot surfaces	Leather gloves, safety shoes, safety glasses, ear plugs, and hardhat. Fire extinguishers rated at least 10lb each on-hand. All high pressure valves must be de-energized and locked out. Operators shall avoid breathing exhaust. Workers shall not place any part of their anatomy within the engine compartment while the engine is running unless specifically identified in the manufacturer's user manual.
Abrasive waterjet cutting operation	Fire Explosion High Pressure components	Administrative control: Personnel are not permitted to be within 30 ft of the waterjet cutting operation or any high pressure line unless specifically trained. No one shall be in the exclusion zone during cutting operations on an ordnance shape. In the unlikely event of a fire or explosion due to an energetic reaction, no attempt shall be made to fight the fire.
Inspection of cut ordnance shape	Explosive Chemical – toxicity Fire	Administrative control: Personnel are not permitted to be within the waterjet exclusion zone after cutting operations on an ordnance shape until authorized by the Site Safety Officer. A UXO qualified individual will verify the presence of, or absence of any explosive fillers or other related hazards after the ordnance shape has been cut, prior to other personnel being allowed to enter the cutting area.

ACTIVITY HAZARD ANALYSIS

Work Task Sequence (Identify the principal steps involved and the sequence of work activities)	Identify & Analyze the Hazards (Analyze each principal step for potential hazards)	Hazard Controls (Develop specific controls for each potential hazard)

ACTIVITY HAZARD ANALYSIS

Equipment to be used 2.2.7 (List equipment to be used in the work activity)	Inspection Requirements 2.2.8 (List inspection requirements for the work activity)	Training Requirements (List training requirements including hazard communication)
High pressure waterjet powerpack	Daily 1) Oil, coolant, and fuel inspection. 2) Water inlet and cooling inspection. 3) High pressure components integrity	Waterjet servicing training

ACTIVITY HAZARD ANALYSIS

Activity: Removing Ordnance Shapes From Fixture (6.1.5)	Date: July 8, 2003
	Project: Demilitarization of Ordnance Shapes at the Former NSWC-WO Facility
Description of the work: Removal of the sectioned ordnance shapes for disposal.	Site Supervisor: Paul L. Miller
	Site Safety Officer:
	Review for latest use: Before the job is performed.

Work Activity Sequence (Identify the principal steps involved and the sequence of work activities)	Potential Health and Safety Hazards (Analyze each principal step for potential hazards)	Hazard Controls (Develop specific controls for each potential hazard)
Shutdown of Diesel Waterjet Intensifier	Noise High pressure components Moving parts Exhaust vapor Fire Hot surfaces	Leather gloves, safety shoes, safety glasses, ear plugs, and hardhat. Fire extinguishers rated at least 10lb each on-hand. All high pressure valves must be de-energized and locked out. Operators shall avoid breathing exhaust. Workers shall not place any part of their anatomy within the engine compartment while the engine is running unless specifically identified in the manufacturer's user manual.
Removing cutting track and cutting head from ordnance shape.	Hand tools Heavy items Residual surface contamination Dust – toxicity Explosion hazard Explosive – toxicity Slipping hazard	Leather gloves, (chemical gloves if explosives are present), safety shoes or boots, safety glasses, and hardhat. Administrative control: All ordnance shapes must be treated as if containing explosives. Do not strike, drop, or impact ordnance shapes. Smoking or open flame not permitted within 50 ft of operation. Fire extinguishers rated at least 10lb each on-hand. All equipment must be de-energized and locked out. Operators shall avoid breathing dust. In the event of excessive dust, an air purifying respirator with a P-95 dust filter shall be worn.
Removing ordnance shape from fixture	Material handling equipment (forklift) Heavy items Residual surface contamination Explosive – toxicity Explosion hazard Slipping hazard	Leather gloves, (chemical gloves if explosives are present), safety shoes or boots, safety glasses, and hardhat. Administrative control: Workers are not allowed to work around moving forklift. Administrative control: All ordnance shapes must be treated as if containing explosives. Do not strike, drop, or impact ordnance shapes. Smoking or open flame not permitted within 50 ft of operation. Fire extinguishers rated at least 10lb each on-hand. All equipment must be de-energized and locked out. Operators shall avoid breathing dust. In the event of excessive dust, an air purifying respirator with a P-95 dust filter shall be worn.

ACTIVITY HAZARD ANALYSIS

Work Task Sequence (Identify the principal steps involved and the sequence of work activities)	**Identify & Analyze the Hazards** (Analyze each principal step for potential hazards)	**Hazard Controls** (Develop specific controls for each potential hazard)

ACTIVITY HAZARD ANALYSIS

Equipment to be used 2.2.9 (List equipment to be used in the work activity)	Inspection Requirements 2.2.10 (List inspection requirements for the work activity)	Training Requirements (List training requirements including hazard communication)
High pressure waterjet powerpack	Daily 1) Oil, coolant, and fuel inspection. 2) Water inlet and cooling inspection. 3) High pressure components integrity	Waterjet servicing training
Hand tools Waterjet cutting tools	Daily inspection for damaged or missing parts	Waterjet servicing training
Fire Extinguisher, 70:B minimum	Daily inspection of extinguishers being present and in working order. Monthly inspection that the pressure is within manufacturer's allowable tolerance. Annual professional inspection and recharge as required.	Incipient fire fighting. Fire extinguisher inspection.

ACTIVITY HAZARD ANALYSIS

Activity: Area Cleanup and Decontamination (6.1.6)	Date: July 8, 2003
	Project: Demilitarization of Ordnance Shapes at the Former NSWC-WO Facility
Description of the work: Periodic cleanup and decontamination after each ordnance item as well as daily, weekly, and final cleanup and decontamination.	Site Supervisor: Paul L. Miller
	Site Safety Officer:
	Review for latest use: Before the job is performed.

Work Activity Sequence (Identify the principal steps involved and the sequence of work activities)	Potential Health and Safety Hazards (Analyze each principal step for potential hazards)	Hazard Controls (Develop specific controls for each potential hazard)
Starting Diesel Waterjet Intensifier	Noise High pressure components Moving parts Exhaust vapor Fire Hot surfaces	Leather gloves, safety shoes, safety glasses, ear plugs, and hardhat. Fire extinguishers rated at least 10lb each on-hand. All high pressure valves must be de-energized and locked out. Operators shall avoid breathing exhaust. Workers shall not place any part of their anatomy within the engine compartment while the engine is running unless specifically identified in the manufacturer's user manual.
Washdown / decontamination operation	High pressure water Explosive – toxicity Explosive – fire Slipping hazard Noise	Chemical resistant gloves, safety boots, safety goggles, ear plugs, and hardhat. Administrative control: Only authorized and trained personnel to be within 50 ft of washdown operations. Administrative control: Smoking or open flame not permitted within exclusion zone. Fire extinguisher rated at least 20:B on-hand. Administrative control: Worker responsible for washdown must pay close attention to direction of the jet spray and not engage personnel or fragile equipment. Operators shall avoid breathing dust. In the event of excessive dust, an air purifying respirator with a P-95 dust filter shall be worn.
Manual cleanup operations	Hand tools Explosive – toxicity Explosive – fire Slipping hazard Heavy items	Chemical resistant gloves, safety boots, safety goggles, ear plugs, and hardhat. Administrative control: All equipment must be de-energized and locked out. Only authorized and trained personnel to be within exclusion zone. Proper lifting technique required for heavy items. Administrative control: Smoking or open flame not permitted within exclusion zone. Fire extinguisher rated at least 20:B on-hand. Operators shall avoid breathing dust. In the event of excessive dust, an air purifying respirator with a P-95 dust filter shall be worn.

ACTIVITY HAZARD ANALYSIS

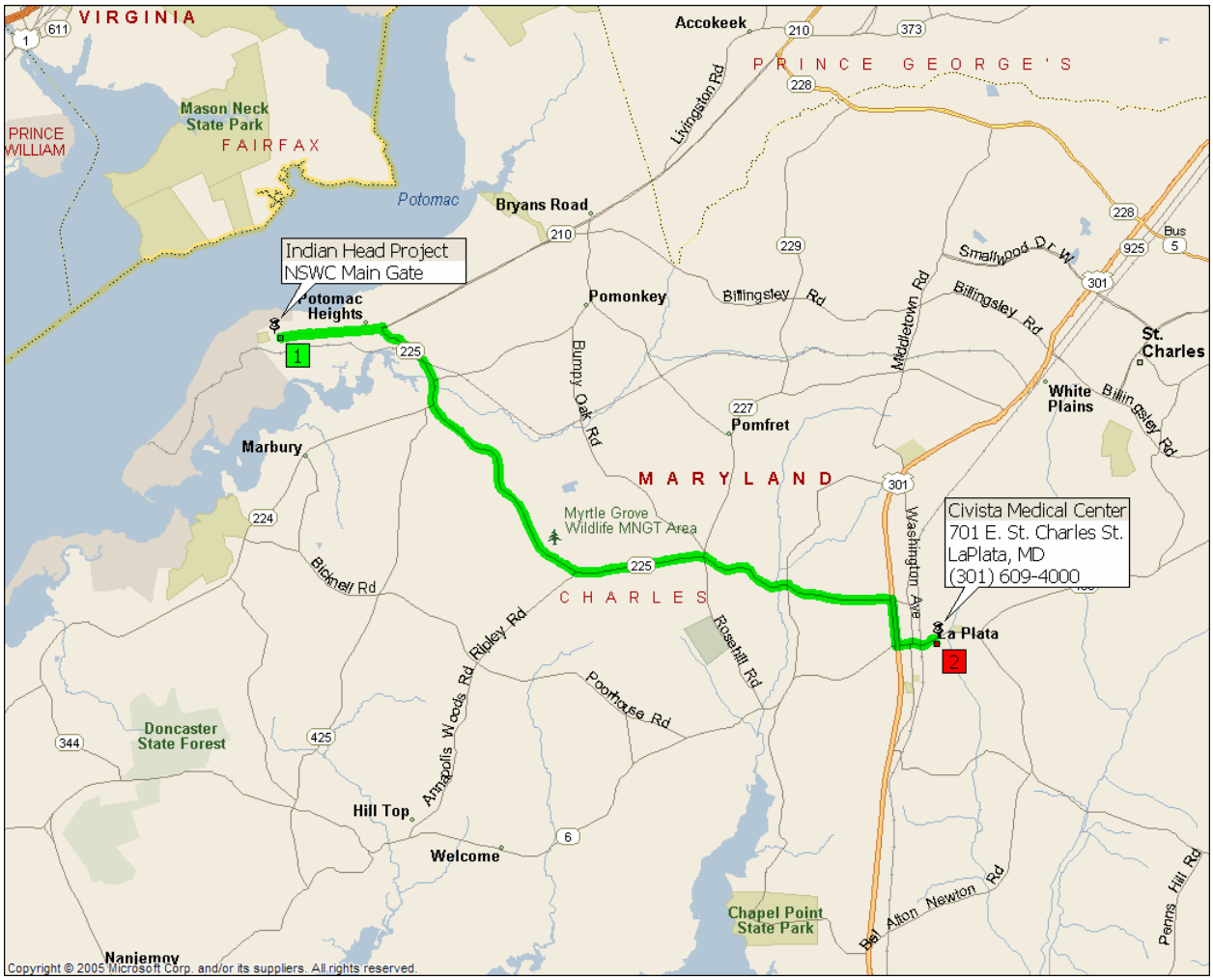
Work Task Sequence (Identify the principal steps involved and the sequence of work activities)	Identify & Analyze the Hazards (Analyze each principal step for potential hazards)	Hazard Controls (Develop specific controls for each potential hazard)
Pump our containment sump	Explosive – toxicity Explosive – fire	Administrative control: All equipment must be de-energized and locked out. Gradient personnel should not be in close proximity to pumping operations. Administrative control: Smoking or open flame not permitted within 50 ft of refueling operation. Fire extinguisher rated at least 20:B on-hand.

ACTIVITY HAZARD ANALYSIS

Equipment to be used 2.2.11 (List equipment to be used in the work activity)	Inspection Requirements 2.2.12 (List inspection requirements for the work activity)	Training Requirements (List training requirements including hazard communication)
Waterjet washdown wand	Daily inspection for damaged or missing parts	Waterjet servicing training
High pressure waterjet powerpack	Daily 1) Oil, coolant, and fuel inspection. 2) Water inlet and cooling inspection. 3) High pressure components integrity	Waterjet servicing training
Fire Extinguisher, 70:B minimum	Daily inspection of extinguishers being present and in working order. Monthly inspection that the pressure is within manufacturer's allowable tolerance. Annual professional inspection and recharge as required.	Incipient fire fighting. Fire extinguisher inspection.
Hand tools	Daily inspection for damaged or missing parts	Waterjet servicing training

Attachment 4
Directions to the Hospital

Route to Hospital:
Civista Medical Center
701 E. St. Charles Street
LaPlata, MD
(301) 609-4000



Summary: 13.6 miles (21 minutes)

Time	Mile	Instruction	For	Toward
9:00 AM	**0.0**	**Depart Indian Head on SR-210 [Indian Head Hwy] (East)**	**1.6 mi**	
9:02 AM	1.6	Turn RIGHT (South) onto SR-225 [Hawthorne Rd]	1.2 mi	
9:04 AM	2.8	Bear RIGHT (South) onto SR-224 [SR-225]	0.4 mi	
9:05 AM	3.2	Bear LEFT (South-East) onto SR-225 [Hawthorne Rd]	8.6 mi	
9:17 AM	11.8	Keep STRAIGHT onto SR-225 [W Hawthorne Rd]	0.4 mi	
9:18 AM	12.2	Turn RIGHT (South) onto US-301 [Blue Star Memorial Hwy]	0.7 mi	
9:19 AM	12.9	Turn LEFT (East) onto SR-6	21 yds	

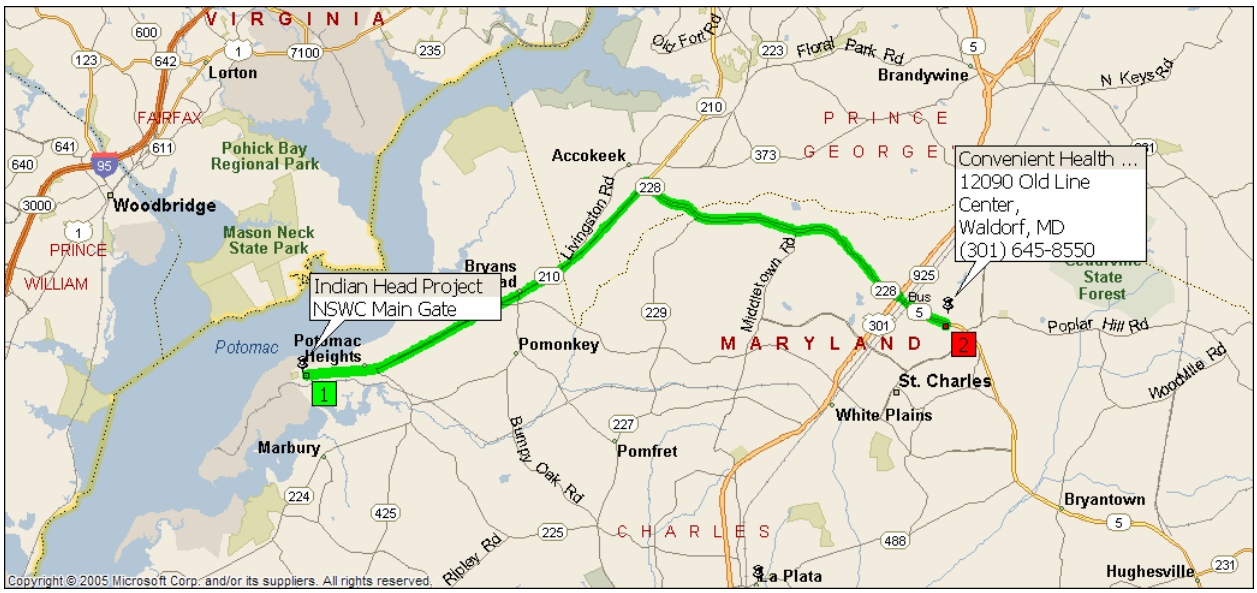
9:20 AM	12.9	Keep STRAIGHT onto SR-6 [Charles St]	0.6 mi
9:21 AM	13.5	Turn RIGHT (South) onto Garrett Ave	131 yds
9:21 AM	**13.6**	**Arrive La Plata**	

SUMMARY

Driving distance: 13.6 miles
Trip duration: 21 minutes
Driving time: 21 minutes

Route to Health Resources Clinic

Convenient Health Care
12090 Old Line Center
Waldorf, MD 20602
301-645-8550



Summary: 17.5 miles (24 minutes)

Time	Mile	Instruction	For	Toward
9:00 AM	**0.0**	**Depart Indian Head on SR-210 [Indian Head Hwy] (East)**	**9.3 mi**	
9:11 AM	9.3	Keep RIGHT onto Local road(s)	153 yds	
9:12 AM	9.4	Keep STRAIGHT onto SR-228 [Berry Rd]	6.7 mi	
9:21 AM	16.1	Bear RIGHT (South-East) onto SR-5 Bus	1.3 mi	
9:23 AM	17.4	Turn RIGHT (South) onto Old Line Center	98 yds	
9:24 AM	**17.5**	**Arrive 12090 Old Line Center, Waldorf, MD 20602**		

SUMMARY

Driving distance: 17.5 miles
Trip duration: 24 minutes
Driving time: 24 minutes

Attachment 5
Health and Safety Plan
Amendment Documentation Form

Site-Specific Health & Safety Plan
Amendment Documentation

Project Name: **Project No.**

Amendment No. **Date:**

The Amendment Addresses the Following Sections:

Task(s) Amendment Affects:.

Reason For Amendment:

Amendment:

Completed by: **Approved by:**

Attachment 6
Hurricane Preparedness Plan

SITE-SPECIFIC HURRICANE PREPAREDNESS PLAN (HPP)
REMEDIAL/REMOVAL ACTION FOR SITE 28
NAVAL SUPPORT FACILITY, INDIAN HEAD
INDIAN HEAD, MARYLAND

Contract No. N62470-02-D-3260
Task Order No. 093

Prepared for:

NAVAL FACILITIES ENGINEERING COMMAND WASHINGTON
1314 Harwood Street, S.E.
Washington Navy Yard, DC 20374-5018

Prepared by:

Shaw Environmental, Inc.
500 East Main Street, Suite 1630
Norfolk, Virginia 23510

Project No. 126566

June 2007

HURRICANE PREPAREDNESS PLAN

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LIST OF ACRONYMS

COR	Condition of Readiness
FEMA	Federal Emergency Management Administration
HPP	Hurricane Preparedness Plan
mph	Miles per Hour
NOAA	National Oceanic and Atmospheric Administration
NSFO	Naval Special Fuel Oil
PPE	Personal Protective Equipment
SSO	Site Safety Officer

1.0 INTRODUCTION

PURPOSE

This Hurricane Preparedness Plan (HPP) outlines the general responsibilities and actions to be taken in preparation for and response to a hurricane or hurricane warnings at the Indian Head Maryland, Site 28 project Site. All personnel should understand that predicting the occurrence and path of a hurricane is difficult, however the risk can be minimized and controlled by following the procedures in this plan.

SCOPE

This procedure is applicable to all site personnel, including subcontractors; temporary construction facilities; and remediation equipment present at the Fuel Farm project sites.

DISCUSSION

This procedure provides information on how to protect personnel and property in the event of a hurricane. In the Indian Head, Maryland area, attention must be paid to all hurricanes, since there is no way to determine with 100 percent accuracy whether a hurricane will actually hit the area until a few hours before landfall.

The following table demonstrates that the accuracy of forecasting where a hurricane landfall will occur is very low more than 24 hours in advance of a storm.

Hours Before Landfall	Maximum Probability Values
72 Hours	10 Percent
48 Hours	13-18 Percent
36 Hours	20-25 Percent
24 Hours	35-45 Percent
12 Hours	60-70 Percent

2.0 DEFINITIONS

The following definitions apply to various terms used in this document.

Conditions of Readiness (COR):

Condition V - Destructive winds are possible at the Indian Head, Maryland site within 96 hours. Normal daily job-site cleanup and good housekeeping practices.

Condition IV - Destructive winds are possible at the Indian Head, Maryland site within 72 hours. Normal daily job-site cleanup and good housekeeping practices. Collect and store in piles or containers, scrap lumber, waste material, and rubbish for removal and disposal at the end of each work day. Maintain the construction site, including storage areas, free of accumulation of debris. Stack form lumber in neat piles less than 4 feet high. Remove all trash debris and other objects which could become missile hazards. Contact Resident Officer In Charge of Construction (LANTDIV REPRESENTATIVE) for Condition requirements, updates, and completion of required actions.

Condition III - Destructive winds are possible at the Indian Head, Maryland site within 48 hours. Maintain Condition IV requirements. Begin securing the job-site for and taking those actions necessary for Condition I that cannot be completed within 18 hours. Cease all routine activities that might interfere with securing operations. Begin collecting and stowing all gear and portable equipment. Make preparations for securing buildings. Review requirements pertaining to Condition II and continue action as necessary to attain Condition III readiness.

Condition II - Destructive winds are possible at the Indian Head, Maryland site within 24 hours. Curtail or cease routine activities until securing operations are complete. Reinforce or remove form work and scaffolding. Secure machinery, tools, equipment and materials, or remove from job site. Expend every effort to clear all missile hazards and loose equipment from the job-site. Contact LANTDIV REPRESENTATIVE for weather and COR updates and completion of required actions.

Condition I - Destructive winds are possible at the Indian Head, Maryland site within 12 hours. Perform and complete all remaining actions required for lower conditions of readiness. Secure the job-site and leave the government premises.

Destructive Winds - Generally winds reaching or exceeding the force of a tropical storm ($\geq$ 39 miles per hour [mph] or 34 knots). Winds from any storm system (tropical or otherwise) that are determined to have the potential to cause property damage or personal injury that would warrant the Condition IV alert.

Gale - Non-tropical windstorm with winds 38 to 63 mph (33 to 55 knots).

Hurricane Watch - An announcement for specific areas where a hurricane or an incipient hurricane poses a possible threat to a coastal area, generally within 36 hours.

Hurricane Warning - A warning that sustained winds of 74 mph (64 knots) or higher, associated with a hurricane are expected in a specified coastal area in 24 hours or less.

Hurricane - A tropical cyclone in which the maximum sustained surface wind is 74 mph (64 knots) or greater.

Missile Hazard - Any object that may become airborne during high winds.

Severe Weather - Any storm of tropical or non-tropical origin that has the capacity to produce destructive winds

Small Area Storms – Thunderstorms or tornadoes.

Small Area Storms Condition I - Destructive winds, heavy rain, lightening and hail are imminent within 1-hour.

Small Area Storms Condition II - Destructive winds, heavy rain, lightening and hail are expected within 6-hours.

Storm - Non-tropical windstorm with winds 38 to 63 mph (33 to 55 knots).

Storm Surge - An abnormal rise in sea level accompanying a hurricane or other intense storm, and whose height is the difference between the observed level of the sea surface and the level that would have occurred in the absence of the storm.

Storm Tide - The actual sea level resulting from the astronomical tide combined with the storm surge. This term is used interchangeably with "Hurricane Tide."

Tornado - Violent rotating columns of air with winds 115 to 288 mph (100 to 250 knots).

Tropical Depression - A tropical low pressure system in which the maximum sustained surface wind is 38 mph (33 knots) or less.

Tropical Storm - A tropical low pressure system in which the maximum surface wind ranges from 39 to 73 mph (34 to 63 knots) inclusive. This is the strength at which the National Hurricane Center applies a name to the storm.

Tropical Storm Watch - Tropical storm conditions pose a threat to a coastal area generally within 36 hours.

Tropical Storm Warning - A warning for tropical storm conditions with sustained winds within the range of 39 to 73 mph (34 to 63 knots) that are expected in a specified coastal area within 24 hours or less.

3.0 RESPONSIBILITIES

Project Manager – Steve Carriere

The Project Manager is responsible for ensuring that all adequate measures have been taken to prepare for hurricanes and to protect site personnel and property in the event of a hurricane. The Project Manager will ensure that ample resources are available to implement this plan and that all personnel are aware of this plan and their responsibilities.

Site Superintendent – TBD

The Site Superintendent will communicate all hurricane information to site personnel and keep the site personnel continually informed of the measures to be taken. The Site Superintendent is responsible for the coordination and direction of site equipment shut-down and will oversee the preparation of site facilities for any imminent storm. The Site Superintendent will oversee the coordination of both pre- and post-storm operations and will ensure that the proper material, equipment, and supplies are utilized to implement this procedure.

Site Safety Officer – Michael Harrison

The Site Safety Officer (SSO) will monitor weather information, including the National Weather Service probability values for landfall. The SSO will maintain the necessary emergency supplies, and will periodically tour the site to ensure that proper steps are being taken to protect site personnel and property. The SSO will develop the emergency contact list will be maintained in a site dedicated vehicle.

Note: When personnel identified in Section 3.0 leave the site, they are responsible for notifying the Site Superintendent or a designated back-up person. The back-up person will be instructed in their responsibilities in the event of a hurricane.

4.0 EMERGENCY OPERATING PROCEDURES

Condition V - Early Preparedness

The Site Superintendent will notify the Project Manager when a tropical storm has been named and/or any severe weather has the potential to produce destructive winds at the Indian Head, Maryland site within 96 hours. This will initiate COR Condition V. This phase will continue until:

- The storm or condition is downgraded
- The storm track poses no threat to the site
- Condition IV begins.

During Condition V, the progress of the storm will be monitored and tracked. The Program Manager will be contacted at least twice daily for Condition Requirements updates and to inform him of completion of required actions for Condition V.

See Attachment A for the Hurricane Preparedness Responsibility Punch List - Condition V.

Condition IV - (Destructive winds are possible within 72 Hours)

This COR starts when severe weather is within 72 hours of posing a threat to the project location. The SSO will ensure that the following steps are taken:

- Monitor the storm and inform the Project Manager of its progress
- Check Personal Protective Equipment (PPE) supplies and equipment to determine if any shipments are required or if pending shipments should be advanced or postponed

During Condition IV, the progress of the storm will be continuously monitored and tracked. The Site Superintendent will instruct site personnel to begin general cleanup of all loose materials that may pose a hazard during high winds or rain. This will include removal of all debris, trash, and other items that may become missile hazards. All lumber will be stacked in neat piles less than 4 feet high. The Program Manager will be contacted at least twice daily for Condition Requirements updates and to inform him of completion of required actions for Condition IV.

The Site Superintendent will keep all site personnel advised of the status of the storm and site preparation activities. Due to the urgency and amount of work involved in preparing for a threatening storm, all construction operations that might interfere with securing operations, such as starting a major excavation, will cease.

The Site Superintendent will ensure that the following steps are taken:

- Fill fuel tanks in all equipment on-site
- Secure stockpiled material on-site
- Review requirements for Condition II with all site personnel
- Maintain condition IV requirements.

See Attachment A for the Hurricane Preparedness Responsibility Checklist - Condition IV.

Condition III - Tropical Storm Warning (Destructive winds are possible Within 48 Hours)

This COR starts when severe weather places the project site under a tropical storm warning. Condition III activities will also start if a threatening tropical storm is upgraded to a hurricane, or a severe storm approaching the Indian Head, Maryland site has generated destructive winds in other locations. The Project Manager, Site Superintendent and SSO will determine when to cease all operations based upon current weather conditions and/or as directed by the LANTDIV REPRESENTATIVE. If the storm or Condition is downgraded, the Project Manager and Site Superintendent will meet with the Program Manager and LANTDIV REPRESENTATIVE to decide if a downgrade of the COR is appropriate. Actions for Condition III will be maintained and the following shall also be completed:

- Machinery, tools, equipment, and materials will be secured or removed form the site
- Take actions to secure job-site necessary for Condition II that cannot be completed within 18 hours.

See Attachment A for the Hurricane Preparedness Responsibility Checklist - Condition III.

Condition II - Destructive Winds are anticipated <u>within 24 hours</u> or a Small Area Storm is anticipated <u>within 6 hours</u>.

Condition II begins when destructive winds are anticipated within 24 hours, a small area storm within 6 hours, and/or as directed by the LANTDIV REPRESENTATIVE. The Project Manager and Site Superintendent will determine when to demobilize from the site based upon weather conditions. During this phase the Site Superintendent will direct the following actions:

- Secure machinery, tools, equipment and materials or remove them from the job-site
- Conduct a roll call of personnel on-site and inform the SSO
- Notify personnel on leave of schedule changes
- Personnel needing to leave the project to attend to personal matters will notify their Site Superintendent immediately
- Heavy equipment will be secured according to the manufacturer's recommendations
- All small field equipment will be secured
- All visitors from the site are evacuated
- Make a final site walk-through to determine that the site is secure and clear all missile hazards from the job-site
- Inform the Project Manager that all personnel are being released from the site.

If the storm or Condition is downgraded, the Project Manager and Site Superintendent will meet to decide if a downgrade of the phase is necessary.

See Attachment A for the Hurricane Preparedness Responsibility Checklist - Condition II.

Condition I - Destructive winds are anticipated <u>within 12 hours</u> or a Small Area Storm is imminent <u>within 1 hour</u>.

- Complete all remaining actions required for lower conditions of readiness
- Secure job-site access and evacuate to safe refuge.

See Attachment A for the Hurricane Preparedness Responsibility Checklist - Condition I.

Resume Site Operations

The Project Manager will contact the Program Manager to determine when site operations will resume. Although the hurricane/severe weather has passed, hazards may still exist because of water damage, other hazardous conditions, dangers from electric shock, poisonous snakes, etc.

The Site Superintendent and SSO will conduct a damage survey with the Project Manager. Photographs of the storm damage at the site will be taken by the Site Superintendent or SSO. They will develop a prioritized recovery plan from the survey findings. Subsequently, all site personnel will be notified when it is safe to return to work. Required personnel and subcontractor expertise will be mobilized to the site to repair any damaged equipment.

See Attachment A for the Hurricane Preparedness Responsibility Checklist - Resume Site Operations.

5.0 DEBRIEFING

Following the return to work of site personnel, the Site Superintendent will conduct a debriefing with site personnel. The debriefing will accomplish the following objectives:

- Finalize a recovery plan
- Review the Hurricane Plan for effectiveness
- Suggest and agree on improvements to the plan
- Incorporate plan changes

When completed, the Project Manager and Site Superintendent will meet with site personnel to discuss any corrective actions or changes in this plan.

6.0 REFERENCES

The list of emergency telephone numbers is included as Attachment B. In addition, an example of a Hurricane Tracking Chart is presented in Attachment C.

The following references and sources of information may be consulted for additional guidance on hurricane preparedness and response.

- Disaster Planning Guide for Business and Industry, Federal Emergency Management Administration (FEMA).

- U.S. Department of Commerce; National Oceanic and Atmospheric Administration (NOAA)

ATTACHMENT A

HURRICANE PREPAREDNESS RESPONSIBILITY CHECKLISTS

HURRICANE PREPAREDNESS CHECKLIST

Condition V

Date/Time Entered Condition V:_____

Severe Weather/Tropical Storm: _____

Action Items

☐ Project Manager Notified

☐ Track of Storm Poses No Threat

☐ Storm or Condition is Downgraded

☐ Upgrade to Condition IV

Storm Location

Date/Time:_____ Date/Time:_____

Location/Coordinates:_____ Location/Coordinates:_____

Date/Time:_____ Date/Time:_____

Location/Coordinates:_____ Location/Coordinates:_____

Condition V Action Items Complete:_____ Date:_____

HURRICANE PREPAREDNESS CHECKLIST

Condition IV (Landfall within 72 hours)

Date/Time Entered Condition IV:_____

Action Items:

☐ Notify Project Manager

☐ Notify Project Superintendent

☐ Notify Site Personnel

☐ Assemble shift personnel to begin preparation

☐ Track storm on hurricane tracking map (Attachment C) (if applicable)

☐ Secure all heavy equipment located at the site in accordance with manufacturer's specifications. All equipment will be moved to a secured site location.

☐ All equipment fuel tanks will be filled.

☐ All subcontractors with equipment or supplies on-site will be notified to begin removal procedures

Condition IV Action Items Complete:_____ Date:_____

HURRICANE PREPAREDNESS CHECKLIST

Condition III (Landfall within 48 hours)

Date/Time Entered Condition III:_____

Action Items:

☐ Provide the status of the storm to site personnel on an hourly basis

☐ Take actions to secure job-site necessary for Condition I that cannot be accomplished in 18 hours

☐ Recheck all items on checklist IV to ensure they are complete (i.e. gas tanks are still filled)

See itemized equipment checklist (itemized list of equipment to be secured/removed and COR for action)

Condition III Action Items Complete:_____ Date:_____

HURRICANE PREPAREDNESS CHECKLIST

Itemized Equipment Checklist, Condition III.

Equipment	Secure in Place	Remove from Project Site

HURRICANE PREPAREDNESS CHECKLIST

Condition II

Date/Time Entered Condition II:_____

Action Items:

☐ Evacuate all visitors from the site

☐ Conduct a role call of site personnel and inform the Project Manager

☐ Check the status all incoming shipments of supplies and equipment

☐ Remove all unnecessary vehicles from the site

☐ Secure heavy equipment in accordance with manufacturer's specification

☐ Secure all valuable records and equipment

☐ Release personnel from the site

☐ Recheck all items on checklist IV and III to ensure they are complete (ie: gas tanks are still filled)

Condition II Action Items Complete:_____ Date:_____

HURRICANE PREPAREDNESS CHECKLIST

Condition I

Date/Time Entered Condition I:_____

Action Items:

☐ Complete all action items for lower conditions of readiness

☐ Secure job-site access and evacuate to safe refuge

Condition I Action Items Complete:_____ Date:_____

ATTACHMENT B
EMERGENCY PHONE NUMBERS

Table 9-1 Emergency Telephone Numbers

Local Agencies	
Base Fire Protection Division	(301) 744-4333
Ambulance	(301) 744-4333
Fire	(301) 744-4333
Security	(301) 744-4333
Dispatch	(301) 744-4381
LEPC	Will be notified by Fire/Dispatch
Hospital	
Civista Medical Center 701 E. St. Charles Street LaPlata, MD	(301) 609-4000
Health Resources Clinic Convenient Health Care 12090 Old Line Center Waldorf, MD 20602	(301) 645-8550
See Attachment 4 for directions to the hospital and clinic.	
National Capital Poison Center	(800) 222-1222
Federal Agencies	
Center for Disease Control	(404) 639-3311
National Response Center	(800) 424-8802
Department of the Navy, Atlantic Division (LANTDIV)	
Facilities Engineering Acquisition Division - LT Mike O'Donnell	(301) 744-2177
Contracting Officer Technical Representative – Cathy Gardner	(301) 744-2181
Shaw Personnel	
Project Manager – Steve Carriere	(609) 234-6361 (cellular)
Site Superintendent – To be determined	
Site Safety Officer – Michael Harrison	(618) 599-3838 (cellular)
LANTDIV Safety Manager- Kym Edelman	(757) 435-5384 (cellular)
Program CIH – Dave Mummert	(419) 425-6129 (office)
Regional Health and Safety Manager – Joe Hoyt	(804) 337-6982 (cellular)
Shaw E & I (24 hour)	(866) 299-3445

ATTACHMENT C
HURRICANE TRACKING MAP

This map will posted on the jobsite in the event of an actual hurricane. The map will be updated daily for the NOAA website.

HURRICANE PREPAREDNESS CHECKLIST

Resume Site Operations

Date/Time Resume Site Operations:_____

Action Items:

- ☐ Conduct a damage survey
- ☐ Notify all site personnel when to return to work
- ☐ Develop a prioritized recovery plan
- ☐ Inspect electrical equipment before re-energizing to detect and repair damage
- ☐ Provide bottled water for drinking until normal drinking water is deemed safe to drink
- ☐ Remove storm debris from site
- ☐ Notify Program Manager of the resumption of site activities

Resume Site Operations Action Items Complete:_____ Date:_____

Attachment 7
Accident Prevention Plan

SITE-SPECIFIC ACCIDENT PREVENTION PLAN
REMEDIAL/REMOVAL ACTION FOR SITE 28
NAVAL SUPPORT FACILITY, INDIAN HEAD
INDIAN HEAD, MARYLAND

Contract No. N62470-02-D-3260
Task Order No. 093

Prepared for:

NAVAL FACILITIES ENGINEERING COMMAND WASHINGTON
1314 Harwood Street, S.E.
Washington Navy Yard, DC 20374-5018

Prepared by:

Shaw Environmental, Inc.
500 East Main Street, Suite 1630
Norfolk, Virginia 23510

Project No. 126566

June 2007

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LIST OF ACRONYMS

AHA	Activity Hazard Analysis
ANSI	American National Standards Institute
APP	Accident Prevention Plan
ASTM	American Society for Testing and Materials
CD	Compact Disc
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
DoD	Department of Defense
EH&S	Environmental Health and Safety
EMR	Experience Modification Rate
EMS	Emergency Medical Services
HPP	Hurricane Preparedness Plan
HS	Health and Safety
HSM	Health and Safety Manager
NIOSH	National Institute for Safety and Health
OSHA	Occupational Safety and Health Administration
PM	Project Manager
PPE	Personal Protective Equipment
Shaw	Shaw Environmental, Inc.
SSHSP	Site Specific Health and Safety Plan
SS/SSO	Site Supervisor/Site Safety Officer
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard

1.0 BACKGROUND INFORMATION

The primary site tasks include the following:

- Mobilization and site setup
- Clearing and grubbing
- Waste characterization field sampling.
- Set up and maintenance of erosion and sediment controls
- Material excavation and hauling
- Material screening and load-out
- Site restoration
- Site breakdown and equipment decontamination

Activity Hazard Analyses (AHA) have been prepared for the above activities and are included in Attachment C of the Site Specific Health and Safety Plan (SSHSP).

Shaw Environmental, Inc. (Shaw) Accident Experience

YEAR	Experience Modification Rate (EMR) (Interstate)	OSHA Recordable Incident Rate
2006	0.52	0.83
2005	0.49	1.03
2004	0.50	1.07

CORPORATE POLICY

Subject: SAFETY

1.0 PURPOSE AND SUMMARY

It is the policy of Shaw to provide a safe and healthful workplace for all employees, subcontractors, and consultants in compliance with governmental requirements. Additionally, the requirements of our clients shall take precedence provided that their requirements exceed those of Shaw and governmental regulations.

We believe in two fundamental principles of safety: all accidents, injuries and occupational illnesses are preventable; and if an operation cannot be done safely, we will not do it. To put these principles into practice, every associate will receive the appropriate training, equipment, and other resources necessary to complete assigned tasks in a safe and efficient manner.

Safety, industrial hygiene and loss prevention are the direct responsibility of all members of management, who must create an environment in which everyone shares a concern for their own safety and the safety of their associates. Safety shall take precedence over expediency or short cuts. It is a condition of employment that all employees work safely and follow established safety rules and procedures. No individual(s) may pose a direct threat to the health and safety of other individuals in the workplace.

Managers must conduct their businesses in compliance with governmental safety regulations and company procedures. All Shaw health and safety procedures shall be implemented for all Shaw employees on all projects where Shaw is the subcontractor, or a joint venture partner. If Shaw is the prime contractor, Shaw procedures shall be applied to all Shaw and subcontractor personnel.

The implementation of effective safety and health practices is a key measure of managerial performance. Management, with the assistance of the internal health and safety professional staff, will conduct audits to assess the effectiveness of the safety program(s) in place, and to identify areas for improvement. All deficiencies shall be corrected promptly.

All injuries, occupational illnesses, vehicle accidents, and incidents with potential for injury or loss will be investigated. Appropriate corrective measures will be taken to prevent recurrence, and to continually improve the safety of our workplace.

3.0 RESPONSIBILITIES AND LINES OF AUTHORITY

Safety responsibilities, accountability and lines of authority are discussed in Section 2.0 of the SSHSP. The Project Manager (PM), Site Supervisor/Site Safety Officer (SS/SSO), and Health and Safety Manager (HSM) are responsible for formulating and enforcing health and safety requirements, and implementing the SSHSP.

4.0 SUBCONTRACTORS AND SUPPLIERS

Each subcontractor working on the project site will be required to adhere to the SSHSP and the requirements presented below.

4.1 SUBCONTRACTOR/SUPPLIER COORDINATION AND CONTROL

All subcontractors will be screened for safety performance and compliance with Federal Alcohol and Drug testing requirements prior to being issued any contract for site work. Subcontractors will comply with the requirements for site safety as outlined in Shaw's Health and Safety (HS) Procedure HS011 (Attachment B of the SSHSP). The SS/SSO will be responsible for the conduct and control of Shaw subcontractors.

4.2 SUBCONTRACTOR/SUPPLIER SAFETY RESPONSIBILITIES

All subcontractor employees are subject to the same training and medical surveillance requirements as Shaw personnel depending on job activity. All activities involving the potential for exposure to hazardous waste materials will require medical and training certification as mandated by 29 Code of Federal Regulations (CFR) 1910.120 and 29 CFR 1926.65. All subcontractor personnel will be required to sign in daily and be required to attend a daily meeting discussing operations and safety issues. All subcontractors involved in construction/remedial activities will complete a Subcontractor Pre-Job Safety Checklist prior to the start of work at the site. Subcontractors will submit AHAs for their work activities to the SS/SSO. The subcontractor reports directly to the Project Manager. All incidents involving subcontractor employees shall be reported to the SS/SSO and a copy of the subcontractor's injury/illness report shall be submitted to the SS/SSO within 24 hours.

Subcontractors are required to read and sign the SSHSP and comply with all requirements of this Accident Prevention Plan (APP). Contractors not in compliance will be immediately dismissed from the site.

Suppliers delivering various materials to the project site or providing equipment/ equipment maintenance will comply with all Naval Facility rules and regulations. Supplier personnel will not be permitted into contaminated areas unless training and medical surveillance is in accordance with 29 CFR 1910.120/1926.65. Contractors will not ride on tractors, forklifts or similar vehicles unless specific seats are provided. They will follow facility hot work rules if hot work is required for vehicle or equipment maintenance. Trucks will be loaded and unloaded in a safe and effective manner and materials will be stored safely in designated locations only. Associated packaging will be properly disposed of and litter will not permitted to be scattered or blown from truck beds. Operators of mobile equipment on site must observe all traffic rules such as speed limits and right-of-ways of pedestrians.

5.0 TRAINING

Outlines of the site safety orientation and training for site personnel, subcontractors and visitors are provided in Section 10.0 of the SSHSP.

5.1 MANDATORY TRAINING AND CERTIFICATIONS

Mandatory training and certifications are discussed in Section 10.0 of the SSHSP.

5.2 EMERGENCY RESPONSE TRAINING

All Shaw personnel who have completed the Shaw 40-hour HAZWOPER Training are qualified as emergency responders per 29 CFR 1910.120/1926.65 (e)(3)(iv). Site Specific Emergency Response Procedures will be reviewed with all site personnel as a part of site indoctrination.

5.3 SUPERVISORY AND EMPLOYEE SAFETY MEETINGS

The Shaw SS/SSO will conduct daily safety meetings at the start of each work shift for on-site personnel and will require subcontractors to follow similar meeting procedures or participate in the Shaw daily safety meetings. Daily safety meetings will comply with HS051 (Attachment B of the SSHSP).

6.0 HEALTH AND SAFETY INSPECTIONS

6.1 INSPECTIONS

The Shaw Project Manager and SS/SSO are required to conduct bi-monthly inspections of the sites using the Project Safety Inspection Report. The SS/SSO is responsible for conducting and preparing reports of daily safety inspections of work processes, site conditions, and equipment conditions and submitting them to HSM. The SS/SSO will discuss any necessary corrective actions with the SS/SSO and review new procedures. Copies of these reports are maintained on file at the project locations.

The Shaw HSM representative may periodically conduct site visits and perform Site Safety Assessments. These reports are kept on file at the Mt Arlington NJ, office and are tracked in a database for each Shaw Project Manager and SS/SSO, including the number of action items noted during the visit and written confirmation of the corrective actions for each item. These responses are compiled and provided to program management for review.

6.2 EXTERNAL INSPECTIONS/CERTIFICATIONS

Shaw does not anticipate, but may consider the use of outside sources, to provide safety inspections on an as necessary basis.

As required, safety equipment will comply with appropriate regulations of OSHA (Occupational Safety and Health Administration), NIOSH (National Institute for Occupational Safety and Health), ANSI (American National Standards Institute), ASTM (American Society for Testing and Materials), United States Coast Guard (USCG), or other recognized certification organizations.

7.0 SAFETY AND HEALTH EXPECTATIONS, INCENTIVE PROGRAMS, AND COMPLIANCE

Shaw considers safety the highest priority during work at a site containing potentially hazardous materials and has established a goal of **zero incidents** for all projects. All projects will be conducted in a manner that minimizes the probability of near misses, equipment/property damage or injury. Shaw will establish programs to recognize people and projects that demonstrate excellence in safety performance. Shaw will use safety observation programs to identify and correct unsafe acts and conditions. Safety awareness programs will be used to provide continuous training and development of good safety practices. Shaw site supervision will investigate all incidents to determine root causes and institute corrective actions to prevent recurrence. Shaw will provide and enforce safety rules to protect employees, subcontractors, clients and the public.

7.1 SHAW SAFETY INCENTIVE PROGRAMS:

A copy of the Shaw Safety Incentive Award Program will be available at each project. The Shaw Project Manager will develop a site-specific program for approval by the HSM and the LANTDIV program Manager within 10 days of project mobilization.

7.2 SHAW EMPLOYEE SAFETY RESPONSIBILITY REQUIREMENTS

Each employee is responsible for personal safety as well as the safety of others in the area and is expected to participate fully in the ***Safety Improvement Process***, particularly the Safety Observation Program. The employee will use all equipment provided in a safe and responsible manner as directed by the SS/SSO. All Shaw personnel will follow the policies set forth in the Shaw Health and Safety Procedures HS001-999 (Available on site on compact disc [CD]). Site personnel concerned with any aspect of health and safety shall bring it to the attention of the SS/SSO. If not satisfied, they should contact the HSM. All project personnel have the authority to stop work if in their judgement serious injury could result from continued activity. The SS/SSO shall be notified immediately if this becomes necessary. To protect the health and safety of all personnel, employees that knowingly disregard safety policies/procedures may be subject to disciplinary actions up to and including termination. Shaw Employee Safety Responsibility is fully detailed in HS010 Employee Safety and Health Work Rules (Attachment B of the SSHSP).

7.3 MANAGERS AND SUPERVISORS SAFETY ACCOUNTABILITY

It is the duty of the first line supervisor to motivate employees to adhere to Shaw's safety policy in each work situation. A first line supervisor for these purposes is defined as that person designated to give immediate on-site supervision to personnel involved in a task.

All supervisors shall have complete knowledge of the safe procedure for all jobs and tasks under their supervision, or when in doubt, shall seek assistance prior to initiating a task. This is the only acceptable manner in which to perform the task. If the task cannot be accomplished safely, it will not be attempted.

Supervisors will:

- Explain the safety procedure involved with a task to each employee and check frequently to see that the employee understands and works as instructed.
- Allocate sufficient time for the training and coaching of all employees to insure that everyone knows the correct procedure for safely accomplishing required tasks.
- Prevent new employees from performing any tasks until required training is completed.
- Immediately correct unsafe conditions that involved site employees or contractors.
- Ensure that the employees are outfitted with and wear personal protective equipment (PPE) as specified by this APP, SSHSP, other Shaw procedures or as directed by the HSM.
- Set a good safety example.
- Obtain the cooperation of employees and contractors.
- Provide a safe work environment for employees and contractors.
- Confirm contractor safety performance records have been verified prior to contract award and monitor contractor performance during operations.
- Report all accidents, near misses and property damage in accordance with the Incident Management and Reporting Procedure.
- Establish a safety culture, using the elements of the Shaw Safety Improvement process, which promotes awareness, encourages participation and recognizes excellence.

8.0 ACCIDENT REPORTING

8.1 EXPOSURE DATA (MAN-HOURS WORKED)

The Shaw's Environmental Health and Safety (EH&S) Manager tracks and maintains incident records as to Federal reporting requirement. Incident rates are reported monthly to the Shaw's EH&S Manager. Incident Rates and Workers Compensation losses are tracked for each business line.

8.2 ACCIDENT INVESTIGATIONS, REPORTS AND LOGS

The SS/SSO conducts accident/incident investigations. A report is completed by the SS/SSO and it must be submitted to the Shaw Baton Rouge, Louisiana Safety Department within 24 hours. All incident reporting forms are provided in HS020.

8.3 IMMEDIATE NOTIFICATION OF MAJOR INCIDENTS

Shaw will immediately notify the client of any major incident, including injury, fire, equipment/ property damage, and environmental incident. A full report will be provided within 24 hours. The following procedure will be followed in response to any major personal injury.

8.4 ACCIDENT 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 SS/SSO to alert him of a medical emergency situation. The work crew 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 injury, if known.

9.0 MEDICAL SUPPORT

On-site Medical Support/Off-site Medical Arrangements will be outlined in Section 9.0 of the SSHSP.

10.0 PERSONAL PROTECTIVE EQUIPMENT

Protection levels provided in the SSHSP will be established for the site work activities based on the levels of site contaminants and the scope of work. Once on-site, results of air monitoring and visual inspection of the work activities may indicate the need for changes in these PPE level(s). Any significant change in the PPE level will be approved by the SS/SSO in consultation with the CIH and/or HSM. PPE selection criteria are outlined in HS600 and HS601 (Attachment B of the SSHSP).

All personnel using respiratory protection will be cleared by a physician for use of a respirator and will be fit-tested to assure they can achieve an acceptable fit. Physician clearance and results of fit testing will be documented as required by HS100 (Attachment B of the SSHSP).

11.0 PLANS REQUIRED BY THE SAFETY MANUAL

11.1 HAZARD COMMUNICATION PROGRAM

The Site-Specific Hazard Communication Program is included Section 4.2 of the SSHSP. Shaw Hazard Communication Program complies with 29 CFR 1926.59/1910.1200 and is outlined in HS060 (Attachment B of the SSHSP).

11.2 EMERGENCY RESPONSE PLANS

The Emergency Response and Contingency Plan is included in Section 9.0 of the SSHSP.

11.3 LAYOUT PLANS

Work zones are defined in Section 5.0 of the SSHSP.

11.4 RESPIRATORY PROTECTION PLAN

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

The criteria for determining respirator need have been evaluated based on the site contaminants. Air monitoring will be conducted to confirm that respiratory protection levels are adequate. All respirator users will be OSHA trained in proper respirator use and maintenance. The SS/SSO will observe workers during respirator use for signs of stress. The SS/SSO, and HSM will also evaluate the implementation of the SSHSP, periodically, to determine its continued effectiveness with regard to respiratory protection. All persons assigned to use respirators will have medical clearance to do so.

11.5 CONTINGENCY PLAN FOR SEVERE WEATHER

Contingency plans for severe weather are included in Section 9.0 of SSHSP. A Hurricane Preparedness Plan (HPP) is located in Attachment G of the SSHSP.

11.6 ALCOHOL AND DRUG ABUSE PREVENTION PLAN

Shaw substance abuse procedures are outlined in Shaw HS101 - Drug, and Alcohol Testing.

12.0 CONTRACTOR INFORMATION TO MEET THE REQUIREMENTS OF THE MAJOR SECTIONS OF EM 385-1-1

In addition to this APP, Shaw has prepared a SSHSP to meet the major requirements of United States Army Corps of Engineers (USACE) Manual 385-1-1. Additional procedures for major requirements are provided in the Shaw Health and Safety Procedures Manual HS001-999 (Available on site on CD).

Attachment 8
Safety Plan Acknowledgement

WORKER ACKNOWLEDGEMENT TO HEALTH-AND-SAFETY PLAN

.

I have been informed of, and will abide by, the procedures set forth in the SSHSP developed for Indian Head. I have also been provided with an opportunity to read this SSHSP and the hazard communication program. I also have been properly trained, medically monitored, and fit tested for the work that I am to perform.

Name	**Date**

WORKER ACKNOWLEDGEMENT TO HEALTH-AND-SAFETY PLAN

.

I have been informed of, and will abide by, the procedures set forth in the SSHSP developed for Indian Head. I have also been provided with an opportunity to read this SSHSP and the hazard communication program. I also have been properly trained, medically monitored, and fit tested for the work that I am to perform.

Name	**Date**

WORKER ACKNOWLEDGEMENT TO HEALTH-AND-SAFETY PLAN

.

I have been informed of, and will abide by, the procedures set forth in the SSHSP developed for Indian Head. I have also been provided with an opportunity to read this SSHSP and the hazard communication program. I also have been properly trained, medically monitored, and fit tested for the work that I am to perform.

Name	**Date**

Attachment 9
OSHA 300 Log

OSHA's Form 300 (Rev. 01/2004)

Log of Work-Related Injuries and Illnesses

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

Year 2004

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

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

Form approved OMB no. 1218-0176

Establishment name Shaw Environmental & Infrastructure, Inc.

City _____ State _____

Identify the person		Describe the case					Classify the case											
							CHECK ONLY ONE box for each case based on the most serious outcome for that case:				Enter the number of days the injured or ill worker was:		Check the "injury" column or choose one type of illness:					
(A) Case No.	(B) Employee's Name	(C) Job Title (e.g., Welder)	(D) Date of injury or onset of illness (mo./day)	Business Line - Project/Site	(E) Where the event occurred (e.g. Loading dock north end)	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (e.g. Second degree burns on right forearm from acetylene torch)	Death	Days away from work	Remained at work		Away From Work (days)	On job transfer or restriction (days)	(M) Injury	Skin Disorder	Respiratory Condition	Poisoning	Hearing Loss	All other illnesses
									Job transfer or restriction	Other record-able cases								
							(G)	(H)	(I)	(J)	(K)	(L)	(1)	(2)	(3)	(4)	(5)	(6)
						Page totals	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

Be sure to transfer these totals to the Summary page (Form 300A) before you post it.

	Injury	Skin Disorder	Respiratory Condition	Poisoning	Hearing Loss	All other illnesses
	(1)	(2)	(3)	(4)	(5)	(6)

Public reporting burden for this collection of information is estimated to average 14 minutes per response, including time to review the instruction, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistics, Room N-3644, 200 Constitution Ave, NW, Washington, DC 20210. Do not send the completed forms to this office.

OSHA's Form 300A (Rev. 01/2004)

Summary of Work-Related Injuries and Illnesses

Year 2004

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

Form approved OMB no. 1218-0176

All establishments covered by Part 1904 must complete this Summary page, even if no injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete

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

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

Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
0	0	0	0
(G)	(H)	(I)	(J)

Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
0	0
(K)	(L)

Injury and Illness Types

Total number of… (M)			
(1) Injury	0	(4) Poisoning	0
(2) Skin Disorder	0	(5) Hearing Loss	0
(3) Respiratory Condition	0	(6) All Other Illnesses	0

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

Establishment information

Your establishment name

Street

City State Zip

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

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

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

Employment information

Annual average number of employees

Total hours worked by all employees last year

Sign here

Knowingly falsifying this document may result in a fine.

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

Company executive Title

Phone Date

Public reporting burden for this collection of information is estimated to average 50 minutes per response, including time to review the instruction, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistics, Room N-3644, 200 Constitution Ave, NW, Washington, DC 20210. Do not send the completed forms to this office.

OSHA's Form 301

Injuries and Illnesses Incident Report

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

U.S. Department of Labor

Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

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

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

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

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

Completed by

Title

Phone Date

Information about the employee

1) Full Name

2) Street

City State Zip

3) Date of birth

4) Date hired

5) ☐ Male
☐ Female

Information about the physician or other health care professional

6) Name of physician or other health care professional

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

Facility

Street

City State Zip

8) Was employee treated in an emergency room?
☐ Yes
☐ No

9) Was employee hospitalized overnight as an in-patient?
☐ Yes
☐ No

Information about the case

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

11) Date of injury or illness

12) Time employee began work AM/PM

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

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

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

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

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

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

Public reporting burden for this collection of information is estimated to average 22 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Persons are not required to respond to the collection of information unless it displays a current valid OMB control number. If you have any comments about this estimate or any other aspects of this data collection, including suggestions for reducing this burden, contact: US Department of Labor, OSHA Office of Statistics, Room N-3644, 200 Constitution Ave, NW, Washington, DC 20210. Do not send the completed forms to this office.

Attachment 10
Blood Borne Pathogens Exposure Control Plan

Blood-Borne Pathogen Exposure Control Plan

Blood-borne pathogens are microorganisms (i.e., bacteria, virus) sometimes present in blood and certain body fluids, which are capable of causing human disease or death. These pathogens can also be present on objects and surfaces that have had contact with infected blood or certain body fluids. Blood-borne pathogens are also capable of causing human disease or death to unprotected people who are exposed to infected blood or body fluids. Diseases caused by blood-borne pathogens include, but are not limited to, hepatitis A, hepatitis B, hepatitis C, malaria, acquired immunodeficiency syndrome (AIDS), and other sexually transmitted diseases. The most significant of these and of greatest concern are hepatitis B and AIDS.

Hepatitis B is a serious disease caused by the hepatitis B virus (HBV), which attacks the liver. The virus can cause lifelong infection, cirrhosis (scarring) of the liver, liver cancer, liver failure, and death. Exposure symptoms include fever, fatigue, nausea, vomiting, muscle aches, loss of appetite, and jaundice (yellowing of the eyes or skin). Hepatitis diagnosis is difficult because some symptoms are similar to the flu and may remain mild for an extended period. The HBV can remain infectious for up to 10 days, even in dried blood. Hepatitis B vaccine is available for all age groups to prevent HBV infection.

Human immunodeficiency virus (HIV) is the virus that causes AIDS. People with HIV have what is called HIV infection. Some of these people will develop AIDS because of their HIV infection. Humans may be infected with HIV for many years without experiencing any symptoms. Upon development of AIDS, symptoms may include weight loss, skin lesions, dry cough, fever, fatigue, diarrhea, swelling of the lymph glands, and death. Presently, no cure exists for HIV or AIDS, and no vaccination is currently available.

A hazard exists for blood and other bodily fluids to be infected with dangerous, infectious pathogens. Employees could become infected if they are exposed to these blood-borne pathogens.

The purpose of this Blood-borne Pathogen Exposure Control Plan is to provide the information, procedures, and requirements necessary to prevent employee exposure to blood-borne pathogens.

Regulatory, Requirement, and Policy Compliance

This Blood-borne Pathogen Exposure Control Plan has been prepared in compliance with:

- 29 CFR 1910.1030, Blood-borne Pathogens
- *EM 385-1-1, Safety and Health Requirements Manual* (USACE, 2003a), Section A.03.06
- Shaw E & I Procedure No. HS512

Exposure Determination

The OSHA requires employers to perform an exposure determination, identifying employees who may incur occupational exposure to blood or other potentially infectious materials. The exposure determination is made without regard to the use of PPE. For exposure determination purposes, employees are considered to be exposed, even if they wear PPE.

Activities at this project do not present a high risk of employee exposure to blood or other body fluids. An exception to this would be under circumstances when personnel administer first aid care or CPR to injured workers and when personnel clean-up areas and equipment that may have been exposed to blood because of the incident. In these cases, there is reasonable potential for employee skin, eye, mucous membrane, or potential contact with blood or other bodily fluids.

The OSHA requires a listing of job classifications with identification of tasks performed in which some employees may have potential for occupational exposure. This requirement is for employees to clearly understand the tasks that they may perform have a potential for occupational exposure to infectious materials. The job classifications and associated tasks with an exposure potential are as follows:

- Field Supervisor—Administer first aid or CPR; decontaminate or disinfect surfaces and articles that have contacted infectious materials, and prepare biohazard waste for temporary storage and subsequent disposal.

- Site Safety and Health Officer—Administer first aid or CPR; decontaminate or disinfect surfaces and articles that have contacted infectious materials, and prepare biohazard waste for temporary storage and subsequent disposal.

- Laborer—Administer first aid or CPR; decontaminate or disinfect surfaces and articles that have contacted infectious materials, and prepare biohazard waste for temporary storage and subsequent disposal.

These employees have potential for exposure to blood-borne pathogens when administering first aid or CPR and when performing post-accident clean-up operations due to the following:

- Contact or absorption of blood or blood-contaminated objects through open or broken skin (i.e., cuts, scratches, and rashes)
- Blood splashes to their eyes, nose, or mouth, or other mucous membranes
- Punctures through the skin with a contaminated sharp object (such as, scissors)

Workers can reduce their risk of contacting blood-borne pathogens by implementing the recommended work practices (outlined in this plan) before, during, and after responding to emergency medical incidents primarily involving personal injuries.

Schedule of Implementation

The procedures in this Blood-borne Pathogen Exposure Control Plan are to be implemented immediately.

Implementation includes:

- Verifying personnel who are available to voluntarily provide first aid care and CPR hold a valid training certificate from a reputable training provider (American Red Cross or American Heart Association).

  The SSHO is responsible for verifying that an appropriate number of personnel have been trained in and hold valid certification to perform first aid and CPR.

- Verifying that personnel voluntarily providing first aid care, CPR, post-accident clean-up operations, and biohazard waste handling have received the specialized training meeting the requirements of 29 CFR 1910.1030; *EM 385-1-1, Safety and Health Requirements Manual* (USACE, 2003a), Section A.03.06; and Shaw E & I Procedure No. HS512. This training is required for applicable personnel prior to the commencement of work and at least annually thereafter. This training shall cover the following elements:

  - Copy of 29 CFR 1910.1030 and this procedure including an explanation of the contents
  - General explanation of the epidemiology and symptoms of blood-borne diseases
  - Explanation of the modes of transmission of blood-borne pathogens

- Explanation of the appropriate methods for recognizing tasks and other activities that may involve exposure to blood and other potentially infectious materials

- Explanation of the use and limitations of practices that will prevent or reduce exposure including appropriate engineering controls, work practices, and PPE

- Information of the types, proper use, location, removal, handling, decontamination, and/or disposal of PPE

- Explanation of the basis for selection of PPE

- Information on the hepatitis B vaccine, including information on its efficacy, safety, and the benefits of being vaccinated

- Information on the appropriate actions to take and persons to contact in an emergency

- Explanation of the procedure to follow if an exposure incident occurs including the method of reporting the incident and the medical follow-up that will be made available

- Information on the medical counseling that is provided for exposed individuals

- Explanation of required signs and labels

The SSHO is responsible for verifying that this blood-borne pathogen training has occurred.

- Verifying that engineering controls are readily available at the project for use in an emergency. Engineering controls for this project include the following:

  - (5) Red-bags for temporary storage of contaminated PPE and cleaning materials

  - (1) Appropriately labeled, 30-gallon hard-plastic container for the temporary storage of red-bagged waste

  - (1) Whisk-broom and dust pan for cleaning up contaminated broken glass

  - (1) Gallon container of Clorox® household bleach

  - (1) Large utility sponge

- (2) Rolls of paper towels
- (1) Container of liquid disinfectant hand soap
- (10) “Biohazard” warning labels
- (10) Individually packaged disinfectant towelettes
- (2) CPR barriers

The SSHO is responsible for verifying that this inventory of engineering controls is readily available at the project site for emergency use.

- Verifying that the appropriate PPE for use in an emergency is readily available at the project site.

Personal protective equipment is necessary to prevent employee exposures to infectious materials. The necessary PPE, which shall be maintained separately for use in an emergency include the following:

- (Five) P-100 Particulate filtering face-piece respirator (3-M 8293 or equivalent)
- (Two) Face-shields with ratcheting head-suspension
- (Three-pair) Safety glasses with clear lens
- (Box of 100) Disposable nitrile examination gloves
- (Three-pair) PVC Monkey Grip work gloves
- (Four) Poly-coated or Saran-coated disposable Tyvek® coveralls with attached hood
- (Eight-pair) Vinyl or latex disposable boot covers
- (Eight) Fluid-resistant surgical hoods

The SSHO is responsible for verifying that the above inventory of PPE is readily available at the project site for emergency use.

Work Practice Controls

Work practice controls reduce the likelihood of exposure by altering the manner in which a task is performed. The work practice controls outlined in this section are applicable to the administration of first aid and the subsequent clean-up operations.

Work practice controls shall be instituted whenever there is potential for employee contact with blood and bodily fluid. Situational examples where these controls are to be implemented include, but are not limited to:

- The voluntary administration of first aid care, such as application of bandages to minor or major cuts and abrasions of another person. This care may allow for contact with sores, wounds, broken skin, blood, or other bodily fluids.
- The voluntary administration of first aid care, such as providing CPR.
- Clean-up activities involving handling soiled articles (e.g., gauze, bandages, compresses, etc.) and the decontamination or disinfecting of surfaces and articles that have contacted potentially infectious materials, such as blood or other bodily fluids.
- Prepare biohazard waste for temporary storage and subsequent disposal.

Based upon professional judgment, an employee may choose to temporarily forego the use of PPE if the employee determines that the use of the PPE will further jeopardize his well-being or that of the injured worker. This limited application must be carefully evaluated and considered by the employee. If this situation does occur, Shaw will investigate and document the circumstances in an effort to provide alternative means to avoid further occurrence.

The following are specific work practice controls that shall be implemented in the above noted situations or whenever an employee determines that the implementation of these work practices is prudent or necessary:

- The appropriate PPE shall be donned prior to engaging in any activities that have the potential for employee contact with potentially infectious materials, such as blood or other bodily fluids.
- Hands and face will be washed as soon as possible after engaging in any activities that have the potential for employee contact with potentially infectious materials, such as blood or other bodily fluids. If wash facilities are not readily available, individually packaged disinfectant towelettes may be used in the interim.
- Eating, drinking, or smoking is not allowed in any work area where a potential exists for occupational exposure to blood-borne pathogens.
- Open wounds or cuts shall be promptly bandaged.
- Work surfaces and areas shall be cleaned and disinfected immediately after being contacted by potentially infectious materials. A 10 percent bleach solution (one part bleach added to nine parts water) shall be applied and

allowed to have a contact time of 15 minutes. Non-disposable articles, equipment, or materials contaminated with potentially infectious materials shall be similarly cleaned/disinfected prior to reuse.

- All bins, pails, cans, and similar receptacles intended for reuse, which have become contaminated with blood or other potentially infectious materials shall be cleaned and disinfected immediately after use.

- Broken glassware, which may be contaminated, shall not be picked up directly by hand. Broken glass shall be picked-up using mechanical means, such as by using a whiskbroom and dustpan.

- All PPE shall be immediately removed upon leaving the potentially contaminated work area, or as soon as possible if visibly contaminated. The contaminated PPE shall be placed in a labeled "red-bag" and then placed in the 30-gallon container for temporary storage and subsequent disposal.

- Any clothing that has contacted blood or other potentially infectious fluids shall be removed as soon as possible.

- Any clothing that has contacted blood or infectious fluids shall be placed in a labeled "red-bag" and then placed in the 30-gallon container for temporary storage and subsequent disposal.

Universal Precautions

Universal precautions is a method of infection control, which operates on the assumption that all human blood and bodily fluids are to be treated as if they are known to be infectious for HIV, HBV, or other blood-borne pathogens. Universal precautions shall be observed to prevent contact with blood or other potentially infectious materials. Universal precautions consist of the following practices:

- All workers shall routinely use appropriate barrier precautions to prevent skin and mucous-membrane exposure when contact with blood or other bodily fluids is anticipated. Gloves should be worn for touching blood and bodily fluids, mucous membranes, or non-intact skin and for handling items or surfaces contaminated with blood or body fluids. Masks and protective eyewear or face shields shall be worn during procedures that are likely to generate droplets of blood or other body fluids to prevent exposure of mucous membranes of the mouth, nose, and eyes. Protective suits shall be worn during procedures that are likely to generate splashes of blood or other bodily fluids.

- Hands and other skin surfaces shall be washed immediately and thoroughly if contaminated with blood or other bodily fluids. Hands shall be washed immediately after gloves are removed, using a disinfectant soap.

- Cardiopulmonary resuscitation barriers or other ventilation devices should be available for use in areas in which the need for resuscitation is foreseeable.

- Workers who have exudative lesions or weeping dermatitis shall be excluded from handling potentially infectious materials until the condition resolves.

- Pregnant workers should be especially familiar with and strictly adhere to precautions to minimize the risk of transmission.

Personal Protective Equipment

The proper use of PPE is an effective work practice control. The following requirements for PPE are mandatory whenever there is potential for employee contact with blood and bodily fluid:

- Inspect PPE prior to use to verify it is in good working order and without defects.

- Blood or other potentially infectious materials.

- Disposable (single use) gloves, such as surgical or examination gloves shall be replaced when visibly soiled, torn, punctured, or when their ability to function as a barrier is compromised. Gloves should be changed as soon as possible after contact with blood or bodily fluids. After use, remove gloves from top to bottom inside out, not allowing unprotected skin to contact the exterior of the gloves. Hands and other skin surfaces shall be washed with disinfectant soap immediately after care has been rendered or clean up has been completed. Gloves reduce the incidence of blood contamination of hands, but they cannot prevent penetrating injuries caused by sharp objects. Do not reuse gloves once removed. A CPR barrier shall be used when administering CPR.

- Protection for the eyes, face, hands, body, feet, and against inhalation hazards shall be provided as appropriate for each job.

- Gloves shall be worn when employees have the potential for direct skin contact with or when handling items or surfaces soiled with blood, other potentially infectious materials, mucous membranes, and non-intact skin.

- Polyvinyl chloride work gloves may be disinfected for immediate reuse if the integrity of the glove is not compromised; however, gloves must be discarded if they are cracked, peeling, discolored, torn, punctured, or exhibit other signs of deterioration. All gloves shall be discarded at the conclusion of the activity or at the end of the shift – whichever comes first.

- Masks and eye protection or chin-length face shields shall be worn whenever splashes, spray, splatter, droplets, or aerosols of blood or other potentially infectious materials may be generated and there is a potential for eye, nose, or mouth contamination.

- Fluid-resistant clothing (e.g., coated Tyvek® suits) shall be worn if there is a potential for splashing or spraying of blood or potentially infectious materials. Coated Tyvek® coveralls shall also be worn during clean-up activities involving decontamination or disinfecting of surfaces and articles that have contacted potentially infectious materials, and when preparing biohazard waste for temporary storage and subsequent disposal.

- Fluid-resistant clothing (e.g., coated Tyvek® suits) shall be worn if there is a potential for clothing becoming soaked with blood or other potentially infectious materials.

- Surgical caps or hoods shall be worn if there is a potential for splashing or splattering of blood or potentially infectious materials on the head.

- Fluid-proof coverings shall be worn if there is a potential for shoes or boots to contact blood or other potentially infectious materials.

- Disposable nitrile or vinyl gloves shall be worn for touching blood and bodily fluids requiring universal precautions, mucous membranes, or non-intact skin and for handling items or surfaces soiled with blood or bodily fluids to which universal precautions apply.

Waste Handling

All wastes generated because of administering emergency first aid care and the subsequent clean-up activities shall be placed in red-bags, labeled as a biohazard, and kept separately from other trash. Wastes used in medical emergency treatment (i.e., gloves, towels, and gauze) shall also be bagged and stored in an identical manner. Red-bagged, biohazard waste shall be placed in the 30-gallon collection container, labeled, and secured for temporary storage and disposal. Additional containers shall be obtained as needed and containers shall not be overfilled.

Biohazard Waste Disposal

A Shaw Transportation and Disposal Coordinator shall be contacted to arrange for proper disposal of biohazard wastes. The waste shall remain secured on site in labeled container(s) until disposal arrangements have been made at an approved disposal facility. Disposal of the infectious waste container(s) shall be in accordance with applicable local, state, and federal regulations.

Medical Requirements

Employees receive medical evaluations in accordance with Shaw E & I Procedure No. HS100. The medical requirements of this exposure control plan include provisions for vaccinations to all exposed employees as well as for post-exposure procedures and evaluations. All employees with potential for occupational exposure to blood-borne

pathogens shall receive the hepatitis B vaccination and tetanus vaccination prior to workplace exposure, unless they read and sign a Hepatitis B and Tetanus Vaccination Declination form .

Hepatitis B Vaccination

All potentially exposed employees will have made available to them, at no cost, a hepatitis B vaccination. Recombivax or Accelerated Recombivax vaccines shall be utilized. If the employee has previously received the hepatitis B vaccination and/or antibody testing reveals that the employee is immune, a new vaccination is not required. Employees may be subjected to occupational exposure immediately after receiving the first shot in the hepatitis B vaccination series. Antibody testing shall be performed 30-days after completing the hepatitis B vaccination series. Employees unable to develop immunity shall be precluded from further occupational exposure. If a physician recommends a booster dose(s), the doses shall be provided according to standard recommendations for medical practice. The employee will also receive training as to the vaccine's efficacy, safety, benefits, and consequences prior to administration. The vaccination series may also be initiated within 24-hours of an incident with exposure potential.

Tetanus Vaccination

All employees subject to this policy shall maintain current status documentation of their tetanus vaccination [current status for tetanus vaccination is within five (5) years]. All potentially exposed employees shall be offered a tetanus vaccination at no cost.

Post-Exposure Procedures and Evaluation

All exposure incidents shall be reported as required by Shaw E & I Procedure No. HS020, "Accident Prevention Program: Reporting, Investigation and Review." The Corporate Medical Director shall be advised in addition to standard notification procedures.

Following a report of an exposure incident, each involved employee shall be offered a confidential medical evaluation and follow-up, which includes at least the following elements:

- Documentation of the route(s) of exposure.
- Hepatitis B virus and HIV antibody status of the source patient(s) (if known), and how the exposure occurred.
- The medical confidentiality rights of the source patient shall be preserved at all times.

- If the source patient can be determined and permission is obtained, collection of and testing of the source patient's blood to determine the presence of HIV or HBV infection shall be conducted under the direction of the attending physician.

- Collection of blood from the exposed employee as soon as possible after the exposure incident for the determination of HIV and/or HBV status. Actual core antibody and surface antigen testing of the blood or serum sample may be done at that time or later if the employee so requests. If the test is deferred, arrangements shall be made through the attending physician to properly archive the specimen.

- Follow-up of the exposed employee including antibody and antigen testing, counseling, illness reporting, and safe and effective post-exposure prophylaxis, according to standard recommendations for medical practice as defined by the Corporate Medical Director.

Where applicable laws require employee consent, documented consent shall be obtained prior to testing. If an employee refuses the blood test, documentation of the refusal will be made. Documentation of the test results shall be made available to the exposed employee(s). All test results shall be kept confidential.

Physician Information

The following information shall be provided to the evaluating physician:

- Copy of 29 CFR 1910.1030 and its appendices

- Description of the affected employee's duties as they relate to the employee's occupational exposure

Physician Opinion

For each potentially exposed employee evaluation, the employee shall receive a copy of the evaluating physician's written opinion within 15 working days of the completion of the evaluation. The written opinion shall be limited to the following information:

- The physician's recommended limitations upon the employee's ability to receive the hepatitis B vaccination.

- A statement that the employee has been informed of the results of the medical evaluation and that the employee has been told about any medical conditions resulting from exposure to blood or other potentially infectious materials, which require further evaluation or treatment.

- Specific findings or diagnoses, which are related to the employee's ability to receive the HBV vaccination. Any other findings and diagnoses shall remain confidential.

Hazard Communication

There are regulatory requirements for labels, signs, and training. The provisions and exceptions for these are contained in the subsections below.

Warning Labels

Containers used for disposal of blood-contaminated supplies and waste will be labeled in accordance with the word "biohazard." The following symbol shall be an integral part of the label:

Warning Signs

There are no designated areas for medical treatment on site, because first aid is provided on an emergency basis only; therefore, warning signs are not applicable. In cases of potential exposure, observers and nonessential personnel should be verbally warned to keep a safe distance from injured personnel.

Employee Training Program

All employees who are first aid/CPR trained and may provide assistance shall be trained in the requirements for voluntary providers as described in Shaw E & I Procedure No. HS512, this SSHSP and its addenda, and the general provisions of this procedure.

Recordkeeping

There are federal record-keeping requirements for training, medical, and incident reporting documentation. The provisions for keeping these records are contained in the subsections below.

Training Records

All employees covered under this exposure plan shall be trained as required. A record of the training shall be appropriately generated. The training record will contain the date of the training session(s), the contents or a summary of the training session(s), the names of

persons conducting the training, and the names of all persons attending the training sessions.

The training records will be maintained by the Shaw Training Department for at least five (5) years from the training date.

Medical Records

Medical records necessary for Shaw employees will include documentation of HBV vaccination status, medical follow-up, post-exposure testing, and a medical professional's written evaluation.

The employee medical records will be forwarded to and maintained by Health Resources, 600 West Cumming Park, Suite 3400, Woburn, Massachusetts 01801-6350 for inclusion in the employee's medical file. Confidentiality of all medical records shall be maintained.

Shaw Environmental, Inc. maintains employee medical records for the duration of the employee's employment plus 30 years thereafter. If, for whatever reason, Shaw no longer does business and no successor exists, Shaw will notify the director of NIOSH in writing three (3) months prior to the disposal of records. If so directed, the records shall be transferred to the director of NIOSH.

Incident Recording

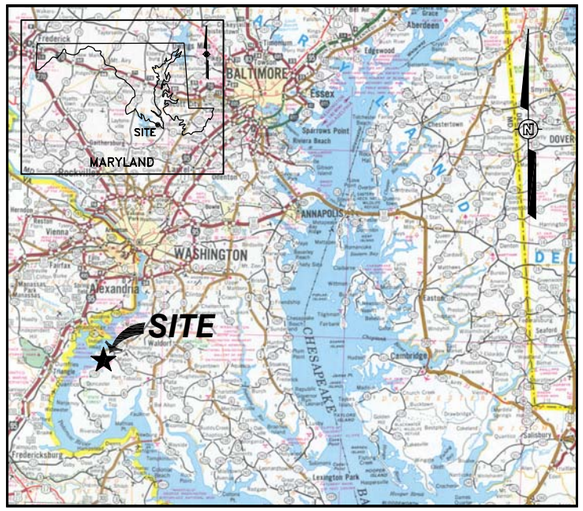
An incident that occurs because of rendering emergency medical care will be recorded on the OSHA 300 log as OSHA defines work-related injuries and illnesses. All injuries involving the release of blood or bodily fluids must be immediately reported to the Project CIH for proper reporting and follow-up.

Plan Review and Update

This Blood-borne Pathogen Exposure Control Plan shall be reviewed and updated on an annual basis.

APPENDIX C

Erosion and Sedimentation Control Plan

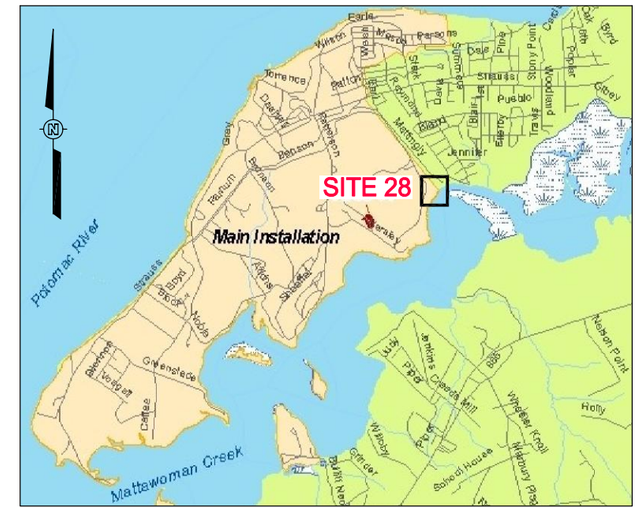


SITE LOCATION MAP

APPROXIMATE SCALE
0 12 24 MILES

INDEX OF DRAWINGS

SHAW DRAWING NUMBER	SHEET REFERENCE NUMBER	DESCRIPTION
126566-T1	T-1	TITLE SHEET
126566-D1	ES-1	PROJECT DESCRIPTION AND SEQUENCE OF CONSTRUCTION
126566-D6	ES-2	EXISTING SITE CONDITIONS
126566-D5	ES-3	EROSION AND SEDIMENT CONTROL FEATURES
126566-D2	ES-4	EROSION AND SEDIMENT CONTROL PLAN DETAILS
126566-D3	ES-5	EROSION AND SEDIMENT CONTROL PLAN NOTES
126566-D4	ES-6	VEGETATION STABILIZATION METHODS AND MATERIALS



SITE VICINITY MAP

SCALE
0 0.5 1 MILE

EROSION AND SEDIMENT CONTROL PLAN

LANTDIV CONTRACT NO. N62470-02-D-3260
SITE 28 - REMOVAL ACTION
INDIAN HEAD, MARYLAND

PREPARED FOR

NAVAL SUPPORT FACILITY INDIAN HEAD INDIAN HEAD, MARYLAND

OFFICE: Pittsburgh, PA
DRAWING NUMBER: 126566-T1

Image: 809401IM1.jpg
126566im2.jpg
NAVFAC Logo.jpg
Xref:

File: O:\CAD Standards\Shaw\Formats\Shaw Layouts-draft-ps.dwg
Plot Date/Time: Oct 04, 2007 - 1:53pm
Plotted By: bernadette.oconnor

REVISIONS

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

Shaw Environmental, Inc.

DESIGNED BY	D. Pringle	5/17/07	CHECKED BY S. Seger 5/24/07
DRAWN BY	B. Snyder	5/17/07	APPROVED BY S. Carriere 10/4/07

NAVFAC Naval Facilities Engineering Command
NAVFAC Headquarters

NAVAL SUPPORT FACILITY, INDIAN HEAD
SITE 28 - REMOVAL ACTION
INDIAN HEAD, MARYLAND
TITLE SHEET

SCALE: AS SHOWN
SIZE: B
DELIVERY ORDER NO. 093
CONSTR. CONTRACT NO. N62470-02-D-3260
NAVFAC DRAWING NO. --
SHEET I.D. T-1

PROJECT DESCRIPTION

THIS PROJECT IS BEING PERFORMED FOR THE DEPARTMENT OF THE NAVY, NAVAL FACILITIES ENGINEERING COMMAND (NAVFAC), WASHINGTON. THE PROJECT IS A REMOVAL ACTION AT SITE 28 UNDER THE INSTALLATION RESTORATION (IR) PROGRAM AT THE NAVAL SUPPORT FACILITY, INDIAN HEAD (NSF-IH), INDIAN HEAD, MARYLAND. NSF-IH IS A FACILITY OF THE NAVAL SUPPORT ACTIVITY SOUTH POTOMAC IN THE NAVAL DISTRICT WASHINGTON REGION.

NSF-IH IS LOCATED IN NORTHWESTERN CHARLES COUNTY, MARYLAND APPROXIMATELY 25 MILES SOUTHWEST OF WASHINGTON, D.C. AS SHOWN ON THE SITE LOCATION MAP AND THE SITE VICINITY MAP ON SHEET T-1, SITE 28 IS LOCATED IN THE MAIN INSTALLATION OF NSF-IH AND IS LOCATED ALONG THE NORTHEASTERN SHORE OF THE MATTAWOMAN CREEK.

SITE 28 WAS ALSO REFERRED TO AS THE "ORIGINAL NOS (NAVAL ORDNACE STATION) BURNING GROUND", THE "SLAVINS DOCK AREA", AND THE "WILDLIFE AREA". THIS SITE WAS SUBDIVIDED INTO TWO ZONES: A AND B. ZONE A WAS A FORMER ZINC RECOVERY FURNACE AND A FORMER BURNING CAGE. FROM 1928 TO THE EARLY 1950'S, THE ZINC RECOVERY FURNACE WAS IN OPERATION. THE LOCATION OF THE FORMER BURNING CAGE IS UNKNOWN. THE SITE CONTAINS APPROXIMATELY 2,419 CUBIC YARDS OF SOIL TO BE REMOVED FROM ZONE A. ZONE B IS SOUTH OF ZONE A AND IS REFERRED TO AS THE "ORIGINAL BURNING GROUND" AND THE "SHORELINE BURNING CAGE". NO REMEDIAL ACTION IS PLANNED FOR ZONE B.

THE PURPOSE OF THE REMOVAL ACTION IS TO EXCAVATE AND REMOVE IMPACTED SURFACE SOILS FROM SITE 28. VARIOUS EROSION AND SEDIMENT (E&S) CONTROL MEASURES WILL BE INSTALLED PRIOR TO REMOVAL ACTIVITIES IN ORDER TO MINIMIZE ANY THREAT TO THE ADJACENT WATERWAYS. E&S CONTROL PRACTICES FOR THE PROJECT INCLUDE THE INSTALLATION OF SUPER SILT FENCE, STABILIZED CONSTRUCTION ENTRANCE (SCE), SWALE, STONE CHECK DAM, RIP-RAP, EROSION CONTROL MATTING AND SEEDING AND MULCHING.

WASTE CHARACTERIZATION SAMPLING WILL BE CONDUCTED AT SITE 28 IMMEDIATELY AFTER THE KICKOFF MEETING IN ORDER TO DETERMINE TRANSPORTATION AND DISPOSAL ARRANGEMENTS BEFORE SOIL REMOVAL BEGINS. THE SOILS WILL BE CONSOLIDATED WITHIN THE LIMITS OF THE EXCAVATION AND STOCKPILED FOR LOADOUT. THE STOCKPILE WILL BE COVERED WITH PLASTIC SHEETING WHEN INACTIVE. THESE SOILS WILL BE LOADED OUT AND TRANSPORTED TO AN APPROVED OFF SITE DISPOSAL FACILITY. AS THE MATERIAL IS LOADED FOR TRANSPORTATION OFF SITE, THE TRUCKS WILL BE INSPECTED TO ENSURE THAT NO LOOSE SEDIMENT WILL BE DEPOSITED ON ROADS. THE DISTURBED AREAS WILL BE BACKFILLED, SEEDED, FERTILIZED, AND PLANTED WITH WETLAND PLANTS, ONCE THE IMPACTED SOIL IS REMOVED AND VERIFIED.

THE E&S CONTROLS WILL BE INSPECTED WEEKLY AND AFTER EACH RAIN EVENT, WITH THE EXCEPTION OF THE SCE, WHICH WILL BE INSPECTED DAILY. ANY NECESSARY MAINTENANCE WILL BE PERFORMED IMMEDIATELY. ALL OF THE TEMPORARY E&S CONTROLS WILL REMAIN IN PLACE UNTIL THE VEGETATION IS ESTABLISHED. ONCE THE VEGETATION IS ESTABLISHED WMA AND THE ROICC WILL BE NOTIFIED THAT A FINAL INSPECTION WILL BE PERFORMED PRIOR TO REMOVAL OF THE E&S CONTROLS.

SEQUENCE OF CONSTRUCTION

1. HOLD A PRE-CONSTRUCTION MEETING IN ACCORDANCE WITH NOTE 1 OF THE STANDARD EROSION AND SEDIMENT CONTROL PLAN NOTES.
2. CONDUCT WASTE CHARACTERIZATION SAMPLING ACTIVITIES.
3. MOBILIZE PERSONNEL AND EQUIPMENT TO THE SITE.
4. PERFORM SITE PREPARATION, EXCLUDING LAND-DISTURBANCE ACTIVITIES.
5. PERFORM LIMITED CLEARING ACTIVITIES TO GAIN ACCESS TO THE EROSION CONTROLS.
6. INSTALL THE FOLLOWING E&S FEATURES:
   - DIKE/SWALE ON THE NORTHEAST SIDE OF THE SITE PERIMETER WITH A STONE CHECK DAM AND A RIP-RAP APRON IN THE SOUTHEAST CORNER, ON THE CLEAR WATER SIDE, NEAR MATTAWOMAN CREEK.
   - TEMPORARY GABION OUTLET STRUCTURE ON THE DIRTY WATER SIDE OF THE DIKE/SWALE.
   - TEMPORARY GABION OUTLET STRUCTURE AT THE END OF SWALE 4 NEAR MATTAWOMAN CREEK.
   - SUPER SILT FENCE.
7. PERFORM CLEARING AND GRUBBING ACTIVITIES TO GAIN ACCESS TO THE IMPACTED SOILS.
8. INSTALL TEMPORARY 24-INCH PIPE SLOPE DRAIN FROM THE SOUTHERN END OF THE EXISTING 24-INCH CULVERT TO MATTAWOMAN CREEK. THEN INSTALL RIP-RAP APRON AT THE END OF THE PIPE NEAR MATTAWOMAN CREEK.
9. BEGIN THE REMOVAL ACTION STARTING IN THE LOWER PORTION OF THE SITE.
   - EXCAVATE THE MATERIAL FROM THE IMPACTED AREA AND CONSOLIDATE WITHIN THE EXCAVATION AREA.
   - SCREEN MATERIAL FOR POTENTIAL MPPEH.
   - LOAD THE WASTE INTO TRUCKS FOR TRANSPORTATION AND DISPOSAL OFF SITE.
10. CONDUCT CONFIRMATION SAMPLING (BY OTHERS).
11. REMOVE THE TEMPORARY GABION OUTLET STRUCTURE IN SWALE 4. RECONSTRUCT SWALE 4 (INCLUDING RIP-RAP APRON) BEGINNING AT MATTAWOMAN CREEK AND WORKING UPGRADE. INSTALL THE PROPOSED 24-INCH CULVERT, BEGINNING AT THE LOW END AND REMOVE THE EXISTING 24-INCH CULVERT.
12. BACKFILL AND REGRADE THE DISTURBED AREA AS NECESSARY. SEED, FERTILIZE, INSTALL TEMPORARY EROSIONAL CONTROL MATTING, AND MULCH.
13. REPLACE NATIVE WETLAND PLANTS IN DISTURBED WETLAND AREA.
14. DEMOBILIZE PERSONNEL AND EQUIPMENT WHEN APPROPRIATE.
15. ONCE THE VEGETATION IS ESTABLISHED, WMA AND THE ROICC WILL BE NOTIFIED THAT A FINAL INSPECTION WILL BE PERFORMED PRIOR TO REMOVAL OF THE E&S CONTROLS.
16. WITH PERMISSION OF THE MDE INSPECTOR, REMOVE TEMPORARY E & S CONTROLS AND STABILIZE THE RESULTING DISTURBED AREA.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

REVISIONS

Shaw™ Shaw Environmental, Inc.

DESIGNED BY	P. Ingersol	5/18/07	CHECKED BY S. Seger 5/24/07
DRAWN BY	B. Snyder	5/18/07	APPROVED BY S. Carriere 10/4/07

NAVFAC Naval Facilities Engineering Command www.navfac.navy.mil

NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND

SITE 28 - REMOVAL ACTION

PROJECT DESCRIPTION AND SEQUENCE OF CONSTRUCTION

SCALE: AS SHOWN SIZE: D

TASK ORDER NO. 093

CONSTR. CONTRACT NO. N62470-02-D-3260

NAVFAC DRAWING NO.

ES-1

OFFICE Pittsburgh, PA DRAWING NUMBER 126566-D1

Xref:

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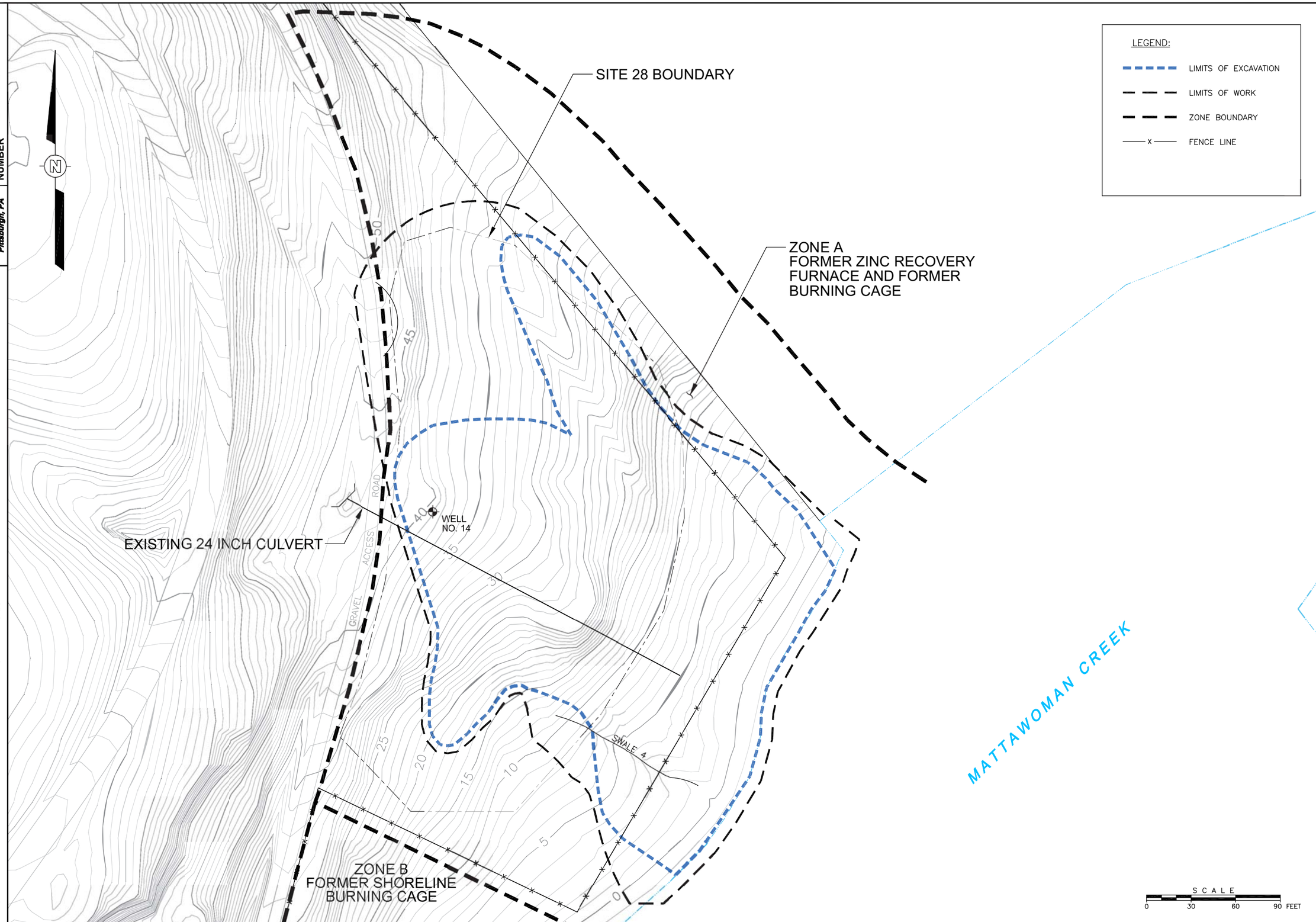
Plotted By: bernadette.oconnor



OFFICE: Pittsburgh, PA

DRAWING NUMBER: 126566-D6

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Plotted By: bernadette.oconnor

REVISIONS

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

Shaw Shaw Environmental, Inc.

DESIGNED BY	D. Pringle	5/18/07	CHECKED BY S. Sager 5/24/07
DRAWN BY	B. Snyder	5/18/07	APPROVED BY S. Carriere 10/4/07

NAVFAC Naval Facilities Engineering Command Washington

NAVAL SUPPORT FACILITY, INDIAN HEAD
SITE 28 - REMOVAL ACTION
INDIAN HEAD, MARYLAND

EXISTING SITE CONDITIONS

SCALE: AS SHOWN
SIZE: D
TASK ORDER NO. 093
CONSTR. CONTRACT NO. N62470-02-D-3260
NAVFAC DRAWING NO.

ES-2

OFFICE: Pittsburgh, PA
DRAWING NUMBER: 126566-D5

LEGEND:

- LIMITS OF EXCAVATION
- LIMITS OF DISTURBANCE
- ZONE BOUNDARY
- FENCE LINE
- SUPER SILT FENCE
- PERIMETER DIKE/SWALE
- STONE CHECK DAM
- PIPE SLOPE DRAIN

NOTE:

THE PROPOSED 24-INCH CULVERT WILL BE COMPLETELY COVERED WITH FINAL GRADING MATERIAL. NO PORTIONS OF THE CULVERT WILL BE EXPOSED AT THE SURFACE.

1 ES-04 PERIMETER DIKE/SWALE

ZONE A
FORMER ZINC RECOVERY FURNACE AND FORMER BURNING CAGE

5 ES-04 STONE CHECK DAM

3 ES-04 STABILIZED CONSTRUCTION ENTRANCE

TRUCK PULL-OFF

MATERIAL SCREENING AREA

INV.EL. 42.0±'

WELL NO. 14

EXISTING 24-INCH CULVERT

PROPOSED 24-INCH CULVERT (SEE NOTE)

SWALE 4

7 ES-04 EARTH DIKE/TEMPORARY GABION OUTLET STRUCTURE

2 ES-04 SUPER SILT FENCE

4 ES-04 24"Ø PIPE SLOPE DRAIN (TEMPORARY)

9 ES-04 PIPE EXTENSION THROUGH SUPER SILT FENCE

10 ES-04 RIP-RAP APRON

8 ES-04 TEMPORARY GABION OUTLET STRUCTURE (DURING WASTE REMOVAL)

10 ES-04 RIP-RAP APRON (FINAL RESTORATION)

6 ES-04 SWALE 4 MODIFICATION

ZONE B
FORMER SHORELINE BURNING CAGE

MATTAWOMAN CREEK

SCALE 0 30 60 90 FEET

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

REVISIONS

Shaw Environmental, Inc.

DESIGNED BY	P. Ingersol	5/18/07	5/24/07
DRAWN BY	B. Snyder	5/18/07	10/4/07
CHECKED BY	S. Seger		
APPROVED BY	S. Carriere		

NAVFAC Naval Facilities Engineering Command Washington

NAVAL SUPPORT FACILITY, INDIAN HEAD
INDIAN HEAD, MARYLAND
SITE 28 - REMOVAL ACTION
EROSION AND SEDIMENT CONTROL FEATURES

SCALE: AS SHOWN
SIZE: D
TASK ORDER NO. 093
CONSTR. CONTRACT NO. N62470-02-D-3260
NAVFAC DRAWING NO.

ES-3

Xref:
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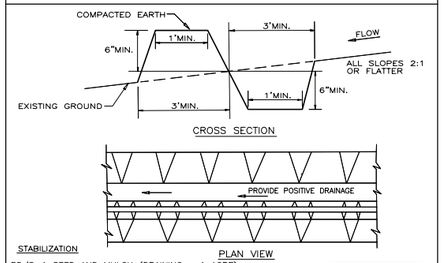
Plotted By: bernadette.ecomer

OFFICE Pittsburgh, PA | DRAWING NUMBER 126566-D2

DETAIL 3 - PERIMETER DIKE / SWALE



STABILIZATION

PD/S-1 SEED AND MULCH (DRAINING ≤ 1 ACRE)
PD/S-2 SEED AND COVER WITH SOIL STABILIZATION MATTING OR LINE WITH SOD (DRAINING BETWEEN 1 AND 2 ACRES)

STANDARD SYMBOL: PD/S-1

Construction Specifications

1. All perimeter dike/swales shall have an uninterrupted positive grade to an outlet. Spot elevations may be necessary for grades less than 1%.

2. Runoff diverted from a disturbed area shall be conveyed to a sediment trapping device.

3. Runoff diverted from an undisturbed area shall outlet into an undisturbed stabilized area at a non-erosive velocity.

4. The swale shall be excavated or shaped to line, grade, and cross-section as required to meet the criteria specified in the standard.

5. Fill shall be compacted by earth moving equipment.

6. Stabilization with seed and mulch or as specified of the area disturbed by the dike and swale shall be completed within 7 days upon removal.

7. Inspection and required maintenance shall be provided after each rain event.

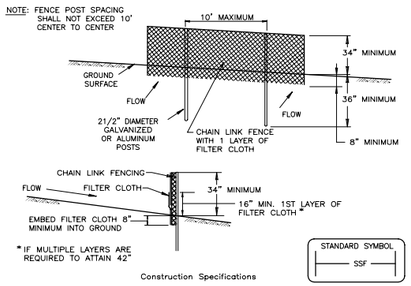
Note: The maximum drainage area for this practice is 2 acres.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE A - 3 - 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 1/ES-03
PERIMETER DIKE/SWALE
SCALE: N.T.S.

DETAIL 33 - SUPER SILT FENCE

NOTE: FENCE POST SPACING SHALL NOT EXCEED 10' CENTER TO CENTER



STANDARD SYMBOL: SSF

Construction Specifications

1. Fencing shall be 42" in height and constructed in accordance with the latest Maryland State Highway Details for Chain Link Fencing. The specification for a 6' fence shall be used, substituting 42" fabric and 6' length posts.

2. Chain link fence shall be fastened securely to the fence posts with wire ties. The lower tension wire, brace and truss rods, drive anchors and post caps are not required except on the ends of the fence.

3. Filter cloth shall be fastened securely to the chain link fence with ties spaced every 24" at the top and mid section.

4. Filter cloth shall be embedded a minimum of 8" into the ground.

5. When two sections of filter cloth adjoin each other, they shall be overlapped by 6" and folded.

6. Maintenance shall be performed as needed and silt buildups removed when "bulges" develop in the silt fence, or when silt reaches 50% of fence height

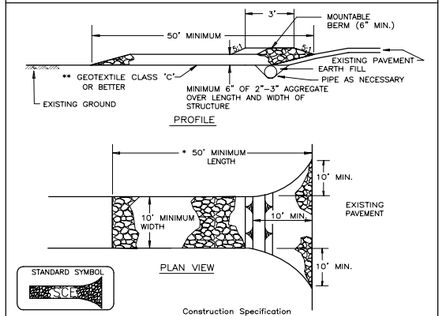
7. Filter cloth shall be fastened securely to each fence post with wire ties or staples at top and mid section and shall meet the following requirements for Geotextile Class F:

Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal/ft²/minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE H - 26 - 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 2/ES-03
SUPER SILT FENCE - STANDARD INSTALLATION
SCALE: N.T.S.

DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE



STANDARD SYMBOL: SCE

Construction Specification

1. Length – minimum of 50' (*30' for single residence lot).

2. Width – 10' minimum, should be flared at the existing road to provide a turning radius.

3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. **The plan approval authority may not require single family residences to use geotextile.

4. Stone – crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.

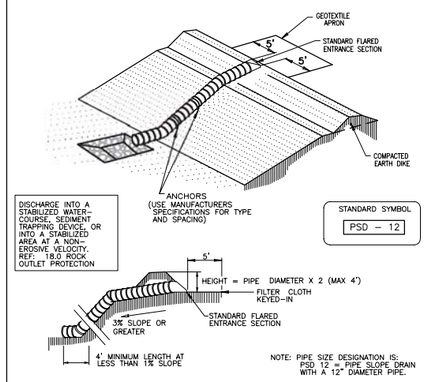
5. Surface Water – all surface water flowing to or diverted toward construction entrances shall be piped through the entrance, maintaining positive drainage. Pipe installed through the stabilized construction entrance shall be protected with a mountable berm with 5:1 slopes and a minimum of 6" of stone over the pipe. Pipe has to be sized according to the drainage. When the SCE is located at a high spot and has no drainage to convey a pipe will not be necessary. Pipe should be sized according to the amount of runoff to be conveyed. A 6" minimum will be required.

6. Location – A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE F - 17 - 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 3/ES-03
STABILIZED CONSTRUCTION ENTRANCE
SCALE: N.T.S

DETAIL 4 - PIPE SLOPE DRAIN



STANDARD SYMBOL: PSD – 12

NOTE: PIPE SIZE DESIGNATION IS: PSD 12 = PIPE SLOPE DRAIN WITH A 12" DIAMETER PIPE.

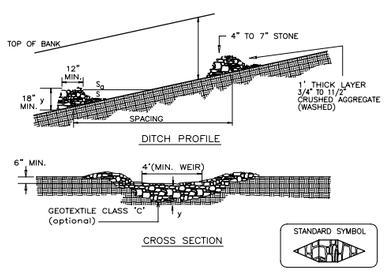
Table 6 Design Criteria for Pipe Slope Drain

Size	Pipe/Tubing Diameter (D) in	Maximum Drainage Area (Acres)
PSD-12	12	0.5
PSD-18	18	1.5
PSD-21	21	2.5
PSD-24	24	3.5
PSD-24 (2)	24	5.0

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE B - 5 - 4	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 4/ES-03
PIPE SLOPE DRAIN
SCALE: N.T.S

DETAIL 7 - STONE CHECK DAM



STANDARD SYMBOL: SCD

STANDARD STONE CHECK DAM DESIGN

SLOPE	SPACING
2% or less	80'
2.1% to 4%	40'
4.1% to 7%	25'
7.1% to 10%	15'
over 10%	use lined waterway design

Construction Specifications

1. Swales and ditches shall be prepared in accordance with the construction specifications described in Section A-2, Standards and Specifications for Temporary Swale.

2. The check dam shall be constructed of 4"-7" stone. The stone shall be placed so that it completely covers the width of the channel and keyed into the channel banks.

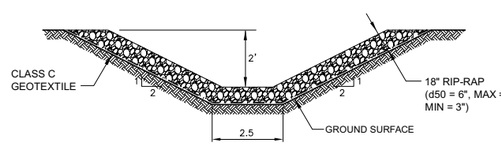
3. The top of the check dam shall be constructed so the the center is approximately 6" lower than the outer edges, forming a weir that water can flow across.

4. The maximum height of the check dam at the center shall not exced 2".

5. The upstream side of the check dam shall be lined with approximately 1" of 3/4" to 11/2" crushed aggregate.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE B - 8 - 5	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 5/ES-03
STONE CHECK DAM
SCALE: N.T.S

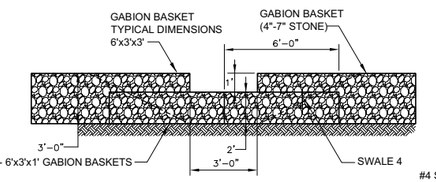


DETAIL 6/ES-03
SWALE 4 MODIFICATION
SCALE: N.T.S

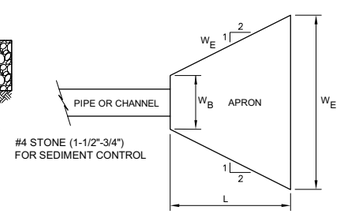
NOTES:

1. THE TEMPORARY GABION OUTLET STRUCTURE SHALL BE PLACED IN THE END OF SWALE 4 DURING THE WASTE REMOVAL OPERATION.

2. THE SUPER SILT FENCE ON EACH SIDE OF THE TEMPORARY GABION OUTLET STRUCTURE MUST BE TURNED, TO RUN ALONG THE TOP OF SWALE 4, DISTANCE OF 10 FEET.



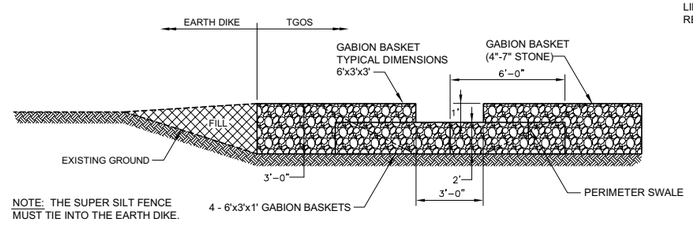
DETAIL 8/ES-03
TEMPORARY GABION OUTLET STRUCTURE (TGOS)
SCALE: N.T.S



	LENGTH (L)	BEGINNING WIDTH (W_B)	END WIDTH (W_E)	STONE (SEE NOTE)	THICKNESS
PIPE SLOPE DRAIN	23 FT.	4 FT.	25 FT.	d_{50}=9.5", d Max=15"	19 IN.
SWALE 4	15 FT.	5 FT.	18 FT.	d_{50}=9.5", d Max=15"	19 IN.

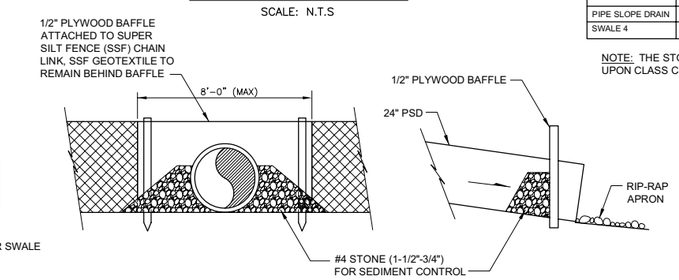
NOTE: THE STONE MUST BE PLACED UPON CLASS C GEOTEXTILE.

DETAIL 10/ES-03
RIP-RAP APRON
SCALE: N.T.S



NOTE: THE SUPER SILT FENCE MUST TIE INTO THE EARTH DIKE.

DETAIL 7/ES-03
EARTH DIKE/TEMPORARY GABION OUTLET STRUCTURE (TGOS) TRANSITION
SCALE: N.T.S



DETAIL 9/ES-03
PIPE EXTENSION THROUGH SUPER SILT FENCE
SCALE: N.T.S

LEGEND:

1/ES-04 — DETAIL IDENTIFICATION
SHEET WHERE DETAIL APPEARS
(–) INDICATES SAME SHEET

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

REVISIONS

DESIGNED BY P. Ingersol 5/18/07 | CHECKED BY S. Seger 5/24/07
DRAWN BY B. Snyder 5/18/07 | APPROVED BY S. Carriere 10/4/07

Shaw™ Shaw Environmental, Inc.

NAVFAC Naval Facilities Engineering Command Washington

NAVAL SUPPORT FACILITY, INDIAN HEAD — INDIAN HEAD, MARYLAND

SITE 28 - REMOVAL ACTION

EROSION AND SEDIMENT CONTROL PLAN DETAILS

SCALE: AS SHOWN | SIZE: D
TASK ORDER NO. 093
CONSTR. CONTRACT NO. N62470-02-D-3260
NAVFAC DRAWING NO.

ES-4

Xref:
Image: NAVFAC Logo.jpg

File: O:\Project\LANTDIV\Indian Head\126566\126566D2.dwg
Plot Date/Time: Oct 10, 2007 – 4:10pm
Plotted By: bernadette.ocomnor

EROSION AND SEDIMENT CONTROL PLAN NOTES

1. THE CONTRACTOR SHALL NOTIFY THE WATER MANAGEMENT ADMINISTRATION (WMA) AT (410) 537–3510 SEVEN (7) DAYS BEFORE COMMENCING ANY LAND DISTURBING ACTIVITY AND, UNLESS WAIVED BY WMA, SHALL BE REQUIRED TO HOLD A PRE–CONSTRUCTION MEETING BETWEEN PROJECT REPRESENTATIVES AND A REPRESENTATIVE OF WMA.

2. THE CONTRACTOR MUST NOTIFY WMA IN WRITING AND BY TELEPHONE AT THE FOLLOWING POINTS:
   A. THE REQUIRED PRE–CONSTRUCTION MEETING.
   B. FOLLOWING INSTALLATION OF SEDIMENT CONTROL MEASURES.
   C. CONSTRUCTION OF EACH STEP IS MANDATORY.
   D. PRIOR TO REMOVAL OR MODIFICATION OF ANY SEDIMENT CONTROL STRUCTURE(S).
   E. PRIOR TO REMOVAL OF ALL SEDIMENT CONTROL DEVICES.
   F. PRIOR TO FINAL ACCEPTANCE.

3. THE CONTRACTOR SHALL CONSTRUCT ALL EROSION AND SEDIMENT CONTROL MEASURES PER THE APPROVED PLAN AND CONSTRUCTION SEQUENCE AND SHALL HAVE THEM INSPECTED AND APPROVED BY THE ROICC INSPECTOR OR WMA INSPECTOR PRIOR TO BEGINNING ANY OTHER LAND DISTURBANCES. MINOR SEDIMENT CONTROL DEVICE LOCATION ADJUSTMENTS MAY BE MADE IN THE FIELD WITH THE APPROVAL OF THE WMA INSPECTOR. THE CONTRACTOR SHALL ENSURE THAT ALL RUNOFF FROM DISTURBED AREAS IS DIRECTED TO THE SEDIMENT CONTROL DEVICES AND SHALL NOT REMOVE ANY EROSION OR SEDIMENT CONTROL MEASURE WITHOUT PRIOR PERMISSION FROM THE WMA INSPECTOR AND ROICC INSPECTOR. THE CONTRACTOR MUST OBTAIN PRIOR ROICC AND WMA APPROVAL FOR CHANGES TO THE SEDIMENT CONTROL PLAN AND/OR SEQUENCE OF CONSTRUCTION.

4. THE CONTRACTOR SHALL PROTECT ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS TO PREVENT THE DEPOSITION OF MATERIALS ONTO PUBLIC ROADS. ALL MATERIALS DEPOSITED ONTO PUBLIC ROADS SHALL BE REMOVED IMMEDIATELY.

5. THE CONTRACTOR SHALL INSPECT DAILY AND MAINTAIN CONTINUOUSLY IN AN EFFECTIVE OPERATING CONDITION ALL EROSION AND SEDIMENT CONTROL MEASURES UNTIL SUCH TIME AS THEY ARE REMOVED WITH PRIOR PERMISSION FROM THE WMA INSPECTOR AND ROICC INSPECTOR.

6. ALL SEDIMENT BASINS, TRAP EMBANKMENTS AND SLOPES, PERIMETER DIKES, SWALES AND ALL DISTURBED SLOPES STEEPER OR EQUAL TO 3:1 SHALL BE STABILIZED WITH SOD OR SEED AND ANCHORED STRAW MULCH, OR OTHER APPROVED STABILIZATION MEASURES, AS SOON AS POSSIBLE BUT NO LATER THAN SEVEN (7) CALENDAR DAYS AFTER ESTABLISHMENT. ALL AREAS DISTURBED OUTSIDE OF THE PERIMETER SEDIMENT CONTROL SYSTEM MUST BE MINIMIZED. MAINTENANCE MUST BE PERFORMED AS NECESSARY TO ENSURE CONTINUED STABILIZATION. (REQUIREMENT FOR STABILIZATION MAY BE REDUCED TO THREE (3) DAYS FOR SENSITIVE AREAS).

7. THE CONTRACTOR SHALL APPLY SOD OR SEED AND ANCHORED STRAW MULCH, OR APPROVED STABILIZATION MEASURES TO ALL DISTURBED AREAS AND STOCKPILES WITHIN FOURTEEN (14) CALENDAR DAYS AFTER STRIPPING AND GRADING ACTIVITIES HAVE CEASED IN THE AREA. MAINTENANCE SHALL BE PERFORMED AS NECESSARY TO ENSURE CONTINUED STABILIZATION. (REQUIREMENT MAY BE REDUCED TO SEVEN (7) DAYS FOR SENSITIVE AREAS).

8. PRIOR TO REMOVAL OF SEDIMENT CONTROL MEASURES, THE CONTRACTOR SHALL STABILIZE AND HAVE ESTABLISHED PERMANENT STABILIZATION FOR ALL CONTRIBUTORY DISTURBED AREAS USING SOD OR AN APPROVED PERMANENT SEED MIXTURE WITH REQUIRED SOIL AMENDMENTS AND AN APPROVED MULCH. WOOD FIBER MULCH MAY ONLY BE USED IN SEEDING SEASON WHERE THE SLOPE DOES NOT EXCEED 10% AND GRADING HAS BEEN DONE TO PROMOTE SHEET FLOW DRAINAGE. AREAS BROUGHT TO FINISHED GRADE DURING THE SEEDING SEASON SHALL BE PERMANENTLY STABILIZED AS SOON AS POSSIBLE, BUT NO LATER THAN FOURTEEN (14) CALENDAR DAYS AFTER ESTABLISHMENT. WHEN PROPERTY IS BROUGHT TO FINISHED GRADE DURING THE MONTHS OF NOVEMBER THROUGH FEBRUARY, AND PERMANENT STABILIZATION IS FOUND TO BE IMPRACTICAL, TEMPORARY SEED AND STRAW MULCH SHALL BE APPLIED TO DISTURBED AREAS. THE FINAL PERMANENT STABILIZATION OF SUCH PROPERTY SHALL BE APPLIED BY MARCH 15 OR EARLIER IF GROUND AND WEATHER CONDITIONS ALLOW.

9. THE SITE'S APPROVAL LETTER, APPROVED EROSION AND SEDIMENT CONTROL PLANS, DAILY LOG BOOKS AND TEST REPORTS SHALL BE AVAILABLE AT THE SITE FOR INSPECTION BY DULY AUTHORIZED OFFICIALS OF WMA AND ROICC RESPONSIBLE FOR PROJECT.

10. SURFACE DRAINAGE FLOWS OVER UNSTABILIZED CUT AND FILL SLOPES SHALL BE CONTROLLED BY EITHER PREVENTING DRAINAGE FLOWS FROM TRAVERSING THE SLOPES OR BY INSTALLING PROTECTIVE DEVICES TO LOWER THE WATER DOWNSLOPE WITHOUT CAUSING EROSION. DIKES SHALL BE INSTALLED AND MAINTAINED AT THE TOP OF CUT OR FILL SLOPES UNTIL THE SLOPES AND DRAINAGE AREAS TO THEM ARE FULLY STABILIZED, AT WHICH TIME THEY MUST BE REMOVED AND FINAL GRADING DONE TO PROMOTE SHEET FLOW DRAINAGE. PROTECTIVE METHODS MUST BE PROVIDED AT POINTS OF CONCENTRATED FLOW WHERE EROSION IS LIKELY TO OCCUR.

11. PERMANENT SWALES OR OTHER POINTS OF CONCENTRATED WATER FLOW SHALL BE STABILIZED WITH SOD OR SEED WITH AN APPROVED EROSION CONTROL MATTING, RIPRAP OR BY OTHER APPROVED STABILIZATION MEASURES.

12. TEMPORARY SEDIMENT CONTROL DEVICES MAY BE REMOVED, WITH PERMISSION OF WMA INSPECTOR AND ROICC INSPECTORS, WITHIN THIRTY (30) CALENDAR DAYS FOLLOWING ESTABLISHMENT OF PERMANENT STABILIZATION IN ALL CONTRIBUTORY DRAINAGE AREAS. STORMWATER MANAGEMENT STRUCTURE USED TEMPORARILY FOR SEDIMENT CONTROL SHALL BE CONVERTED TO THEIR PERMANENT CONFIGURATION WITHIN THIS TIME PERIOD AS WELL.

13. NO PERMANENT CUT OR FILL SLOPE WITH A GRADIENT STEEPER THAN 3:1 WILL BE PERMITTED IN LAWN MAINTENANCE AREAS. A SLOPE GRADIENT OF UP TO 2:1 WILL BE PERMITTED IN NON–MAINTENANCE AREAS PROVIDED THAT THOSE AREAS ARE INDICATED ON THE EROSION AND SEDIMENT CONTROL PLAN WITH A LOW–MAINTENANCE GROUND COVER SPECIFIED FOR PERMANENT STABILIZATION. SLOPE GRADIENT STEEPER THAN 2:1 WILL NOT BE PERMITTED WITH VEGETATIVE STABILIZATION.

14. FOR FINISHED GRADING, THE CONTRACTOR SHALL PROVIDE ADEQUATE GRADIENTS SO AS TO PREVENT WATER FROM STANDING ON THE SURFACE MORE THAN TWENTY–FOUR (24) HOURS AFTER THE END OF A RAINFALL EXCEPT IN DESIGNATED DRAINAGE COURSES AND SWALE FLOW AREAS WHICH MAY DRAIN AS LONG AS FORTY–EIGHT (48) HOURS AFTER THE END OF A RAINFALL. AREAS DESIGNED TO HAVE STANDING WATER SHALL NOT BE REQUIRED TO MEET THIS REQUIREMENT.

15. SEDIMENT TRAPS OR BASINS ARE NOT PERMITTED WITHIN 20 FEET OF A FOUNDATION WHICH IS EXISTING OR UNDER CONSTRUCTION. NO STRUCTURE MAY BE CONSTRUCTED WITHIN 20 FEET OF AN ACTIVE SEDIMENT TRAP OR BASIN.

16. THE WMA INSPECTOR HAS THE OPTION OF REQUIRING ADDITIONAL SAFETY OR SEDIMENT CONTROL MEASURES, IF DEEMED NECESSARY.

17. ALL TRAP DEPTH DIMENSIONS ARE RELATIVE TO THE OUTLET ELEVATION. ALL TRAPS MUST HAVE A STABLE OUTFALL. ALL TRAPS AND BASINS SHALL HAVE STABLE INFLOW POINTS.

18. VEGETATIVE STABILIZATION SHALL BE PERFORMED IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL. REFER TO APPROPRIATE SPECIFICATIONS FOR TEMPORARY SEEDING, PERMANENT SEEDING, MULCHING, SODDING AND GROUND COVERS.

19. TEMPORARY SEDIMENT TRAP(S) SHALL BE CLEANED OUT AND RESTORED TO THE ORIGINAL DIMENSIONS WHEN SEDIMENT HAS ACCUMULATED TO A POINT ONE HALF (1/2) THE DEPTH BETWEEN THE OUTLET CREST AND THE BOTTOM OF THE TRAP. SEDIMENT BASINS SHALL BE CLEANED OUT AND RESTORED TO THE ORIGINAL DIMENSIONS WHEN SEDIMENT HAS ACCUMULATED TO ONE HALF (1/2) THE DEPTH BETWEEN THE DEWATERING ELEVATION AND THE BOTTOM OF THE BASIN.

20. SEDIMENT REMOVED FROM TRAPS (AND BASINS) SHALL BE PLACED AND STABILIZED IN APPROVED AREAS, BUT NOT WITHIN A FLOODPLAIN, WETLAND OR TREE–SAVE AREA. WHEN PUMPING SEDIMENT LADEN WATER, THE DISCHARGE MUST BE DIRECTED TO A SEDIMENT TRAPPING DEVICE PRIOR TO RELEASE FROM THE SITE. A SUMP PIT MAY BE USED IF SEDIMENT TRAPS THEMSELVES ARE BEING PUMPED OUT.

21. WHERE DEEMED APPROPRIATE BY THE ENGINEER OR INSPECTOR, SEDIMENT BASINS AND TRAPS MAY NEED TO BE SURROUNDED WITH AN APPROVED SAFETY FENCE. THE FENCE MUST CONFORM TO LOCAL ORDINANCES AND REGULATIONS. THE DEVELOPER OR OWNER SHALL CHECK WITH LOCAL BUILDING OFFICIALS ON APPLICABLE SAFETY REQUIREMENTS. WHERE SAFETY FENCE IS DEEMED APPROPRIATE AND LOCAL ORDINANCES DO NOT SPECIFY FENCING SIZES AND TYPES, THE FOLLOWING SHALL BE USED AS A MINIMUM STANDARD. THE SAFETY FENCE MUST BE MADE OF WELDED WIRE AND AT LEAST 42 INCHES HIGH, HAVE POSTS SPACED NO FARTHER APART THAN 8 FEET, HAVE MESH OPENINGS NO GREATER THAN 2 INCHES IN WIDTH AND 4 INCHES IN HEIGHT WITH A MINIMUM OF 14 GAUGE WIRE. SAFETY FENCE MUST BE MAINTAINED AND IN GOOD CONDITION AT ALL TIMES.

22. SEDIMENT CONTROL FOR UTILITY CONSTRUCTION FOR AREAS OUTSIDE OF DESIGNED CONTROLS OR AS DIRECTED BY ENGINEER, WMA INSPECTOR, OR THE ROICC: (NOT APPLICABLE)
   (A) CALL "MISS UTILITY" AT 1–800–257–7777 48 HOURS PRIOR TO THE START OF WORK
   (B) EXCAVATED TRENCH MATERIAL SHALL BE PLACED ON THE HIGH SIDE OF THE TRENCH.
   (C) TRENCHES FOR UTILITY INSTALLATION SHALL BE BACKFILLED, COMPACTED AND STABILIZED AT THE END OF EACH WORK DAY. NO MORE TRENCH SHALL BE OPENED THAN CAN BE COMPLETED THE SAME DAY, UNLESS,
   (D) TEMPORARY SILT FENCE SHALL BE PLACED IMMEDIATELY DOWNSTREAM OF ANY DISTURBED AREA INTENDED TO REMAIN DISTURBED FOR MORE THAN ONE DAY.

23. OFF–SITE SPOIL OR BORROW AREAS ON STATE OR FEDERAL PROPERTY MUST HAVE PRIOR APPROVAL BY WMA AND OTHER APPLICABLE STATE, FEDERAL AND LOCAL AGENCIES, OTHERWISE, APPROVAL MUST BE GRANTED BY THE LOCAL AUTHORITIES. ALL WASTE AND BORROW AREAS OFF SITE MUST BE PROTECTED BY SEDIMENT CONTROL MEASURES AND STABILIZED.

24. FOR SITES WHERE INFILTRATION DEVICES ARE USED FOR THE CONTROL OF STORMWATER, EXTREME CARE MUST BE TAKEN TO PREVENT RUNOFF FROM UNSTABILIZED AREAS FROM ENTERING THE STRUCTURE DURING CONSTRUCTION. SEDIMENT CONTROL DEVICES PLACED IN INFILTRATION AREAS MUST HAVE BOTTOM ELEVATIONS AT LEAST TWO (2) FEET HIGHER THAN THE FINISH GRADE BOTTOM ELEVATION OF THE INFILTRATION PRACTICE. WHEN CONVERTING A SEDIMENT TRAP TO AN INFILTRATION DEVICE, ALL ACCUMULATED SEDIMENT MUST BE REMOVED AND DISPOSED OF PRIOR TO FINAL GRADING OF INFILTRATION DEVICE.

25. WHEN A STORM DRAIN SYSTEM OUTFALL IS DIRECTED TO A SEDIMENT TRAP OR SEDIMENT BASIN AND THE SYSTEM IS TO BE USED FOR TEMPORARILY CONVEYING SEDIMENT LADEN WATER, ALL STORM DRAIN INLETS IN NON–SUMP AREAS SHALL HAVE TEMPORARY ASPHALT BERMS CONSTRUCTED AT THE TIME OF BASE PAVING TO DIRECT GUTTER FLOW INTO THE INLETS TO AVOID SURCHARGING AND OVERFLOW OF INLETS IN SUMP AREAS.

26. SITE INFORMATION:

TOTAL AREA OF FACILITY (BASE, CAMPUS, PARK, ETC.)	6,500	ACRES
TOTAL AREA OF PROJECT SITE	1.7	ACRES
AREA DISTURBED	1.46	ACRES
AREA TO BE ROOFED OR PAVED	0	ACRES
TOTAL CUT	2,419	CUBIC YARDS
TOTAL FILL	3,562	CUBIC YARDS
OFFSITE WASTE/BORROW AREA LOCATION	TBD	

27. ALL WATER REMOVED FROM EXCAVATED AREAS (e.g. UTILITY TRENCHES) SHALL BE PASSED THROUGH AN MDE APPROVED DEWATERING PRACTICE OR PUMPED TO A SEDIMENT TRAP OR BASIN PRIOR TO DISCHARGE FROM THE SITE (i.e, VIA A FUNCTIONAL STORM DRAIN SYSTEM OR STABLE GROUND SURFACE).

STANDARD STABILIZATION NOTE:

FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE. PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN 7 CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES GREATER THAN THREE HORIZONTAL TO ONE VERTICAL (3H:1V); AND 14 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.

DESIGN CERTIFICATION:

"I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH THE 1994 STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL OR CURRENT REVISIONS OF THEREOF, AND DEPARTMENT OF THE ENVIRONMENT STORMWATER MANAGEMENT REGULATIONS."

NOTE: APPROVED FULL SIZED, STAMPED ORIGINAL IS AVAILABLE ONSITE FOR DURATION OF THE PROJECT

DATE

MD. REGISTRATION NO. P.E.

OWNER'S/DEVELOPER'S CERTIFICATION:

"I/WE HEREBY CERTIFY THAT ALL CLEARING, GRADING, CONSTRUCTION, AND/OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS PLAN AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT – APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I HEREBY AUTHORIZE THE RIGHT OF ENTRY FOR PERIODIC ON–SITE EVALUATION BY STATE OF MARYLAND DEPARTMENT OF THE ENVIRONMENT COMPLIANCE INSPECTORS."

SIGNED REPLICATIONS AVAILABLE UPON REQUEST

DATE OWNER/DEVELOPER SIGNATURE

CARD NO. PRINTED NAME AND TITLE

WARNING ! EROSION AND SEDIMENT CONTROL WILL BE STRICTLY ENFORCED ! ! !

OFFICE Pittsburgh, PA | DRAWING NUMBER 126566-D3

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Plot Date/Time: Oct 04, 2007 – 1:59pm
Plotted By: bernadette.oconnor

REVISIONS

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

Shaw Environmental, Inc.

DESIGNED BY	D. Pringle	5/18/07	CHECKED BY	S. Sager	5/24/07
DRAWN BY	B. Snyder	5/18/07	APPROVED BY	S. Carriere	5/25/07

NAVFAC Naval Facilities Engineering Command www.navfac.navy.mil

NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND

SITE 28 - REMOVAL ACTION

EROSION AND SEDIMENT CONTROL PLAN NOTES

SCALE:	SIZE:
AS SHOWN	D

TASK ORDER NO. 093

CONSTR. CONTRACT NO. N62470–02–D–3260

NAVFAC DRAWING NO.

ES-5

VEGETATION STABILIZATION METHODS AND MATERIALS

SECTION 1 – PREPARATIONS FOR SEEDING

A. GENERAL SITE PREPARATION

1. INSTALL EROSION AND SEDIMENT CONTROL STRUCTURES IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.
2. PERFORM GRADING OPERATIONS AT RIGHT ANGLES TO THE SLOPE TO THE EXTENT POSSIBLE. FINAL GRADING AND SHAPING IS NOT USUALLY NECESSARY FOR TEMPORARY SEEDING.
3. SCHEDULE REQUIRED SOIL TESTS TO DETERMINE SOIL AMENDMENT COMPOSITION AND APPLICATION RATES FOR SITES HAVING DISTURBED AREA OVER 5 ACRES.

B. SOIL AMENDMENTS (FERTILIZER AND LIME SPECIFICATIONS)

1. SOIL TESTS MUST BE PERFORMED TO DETERMINE THE EXACT RATIOS AND APPLICATION RATES FOR BOTH LIME AND FERTILIZER ON SITES HAVING DISTURBED AREAS OVER 5 ACRES. SOIL ANALYSIS MAY BE PERFORMED BY THE UNIVERSITY OF MARYLAND OR A RECOGNIZED COMMERCIAL LABORATORY. SOIL SAMPLES TAKEN FOR ENGINEERING PURPOSES MAY ALSO BE USED FOR CHEMICAL ANALYSIS.
2. FERTILIZERS SHALL BE UNIFORM IN COMPOSITION, FREE FLOWING, AND SUITABLE FOR ACCURATE APPLICATION BY APPROVED EQUIPMENT. FERTILIZERS SHALL BE DELIVERED TO THE SITE, FULLY LABELED ACCORDING TO APPLICABLE STATE FERTILIZER LAWS AND SHALL BEAR THE NAME, TRADE NAME OR TRADEMARK, AND WARRANTY OF THE PRODUCER.
3. LIME MATERIALS SHALL BE GROUND LIMESTONE (HYDRATED OR BURNT LIME MAY BE SUBSTITUTED) WHICH CONTAINS AT LEAST 50% TOTAL OXIDES (CALCIUM OXIDE PLUS MAGNESIUM OXIDE). LIMESTONE SHALL BE GROUND TO SUCH FINENESS THAT AT LEAST 50% WILL PASS THROUGH A #100 MESH SIEVE, AND 98 TO 100% WILL PASS THROUGH A #20 MESH SIEVE.
4. INCORPORATE LIME AND FERTILIZER INTO TOP 3–5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.

C. SEEDBED PREPARATION

1. TEMPORARY SEEDING
   a. SEEDBED PREPARATION SHALL CONSIST OF LOOSENING SOIL TO A DEPTH OF 3 INCHES TO 5 INCHES BY MEANS OF SUITABLE AGRICULTURAL OR CONSTRUCTION EQUIPMENT, SUCH AS DISC HARROWS, CHISEL PLOWS, OR RIPPERS MOUNTED ON CONSTRUCTION EQUIPMENT. AFTER THE SOIL IS LOOSENED, IT SHOULD NOT BE ROLLED OR DRAGGED SMOOTH, BUT LEFT IN THE ROUGHENED CONDITION. PLACED TOPSOIL OR SLOPED AREAS (GREATER THAN 3:1) SHOULD BE TRACKED BY A DOZER LEAVING THE SURFACE IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE.
   b. APPLY FERTILIZER AND LIME AS PRESCRIBED IN SECTION 3, AND INCORPORATE INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
2. PERMANENT SEEDING
   a. MINIMUM TOPSOIL CONDITIONS REQUIRED FOR PERMANENT VEGETATIVE ESTABLISHMENT:
      1. SOIL pH SHALL BE BETWEEN 6.0 AND 8.0
      2. SOLUBLE SALTS SHALL BE LESS THAN 500 PARTS PER MILLION (PPM).
      3. THE SOIL SHALL CONTAIN LESS THAN 40% CLAY, BUT ENOUGH FINE GRAINED MATERIAL (>30% SILT PLUS CLAY) TO PROVIDE THE CAPACITY TO HOLD A MODERATE AMOUNT OF MOISTURE.
      4. SOIL SHALL CONTAIN 1.5% MINIMUM ORGANIC MATTER BY WEIGHT.
      5. SOIL MUST CONTAIN SUFFICIENT PORE SPACE TO PERMIT ADEQUATE ROOT PENETRATION.
      6. IF THESE CONDITIONS CANNOT BE MET BY SOILS ON SITE, ADDING TOPSOIL IS REQUIRED IN ACCORDANCE WITH SECTION 21 "STANDARD AND SPECIFICATION FOR TOPSOIL" OF THE 1994 MD STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT.
   b. AREAS PREVIOUSLY GRADED IN CONFORMANCE WITH THE DESIGN DRAWINGS SHALL BE SCARIFIED OR OTHERWISE LOOSENED TO A DEPTH OF 3 TO 5 INCHES PRIOR TO PLACEMENT OF TOPSOIL.
   c. APPLY FERTILIZER AND LIME AS PRESCRIBED IN SECTION 4 AND MIX SOIL AMENDMENTS INTO THE TOP 3–5 INCHES OF TOPSOIL BY DISKING OR OTHER SUITABLE MEANS.
   d. REMOVE LARGE OBJECTS LIKE STONES AND BRANCHES, AND READY THE AREA FOR SEED APPLICATION. WHERE SITE CONDITIONS WILL NOT PERMIT NORMAL SEEDBED PREPARATION, LOOSEN SURFACE SOIL BY DRAGGING WITH A HEAVY CHAIN OR OTHER EQUIPMENT TO ROUGHEN THE SURFACE. STEEP SLOPES (STEEPER THAN 3:1) SHOULD BE TRACKED BY A DOZER LEAVING THE SOIL IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE. THE TOP 1 –3 INCHES OF SOIL SHOULD BE LOOSE AND FRIABLE. SEEDBED LOOSENING MAY NOT BE NECESSARY ON NEWLY DISTURBED AREAS.

SECTION 2 – SEED AND MULCH SPECIFICATIONS

A. SEED SPECIFICATIONS

1. ALL SEED MUST MEET THE REQUIREMENTS OF THE MARYLAND STATE SEED LAW. ALL SEED SHALL BE SUBJECT TO RE–TESTING BY A RECOGNIZED SEED LABORATORY. ALL SEED USED SHALL HAVE BEEN TESTED WITHIN 6 MONTHS IMMEDIATELY PRECEDING THE DATE OF SOWING SUCH MATERIAL ON THIS JOB.

   NOTE: SEED TAGS SHALL BE MADE AVAILABLE TO THE INSPECTOR TO VERIFY TYPE AND RATE OF SEED USED.

2. INOCULANT – THE INOCULANT FOR TREATING LEGUME SEED IN THE SEED MIXTURES SHALL BE A PURE CULTURE OF NITROGEN–FIXING BACTERIA PREPARED SPECIFICALLY FOR THE SPECIES. INOCULANTS SHALL NOT BE USED LATER THAN THE DATE INDICATED ON THE CONTAINER. ADD FRESH INOCULANT AS DIRECTED ON PACKAGE. USE FOUR TIMES THE RECOMMENDED RATE WHEN HYDROSEEDING. IT IS VERY IMPORTANT TO KEEP INOCULANT AS COOL AS POSSIBLE UNTIL USED. TEMPERATURES ABOVE 75 – 80 DEGREES FAHRENHEIT CAN WEAKEN BACTERIA AND MAKE INOCULANT LESS EFFECTIVE.

B. METHODS OF SEEDING

1. HYDROSEEDING: APPLY SEED AND FERTILIZER SLURRY UNIFORMLY WITH HYDRO–SEEDER AT THE RATES PRESCRIBED IN SECTION 3 OR 4.
   a. IF FERTILIZER IS BEING APPLIED AT THE TIME OF SEEDING, THE APPLICATION RATES WILL NOT EXCEED THE FOLLOWING: NITROGEN – MAXIMUM OF 100 POUNDS PER ACRE TOTAL OF SOLUBLE NITROGEN; P205 (PHOSPHOROUS): 200 POUNDS/ACRE; K20 (POTASSIUM): 200 POUNDS/ACRE
   b. LIME – USE ONLY GROUND AGRICULTURAL LIMESTONE (UP TO 3 TONS PER ACRE MAY BE APPLIED BY HYDROSEEDING). NORMALLY, NOT MORE THAN 2 TONS ARE APPLIED BY HYDROSEEDING AT ANY ONE TIME. DO NOT USE BURNT OR HYDRATED LIME WHEN HYDROSEEDING.
   c. SEED AND FERTILIZER SHALL BE MIXED ON SITE, AND SEEDING SHALL BE DONE IMMEDIATELY WITHOUT INTERRUPTION.
2. DRY SEEDING: THIS INCLUDES USE OF CONVENTIONAL DROP OR BROADCAST SPREADERS.
   a. APPLY SEED TO SOIL AT THE RATES PRESCRIBED IN SECTION 3 OR 4. THE SEEDED AREA SHALL THEN BE ROLLED WITH A WEIGHTED ROLLER TO PROVIDE GOOD SEED TO SOIL CONTACT.
   b. WHERE PRACTICAL, SEED SHOULD BE APPLIED IN TWO DIRECTIONS PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION.
3. DRILL OR CULTIPACKER SEEDING: THIS INCLUDES THE USE OF MECHANIZED SEEDERS THAT APPLY AND COVER SEED WITH SOIL.
   a. CULTIPACKING SEEDERS ARE REQUIRED TO BURY THE SEED IN SUCH A FASHION AS TO PROVIDE AT LEAST 1/4 INCH OF SOIL COVERING. SEEDBED MUST BE FIRM AFTER PLANTING.
   b. WHERE PRACTICAL, SEED SHOULD BE APPLIED IN TWO DIRECTIONS PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION.

C. MULCH SPECIFICATIONS

1. STRAW SHALL CONSIST OF THOROUGHLY THRESHED WHEAT, RYE OR OAT STRAW, REASONABLY BRIGHT IN COLOR, AND SHALL NOT BE MUSTY, MOLDY, CAKED, DECAYED, OR EXCESSIVELY DUSTY, AND SHALL BE FREE OF NOXIOUS WEED SEEDS AS SPECIFIED IN THE MARYLAND SEED LAW.

   NOTE: ONLY STERILE STRAW MULCH SHOULD BE USED IN AREAS WHERE A STAND OF ONE SPECIES OF GRASS IS DESIRED.

2. WOOD CELLULOSE FIBER MULCH (WCFM)

   WCFM MUST CONFORM TO THE FOLLOWING PHYSICAL REQUIREMENT: FIBER LENGTH TO APPROXIMATELY 10mm., DIAMETER APPROXIMATELY 1 mm., pH RANGE OF 4.0 TO 8.5, ASH CONTENT OF 1.6% MAXIMUM AND WATER HOLDING CAPACITY OF 90% MINIMUM. WCFM SHALL CONSIST OF SPECIALLY PREPARED WOOD CELLULOSE PROCESSED INTO A UNIFORM FIBROUS PHYSICAL STATE. WCFM SHALL BE DYED GREEN OR CONTAIN A GREEN DYE IN THE PACKAGE THAT WILL PROVIDE AN APPROPRIATE COLOR TO FACILITATE VISUAL INSPECTION OF THE UNIFORMLY SPREAD SLURRY. WCFM, INCLUDING DYE, SHALL CONTAIN NO GERMINATION OR GROWTH INHIBITING FACTORS. WCFM SHALL CONTAIN INHIBITING FACTORS. WCFM SHALL CONTAIN NO ELEMENTS OR COMPOUNDS AT CONCENTRATION LEVELS THAT WILL BE PHYTOTOXIC. WCFM SHALL BE MANUFACTURED AND PROCESSED IN SUCH A MANNER THAT THE WOOD CELLULOSE FIBER MULCH WILL REMAIN IN UNIFORM SUSPENSION IN WATER UNDER AGITATION AND WILL BLEND WITH SEED, FERTILIZER, AND OTHER ADDITIVES TO FORM A HOMOGENOUS SLURRY. THE MULCH MATERIAL SHALL FORM A GROUND COVER, ON APPLICATION, HAVING MOISTURE ABSORPTION AND PERCOLATION PROPERTIES AND SHALL COVER AND HOLD GRASS SEED IN CONTACT WITH THE SOIL WITHOUT INHIBITING THE GROWTH OF THE GRASS SEEDINGS.

D. MULCHING SEEDED AREAS

1. MULCH SHALL BE APPLIED TO ALL SEEDED AREAS AS SOON AS POSSIBLE AFTER SEEDING. STRAW MULCH SHALL ONLY BE USED ON SLOPES OF 6H:1V OR FLATTER. WOOD CELLULOSE FIBER MULCH MAY BE USED ON SLOPES OF 6H:1V OR STEEPER PROVIDED FLOWS ARE NOT CONCENTRATED. EROSION CONTROL BLANKETS MAY BE USED ON SLOPES OF 6H:1V OR STEEPER PROVIDED THE PRODUCT IS APPROPRIATE FOR THE FIELD APPLICATION.
2. IF GRADING IS COMPLETED OUTSIDE OF THE SEEDING SEASON, MULCH ALONE SHALL BE APPLIED AS PRESCRIBED IN THIS SECTION AND MAINTAINED UNTIL THE SEEDING CAN BE PERFORMED IN ACCORDANCE WITH THESE SPECIFICATIONS.
3. WHEN STRAW MULCH IS USED, IT SHALL BE SPREAD OVER ALL SEEDED AREAS AT THE RATE OF 2 TONS/ACRE. MULCH SHALL BE APPLIED TO A UNIFORM LOOSE DEPTH OF BETWEEN 1 AND 2 INCHES. MULCH APPLIED SHALL ACHIEVE A UNIFORM DISTRIBUTION AND DEPTH SO THAT THE SOIL SURFACE IS NOT EXPOSED. IF A MULCH ANCHORING TOOL IS TO BE USED, THE RATE SHOULD BE INCREASED TO 2.5 TONS/ACRE.
4. WHEN WOOD CELLULOSE FIBER MULCH IS USED, IT SHALL BE APPLIED AT A MINIMUM NET DRY WEIGHT OF 1,500 LBS. PER ACRE. THE WOOD CELLULOSE FIBER SHALL BE MIXED WITH WATER, ACCORDING TO THE MANUFACTURER'S RECOMMENDATION.

E. MULCH ANCHORING

1. MULCH ANCHORING SHALL BE PERFORMED IMMEDIATELY FOLLOWING MULCH APPLICATION TO MINIMIZE LOSS BY WIND OR WATER.
2. STRAW MULCH MAY BE ANCHORED WITH A TRACTOR DRAWN IMPLEMENT DESIGNED TO PUNCH AND ANCHOR MULCH INTO THE SOIL SURFACE A MINIMUM OF 2 INCHES. THIS IS MOST EFFECTIVE ON LARGE AREAS, BUT IS LIMITED TO SLOPES WHERE EQUIPMENT CAN OPERATE SAFELY. IF USED ON SLOPING LAND, THIS PRACTICE SHOULD BE USED ON THE CONTOUR, IF POSSIBLE.
3. WOOD CELLULOSE FIBER MAY BE USED FOR ANCHORING STRAW. THE FIBER BINDER SHALL BE APPLIED AT A NET DRY WEIGHT OF 750 LBS./ACRE. THE WOOD CELLULOSE FIBER SHALL BE MIXED WITH WATER, AND THE MIXTURE SHALL CONTAIN A MAXIMUM OF 50 LBS. OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
4. SYNTHETIC BINDERS – SYNTHETIC BINDERS SUCH AS ACRYLIC DRL (AGRO–TACK), DCA–70, PETROSET, TERRA TAX II, TERRA TACK AR, OR OTHER SIMILAR BINDER MAY BE USED AT RATES RECOMMENDED BY THE MANUFACTURER TO ANCHOR MULCH. APPLICATIONS OF LIQUID BINDERS SHOULD BE APPLIED HEAVIER AT EDGES WHERE WIND CATCHES MULCH, SUCH AS IN VALLEYS AND ON CRESTS OF BANKS. THE REMAINDER OF AREA SHOULD BE UNIFORM AFTER BINDER APPLICATION.
5. LIGHTWEIGHT PLASTIC NETTING MAY BE STAPLED OVER THE MULCH ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

SECTION 3: TEMPORARY SEEDING

VEGETATION – ANNUAL GRASS OR GRAIN USED TO PROVIDE COVER ON DISTURBED AREAS FOR UP TO TWELVE MONTHS. FOR LONGER DURATION OF VEGETATIVE COVER, PERMANENT SEEDING IS REQUIRED.

TEMPORARY SEEDING SUMMARY

SEED MIXTURE (HARDINESS ZONE 7a)					FERTILIZER* RATE (10–10–10)	LIME RATE*
NO.	SPECIES	APPLICATION ** RATE (lb/ac)	SEEDING DATES	SEEDING DEPTHS		
1	CEREAL RYE GRAIN	75	1–FEB TO 30–NOV	1 INCH	600 lbs/ac (15 lbs/1000 sf)	2 Tons/ac (100 lbs/ 1000 sf)
2	FOXTAIL MILLET	75				

* MAY BE MODIFIED PER SOIL TEST RECOMMENDATIONS OF THE MARYLAND COOPERATIVE EXTENSION SERVICE, NOT TO EXCEED THE MAXIMUMS SET IN SECTION 2 (B) (1) (a) AND (b).

** THE TOTAL SEED APPLICATION WILL BE 150 lbs/acre AT A MINIMUM.

SECTION 4: PERMANENT SEEDING

SEEDING GRASS AND LEGUMES TO ESTABLISH GROUND COVER FOR A MINIMUM PERIOD OF ONE YEAR ON DISTURBED AREAS GENERALLY RECEIVING LOW MAINTENANCE.

PERMANENT SEEDING SUMMARY

SEED MIXTURE (HARDINESS ZONE 7a)					FERTILIZER RATE* (10–20–20)			LIME* RATE
NO.	SPECIES	APPLICATION RATE (lb/ac)	SEEDING** DATES	SEEDING DEPTHS	N	P205	K20	
1	BIG BLUESTEM	4	1–MAR TO 15–NOV	1 INCH	90 lb/ac (2 lb/ 1000 SF)	175 lb/ac (4 lb/ 1000 SF)	175 lb/ac (4 lb/ 1000 SF)	2 tons/ac (100 lb/ 1000 SF)
2	LITTLE BLUESTEM	6						
3	SWITCHGRASS	2						
4	INDIANGRASS	6						
5	CANADIAN WILD RYE	10						
6	PARTRIDGE PEA	2						
7	ANNUAL RYE GRASS	25						

* MAY BE MODIFIED PER SOIL TEST RECOMMENDATIONS OF THE MARYLAND COOPERATIVE EXTENSION SERVICE, NOT TO EXCEED THE MAXIMUMS SET IN SECTION 2 (B) (1) (a) AND (b).

** IF A MID–SUMMER PLANTING IS DESIRED, USE 20 lb/ACRE SERECIA LESPEDEZA. IF MIDWINTER PLANTING IS DESIRED, SEEDING MUST BE BY DRILL OR CULTIPACKER. IF LATE FALL/EARLY WINTER PLANTING IS DESIRED, USE 56 lb/ACRE CEREAL RYE GRAIN AS NURSE CROP.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

REVISIONS

Shaw Environmental, Inc.

DESIGNED BY	D. Pringle	5/18/07	CHECKED BY S. Seger 5/24/07
DRAWN BY	B. Snyder	5/18/07	APPROVED BY S. Carriere 10/4/07

NAVFAC Naval Facilities Engineering Command

NAVAL SUPPORT FACILITY, INDIAN HEAD INDIAN HEAD, MARYLAND

SITE 28 - REMOVAL ACTION

VEGETATION STABILIZATION METHODS AND MATERIALS

SCALE: AS SHOWN SIZE: D

TASK ORDER NO. 093

CONSTR. CONTRACT NO. N62470–02–D–3260

NAVFAC DRAWING NO.

ES-6

OFFICE Pittsburgh, PA DRAWING NUMBER 126566-D4

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Plotted By: bernadette.connor

APPENDIX D

Environmental Protection/Pollution Prevention Plan

ENVIRONMENTAL PROTECTION/POLLUTION PREVENTION PLAN
REMOVAL ACTION FOR SITE 28
NAVAL SUPPORT FACILITY, INDIAN HEAD
INDIAN HEAD, MARYLAND
TASK ORDER 093

Prepared for:

DEPARTMENT OF THE NAVY
Contract No. N62470-02-D-3260
Naval Facilities - Washington
Washington Navy Yard, Building 212
1314 Harwood Street, S.E.
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June 8, 2007

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LIST OF ACRONYMS

Acronym	Title
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COE	Corps of Engineers
E&S	erosion and sediment
EC	Emergency Coordinator
EP/PP	Environmental Protection/Pollution Prevention
ESCP	Erosion and Sediment Control Plan
IAS	Initial Assessment Study
LANTDIV	Department of the Navy, Atlantic Division
MPPEH	Material Potentially Presenting an Explosive Hazard
MSDS	Material Safety Data Sheet
NAVFAC	Naval Facilities Engineering Command
Navy	U.S. Navy
NSF-IH	Naval Support Facility-Indian Head
NTR	Navy Technical Representative
OSHA	Occupational Safety and Health Administration
PID	photoionization detector
QC	Quality Control
RI	Remedial Investigation
ROICC	Resident Officer in Charge of Construction
Shaw	Shaw Environmental, Inc.
SSHSP	Site-Specific Health and Safety Plan
SSO	Site Safety Officer

1.0 INTRODUCTION

This Environmental Protection/Pollution Prevention (EP/PP) Plan has been prepared by Shaw Environmental, Inc. (Shaw) for the Department of the Navy, Atlantic Division (LANTDIV) Naval Facilities Engineering Command (NAVFAC), Washington, DC. The purpose of the EP/PP Plan is to present information needed to minimize the hazards to human health and the environment from fires, explosions, spills, or any unplanned or sudden release of constituents of concern during the soil removal action being performed by Shaw at Site 28 at the Naval Support Facility-Indian Head (NSF-IH), Maryland.

This plan fulfills the requirements set forth in the following documents:

- Code of Federal Regulations (CFR)
  - 29 CFR 1910 - Subpart G: Occupational Health and Environmental Control
  - 40 CFR 112: Oil Pollution Prevention
  - 40 CFR 261: Identification and Listing of Hazardous Waste
  - 40 CFR 262: Generators of Hazardous Waste
  - 40 CFR 263: Transporters of Hazardous Waste
  - 40 CFR 268: Land Disposal Restrictions
  - 40 CFR 279: Used Oil Regulations
  - 49 CFR 178: Shipping Container Specification

- COMAR 26.13: Department of the Environment, Disposal of Controlled Hazardous Substances

- Corps of Engineers (COE)
  - COE EP-1165-2-304: 1976 Flood Plain Regulations for Flood Plain Management.

This plan is intended for use during the soil removal action and associated activities at Site 28. This plan establishes guidelines that must be followed by Shaw and any of its subcontractors during activities at the site, and must be used in conjunction with the other project plans and drawings.

1.1 PRE-CONSTRUCTION SURVEY

The Site QC Manager will conduct a preconstruction prior to the start of work. The results of the survey, including photo documentation, will be submitted to the ROICC/NTR in an Environmental Conditions Report.

1.2 SOIL REMOVAL ACTIVITIES

The soil removal activities for the site generally consist of the following:

- Mobilization to site and site setup
- Installation and maintenance of erosion and sediment controls
- Clearing and grubbing
- Excavation of soil and debris from defined waste area

- Waste staging and mechanical screening
- Backfilling and regrading the excavation
- Restoration of the site
- Demoblization.

1.3 PERMITTING REQUIREMENTS

No regulatory permits are required for the soil removal action at Site 28 because all actions will be conducted on site. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121 (e) exempts any response action conducted entirely on site from federal, state, and local permit application procedures. On-site actions need only comply with the substantive aspects of environmental regulations.

2.0 ORGANIZATION STRUCTURE FOR IMPLEMENTATION

This section describes the personnel and required chain of command that will control and direct environmental protection activities at the site.

2.1 RESPONSIBLE PARTIES

The U.S. Navy (Navy) is the owner of the project site and the responsible party for the remediation activities. The Navy has contracted Shaw to perform the remediation activities. For the duration of the remediation activities, the Shaw will notify the Navy of any environmental protection incident as soon as possible.

2.1.1 Navy

The Navy is responsible for all notifications to local, state, and federal authorities. The ROICC will oversee Shaw's execution of environmental protection.

2.1.2 Shaw

Shaw is responsible for implementing environmental protection procedures and is responsible for all information contained in this document and as described in the Site-Specific Health and Safety Plan (SSHSP).

2.2 EMERGENCY SERVICES

A summary of local and state emergency service agencies is listed in the SSHSP. Individual emergency agencies and responsibilities are as follows.

2.2.1 Police

The NSF-IH Security Police will provide police support as needed. Unlawful entry into the site will be reported to the Security Police.

2.2.2 Fire Department

All environmental protection situations requiring fire department personnel and equipment will be reported to the NSF-IH Fire Department.

2.3 COORDINATION RESPONSIBILITIES

All environmental protection provisions will be implemented by means of the organizational structure. The Program Manager is responsible for coordination, training, drills, notification to the Navy, and other aspects of the EP/PP Plan.

2.3.1 Program Manager

The Program Manager is the person in charge of the overall project and has full authority for coordination and direction of the project. The Program Manager will communicate directly with the NTR. The Program Manager is ultimately responsible for completion of the project in accordance with the plans.

2.3.2 Project Manager

The Project Manager is responsible for the day-to-day management and integration of all elements of the project and will be accountable for each activity. He delegates the authority for the implementation, maintenance, and compliance of the project activities with this document and the SSHSP to the Site Safety Officer (SSO), or Site Superintendent in the absence of the SSO.

2.3.3 Site Safety Officer

The SSO will be responsible for all environmental health and safety activities including air monitoring activities, overseeing the decontamination of equipment and clothing, decontamination procedures and emergency response procedures. The SSO will also be responsible for training of on-site personnel as may be necessary. The SSO has the authority to stop any operation that threatens the health and/or safety of the team or surrounding populace. The weekly environmental protection inspections and daily health and safety activities may be conducted by the SSO or the Site Superintendent. The Site Superintendent is responsible for assuring that the daily environmental protection is performed.

2.3.4 Site Superintendent

The Site Superintendent is responsible for field implementation of the environmental procedures and the health and safety program when the SSO is not present. This responsibility includes advising site workers of the specific health and safety requirements and consulting with the SSO regarding appropriate changes to the environmental protection section and the SSHSP.

2.3.5 Emergency Coordinator

The Emergency Coordinator (EC) will implement and coordinate all environmental procedures during spills and releases. During an emergency, the EC will activate alarm systems, notify the Fire Department, notify the ROICC, identify the problem, assess the health or environmental hazards, and take all reasonable measures to stabilize the situation. The EC will also be responsible for follow-up activities after the incident such as treating, storing, or disposing of residues and impacted soil, decontamination and maintenance of emergency equipment, and submission of any reports. The EC is also responsible for personnel training and evacuation drills. The Site Superintendent or the SSO, depending on who is on site, will be the EC. The EC will be on-site during all removal operations.

2.3.6 Site Personnel

All personnel will be responsible for working in a safe and healthy manner. Each will be required to comply with all applicable local, state, and federal rules and regulations, as defined in the SSHSP.

3.0 MATERIALS INVENTORY COMPATIBILITY

This section contains information regarding the materials that may be involved in a spill or release. Table 1 lists quantities of the materials present on-site by type.

3.1 ON-SITE MATERIALS

Site 28 is in the northeast corner of the facility, on the shore of Mattawoman Creek. The site encompasses observation Well 14, the former location of the zinc recovery furnace, and the former shoreline burning cage.

Previous investigations included an Initial Assessment Study (IAS) and a Remedial Investigation (RI). The IAS report concluded that smokeless powder may have been burned at the site and various contaminated wastes were burned openly. The RI report indicated that because of past activities at the site, there are both potential human health and ecological risks associated with constituents in the soil.

The risk assessments concluded that the following constituents in soil pose a risk to human health and ecological receptors:

- Lead
- Antimony
- Cadmium
- Copper
- Mercury
- Nickel
- Silver
- Zinc.

3.2 ORGANIC VAPOR RELEASES

Organic vapor releases may occur during excavation activities. Organic vapor concentrations in the air during excavation activities will be monitored using air-monitoring equipment such as a photoionization detector (PID). Air monitoring requirements are described in the SSHSP.

3.3 FUEL AND FLAMMABLE LIQUIDS

To perform the project activities, Shaw will have fuels and oils on site for construction vehicles. The types of materials that may be stored at the fuel depot are as follows:

- Diesel fuel
- Gasoline
- Motor transmission oils
- Greases
- Used oil
- Hydraulic fluid.

3.4 OTHER MATERIALS OF CONCERN

Other materials necessary to complete the project that have the potential for spills and releases are listed below. The exact quantity and type of these materials will be determined during the interim removal action:

- Agricultural lime
- Fertilizer

These materials will be used as landscaping materials during the construction and restoration period.

In addition, it is anticipated that material potentially presenting an explosive hazard (MPPEH) could be recovered during the material screening process at Site 28. Details of the screening process and MPPEH recovery are discussed in the *Draft Work Plan for the Removal Action for Site 28* (Shaw, 2007).

3.5 MATERIAL COMPATIBILITY

The materials mentioned in Sections 3.1 to 3.4 are not anticipated to be mixed or combined during site operations, and will be stored so as to prevent accidental mixing in the event of a spill/release.

3.6 ACTIVITY HAZARDOUS WASTE MANAGEMENT PLAN

The transportation and disposal coordinator for Shaw will coordinate transportation and disposal activities. The actual sampling and analysis of contaminated substances for off-site disposal will be coordinated through the project chemist, and the execution of collecting samples will be the responsibility of the Site Quality Control (QC) Manager. All procedures will comply with federal and state regulations. In accordance with station regulation, Shaw will substitute materials as necessary to reduce the generation of hazardous waste.

3.7 HAZARDOUS MATERIALS

Hazardous materials to be brought on site and used during remedial action activities are included in Table 1. Material Safety Data Sheets (MSDS) for each material are included in the SSHSP, and a copy of the MSDSs will be available on site in the office trailer.

4.0 EMERGENCY AND DECONTAMINATION EQUIPMENT

This section discusses the types of emergency equipment to be used in the event of a spill or other emergency situation.

4.1 SMALL-SCALE EMERGENCY EQUIPMENT

Small-scale emergency equipment will include the following:

- Dry chemical, ABC-rated fire extinguishers
- Spill control equipment
- Absorbent materials
- Decontamination equipment
- Air purifying respirators
- Radio and telephone equipment
- Windsocks
- Various hand tools

This equipment will be made accessible to all on-site workers. Locations of such equipment will be posted at the office trailer. A list of the small equipment is provided in Table 2.

4.2 LARGE-SCALE EMERGENCY EQUIPMENT

Large-scale emergency equipment will include the same equipment used in the ongoing construction activities. The equipment will include front-end loaders, bulldozers, and excavators if equipment of such size is necessary. Other emergency equipment may be obtained from the Fire Department or other emergency response agencies, if required. A list of large equipment proposed for on-site use is provided in Table 2.

4.3 DECONTAMINATION EQUIPMENT

Equipment necessary for decontamination activities will be provided, installed, and verified in working order prior to any site operations. Equipment for the decontamination area includes the following items:

- Decontamination pad and sump
- Clean water supply
- Detergent solution
- Containers for used decontamination solution and decontamination residues/solids
- Brushes
- Waste containers

The decontamination pad will be a polyvinyl-lined platform and frame constructed of wood that will be configured to drain to an integral 55-gallon drum. A sump pump will be installed in the drum. The pump will discharge through a hose to a 1,000-gallon poly-tank. The platform will be sufficiently reinforced to allow for heavy vehicle ingress and egress from the decontamination pad.

5.0 SITE EVACUATION PLAN

This section details the procedures to be followed in the event that the site needs to be evacuated.

5.1 SITE EVACUATION SIGNAL

All site personnel, including equipment operators, technicians, and supervisors, will evacuate the site upon hearing the evacuation signal. The signal will consist of a continuous blast from an air horn. The blast will be at least 15 seconds in duration, and will be sounded from a location that broadcasts clearly to the entire site. The signal will be repeated at least two times to alert all personnel. Site radios may also be used to notify personnel, including operators who may not hear the air horn signal. A visual signal (clutching the throat with the hands) will indicate a site evacuation.

5.2 SITE EVACUATION ROUTES

After the evacuation signal is sounded, all personnel will immediately proceed to the predetermined meeting points (Figure 1). One of the meeting points will be located in the material screening area in the western portion of the site near the gravel access road. The other meeting points will be located at each of the two stabilized construction entrances along the gravel access road north and south of the material screening area. The evacuation meeting points will be chosen each day as a function of the current area worked and wind direction. Wind direction will be noted during the evacuation by observing the windsocks. All attempts to reach the upwind meeting location must be taken. All equipment, trucks, and other internal combustion engines will be shut down prior to personnel evacuation if the equipment can be reached without risking personal safety. The evacuation routes will depend on project phase and generally the most direct route to a meeting point.

The EC will contact the Fire Protection Division and the Navy ROICC to inform that officer of the nature and extent of the emergency. A meeting point coordinator will be chosen at the meeting point. This person will be the most senior person (e.g., SSO, EC, foreman, or other supervision) at the location. The meeting point coordinator will follow actions described in Section 5.3.

5.3 POST-EVACUATION ACTIONS

A head count of personnel assembled at the meeting point will be taken by the meeting point coordinator after the evacuation and provided to the EC. Information regarding missing and/or injured personnel will be brought to the immediate attention of the meeting point coordinator. No personnel will attempt to re-enter the site at this time. The EC or appointed representative will coordinate activities with the Navy. After the emergency has been resolved, the EC will indicate when personnel can enter the site and resume work.

5.4 SITE EVACUATION DRILL

All site personnel must be familiar with the evacuation signal and evacuation procedures prior to any site operations. The evacuation plan will be executed during an announced drill within 10 days after major activities have begun at the site. The EC will announce the drill time to all site personnel and will notify the Navy authorities as to the nature and time of the drill. The drill will include contacting authorities to verify communication procedures.

6.0 SPILL PREVENTION AND RESPONSE

This section discusses the techniques that will be utilized to minimize the potential for spills and the measures that will be implemented in response to a spill.

6.1 POTENTIAL SPILL SOURCES AND PREVENTION PRACTICES

The following includes the detailed site procedures for activities that include containment, collection, and material disposal or reuse.

6.2 EXCAVATION AREA

The excavation area contains soil waste that will be excavated for off-site disposal. The potential spill source is runoff, or water from the excavation. The excavation areas will be bermed if necessary to contain all source material within the excavation area. The Erosion and Sediment Control Plan (ESCP) outlines practices to divert run-on from entering the excavations and prevent contaminated precipitation/leachate generated within the excavation from running off.

6.3 FUEL STORAGE

Vehicle fuels and oils will be stored within fuel depot areas in approved storage containers. The fuel tanks will be anchored to the ground, stabilized on skids, or placed on saddles to prevent overturning and rolling. Containers will be placed outside of the maximum turning radius of all vehicles, as well as turnaround or unloading zones. Secondary containment is required for all fuel containers larger than 5 gallons and will occupy 110 percent of the aggregate storage volume. All tanks will be placarded with the National Fire Safety system for hazardous material classification and the tanks will be electrically grounded. A Spill Prevention, Control and Countermeasures Plan, required under 40 CFR 112, will be prepared if total on-site petroleum aboveground storage capacity of a single container is in excess of 660 gallons or the aggregate aboveground storage capacity is greater than 1,320 gallons.

6.4 ON-SITE MATERIAL TRANSPORTATION

All source material will be transported on site haul roads. Practices for preventing material spills will include not overfilling trucks, drivers traveling at posted speeds, and having haul roads maintained in good condition. Additional information is provided in the SSHSP.

6.5 EXTERNAL FACTORS

The following describes actions to be taken to alleviate effects to public health and safety or the environment from factors external to the site.

6.5.1 Power Outages

Power will be from utility service drops and/or site generators. Shaw will have access to a backup generator in case of failure of the primary service drops and/or generator(s) where such failure may impact the public health or safety of the environment and public.

6.5.2 Severe Weather

Short-duration, high-intensity rain showers may create unexpected erosion and drainage problems such as slope and containment berm erosion and failure. After such events, all containment devices and structures will be closely inspected for structural and practical integrity. In addition, spillage or leakage will be immediately corrected. Repair to these containment devices will be made as soon as possible or at least before construction continues and will be logged in the Site Superintendent's daily report.

6.6 PROTECTION OF NATURAL RESOURCES

Shaw will limit the extent of clearing and grubbing operations to the areas shown on the ESCP Drawings. All reasonable attempts will be made to minimize landscape defacement beyond the limits of disturbance. This will include the trimming of trees and brush instead of removal, wherever possible. Operation of equipment will be limited to the confines of the work area to minimize the potential for residual damage to landscape features.

Although site personnel will take all reasonable measures to assure no residual damage beyond the limits of disturbance, it is inevitable that some damage will occur. In the event that damage is done to the landscape beyond the limits of disturbance, the affected area or feature will be restored to the satisfaction of the ROICC as soon as the restoration is deemed practical. Damaged trees and shrubs will be treated with approved measures by experienced workers. Plant life or trees damaged beyond repair will be cleared and replaced as directed. Vegetation removed as part of the planned clearing will be replaced in accordance with the work plan.

Fish and wildlife resources along with water flows and native wetland habitats adjacent to the project will be disturbed temporarily during the site work. The disturbed areas will be restored (backfilled, graded, and replanted with native wetland plants) as a part of site restoration. It is anticipated that there will be no long-term impacts as a result of this work. The ROICC's approval is required before any equipment is permitted to cross live streams. In areas where frequent crossings are required, temporary culverts or bridges will be installed. The ROICC's approval is required prior to the installation of these temporary structures. They will be removed upon completion of work and the area will be repaired to its original condition.

Historical and archaeological items discovered during the remedial action activities will be protected in place and reported immediately to the ROICC. Work will be stopped in the immediate area of any discovery until directed by the ROICC to resume work. The Government will retain ownership and control over any historical and archaeological resource encountered at the site.

6.6.1 Dust Control and Erosion Protection

Water trucks with sprinkling attachments will be utilized, as necessary, to control dust in the excavation areas and haul roads, and during site grading activities. The water source for the trucks will be approved by the ROICC prior to use. Water will be applied in sufficient quantity to prevent creation of dust, but excessive watering that may result in a muddy condition that may be transferred to the haul roads will not be permitted. Determination of the need for dust control will be the responsibility of the Site Superintendent as dictated by changes in site conditions on a continuing basis. The Navy or ROICC may suspend work if necessary due to dust generation that causes a safety or air quality problem.

6.6.2 Control Measures

The following sections discuss the temporary and permanent erosion and sediment (E&S) control measures that will be installed during construction activities. All control measures will be installed as indicated in the ESCP.

6.6.2.1 Temporary Control Measures

Temporary E&S control measures will be installed prior to any intrusive work, and will remain in place until permanent vegetation has been established. Temporary E&S control measures include super silt fence, soil berms, earth dike, stone check dams, stabilized construction entrances, and erosion control matting. The temporary E&S controls will be installed as described in the work plan and as indicated in the ESCP.

6.6.2.2 Permanent Control Measure

The permanent E&S control measure includes establishing vegetation. This measure will be implemented prior to the completion of site activities. This permanent control measure will be installed as described in the work plan and as indicated in the ESCP.

6.7 MAINTENANCE

Shaw will be responsible for the proper maintenance of all new planted and seeded areas while on site and until formal acceptance by the ROICC. Final acceptance will be viewed as the final site inspection with no remaining punch list items.

6.8 RUNOFF

All runoff from the disturbed project areas will pass through E&S control facilities.

7.0 PREVENTATIVE ACTIONS

This section discusses the preventative measures that will be utilized to minimize the possibility of a spill or discharge.

7.1 INSPECTION

Inspections of site areas will be performed by the Site Superintendent to verify that procedures for proper storage, handling, and transport of materials are being followed. Inspection and monitoring methods will be through visual observation. Monitoring equipment as described in Section 8.0 will be used when necessary. Such areas include the following:

- Excavation areas
- Fuel depots – various fuels and oils.

Other areas and items that will be monitored and noted in the site logbook include:

- Evidence of spilled materials along drainage ditches
- Effectiveness of housekeeping practices
- Various shipping and storage containers used throughout the site
- Staging areas
- Proper placards and labeling of truck and tank contents.

Inspections will be conducted weekly of hazardous material containers and documented in the SSO's Field Activity Daily Log.

7.2 EQUIPMENT MAINTENANCE

All construction equipment will be properly maintained to facilitate safe operation. Equipment (especially trucks) will be properly maintained to minimize spillage or leakage that may occur during on-site transport operations. Further preventive maintenance on trucks is described in Section 7.4.2. Periodic maintenance of heavy equipment will be performed by the equipment vendor who will dispose of waste oil. Daily lubrication will be performed by the operator assigned to the equipment, with no waste oil or lubricant expected to be generated. Spill kits will be ready and available during all maintenance activities.

7.3 CALIBRATION OF MONITORING EQUIPMENT

It is important that all environmental monitoring equipment be calibrated so that accurate readings of potential spilled or leaked materials may be detected upon inspection. Calibration frequency and procedures will be followed as per the manufacturer's recommendations. The SSO will retain calibration records on site.

7.4 HOUSEKEEPING PROGRAM

The site housekeeping program includes neat and orderly storage of materials and equipment; proper truck and tank placards; prompt removal of spillage, regular refuse pickup and disposal; and maintenance of roads and surfaces.

7.4.1 Small Spillage

Small spills (less than 10 gallons) may include solid materials or liquid materials being mishandled, dumped, leaked, knocked over, etc. Any material spillage will be immediately contained and collected and placed in the waste handling pad for later disposal. Excavation of pits will be performed such that exposed source material remains within the limits of excavation or below the limits of temporarily constructed soil berms. All spilled liquids will be contained and collected by absorbent materials and the materials taken to the decontamination pad area. Spilled fuel and impacted soil will be placed on the waste handling pad for later disposal. The EC will notify the ROICC in the event of any spill of hazardous material or petroleum product. The spill will be cleaned up in accordance with Navy and Maryland Department of the Environment requirements.

7.4.2 Trucking

All hauling vehicles will be maintained in good operating condition. Tires will be properly inflated and will have adequate tread depth as per the tire manufacture's recommendations. Trucks will not be overloaded, since overloaded trucks increase the possibility of material spillage. Truck end gates will be inspected to confirm that they close and seal properly. The tires and undercarriages of all trucks leaving the construction sites shall be visually checked by site personnel to minimize the tracking of soil and dust onto the facility's roads. Trucks entering from off site with loads will be tarped to prevent excessive dust.

7.4.3 Temporary Vehicle Decontamination Pad

A vehicle decontamination pad will be provided at the site exit to wash materials from vehicle tires. This reduces the amount of material that falls onto adjoining roads, which will be removed as described in Section 7.4.1.

7.4.4 Worker Training

All employees with the potential of exposure to hazardous substances will be required to attend and complete the Occupational Safety and Health Administration (OSHA) 40-hour health and safety course (Hazardous Waste Operations and Emergency Response) as per 29 CFR 1910.120. All site employees requiring 40-hour OSHA health and safety training will be current with respect to 8-hour annual OSHA refresher training. Employee training documentation is included in the SSHSP.

The site-specific training program will involve at least one hour of instruction per employee. At a minimum, the training program will ensure that personnel are able to respond effectively to emergencies by familiarizing them with emergency procedures and emergency equipment systems including, where applicable:

- Procedures for using, inspecting, repairing, and replacing emergency and monitoring equipment
- Key parameters for automatic cut-off systems
- Communication and alarm procedures
- Response to fires and explosions
- Site evacuation procedures
- Shut-down operation.

In addition, the employee-training program will address other aspects of the environmental protection section, such as preventive maintenance, inspection and monitoring, housekeeping practices, etc.

Job-specific environmental protection and health and safety instructions will be reviewed before beginning each new phase of work. Weekly, or more often if conditions require, the SSO or Site Superintendent will conduct follow-up training related to a change in operations or any other training deemed necessary by the SSO. The SSO will hold daily safety meetings at the beginning of each shift to discuss current considerations. Site evacuation training will be provided as described in Section 5.0 of this plan.

8.0 AIR MONITORING REQUIREMENTS

Air monitoring will be performed as required in the SSHSP. A PID will be used to provide real-time, semi-quantitative data on total organic vapor concentrations in and around the breathing zone of workers and downwind of site activities at the perimeter of the site. This instrument will be calibrated daily and organic vapor concentration will be monitored during site activities.

The SSHSP identifies additional air monitoring instrumentation. The SSHSP also defines action levels for upgrading employee protection and instituting emergency actions. The air monitoring will determine concentrations of site contaminants within the ambient air and workers' breathing zones. The air monitoring measurements will be compared to OSHA standards, which are the basis for defining the site action levels. The SSO will make the decision regarding equipment upgrades and emergency action based on the air quality measurements.

A windsock may be installed to monitor the wind direction. The wind direction will be noted by the EC and other evacuation leaders so that evacuation procedures place personnel upwind of the situation. The windsock will be placed in the material screening area at the site.

TABLES

Table 1 Material Inventory				
Material	**Unit**	**Quantity**	**Location**	**Hazard Class**
Waste Soil	Tons	3,991 (1)	Site 28 excavation	N/A
Diesel Fuel	Gallons	(2)	Fuel Depot	Combustible
Gasoline	Gallons	(2)	Fuel Depot	Flammable
Lime, Fertilizer	Pounds	(2)	Command Center Trailer Area	Corrosive
Motor Transmission Oils	Gallons	(2)	Fuel Depot	Flammable
Greases	Tubes	(2)	Fuel Depot	Flammable
Hydraulic Fluid	Gallons	(2)	Fuel Depot	Flammable

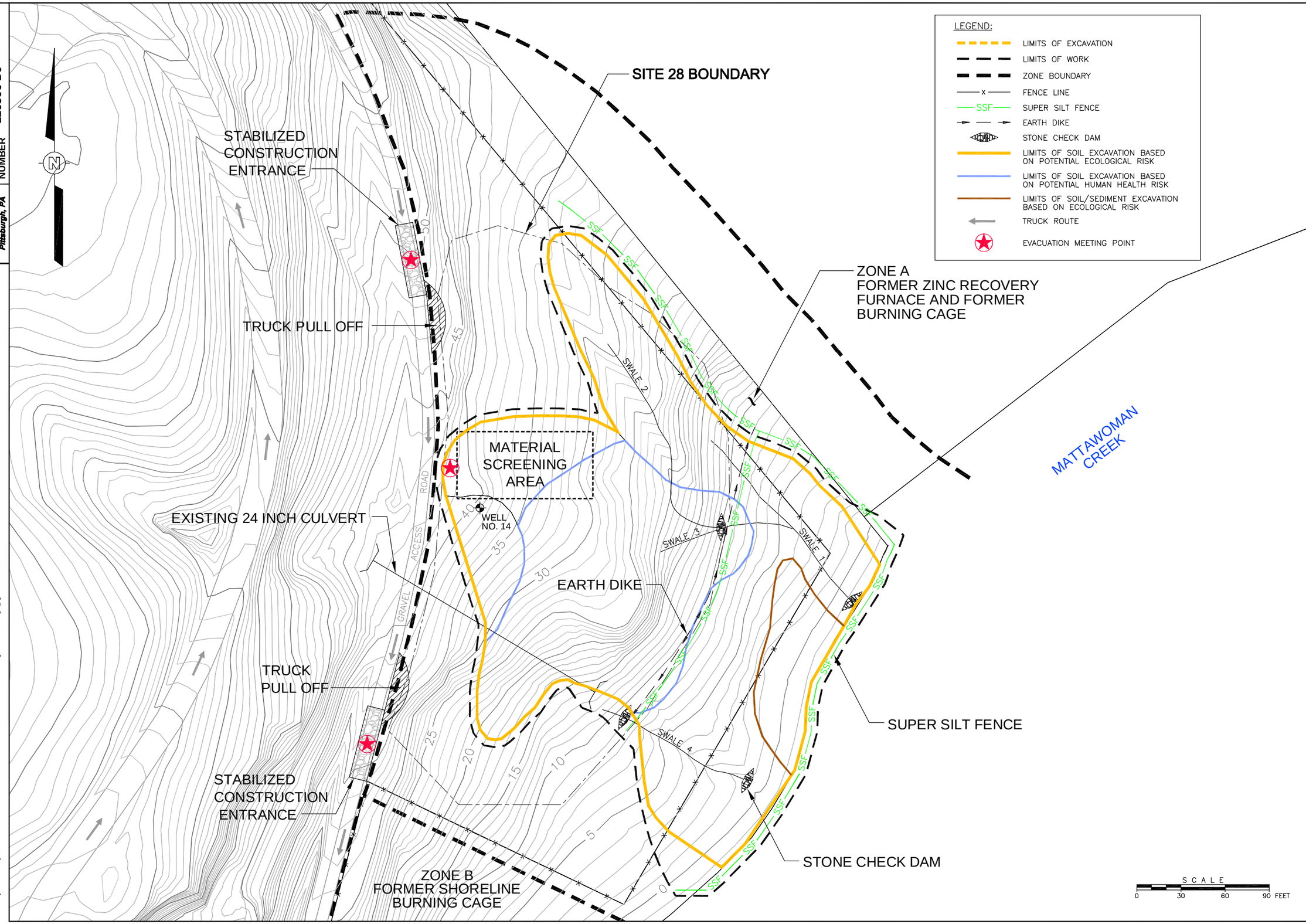
Notes: (1) Estimated. Actual quantity to be determined during construction activities.
(2) Quantities to be determined during construction activities.

Table 2 Equipment List		
LARGE EQUIPMENT		
Equipment (Quantity)	**Use**	**Location**
Front-end Trac Loaders (2)	Transporting/loading waste soil	Excavation area and material screening area
Excavators (2)	Excavating/loading waste soil	Excavation area and material screening area
Mechanical Screeners (2)	Screening soil for MPPEH	Material screening area
Dozer (1)	Grading site	Excavation area
Water Tank Truck (1)	Dust control	Excavation area, material screening area, access roads
Command Center Trailer (1)	Project site management	TBD
Connex Box (1)	Supply storage	TBD – Command Center Trailer
Trash Dumpsters (1)	Household waste disposal	TBD – Command Center Trailer
Sanitation facilities (2)	Toilet facility	Command Center Trailer and material screening area
Pickup Trucks (3)	Personnel transportation	Sitewide
10-Ton Vibratory Compactor	Compaction of backfill material	Excavation area
Brush hog	Clearing and grubbing	Work areas
Brush Chipper	Clearing and grubbing	Work areas
SMALL EQUIPMENT		
Equipment	**Use**	**Location**
Absorbent Materials	Spill control	Command Center Trailer and material screening area
Camera/Photo Equipment	Work documentation	Command Center Trailer
Chainsaws	Clearing and grubbing	Work areas
Decontamination Equipment with a Clean Water Supply (70-80°F)	Cleaning equipment	Decon pad
ABC-Rated Portable Fire Extinguishers(1)	Fire prevention	Command Center Trailer, material screening area
2-Way Radios	Communication	Sitewide
Mini-Ram	Dust Monitoring	Excavation area and material screening area
Photoionization Detector	Air monitoring	Excavation area
Windsock (1)	Wind direction	Material screening area

Table 2 Equipment List		
SMALL EQUIPMENT (CONTINUED)		
Equipment	**Use**	**Location**
LEL 3 Gas Meter	Air monitoring	Excavation area
Trash Pump	Conveying water	Decon pad
Total Survey System	Land survey	Excavation area
Pressure Washer - 2,000 psi	Decon	Decon pad
First-Aid Supplies	First-aid	Command Center Tailer

Note: (1) ABC-rated portable fire extinguishers to include two 20-pound units per trailer, one 10-pound unit in each piece of mobile equipment, and one 20-pound unit at each major mechanical operation.

FIGURE



OFFICE: Pittsburgh, PA
DRAWING NUMBER: 126566-D9

Xref:
Image: NAVFAC Logo.jpg

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Plot Date/Time: Jun 07, 2007 – 11:09am
Plotted By: william.snyder

REVISIONS

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

Shaw® Shaw Environmental, Inc.

DESIGNED BY	D. Pringle	5/18/07	CHECKED BY S. Sager
DRAWN BY	B. Snyder	5/18/07	APPROVED BY S. Carriere

NAVFAC Naval Facilities Engineering Command Washington

NAVAL SUPPORT FACILITY, INDIAN HEAD
INDIAN HEAD, MARYLAND
SITE 28 - REMOVAL ACTION
EVACUATION PLAN

SCALE: AS SHOWN
SIZE: D
TASK ORDER NO. 093
CONSTR. CONTRACT NO. N62470-02-D-3260
NAVFAC DRAWING NO.

FIGURE 1

MARYLAND DEPARTMENT OF THE ENVIRONMENT
Water Management Administration. • Sediment, Stormwater & Dam Safety Program
1800 Washington Blvd. • Baltimore Maryland 21230
(410) 537-3543 • 1-800-633-6101 • http://www.mde.state.md.us

STORMWATER MANAGEMENT WAIVER APPLICATION

OWNER: Naval Support Facility, Indian Head

ADDRESS: 3972 Ward Road, Suite 101
Indian Head, MD 20640

MDE NO.: _____

PROJECT NO.: Shaw Project #126566

LOCATION: Former Zinc Recovery Furnace & Burning Cage

CONSULTANT: Shaw Environmental, Inc.

DESCRIPTION: Removal Action at Site 28

I/We, the Owner/Owners hereby request a stormwater management waiver be granted for the above referenced project in accordance with the following section of the Stormwater Management Guidelines for State and Federal Projects:

X 3.3.A.1. Contract plans and provisions, stormwater management report.

____ 3.3.A.2. Contract plans and provisions, stormwater management report.

____ 3.3.A.3. Contract plans and provisions, stormwater management report.

____ 3.3.B.1. Contract plans and provisions, stormwater management report.

____ 3.3.B.2. Contract plans and provisions, stormwater management report, downstream impact investigation.

____ 3.3.B.3. Contract plans and provisions, stormwater management report.

____ 3.3.B.4. Contract plans and provisions, stormwater management report, downstream impact investigation

____ 3.3.B.5. Contract plans and provisions, stormwater management report, downstream impact investigation.

____ 3.3.B.6 Contract plans and provisions, stormwater management report, downstream impact investigation.

Other evidence submitted: Erosion and Sediment Control Plan

Jeff Bossart — Owner's Name
Jeffrey C Bossart — Signature
10/11/07 — Date

____ Approved ____ Denied/Reason _____

By _____ Water Resources Reviewer _____ Date

Submit to: Maryland Department of the Environment
Water Management Administration
Sediment and Stormwater Plan Review Division
1800 Washington Boulevard, 4th Floor
Baltimore, MD 21230

If a project involves a waiver request for more than one (1) drainage area, a Stormwater Management Waiver Application is required for each drainage area.

MDE/WMA/PER.O58

AS BUILT CERTIFICATION

I hereby certify that the stormwater management facility shown on the plans has (have) been constructed in accordance with the plans approved by the Maryland Department of the Environment, except as noted in red on the "AS BUILT" drawings.

Jeff Bossart	
Name	Signature
# 03593	10/11/07
Maryland registration number	Date
MDE No.	Facility Identification (number and/or type)

"Certify" means to state or declare a professional opinion based on sufficient and appropriate onsite inspections and material tests conducted during construction.

****

DESIGN CERTIFICATION:

"I hereby certify that this plan has been designed in accordance with the 1994 Standards and Specifications for Soil Erosion and Sediment Control, the 2000 Maryland Stormwater design Manual, Volumes I & II and The Maryland Department of the Environment Stormwater Management Regulations.

Name	Signature
Maryland registration number P.E., R.L.S. or R.L.A. (circle)	Date

APPENDIX E

NOSSA ESS Determination and NOSSA Response Letter

DEPARTMENT OF THE NAVY
NAVAL ORDNANCE SAFETY & SECURITY ACTIVITY
FARRAGUT HALL BLDG D-323
23 STRAUSS AVENUE
INDIAN HEAD MD 20640-5555

8020
Ser N535/1024
21 Jun 07

From: Commanding Officer, Naval Ordnance Safety and Security Activity
To: Installation Commanding Officer, Naval Support Activity, South Potomac, Naval Support Facility Indian Head

Subj: EXPLOSIVES SAFETY SUBMISSION DETERMINATION REQUEST FOR INSTALLATION RESTORATION PROGRAM SITE 28 AT INDIAN HEAD MARYLAND

Ref: (a) E-mail NSF IH (HN2WSJ) Mr. S. Jorgensen/NOSSA (N53) Ms. T. Schirf of 5 Jun 07 (w/encls)
(b) NOSSAINST 8020.15, Military Munitions Response Program Oversight of 8 Mar 04
(c) NAVSEA OP 5, Revision 7
(d) E-mail NSF IH (HN2WSJ) Mr. S. Jorgensen/NOSSA (N535) Ms. S. McCahill of 6 Jun 07 (w/encls)
(e) E-mail NSF IH (HN2WSJ) Mr. S. Jorgensen/NOSSA (N537) Mr. R. Urbanski of 13 Jun 07 (w/encls)

1. As requested by reference (a), Naval Ordnance Safety and Security Activity (NOSSA) reviewed the subject Explosives Safety Submission (ESS) Determination Request in accordance with references (b) and (c). Based on the information presented in reference (a), supplemented by reference (d), and amended by reference (e), NOSSA has determined that an ESS is not necessary for the proposed operation.

2. As outlined in your request, we understand that the likelihood of encountering Munitions or Explosives of Concern (MEC) within Indian Head Installation Restoration (IR) Site 28 is considered low and that the following operations and/or conditions will apply:

a. The proposed operation involves the excavation, screening, removal, and subsequent off-site disposal of approximately 2,400 cubic yards of soil from within and around IR Site 28.

b. Although this site was used in the past for smokeless powder burning and zinc recovery furnace operations, IR investigations performed at the site have only found explosives present in levels (ug/kg), which do not pose an explosive hazard.

c. As an additional conservative measure, Unexploded Ordnance technicians will be present at the site during the excavation and screening operations.

d. The operational risk/hazard assessment of this project has determined the risk to be negligible.

e. The site is partially encumbered by the Inhabited Building Distance (IBD) explosives safety quantity-distance (ESQD) arc/Public Transportation Route (PTR) ESQD arc from Building 513. Building 513 is sited for 500,000 pounds of C/D 1.3 material; hence, the same arcs for IBD and PTR. However, as indicated in the enclosure to reference (e), the actual area where soil is to be removed is outside the ESQD arcs. No operations or equipment storage is authorized in the southwestern corner of the site which is within the ESQD arcs. In addition, prior to startup, site operations will be coordinated with Naval Surface Warfare Center, Indian Head Division's Explosives Safety Officer.

f. Prior to initiating work, all personnel performing intrusive operations will be briefed on the potential hazards presented by MEC, such as smokeless powder grains, which may be present at the site.

3. However, if any MEC items are discovered at the site, operations must stop and cannot be resumed until you have submitted and obtained approval of an ESS for this project.

4. The NOSSA point of contact for this ESS Determination is Ms. Sherry McCahill, who can be contacted at DSN 354-4450 or commercial at 301-744-4450.

Pamela G. Clements

PAMELA G. CLEMENTS
By direction

Copy to:
CNO (N411; N45C)
NAVFAC HQ (A. Walker)
NSF IH (HN2WSJ)
NOSSA ESSOLANT (N5L)

REQUEST FOR A NOSSA EXPLOSIVES SAFETY SUBMISSION DETERMINATION

Instructions for use:

The responsible project manager may request a NOSSA N5 determination that an ESS is not required by completing and submitting this form. A blank copy (as a Word document) may be downloaded at https://intranet.nossa.navsea.navy.mil.

MRS identifier: Activity, City and State	Installation Restoration (IR) Program Site 28 Activity: Naval Support Activity South Potomac Location: Naval Support Facility, Indian Head Indian Head, Maryland	Date submitted:	13 June 2007
Responsible project manager: Name, activity, and contact information	Shawn Jorgensen Naval Support Facility, Indian Head (301) 744-2263 (Phone) (301) 744-4180 (Fax) shawn.a.jorgensen@navy.mil	EOD/UXO technical support: Contact information	On-site: Shaw Environmental UXO Technicians (Personnel to be determined) Emergency: EOD Mobile Unit II, Dahlgren Detachment GMC Joel Nelson (540) 653-7425

Site history: Briefly describe past site use; discuss why MEC are known or suspected to be present	Site 28, also referred to as the “Original NOS (Naval Ordnance Station) Burning Ground,” the “Slavins Dock Area,” and the “Wildlife Area,” is located along Mattawoman Creek on the northeastern side of Naval Support Facility, Indian Head (NSF-IH), Enclosure (1). The site was identified in the Initial Assessment Study (IAS) of 1983 as “The Original Burning Ground,” a 1.8-acre site that only burned smokeless powder, based on the material manufactured when the site was operational (circa 1890s to 1942), Enclosure (2). The report also states that it is possible that various other contaminated wastes were open-burned there. The IAS shows the site located in Zone B, which is depicted on Enclosure (3) as the Shoreline Burning Cage. A literature search of the site conducted by Navy Historian Jim Dolph in September 2001 revealed that the site was also the location of a zinc recovery furnace designated as Building 415, shown in Enclosure (4). The building was constructed in 1928 and the last map showing the building is dated October 31, 1952, indicating that the building was demolished in the early 1950s. Mr. Dolph also found information showing that the burning cage was located in Zone A near the zinc recovery furnace shown in Enclosure (3). Unfortunately, the exact location of the former burning cage is unknown. The burning ground is

	shown outside of the existing perimeter fence on at least one historical map; however, burned debris, glass, and slag-like materials have been observed inside the fence, between the mouths of Swales 3 and 4, shown on Enclosure (3). Based on this information and results obtained during sampling events, we believe that the location originally identified by the IAS in Zone B, as shown on Enclosure (3), is incorrect. The Final Remedial Investigation Report for Site 28 of April 2005 identified a potential risk to human health for hypothetical residents and for future construction workers due to arsenic and zinc concentrations in soil and shallow groundwater. The Baseline Ecological Risk Assessment Report of September 2006 identified zinc as a contaminant of potential concern for ecological receptors. Explosives analyses included the full list of nitroaromatics and nitroamines published in US EPA's SW-846 method 8330, nitroglycerin, nitroguanidine, and perchlorate. Detections ranged from 57 µg/kg to 670 µg/kg and included 2,4,6-trinitrotoluene, 2,4,-dinitrotoluene, and nitrobenzene. Most of the explosives detects were in the center of the former zinc recovery furnace area, which is where the burned debris, glass, and slag-like material discussed above is located. However, based on the human health and ecological risk assessments, none of these detections pose an unacceptable risk to human health or the environment.
MEC encountered or believed to be present: Quantity, type/nomenclature, and condition	Other than the low levels of explosives discussed above, no MEC has been discovered during previous PA, RI or EE/CA investigations.

Proposed operation: Describe on-call construction support, anomaly avoidance activities, or other proposed actions; identify if operation is encumbered by existing ESQD arc	This action will remove approximately 2,400 cubic yards of contaminated soil and sediment using excavators and loaders. The removed soil/sediment will be sent to an approved landfill for disposal and the excavation will be backfilled to an improved grade to eliminate the current erosion problem. The soil will be excavated to an average depth of two feet in the blue area shown on Enclosure (5) and to one foot in the yellow area. The sediment shown in the orange area will also be excavated to a depth of one foot. Since soil/sediment will be sent off-site for disposal, NAVFAC requires the soil to be mechanically screened to ensure that no MEC is inadvertently sent off-site, regardless of whether or not MEC is suspected to be present at the site. Based on the site history, we do not expect to find any MEC at this site. Therefore, we consider the soil/sediment screening an ultra-conservative measure. As an additional conservative measure, we will have UXO technicians present during the soil/sediment excavation and screening to ensure that no UXO is inadvertently sent off-site. Following the excavation, the soil/sediment will be stockpiled and hauled to an approved off-site landfill for disposal. All contract personnel working at the site will be briefed on the approved UXO Hazard Control Briefing provided in Enclosure (6). As a precaution, if any potential MEC is found, the work will stop and EOD Dahlgren Detachment personnel will be contacted to assess the item before any additional work is conducted at the site. If EOD personnel determine that an item is live or potentially live, then an Explosive Safety Submission will be prepared for NOSSA approval prior to continuing work at the site. The area of excavation is outside of all Inhabited Building Distance (IBD) and Public Transportation Route (PTR) arcs, as shown on Enclosure (7). In addition, this work will be coordinated with the Naval Surface Warfare Center, Indian Head Division Explosives Safety Office prior to starting construction to ensure that all explosives safety requirements are met.
Risk Assessment Code from page 2:[1]	**5** (Mishap Probability – D, Hazard Severity – IV)

Risk/hazard assessment. In accordance with OPNAVINST 3500.39, Operational Risk Management (ORM), Department of Navy activities must incorporate the principles of ORM into all phases of planning, operations, and training. This includes munitions response actions taken by the Department of Navy and its contractors. Since determining an ESS is not required carries with it inherent risks, the responsible project manager submitting this

request must evaluate those risks using facts, prudence, experience, judgment, and situational awareness. Together with OPNAVINST 3500.39, the table below can serve as a tool in determining the overall risk. Transcribe the Risk Assessment Code to the page 1 of this enclosure.

		Mishap Probability[2]			
		A	**B**	**C**	**D**
Hazard Severity[3]	**I**	1	1	2	3
	II	1	2	3	4
	III	2	3	4	5
	IV	3	4	5	5

Mishap Probability[10]:	Hazard Severity[11]:	Risk Assessment Codes:
A Likely to occur immediately **B** Probably will occur in time **C** May occur in time **D** Unlikely to occur	**I** May cause death **II** May cause severe injury **III** May cause minor injury **IV** Presents a minimal threat	**1** Critical } High **2** Serious } High **3** Moderate **4** Minor } Low **5** Negligible } Low

Enclose page 1 of this request in a letter or memo, or attach it to a digitally signed e-mail, and send to:

- Mail: COMMANDING OFFICER
  NAVAL ORDNANCE SAFETY AND SECURITY ACTIVITY
  ATTN: CODE N53
  23 STRAUSS AVE, BLDG D327
  INDIAN HEAD, MD 20640-5555
- Fax: 301-744-6749 (DSN 354

E-mail: (call 301-744-4450 to obtain an e-mail address)

[2] Note: NOSSA will only consider determining that an ESS is not required when the Risk Assessment Codes are 4 (minor) or 5 (negligible).

[2] "Mishap Probability" is the probability that a hazard will result in a mishap or loss, based on an assessment of such factors as location exposure, affected populations, experience, or previously established statistical information.

[3] "Hazard Severity" is an assessment of the worst credible consequence that can occur as a result of a hazard. Severity is defined by potential degree of injury, illness, property damage, loss of assets, or effect on mission. The combination of two or more hazards may increase the overall level of risk. For the munitions encountered or believed to be present, consider the munitions and fuzing type and configuration, and its armed/unarmed status.

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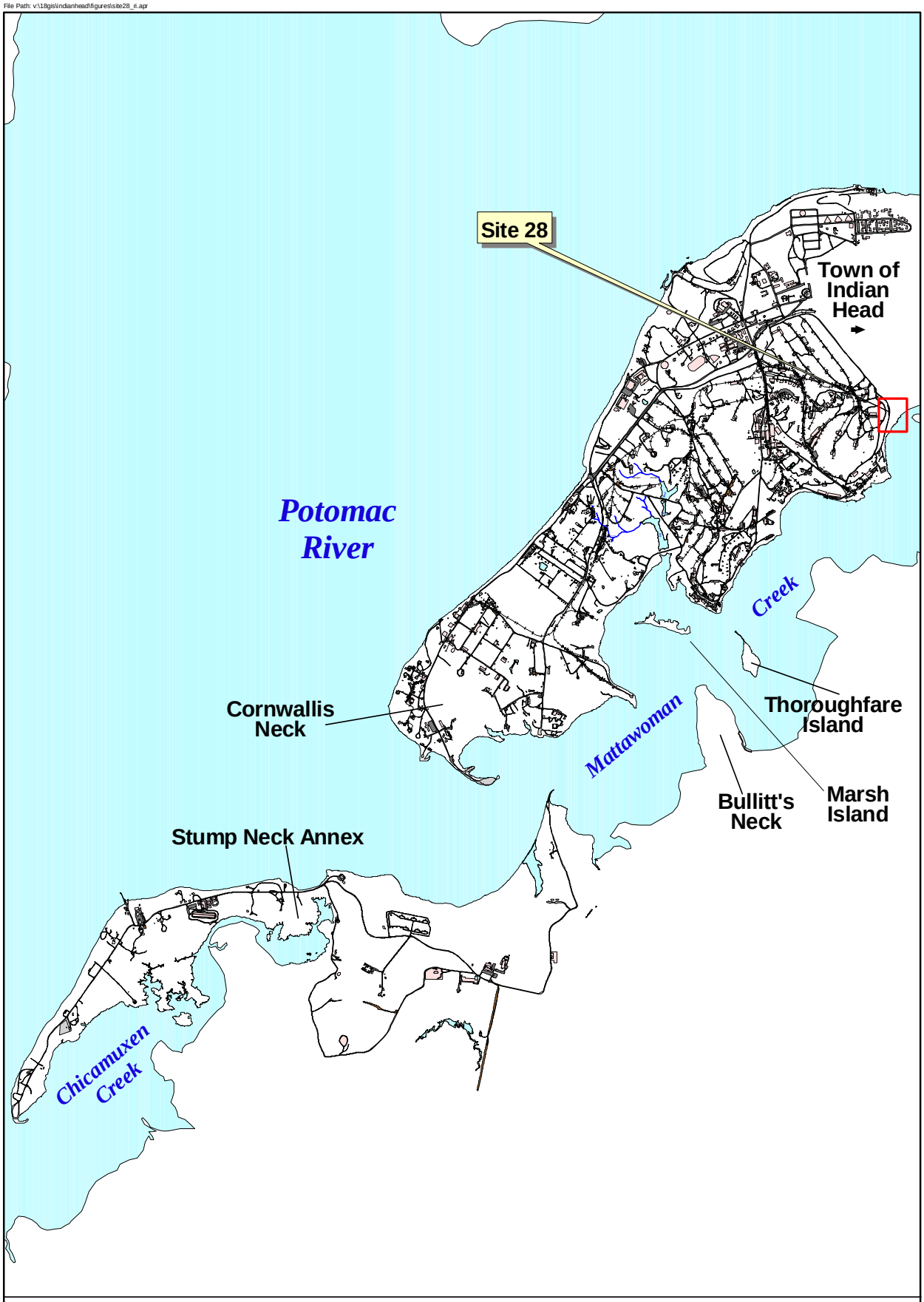


LEGEND

- IR Site Boundary
- Perennial Swale
- Intermittent Swale
- Railroads
- Buildings
- Asphalt Road
- Dirt Road
- Gravel Road

N

0 2500 5000 Feet

Figure 2-1
Location of Site 28
NSF-IH Site 28 EE/CA
Indian Head, Maryland

CH2MHILL

Enclosure (1)

6.6.28 Original Burning Ground (MAP GRID S36, 37) (SITE NO. 28)

This site is the location of the 1.8-acre original NOS burning ground. Team file searches were not able to determine what materials were burned at this site. However, based on the materials manufactured when the site was operational (circa 1890s to 1942), only smokeless powder was burned at this site. It is also possible that various other contaminated wastes were open-burned here. Team site reconnaissance did not indicate any visible signs of these materials. There is not sufficient information to characterize the potential hazard at this site. A Confirmation Study is not recommended at this time.

6.6.29 The Valley (MAP GRID A37 to D41)(SITE NO. 29)

The naturally occurring valley along Torrense Road from grid location A37 to D41 was the site of test firing of naval guns. Magazines, firing points, and a railroad were all built along this valley for about one-half mile beginning at the Potomac River. Firing of guns lasted from 1891 to 1921 by which time proving ground activities had been shifted down river to Dahlgren, Virginia. References to the firing indicate that shells were fired into butts in the valley walls as well as down-river over the Stump Neck area. Occasionally, shells were inadvertently fired across the river into Virginia. References tell of accidental damage from shrapnel and bursting shells on the proving ground. The records search did not reveal specific impact areas.

6.6.30 Stump Neck Impact Area (MAP GRID F-16 and G-16)(SITE NO. 30)

There was alleged to have been naval gun firing at Stump Neck into the marsh at grid locations F-16 and G-16 during pre-World War II years. This firing was said to have been observed from a concrete bunker. The bunker does exist and is located on the bluff at grid location H-13. The concrete appears to be old enough to have been in place prior to World War II. Other details are not available.

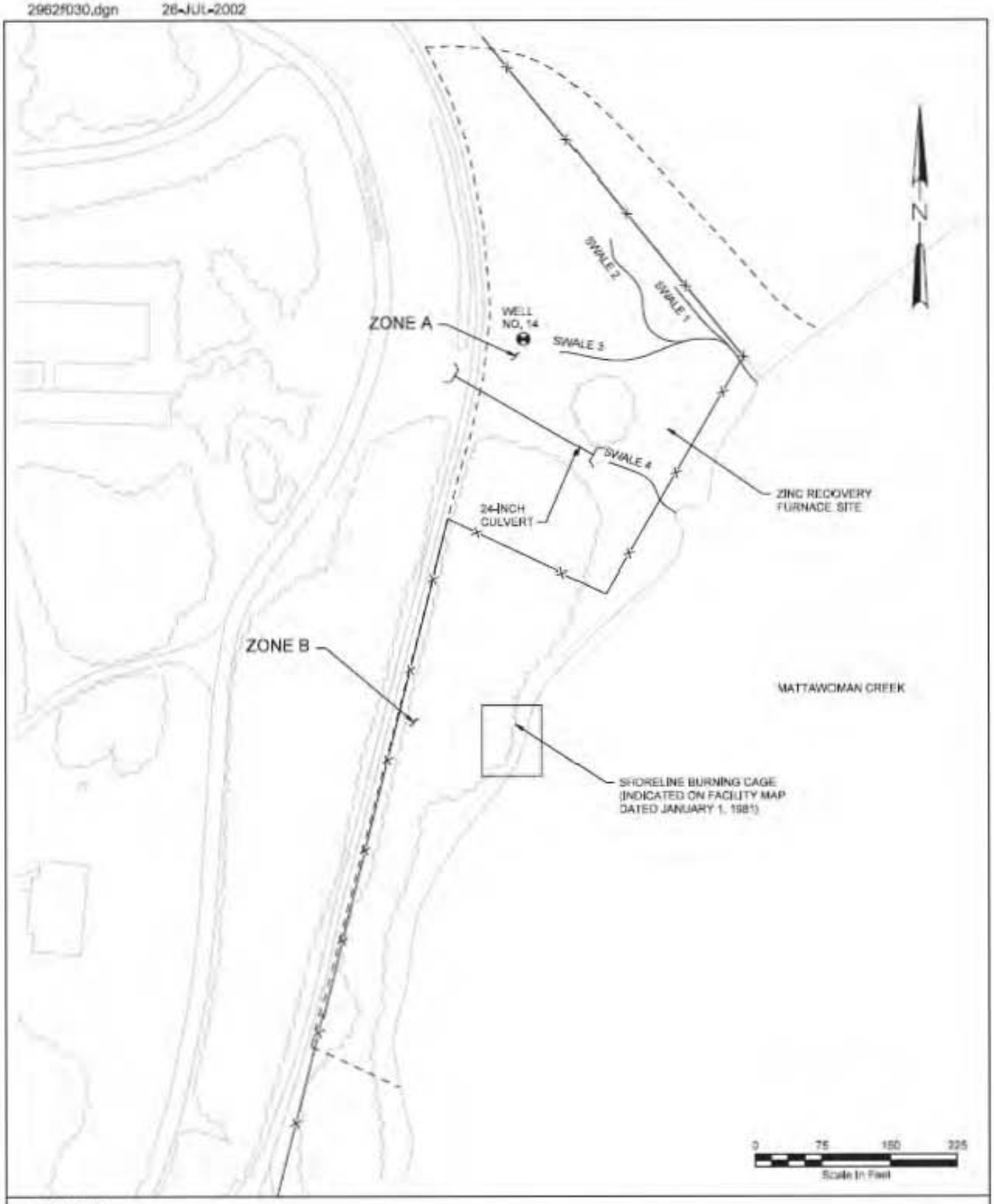
6.6.31 Old Demolition Range (MAP GRID ZZ-26)(SITE NO. 31)

There is said to be an old demolition training ground about 1 acre in area at grid location ZZ-26 at the end of Porter Road. It was in use in 1962 and for "many years" prior to 1962. The closure date is not known; however, Building 2107, built in the late 1970s, is also located in the immediate area. Training activities at this site are believed to be similar to those now practiced at Range #6, an explosive ordnance disposal training range.

6.6.32 Suspected Tool Burial (MAP GRID ZZ-18)(SITE NO. 32)

One person interviewed believed that special beryllium-copper alloy hand tools used in explosive ordnance disposal work were buried in the vicinity of Building 31SN, at grid ZZ-18. The area around the building is paved with asphalt. No other clues are available to confirm this suspicion; however, another confirmed site is reported near Building D-21C, at grid E-15.

2962f030.dgn 26-JUL-2002

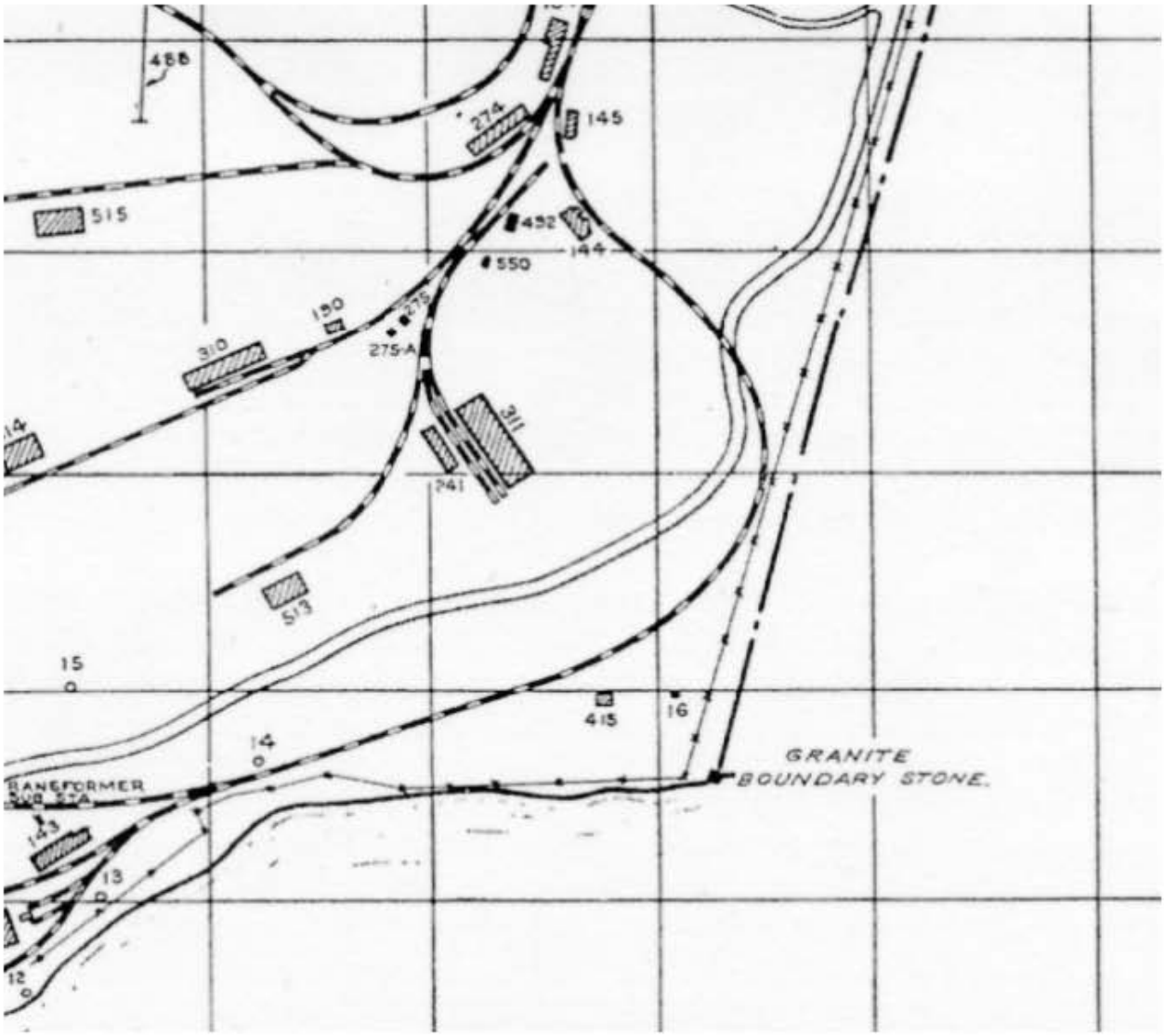


LEGEND

-X——X- FENCE LINE

– – – – – APPROXIMATE SITE BOUNDARY FOR RI

Figure 2-2
Site 28 Layout
NSF-IH Site 28 EE/CA
Indian Head, Maryland


488
274
145
515
432
144
550
150
275-A
310
311
241
513
15
415
16
14
GRANITE
BOUNDARY STONE.
143
13
12

Enclosure (4)

UNKNOWN BLDG
ZINC FURNACE
Here - Dirt Pile

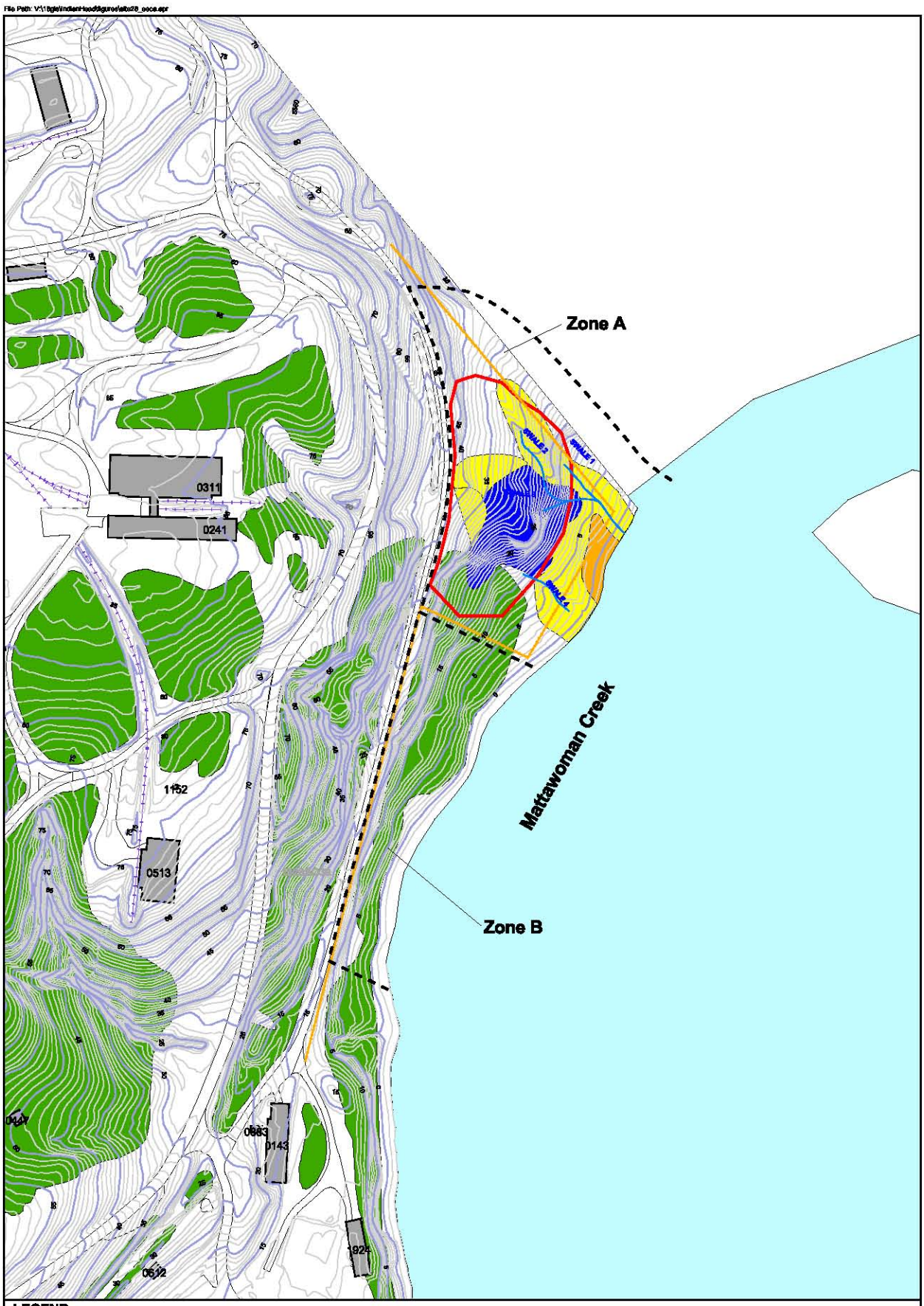


Figure 4-1
Limits of Excavation and/or Soil Amendment
for Alternative 2 and Alternative 3
NSF-IH Site 28 EE/CA
Indian Head, Maryland

CH2MHILL

What to do if you find UneXploded Ordnance (UXO)

At or near Naval Support Facility, Indian Head (NSF-IH)

If Ordnance is Found:

1. **Do not touch, move or dig near or around suspected ordnance**
2. **Walk away in the direction you came**
3. **Identify the area on a map or by terrain feature**
4. **Report immediately to:**

301-744-1111

After Reporting UXO Discovery, the following will occur:

1. Appropriate Naval Support Activity South Potomac personnel are notified, including Police, Fire, Explosives Safety, etc.
2. Dahlgren Detachment Explosive Ordnance Disposal (EOD) is contacted for ordnance assessment and removal.
3. UXO records are documented and kept on file at NSF-IH.

More Info . . .

Mortar

UXO SAFETY WARNINGS

- **When you see UXO, STOP. Do not move closer.**
- **Never use communication devices (walkie-talkies, citizens' band radios, cellular phones, etc.) near UXO.**
- **Never attempt to remove anything near a UXO.**
- **Never attempt to touch, move, or disturb a UXO.**
- **Without moving closer, clearly mark the location of the UXO, if possible.**
- **Avoid any area where UXO is located.**

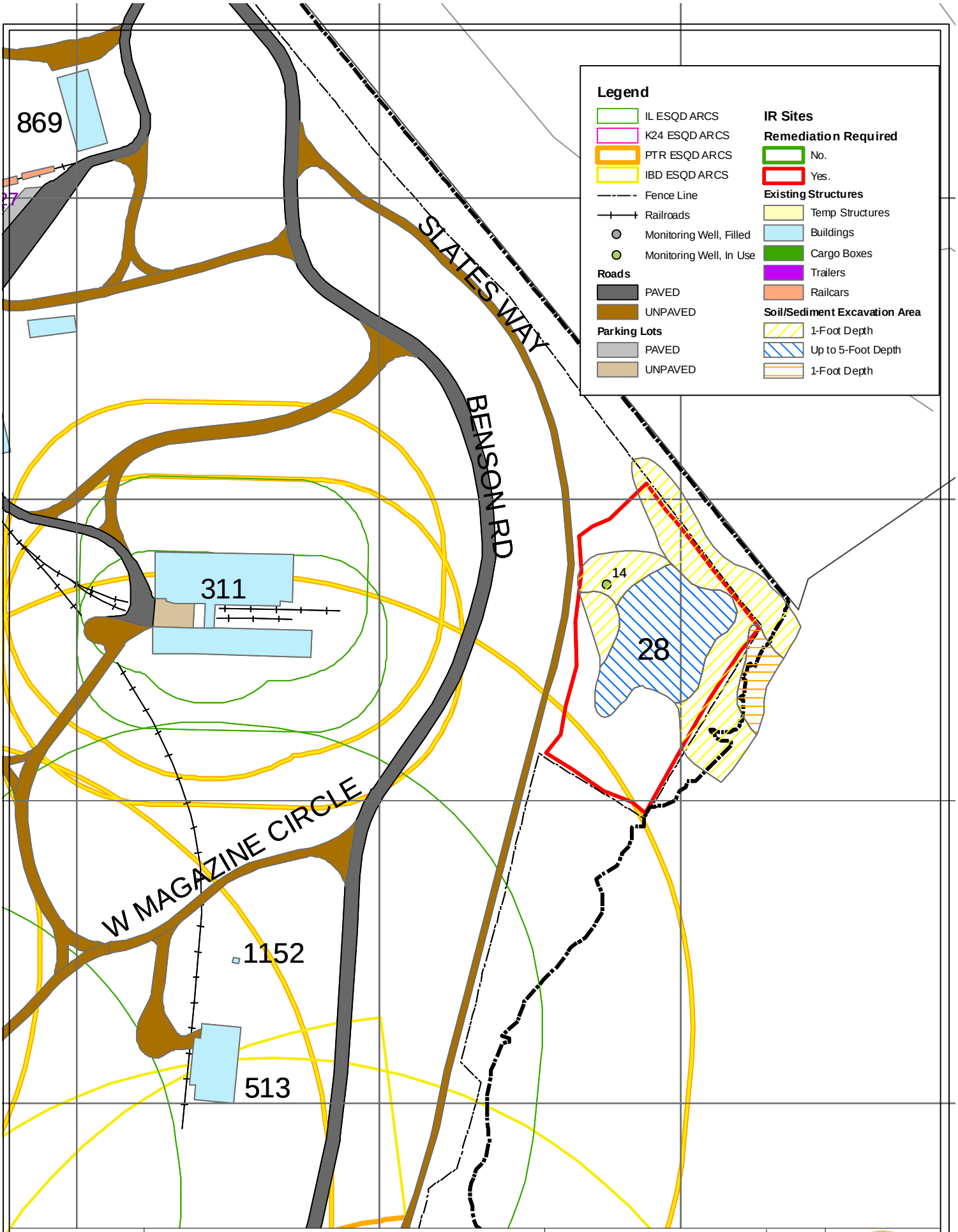
Rocket Motor

A person can lessen the danger of UXO hazards by being able to recognize the hazard and by adhering to the following basic safety guidelines (NAVEODTECHDIV 1994):

1. After identifying potential UXO, do not move any closer to it. Some types of ordnance have magnetic or motion-sensitive proximity fuzing that may detonate when they sense a target. Others may have self-destruct timers built in.
2. Do not transmit any radio frequencies in the vicinity of a suspected UXO hazard. Signals transmitted from items such as walkie-talkies, short-wave radios, citizens' band (CB) radios, cellular phones, or other communication and navigation devices may detonate the UXO.
3. Do not attempt to remove any object on, attached to, or near a UXO. Some fuzes are motion-sensitive, and the UXO may explode.
4. Do not move or disturb a UXO because the motion could activate the fuze, causing the UXO to explode.
5. If possible and without moving closer to the UXO, mark the location of the UXO with engineer tape, colored cloth, or colored ribbon or other suitable material byattaching the marker to an object so that it is about 3 feet off the ground and visible from all approaches. Place the marker no closer than the point where you first recognized the UXO hazard.
6. Leave the UXO hazard area the way that you entered.
7. Report the UXO to the proper authorities (301-744-1111).
8. Stay away from areas of known or suspected UXO. This is the best way to prevent accidental injury or death.

NAVEODTECHDIV. 1994. *Explosive Ordnance Disposal Procedures*. Technical Manual 60A-1-1-15. April 4.

EXAMPLES OF UXO ITEMS THAT MAY BE SEEN AT
NAVAL SUPPORT FACILITY, INDIAN HEAD



Date: 11 April 2007
Scale: 1:2,600
Created By: NSASP GIS
Drawing #: IH Facility 2007

0 55 110 220 330 440 Feet

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Naval Support Activity South Potomac
Naval Support Facility, Indian Head
Installation Restoration Site 28
Original Burning Ground

Enclosure (7)