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FINAL INTERIM REMOVAL ACTION WORK PLAN FOR UXO 19, SITE 11 AND SITE 17
NSWC INDIAN HEAD MD

1/26/2011
CH2MHILL

Final

**Interim Removal Action Work Plan
for
UXO 19, Site 11, and Site 17**

**Naval Support Facility Indian Head
Indian Head, Maryland**

Contract Task Order 0088

January 2011

Prepared for

**Department of the Navy
Naval Facilities Engineering Command
Washington**

Under the

**NAVFAC CLEAN 1000 Program
Contract N62470-08-D-1000**

Prepared by



Chantilly, Virginia

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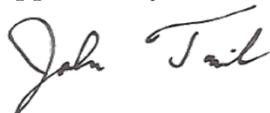
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Naval Support Facility Indian Head
Indian Head, Maryland

Contract Task Order 0088
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NAVFAC CLEAN 1000 Program

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Executive Summary

This munitions response Interim Removal Action (IRA) Work Plan presents the objectives, background, approach, and implementation procedures necessary to conduct an IRA at UXO 19, Igniter Area; Site 11, Caffee Road Landfill; and Site 17, Disposed Metal Parts Along Shoreline, at the Naval Support Facility Indian Head (NSF-IH) in Indian Head, Maryland. NSF-IH is located in northwestern Charles County, Maryland, and consists of two tracts of land: the Main Installation on the Cornwallis Neck Peninsula, and the Stump Neck Annex, across Mattawoman Creek. The IRA will be performed along the shoreline and shallow water of Mattawoman Creek at UXO 19 and Site 17, and along the shoreline of Mattawoman Creek at Site 11.

This document was prepared under the U.S. Department of the Navy (Navy), Naval Facilities Engineering Command Washington Comprehensive Long-term Environmental Action, Navy; Contract Number N62470-08-D-1000, Contract Task Order 0088.

UXO 19, Igniter Area, is located offshore of Mattawoman Creek along a wooded and marshy area in a small promontory referred to as "Thieves Point" and covers approximately 0.01 acre (approximately 20 feet by 20 feet). The IRA, however, will cover an area of approximately 400 feet along the shoreline by 130 feet into the shallow water of Mattawoman Creek. The objective of the IRA at UXO 19 is to remove munitions and explosives of concern (MEC) and non-MEC items along the shoreline and visible MEC within shallow waters to allow for an unimpeded follow-on DGM survey, which will be conducted to detect shoreline subsurface anomalies and creek bottom anomalies.

Site 11, Caffee Road Landfill, is situated at the southern end of Caffee Road, extending about 200 feet on either side of the road. The landfill is bordered by an unnamed creek and wetland to the west and by Mattawoman Creek to the south. Currently, much of the Mattawoman Creek shoreline adjacent to Site 11 consists of concrete, debris, and fill. The objective of the IRA along the shoreline and the land is to clear MEC items before constructing a soil cover that will extend from the land into Mattawoman Creek.

Site 17, Disposed Metal Parts Along Shoreline, is located in the southeastern portion of NSF-IH, and lies adjacent to Site 11. It is a relatively flat and open area with tall grasses and some small trees and brush. Metal items were discarded at the site from the 1960s until the early 1980s, including rocket motor casings, shipping containers, drums, and various metal parts. The objective of the IRA is to remove surface MEC and material potentially presenting an explosive hazard as a housekeeping measure for the protection of human health and the environment.

Contents

Executive Summary.....	v
Abbreviations and Acronyms	ix
1 Introduction	1-1
1.1 Work Plan Organization	1-1
1.2 Base Setting.....	1-2
1.3 Sites Descriptions.....	1-2
1.3.1 UXO 19	1-2
1.3.2 Site 11.....	1-3
1.3.3 Site 17.....	1-4
2 Interim Removal Action Elements	2-1
2.1 Removal Action Objective	2-1
2.2 Removal Action Description	2-1
2.3 Technical Support	2-1
3 Interim Removal Action Implementation.....	3-1
3.1 Pre-IRA Activities	3-1
3.1.1 Mobilization and Site Preparation.....	3-2
3.1.2 Vegetation Clearing Activities	3-2
3.1.3 Work Area Restrictions	3-3
3.2 IRA Activities	3-3
3.2.1 Surface Search and Removal on the Shoreline.....	3-3
3.2.2 Visual Search and Removal on Creek Bottom	3-4
3.2.3 MEC and MPPEH Hazard Classification and Storage	3-4
3.3 Post-IRA Activities.....	3-6
3.3.1 Land Survey.....	3-6
3.3.2 Waste Management	3-6
3.3.3 Documentation.....	3-6
3.3.4 Post-remedial Action Technical Memorandum	3-6
3.4 Quality Control	3-6
4 Environmental Protection Plan	4-1
4.1 Protection of Existing Resources.....	4-1
4.1.1 Flora and Fauna.....	4-1
4.1.2 Air Quality	4-1
4.1.3 Water Quality	4-1
4.1.4 Shallow-Water Shoreline Areas	4-1
4.1.5 Cultural and Archaeological Resources	4-2
4.2 Site Restoration.....	4-2
5 Project Management Plan	5-1
5.1 Project Organization and Responsibilities	5-1
5.1.1 Navy Technical Representative	5-1
5.1.2 FEAD /NSF-IH	5-1

5.2 Project Meeting 5-3
5.3 Project Submittals 5-3
6 References..... 6-1

Appendix

Health and Safety Plan

Table

5-1 Roles, Responsibilities, and Authorities of Individuals Assigned to this Project

Figures

- 1-1 Facility and Site Locations Map
- 1-2 UXO 19 Site Map
- 1-3 Site 11 and Site 17 Site Map

- 5-1 Organizational Chart
- 5-2 Schedule

Abbreviations and Acronyms

DDESB	Department of Defense Explosives Safety Board
DGM	digital geophysical mapping
ECP	entry control point
EPA	U.S. Environmental Protection Agency
ESS	Explosives Safety Submission
EZ	exclusion zone
FEAD	Facility Engineering Acquisition Department
IRA	Interim Removal Action
MDAS	material documented as safe
MEC	munitions and explosives of concern
MDEH	material documented as an explosive hazard
MPPEH	material potentially presenting an explosive hazard
NAVFAC	Naval Facilities Engineering Command
NEW	net explosive weight
NSF-IH	Naval Support Facility Indian Head
QA	quality assurance
QC	quality control
SUXOS	Senior UXO Supervisor
TTNUS	Tetra Tech NUS, Inc.
TP	Technical Paper
UXO	unexploded ordnance
UXOQCS	UXO Quality Control Specialist
UXOSO	UXO Safety Officer
WAMS	<i>Final Water Area Munitions Study (Malcolm Pirnie, 2005)</i>

Introduction

This munitions response Interim Removal Action (IRA) Work Plan presents the objectives, background, approach, and implementation procedures necessary to conduct an IRA at UXO 19, Igniter Area; Site 11, Caffee Road Landfill; and Site 17, Disposed Metal Parts Along Shoreline, at the Naval Support Facility Indian Head (NSF-IH) in Indian Head, Maryland. The IRA will be performed along the shoreline and shallow water of Mattawoman Creek at UXO 19 and Site 17, and along the shoreline of Mattawoman Creek at Site 11. This document was prepared under the U.S. Department of the Navy (Navy), Naval Facilities Engineering Command (NAVFAC) Washington Comprehensive Long-term Environmental Action, Navy; Contract Number N62470-08-D-1000, Contract Task Order 0088.

This Work Plan was developed using information contained in the following reports:

- *Final Water Area Munitions Study, Naval District Washington, Indian Head, Maryland* (Malcolm Pirnie, 2005) (herein referred to as WAMS)
- *Explosives Safety Submission (ESS) for UXO 19, Igniter Area, Naval Support Facility Indian Head, Indian Head, Maryland* (CH2M HILL, 2010) (herein referred to as UXO 19 ESS)
- *Explosive Safety Submission Site 17, Construction Support and Interim Removal Action, Naval Support Facility Indian Head, Indian Head, Maryland* (CH2M HILL, 2011) (herein referred to as Sites 11 and 17 ESS)

This Work Plan incorporates by reference the *Final Master Sampling and Analysis Plan, Naval Support Facility Indian Head, Indian Head, Maryland* (Tetra Tech NUS, Inc. [TTNUS], 2009) (hereafter referred to as the Master Plan).

1.1 Work Plan Organization

This Work Plan is composed of the following sections:

- Section 1 – Introduction
- Section 2 – Interim Removal Action Elements
- Section 3 – Interim Removal Action Implementation
- Section 4 – Environmental Protection Plan
- Section 5 – Project Management Plan
- Section 6 – References

Figures referenced within the text are provided at the end of each section. Appendices follow the References section. Several plans have been prepared in support of this scope and are provided in Section 4 (Environmental Protection Plan), ESS for UXO 19, and ESS for Sites 11 and 17, and the Appendix (Health and Safety Plan). Field methods will be performed in accordance with the ESS for UXO 19 and ESS for Sites 11 and 17, the Master Plan, CH2M HILL's standard operating procedures, and the subcontractors' recommended best practices.

1.2 Base Setting

NSF-IH is a Navy facility in northwestern Charles County, Maryland, approximately 25 miles southwest of Washington, DC. The facility consists of two tracts of land: the Main Installation on the Cornwallis Neck Peninsula, and the Stump Neck Annex, across Mattawoman Creek (Figure 1-1).

The Main Installation contains approximately 2,500 acres and is bounded by the Potomac River to the northwest, west, and south; Mattawoman Creek to the south and east; and the town of Indian Head to the northeast. Included as part of the Main Installation are Marsh Island and Thoroughfare Island, located in Mattawoman Creek. Elevations range from sea level to approximately 125 feet above mean sea level. The Stump Neck Annex contains approximately 1,084 acres and is bounded by Mattawoman Creek to the northeast, the Potomac River to the northwest, and Chicamuxen Creek to the south-southwest. Elevations range from sea level to approximately 10 feet above mean sea level.

Both the Main Installation (Cornwallis Neck Peninsula) and the Stump Neck Annex are on the U.S. Environmental Protection Agency's (EPA) National Priorities List. The Main Installation and Stump Neck Annex are separated by Mattawoman Creek (noncontiguous), have separate EPA identification numbers, and perform dissimilar operations. Mattawoman Creek falls within an active U.S. Coast Guard-designated danger zone from the mouth of the creek and along the southeastern shore of the creek for waterway traffic.

1.3 Sites Descriptions

1.3.1 UXO 19

UXO 19, Igniter Area, is located offshore of the Mattawoman Creek along a wooded and marshy area in a small promontory referred to as "Thieves Point" (Figure 1-2) and covers approximately 0.01 acre (approximately 20 feet by 20 feet). The promontory is a wetland and considered a species protection area. The IRA, however, will cover an area of approximately 400 feet along the shoreline by 130 feet into the shallow water of Mattawoman Creek. Adjacent waterways of the creek are open to fishing, water transit, and seasonal waterfowl hunting.

The history of munitions and explosives of concern (MEC) use at UXO 19 is documented in the WAMS. The WAMS reports that a small pile of igniters was found by Base personnel at the site during an extremely low tide in 1996 or 1997. Based on descriptions in the WAMS, the igniters were assumed to be electric primers or electrically primed rifle cartridges of approximately 50 caliber. Furthermore, the igniters were suspected to be M2 and/or M60 time blasting fuse igniters. The WAMS further reported that in March 2004, additional ordnance items were observed by Base personnel along the shoreline during low tide. These items appeared to be MK 1 MOD 1 or MK 2 MOD 0 float signals, and a 250-, 500-, or 750-pound old-style bomb.

Several of the igniters were reportedly picked up and disposed of, but it is unknown if the disposal of the remaining igniters occurred. The origin of the igniters, dates of use, or date of disposal were unknown. Interviews with former employees indicated that the igniters might have come from the Cast Plant. As part of the WAMS, a site visit was conducted in

June 2003. The WAMS reported that igniters were not observed and there were no indications of MEC because the site was covered with water.

On November 25, 2008, the Navy and CH2M HILL conducted a site visit. Igniters were not observed; however, munitions-related items, dead wood, and other debris were scattered not only at UXO 19, but also along an approximately 400-foot stretch of the shoreline and shallow water. A 100-pound bomb was observed in the shallow water approximately 2 to 4 feet from the shoreline. The same observation was made during the CH2M HILL site visit on April 22, 2009 with the Navy, EPA, and the Maryland Department of the Environment. On October 26, 2009, and January 12, 2010, CH2M HILL attempted to conduct a munitions inventory along the shoreline at UXO 19, but could not complete it because of algae-covered water and frozen water conditions, respectively. CH2M HILL did observe the 100-pound bomb AN-M30A1 Old Style General Purpose with a large hole in the shallow water as well as rocket motors (features consistent with 5.0-inch aerial rocket motor). Precise MEC nomenclatures and quantities of the rocket motors are unknown.

The shoreline topography is flat to gently sloping into the shallow water of the creek. The shoreline is under water, except during low tides. The soils in these areas range from sand to clay, but can often be peaty. Because this is mostly a water area, there is limited vegetation directly onsite. Vegetation adjacent to the site primarily consists of marshlands and uplands containing marsh grasses, low shrubs, and some trees.

1.3.2 Site 11

Site 11, Caffee Road Landfill, is situated at the southern end of Caffee Road, extending about 200 feet on either side of the road. The landfill is bordered by an unnamed creek and wetland to the west and by Mattawoman Creek to the south (Figure 1-3). A review of historical aerial photographs (1956 to 1987) indicated that Site 11 was created by landfilling activities, which occurred after 1956. By 1963, most of the area within Site 11 had been cleared and filled. The filling activities extended the shoreline into Mattawoman Creek by as much as 150 feet from its original position. Currently, much of the Mattawoman Creek shoreline adjacent to Site 11 consists of concrete, debris, and fill.

Because of different historical uses of this site, it is divided into two areas: (1) Area A and the Upland Area because of past landfilling and disposal activities, and (2) Area B because of historical incineration or waste-burning activities. Area A is the landfill where disposal activities occurred and where metal parts were flashed in the area just west of wetland Area Two (IH-02). A literature search conducted at NSF-IH during the remedial investigation (CH2M HILL, 2004) revealed that four open-burning pits had existed along the eastern edge of Site 11. This area was designated as Area B. The original burn location was just west of IH-02 in Area A. Burning in this area stopped when the area was cleaned up and regraded in 2001.

The Area A landfill was used until the early 1960s for the disposal of bulk metal items and trash, rocket motor casings, exploded building debris, rifles, demilitarized ordnance, propellant grains, and open-burning residues (Fred C. Hart Associates, Inc., 1983). There is no information concerning the date when the landfill was first used. In 1980, the Navy reportedly removed 5,000 to 6,000 cubic yards of flashed metal parts from the wetland area. The Initial Assessment Study for Site 11 reported that various materials were dumped or left uncovered for extended periods (Fred C. Hart Associates, Inc., 1983). Because the site was

never permitted as a landfill, there were no cover application procedures to secure deposited or stored waste materials.

The surface of the landfill had been used as the Caffee Road Thermal Treatment Point Pad to store flashed metal parts, which were periodically removed by a metal recycling contractor. With the exception of a new gravel pad, which is now the Caffee Road Thermal Treatment Point Pad, the landfill area was graded and seeded in 2001.

The shoreline adjacent to Site 11 is narrow in some areas (less than 5 feet) and non-existent in other areas because the water practically abuts the land with no shoreline. The MEC items observed along the shoreline consist of the same types of items observed along the shoreline adjacent to Site 17. These items are described in Section 1.3.3. In addition, five MPPEH items observed by CH2M HILL on November 10, 2010 during a visual surface survey of the land portion of Site 11 will be removed.

1.3.3 Site 17

Site 17, *Disposed Metal Parts Along Shoreline*, is located in the southeastern portion of NSF-IH (Figure 1-3), and lies adjacent to Site 11. It is a relatively flat and open area with tall grasses and some small trees and brush. Site 17 was defined in the Initial Assessment Study (Fred C. Hart Associates, 1983) as a 1,000-foot-long stretch of land along the Mattawoman Creek shoreline where metal parts were discarded from the 1960s until the early 1980s. The discarded metals included rocket motor casings, shipping containers, drums, and various metal parts.

The presence of MEC on the land portion of the site was documented in the 2005 non-time critical removal action to remove drums at the surface and from soil to 1 foot below ground surface in a portion of the site. These items included Rocket Motor JATO M8 (net explosive weight [NEW] - 70 pounds); Rocket Motor 2.75-inch MK40 (NEW - 5.9 pounds); and Rocket Motor JATO M3A2 (NEW - 9.34 pounds)

On March 17, 2009, the Navy and CH2M HILL conducted a shoreline walkthrough at Site 11 and Site 17. Non-munitions and munitions-related items, dead wood, and other debris were observed along the shoreline at both sites and in the shallow water at Site 17. Based on the findings of the initial walkthrough, a visual inspection was proposed to identify and document the types and locations of MEC items along the shoreline and up to the low-tide water line in Mattawoman Creek.

On October 27, 2009, CH2M HILL was onsite to conduct a visual inspection of the shoreline. However, at the time of the inspection, only limited observations could be made because floating debris hindered the visibility of possible MEC items in the shallow water. A second visual inspection of the shoreline was conducted on January 12, 2010. At that time, the shallow water portion of the site was frozen and unobservable. Several MEC-related items were observed on the shore, consisting of rocket motors, cartridge casings, and venture caps.



- Legend**
- Approximate Site Boundary
 - Installation Boundary



Imagery Source: Google Earth Pro

Figure 1-1
Facility and Site Locations Map
Interim Removal Action Work Plan for UXO 19, Site 11, and Site 17
NSF-IH, Indian Head, Maryland



Legend

-  Approximate Site Boundary
-  Interim Removal Action Area
-  Installation Boundary

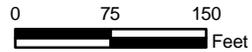
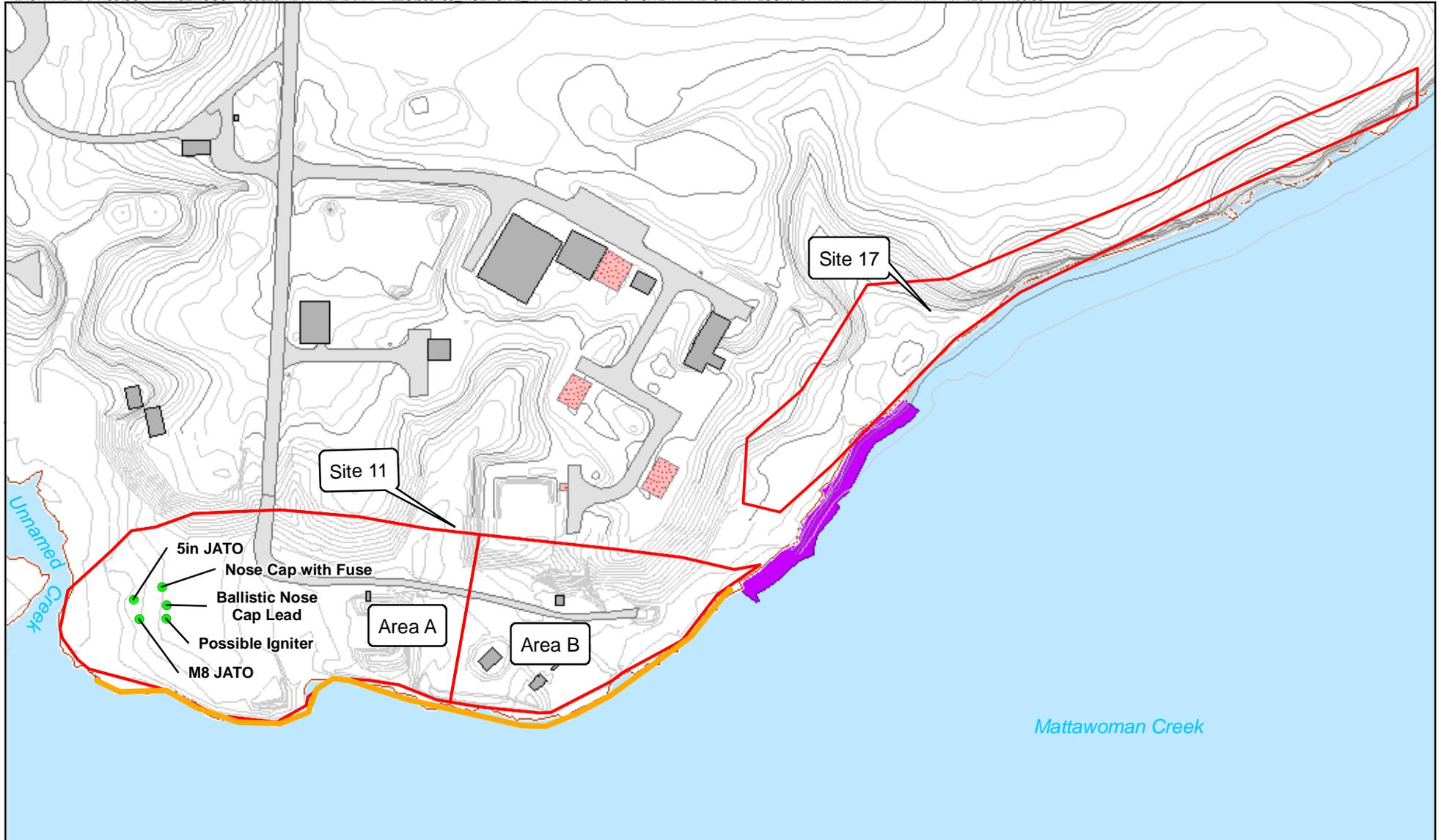


Figure 1-2
UXO 19 Site Map
Interim Removal Action Work Plan for UXO 19, Site 11, and Site 17
NSF-IH, Indian Head, Maryland



Legend

- MPPEH items observed by CH2M HILL during 11/10/10 visual survey
- Approximate Site Boundary
- Interim Removal Action along the shoreline
- Interim Removal Action along the shoreline and shallow water
- Demolished Building
- Building
- Installation Boundary
- Road Area
- Contours (5ft)
- Contours (1ft)

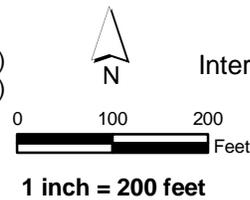


Figure 1-3
 Site 11 and Site 17 Site Map
 Interim Removal Action Work Plan for UXO 19, Site 11, and Site 17
 NSF-IH, Indian Head, Maryland

Interim Removal Action Elements

2.1 Removal Action Objective

This munitions response non-time-critical removal action is being implemented by the Navy using its removal action authority under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and Executive Order 12580. The removal action objective for each site is as follows:

- UXO 19: To remove MEC and non-MEC items along the shoreline and visible MEC within the shallow water to allow for an unimpeded follow-on DGM survey, which will be conducted to detect shoreline subsurface anomalies and creek bottom anomalies
- Site 11: To clear MEC items along the shoreline and Area A before constructing a soil cover that will extend from the land into Mattawoman Creek
- Site 17: To remove surface MEC and non-MEC items along the shoreline and visible MEC within the shallow water to protect human health and the environment

2.2 Removal Action Description

Detailed descriptions of the removal actions at UXO 19 and Sites 11 and 17 are provided in the UXO 19 ESS and the Sites 11 and 17 ESS, respectively. Section 3 of this work plan presents information on implementing the IRA based on the ESS reports. In summary, the IRA at UXO 19 will cover an area of approximately 0.14 acre, approximately 400 feet along the shoreline by 130 feet into the shallow water of Mattawoman Creek. The length of the shoreline at Sites 11 and 17 is approximately 1,411 feet. This includes 384 feet of shoreline adjacent to Site 17 and extending 1,027 feet in a southwesterly direction to the entrance of the unnamed creek. The IRA along the 384-foot shoreline adjacent to Site 17 extends from the mean high tide watermark to the mean low tide watermark, into the visible shallow water bottom not exceeding 3 feet water depth at mean low tide (approximately 30 feet into the creek from the shoreline). Finally, five MPPEH items will be removed from the land portion of Area A.

2.3 Technical Support

A detailed description of the technical support required for the IRA is provided in the UXO 19 ESS and the Sites 11 and 17 ESS. CH2M HILL's unexploded ordnance (UXO) subcontractor will perform the removal actions at all sites. UXO personnel assigned to this project will meet or exceed the requirements of the Department of Defense Explosives Safety Board (DDESB) Technical Paper (TP) 18, *Minimum Qualifications for UXO Technicians and Personnel* for their respective responsibilities (DDESB, 2004). A qualified UXO Technician III will perform the duties of UXO Safety Officer (UXOSO) and UXO Quality Control Specialist (UXOQCS). A UXO Technician III will perform the duties of the Senior UXO Supervisor (SUXOS). The UXOQCS will oversee activities during the response actions. The UXOQCS

will be responsible for implementing the QC plan and performing peer oversight, inspections, and audits in accordance with pass/fail criteria.

Interim Removal Action Implementation

A detailed description of the tasks and subtasks involved in the IRA is presented in this section. The actual execution of the individual tasks will be pre-planned and continually adjusted to overlap durations of specific activities and to allow other tasks to be performed consecutively to maximize the availability and utilization of onsite resources.

3.1 Pre-IRA Activities

Before mobilization, CH2M HILL field personnel will review this Work Plan (including the appendices) to ensure that the scope is executed, and health and safety protocols are adhered to as outlined herein. To enhance the timely mobilization of subcontractors and to meet operational schedule commitments, pre-construction activities, specifically pre-mobilization activities, will begin immediately upon approval of the final Work Plan.

Utility clearance is not required for this effort because the removal action does not consist of intrusive activities and will occur on the shoreline and in shallow water. CH2M HILL's UXO subcontractor will stake out the proposed IRA boundary along the shoreline with wooden stakes and survey the boundary with a global positioning system unit. A UXO Technician II or III will employ anomaly avoidance techniques during placement of the stakes.

Haul Route

Vehicle and truck traffic are inherent in soil removal projects. CH2M HILL will develop, in coordination with NSF-IH, predetermined truck delivery and egress routes to minimize congestion and facilitate loading and offloading operations. Before finalizing the vehicle routes, CH2M HILL will review and document pre-existing conditions. The entire onsite route, including all deficiencies and surfaces in need of repair, will be digitally photographed and submitted to the Navy for future reference. The proposed vehicle route will be driven by the site management staff as a final confirmation that no weight limitations exist over any crossings or culverts. The final site haul route will not be designated until after the pre-IRA meeting. Once approved by the Facility Engineering Acquisition Department (FEAD), the route will be posted and clearly marked for hauling vehicles entering and exiting the site. This will include signage to direct traffic.

MPPEH and material documented as an explosive hazard (MDEH) will be transported on explosive vehicle routes published by NSF-IH to the holding area at Site 17 from UXO 19 and Site 11 in a vehicle that has been inspected by NSF-IH safety personnel for serviceability and conformance to DD Form 626 explosive safety inspection criteria. This vehicle will have an operator with a valid commercial driver's license and hazardous material endorsement. MPPEH/MDEH, if transported, will be secured in a wooden box with sand and sand bags. The vehicle will have a placard displaying "HD 1.1" and the driver will comply with NAVSEA OP 5 guidance (NAVSEA, 2009) for the transportation of explosives. In accordance with Base procedures, any vehicle used to transport explosives will require a

letter of authorization from the Naval Surface Warfare Center Explosive Safety Officer and the company that owns the vehicle.

Pre-Construction Meeting

As discussed in Section 5, a pre-construction meeting will be held in advance of the proposed mobilization date for field activities. At the meeting, CH2M HILL will present an overview of the removal action and discuss project scope, schedule, planned invoicing, health and safety concerns, QC procedures, and any site logistical issues.

3.1.1 Mobilization and Site Preparation

Mobilization

Personnel, equipment, and materials will mobilize to the site to complete the project as defined in this Work Plan. Additional personnel and equipment will mobilize to the site as dictated by task resource demands and subsequently released from the project when work assignments are completed.

Site Preparation

Once initial mobilization is completed, site preparation activities will be conducted. Site preparation will consist of work zone delineation, establishment of a material staging area, and site clearing. High-visibility fence and traffic cones will be placed to identify traffic routes and lanes for the hauling vehicles (as needed). Signage will be posted at entry control points (ECPs) indicating that these areas are considered restricted. The site preparation will consist of the following:

- Informing FEAD and security personnel of site activities and duration for access of construction vehicles and hauling trucks
- Establishing appropriate signage for the project, indicating site activities and the hauling routes for site access and egress. This task will include setting up flagman stations for site control.
- Setting up the MPPEH/MDEH holding areas
- Establishing the exclusion zones at the site with barriers and signage

3.1.2 Vegetation Clearing Activities

Before IRA activities at UXO 19 begin, vegetation clearing may be necessary. Vegetation removal will consist primarily of clearing brush and removing fallen trees, driftwood, and dead fall from along the shoreline. Cleared vegetation will be chipped and spread on the ground or cut up for offsite disposal, unless the Navy directs CH2M HILL to pile the vegetation debris onsite. CH2M HILL's subcontractor will be responsible for clearing the shoreline with manually operated gas-powered tools, such as weed-eaters and/or chainsaws. To ensure the safety of workers, UXO Technicians (II or III) will visually search the areas to be cleared for explosive and non-explosive hazards, marking locations with pin flags or surveyor's ribbons for avoidance during use of the weed-eaters and chainsaws, which will be operated a minimum of 6 inches above the ground surface. Schonstedt GA-52Cx fluxgate magnetometers and White's XLT all-metals detectors will be used in support of the field activities.

3.1.3 Work Area Restrictions

NSF-IH work restrictions and requirements will be implemented throughout the project duration because the sites are within a Navy facility. Access to work areas will utilize non-essential routes to the maximum extent possible to minimize incursions onto active essential pavements.

An exclusion zone (EZ) will be required and enforced throughout implementation of the IRA, in accordance with the ESS reports. The purpose of the EZ is to protect nonessential personnel from any adverse effects generated from an unintentional or intentional detonation, or to protect a potential explosion site from blast overpressure and fragmentation hazards. Signs and/or barriers will be located at ECPs to the EZ. The ECPs will be augmented by audible warning signals to alert the public before beginning any actions that could result in an intentional detonation.

The waterway will be observed from an observation point that enables visual surveillance of the waterway approaches and work in the EZ. If a watercraft approaches, work will halt and the spotter will use a bullhorn and explain the situation. Work will not restart until the watercraft is outside the EZ. Explosive Safety Quantity-Distance arcs and ECPs were calculated as part of the ESS and the results are presented in the ESS reports.

3.2 IRA Activities

MPPEH will be located and removed within the IRA boundary through visual detection. Metal detectors (analog instruments) may be used by UXO Technicians in the shoreline area during removal activities to supplement visual detection but not in the shallow water. The analog instruments to be used will include Schonstedt GA-52Cx fluxgate magnetometers (passive) and White's XLT all-metals detector (active).

3.2.1 Surface Search and Removal on the Shoreline

The visual search requires a systematic observation of the surface along controlled lanes of search. At least two UXO Technicians (II or III) will establish the search lanes; each lane will be a maximum of 6 feet wide. The lanes will be marked with ropes, flags, ribbon, tapes, cones, or other lane control marking methods. The UXO Technicians (II or III) will walk down each lane to visually identify items as MEC/MPPEH or metal. The UXO Technicians (II or III) will identify, classify, and categorize each item based on its explosive hazard and record the information in the field notebook. The data may also be stored in CH2M HILL's munitions response site information management system (commonly referred to as MRSIMS; it is a handheld personal digital assistant), which is equipped with a global positioning system to survey the locations of MEC/MPPEH and metal items.

Once an item has been identified, a second UXO Technician III will confirm the identification or select a more-conservative classification. If the item is a non-MEC metal item, it will be placed in a pile for offsite disposal. If the item is MEC/MPPEH, it will be classified as MDEH or material documented as safe (MDAS) by the SUXOS with concurrence from the UXO Safety Officer (UXOSO).

If the item is classified as MPPEH/MDEH, acceptable to move, and is less than 1 pound NEW, it will be placed in MPPEH/MDEH staging area and secured under padlock to await

explosive venting for a consolidated effort at or near the end of the project. If the item is MDEH, acceptable to move, and more than 1 pound NEW, it will be destroyed by explosive countercharge within the disposal trench. MDEH that is not safe to move will be blown in place applying an explosive countercharge in accordance with the ESS. If the item is classified as MDAS, it will be moved and stored in a locked CONEX box.

3.2.2 Visual Search and Removal on Creek Bottom

Based on observations during the site visits and attempted MEC inventory, Mattawoman Creek can be murky or frozen at various times of the year. A search of the shallow clear water areas will require a search technique known as a "jack-stay search." This entails securing two lines (ropes with floats) from the shore into the creek, where each line will be attached to a floating buoy and anchor (clump). The lines will extend into the creek until the water depth is 3 feet at mean low tide or the visibility of the creek bottom is nil. These two lines will be spaced no more than 6 feet apart.

A UXO Technician II or III wearing a personal flotation device will enter the water search lane and do a visual search of the creek bottom. The distance of the search along each lane will depend on the 3-foot water depth at mean low tide or visibility. Once an item is observed, the UXO Technician II or III will assess the item to classify it as MEC/MPPEH or scrap metal. If an item is a non-MEC metal item, it may be removed and placed onshore in a pile for subsequent offsite disposal or recycling.

If suspected underwater MEC/MPPEH is encountered, it will be classified as MDEH or MDAS by the SUXOS, with concurrence from the UXOSO. If the item is classified as MDEH and acceptable to move, it will be moved to the shore for disposal by explosive countercharge. If an item is classified as MDEH and not safe to move, the UXO Technician II or III will flag and mark the location with a float. The UXO Technician II or III will refer the location to the SUXOS and UXOSO for possible Navy Explosive Ordnance Disposal consultation (EOD). Navy EOD will be contacted for underwater MEC/MPPEH that is not safe to move for confirmation and disposal/disposition recommendations. If the item is classified as MDAS, it will be moved and stored in a locked CONEX box.

Once the search of a lane is complete, the UXO Technician II or III will walk down the opposite side of the moored floating line to conduct a search of the next lane. This process will be repeated along the shoreline within the IRA boundary.

3.2.3 MEC and MPPEH Hazard Classification and Storage

Hazard Classification

The hazard classification and NEW of MEC/MPPEH will be based on characteristics of the type involved, its packaging (if any), and the estimated amount of explosives potentially present. Recovered MEC/MPPEH will be hazard-classified in accordance with NAVSEA OP 5, Volume 1 (NAVSEA, 2009). MPPEH will be managed as MDEH in accordance with OP 5 Chapter 13, Sections 13 to 15. MDAS is MPPEH that has been assessed and documented as not presenting an explosive hazard and for which the chain of custody has been established and maintained. MDEH is MPPEH that cannot be documented as MDAS and has been assessed and documented as to the maximum explosive hazards the material is known or suspected to present, and for which the chain of custody has been established and maintained.

Before release, the UXO Technician will physically inspect the materials in the containers to ensure that they are free of dangerous items, or will conduct demilitarization operations. The UXO Technician will sign the certificate, printed on the DD Form 1348-1A, which states: “We certify and verify that the AEDA residue, Range Residue and/or Explosive Contaminated property listed has been 100 percent properly inspected by us and to the best of my knowledge and belief, are inert and/or free of explosive hazards or other dangerous materials.”

Storage

The storage of the various types of MEC is described in the ESS and summarized below:

- Commercial explosives: None – project will use just-in-time delivery of commercial explosives
- MEC/MDEH: None – guarded until destroyed
- MPPEH/MDEH: Holding Area – Open storage – “Sited” for 1 pound NEW, secured in lockable containers, placard HD (Hazards Division) 1.1

The holding area consists of a maximum of three 20-foot containers with lockable doors, separated by a minimum of K-11 inter-magazine distance (11 feet). Holding area containers will be grounded at two opposing points, to a ground of 25 ohms or less resistivity, placed on a pad that is void of combustible materials, dry grass, or leaves, and placed on dirt, stone, or close-cut surface grass with a 50-foot fire break.

Each CONEX box exceeds 11 feet of separation and is placed at 12 feet of intra-magazine distance separation between the next box. This holding area will also have containers for metal and metal parts that are staged at least 100 feet away from the sited CONEX boxes staging area.

Labels will be affixed to each container identifying contents. The HD 1.1 designation of the holding area will be identified on the activity fire map and discussed with the NSF-IH fire chief before operations. The SUXOS will post a symbol where it will be visible during daylight from a distance of at least 500 feet in every direction. If visibility is obstructed by vegetation or curves in road, the symbol will be placed on the roadway so as to be visible from a distance of 500 feet. One HD 1.1 symbol posted on or near the door end of a CONEX box, or on the headwall of a box, is usually adequate. In addition, a flag will be flown from the fence at the entrance to the site or the farthest barricade from the site whenever explosive operations are occurring (including UXO inspection and movement).

When all materials within a staging area are covered by a single fire symbol, it may be posted at the ECP or on the access roadway. When different classes or divisions of explosives are stored in individual multi-cubicle bays or module cells, they may be further identified by posting the proper symbol on each box, bay, or cell. Placement of symbols will be coordinated with the NSF-IH fire department.

CONEX boxes will remain locked to ensure the integrity of their contents and to prevent commingling of recovered items. Each loaded CONEX box will be equipped with one fully charged Underwriters Laboratory-fire extinguisher (rated for 10 BC or greater capacity) that is readily accessible within 25 feet of the main entrance. The extinguisher will use a

non-freezing extinguishing agent 10-pound dry chemical or other non-toxic vapor type with equivalent extinguishing capacity.

Detailed information on MEC and MPPEH disposition processes are presented in the ESS reports(CH2M HILL, 2010a and 2010b).

3.3 Post-IRA Activities

3.3.1 Land Survey

Following the IRA activities, the IRA areas will be surveyed by a Maryland-licensed surveyor.

3.3.2 Waste Management

The following procedures apply to non-hazardous scrap or debris removed from the sites:

- Economically recyclable debris (such as scrap metal) will be collected and delivered to an appropriate local recycling facility. Recycling will be coordinated with the Navy.
- Non-MEC debris will be accounted for in estimated pounds recovered and type of material, and then shipped offsite.
- Vegetative debris will be mulched and left onsite as ground cover. This will reduce soil erosion from the brush-clearing activities.

The MEC subcontractor will prepare a waste manifest and bill of lading before pickup and submit them to CH2M HILL, who will submit them to NSF-IH for review. NSF-IH will sign the manifest and bill of lading at the time of pickup.

3.3.3 Documentation

Field activities will be documented in a field notebook by CH2M HILL's UXO technicians and CH2M HILL's UXO subcontractor. Records of all data, field forms, maps, photographs, QC data, and related files will be retained in CH2M HILL's Chantilly, VA office. Electronic files of all data generated in the field will also be stored on CH2M HILL's hardware. Paper and electronic copies of draft and final reports will be submitted as specified in this Work Plan.

3.3.4 Post-remedial Action Technical Memorandum

A post-remedial action technical memorandum will be submitted documenting all field activities; it is discussed in Section 5.3 of this work plan.

3.4 Quality Control

QC implementation is described in detail in Section 7 of the ESS reports (CH2M HILL, 2010a and 2010b). QC procedures outlined in these sections of the ESS reports will be adhered to during the IRA activities. CH2M HILL's UXO technicians will review the ESS reports before going out in the field.

Environmental Protection Plan

The Environmental Protection Plan consists of general procedures that will be implemented to protect the environment during MEC removal activities at UXO 19, Site 11, and Site 17.

4.1 Protection of Existing Resources

4.1.1 Flora and Fauna

In 1991-1992, the Maryland Natural Heritage Program of the Maryland Department of Natural Resources (MDNR) conducted a survey of rare, threatened, and endangered species at NSF-IH. Of the species identified, the bald eagle (*Haliaeetus leucocephalus*) is the only known federally listed threatened species identified at NSF-IH. The remainder of the species identified in the survey includes 5 state-listed endangered plants, 2 state-listed threatened plants, 1 state-listed endangered invertebrate, and 18 species of regional concern (MDNR, 1992).

In 1995, three additional rare tree species were identified as part of an Urban Tree Inventory at Indian Head (CH2M HILL, 2001) – the state-threatened eastern arborvitae (*Thuja occidentalis*), state-rare shingle oak (*Quercus imbricaria*), and potentially state-rare pussy willow (*Salix discolor*).

Regardless of status, the wildlife and vegetation comprising the natural habitat will be preserved in their present condition or restored as near as possible to their natural appearance. Wildlife and, for the most-part, vegetation is not expected to be affected because MEC removal activities will be managed to minimize interference. Limited vegetation clearance is planned for the IRA shoreline area of UXO 19; however, this will consist primarily of moving felled trees.

4.1.2 Air Quality

MEC removal activities will be kept under surveillance, managed, and controlled to minimize the discharge of any air pollutants. The nature of the proposed site work make it unlikely that the field activities will result in the generation and discharge of dust or any additional air pollutants.

4.1.3 Water Quality

No water resources are expected to be affected by onsite activities.

4.1.4 Shallow-Water Shoreline Areas

The 1992 MDNR survey also identified ten areas of ecological significance at NSF-IH (totaling 614 acres) that have the potential to support the long-term protection of the rare, threatened, and endangered species. These protection areas are Bullitt Neck Point, Cornwallis Neck Marshes, Hog Island Cove, Thoroughfare Island, Chicamuxen Creek Marsh, Magnolia Seep, Porter Woods, Rum Point, Stump Neck Beaver Marsh, and West Stump Neck Shoreline (MDNR, 1992).

Due to ecological restrictions protecting the bald eagle and short-nosed sturgeon at Site 17 and UXO 19 from December 15 through June 15, fieldwork will be conducted from June 16 through December 14. These restrictions do not apply to Site 11 because the site is outside of the bald eagle 750-foot buffer, and work will not be done in the water, so there is no impact to the short-nosed sturgeon.

4.1.5 Cultural and Archaeological Resources

Based on available data, the probability that significant cultural or archaeological resources are located within the project area appears to be low. Because of the nature of the proposed MEC removal activities, any cultural or archaeological resources that may exist within the project area are not expected to be affected. If any cultural or archaeological materials or resources are discovered within the project area, the NSF-IH Cultural Resources Program Manager will be notified and will provide guidance on performing further work in the area.

4.2 Site Restoration

In general, no site restoration is anticipated to be necessary, based on the nature of surface MEC removal activities. If site features are constructed, such as work areas, structures, fencing, and waste staging areas, they will be dismantled and the site will be restored in accordance with project requirements and directions provided by the FEAD.

Project Management Plan

This Project Management Plan has been prepared to define the project organization, identify key personnel (Figure 5-1) and their responsibilities, and establish reporting requirements and lines of communication for the implementation of the IRA at each site. This plan also includes an overall project schedule (Figure 5-2), pre-IRA meeting, and the project deliverables required during this IRA. This plan has been developed to maintain consistency in procedures and communications during the implementation of the IRA.

5.1 Project Organization and Responsibilities

The organizations that will participate in the implementation of this IRA are described in this subsection. These organizations have specific functions according to their project responsibilities. A project organization chart outlining the relationship between the project organizations is shown on Figure 5-1. Roles, responsibilities, and authorities of the IRA contractor personnel are listed on Table 5-1. The project organizations participating are the following:

- Owner: Navy
- Lead Regulatory Agency: EPA Region III
- Support Regulatory Agency: Maryland Department of the Environment
- IRA Contractor: CH2M HILL
- Subcontractors:
 - Surveyor: To be determined
 - UXO Removal/Disposal: USA Environmental

5.1.1 Navy Technical Representative

The Navy Technical Representative (NTR) at NAVFAC Washington is Mr. Joe Rail, who will be the primary contact. He will be ultimately responsible for the execution of the IRA. He will direct CH2M HILL during the implementation of the IRA. In addition, he will be responsible for the following:

- Administering payment of approved invoices to contractors and ensuring that the funds available are sufficient to meet the requirements of the IRA
- Directing all project interfacing with local, state, and federal regulators and submittals to the Navy and regulators

5.1.2 FEAD /NSF-IH

Ms. Cathy Gardner will represent the FEAD. She will represent NAVFAC Washington as the Construction Project Manager for the Navy. She will be the immediate interface with CH2M HILL, and will be responsible for the following:

- Attending the pre-IRA meeting

- Arranging and securing facility and site access
- Conducting progress inspections of the IRA
- Mitigating interference and delays, resolving site issues, and reporting progress to the Navy

TABLE 5-1
Roles, Responsibilities, and Authorities of Individuals Assigned to this Project

Role	Responsibility	Authority
Project Manager	Management and technical direction of work	Approve subcontractor selection
	Communication with the Navy	Approve invoices to the Navy
	Overview subcontractor performance	Approve baseline schedule
	Select staff	Stop work at the site for reasons relating to health and safety
	Develop Work Plans and support plans	Approve payment to vendors and suppliers
	Meet performance objectives	Approve payment to subcontractors
UXOQCS/UXOSO	Oversee IRA activities	Stop work if there is a health and safety risk
	Review subcontractor qualifications	Approve subcontractor daily report of waste material removed from site
	Provide daily status reports	Resolve subcontractor interface issues
	Plan and coordinate the transport and disposal of waste	Set weekly safety objectives
	Provide direction to subcontractors	Approve corrective action for site work-arounds
	Report issues to the QC Munitions Response Manager and the Program QC Manager	Authority to stop non-compliant work
	Conduct daily safety briefings	Approve daily and weekly status reports
	Stop work for unsafe conditions or practices	Approve corrective action plan for transport and disposal
	Monitor and report on subcontractor health and safety performance	Approve resumption of work for resolved health and safety issues
	Record and report safety statistics	
	Conduct site health and safety orientation	
	Maintain environmental log	

5.2 Project Meeting

A pre-IRA meeting will be held at the site before the start of field activities. The FEAD office, in coordination with CH2M HILL, will identify a date, time, and location for the pre-IRA meeting. The pre-IRA meeting will be attended by the Navy, CH2M HILL, FEAD, fire department, NSF-IH security representatives, and other invited stakeholders. CH2M HILL will present an overview of the IRA and will be prepared to discuss the project scope, schedule, planned invoicing, health and safety concerns, QC procedures, and any site logistical issues.

5.3 Project Submittals

The CH2M HILL SUXOS will be responsible for preparing a field activity summary that describes the work performed each day. This information will be summarized on a weekly basis by the project manager and provided to the Navy and the FEAD.

The summarized information will be included in the post-IRA report, which will document that the scope of work is complete and which will also include the following information:

- A description of the IRA activities, including field notes and daily logs, and QC reports
- Photographs
- Chronology of significant events that occurred during the project
- Documentation of transport and disposal of all materials
- Problems encountered
- Conclusions

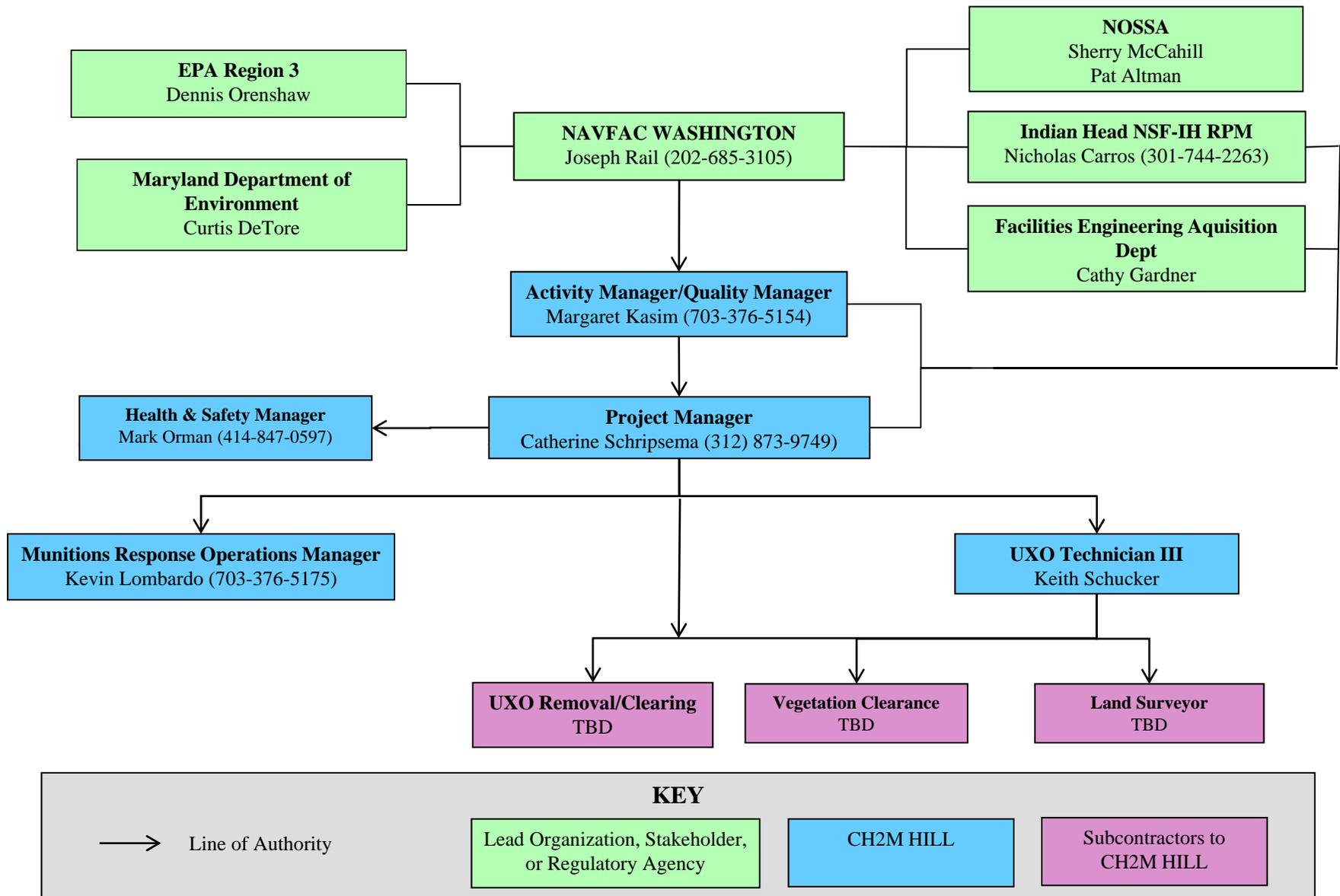
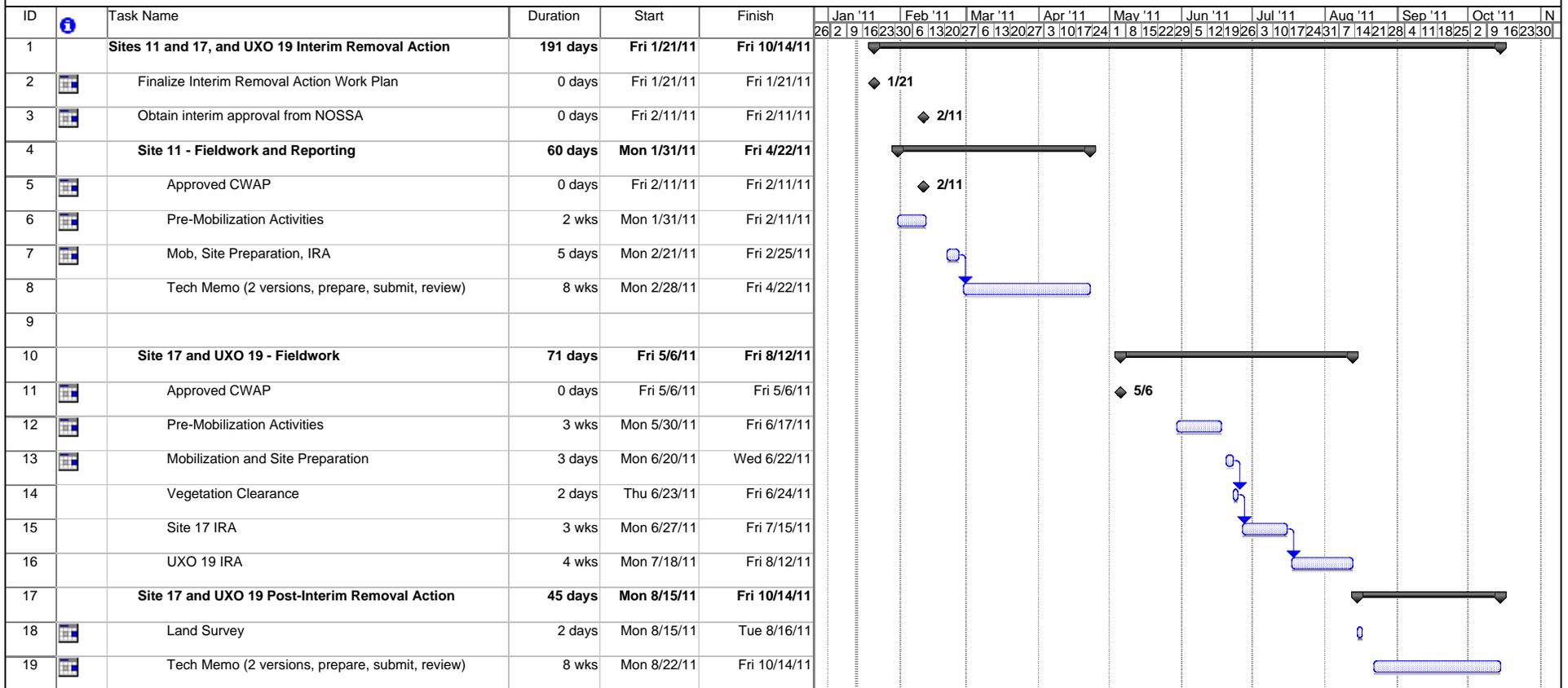


Figure 5-1
Organizational Chart
Interim Removal Action Work Plan for UXO 19, Site 11, and Site 17
NSF-IH, Indian Head, Maryland,

FIGURE 5-2
Schedule
Interim Remedial Action Work Plan for UXO 19, Site 11, and Site 17
NSF-IH, Indian Head, Maryland



Project: IRA
Date: Thu 1/13/11

Task		Milestone		External Tasks	
Split		Summary		External Milestone	
Progress		Project Summary		Deadline	

References

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Appendix
Health and Safety Plan

Health and Safety Plan

**Interim Removal Action for
Sites 11 and 17, and UXO 19**

**Naval Support Facility Indian Head
Indian Head, Maryland**

Prepared for
Department of the Navy
Naval Facilities Engineering Command Washington

Under the
NAVFAC CLEAN 1000 Program
Contract N62470-08-D-1000
Contract Task Order 088

January 2011



CH2MHILL

Chantilly, Virginia

Contents

1	Introduction.....	1-1
1.1	CH2M HILL Policy and Commitment	1-2
1.1.1	Safe Work Policy.....	1-2
1.1.2	Health and Safety Commitment.....	1-2
1.1.3	Project-Specific Health, Safety, and the Environment Goals	1-2
2	Applicability	2-1
3	General Project Information	3-1
3.1	Project Information and Background	3-1
3.2	Site Background and Setting.....	3-1
3.3	Description of Tasks.....	3-1
3.3.1	HAZWOPER-Regulated Tasks.....	3-3
3.3.2	Non-HAZWOPER-Regulated Tasks.....	3-3
4	Project Organization and Responsibilities	4-1
4.1	Client	4-1
4.2	CH2M HILL	4-1
4.2.1	Project Manager.....	4-1
4.2.2	CH2M HILL Responsible Health and Safety Manager.....	4-2
4.2.3	CH2M HILL Safety Coordinator.....	4-2
4.3	CH2M HILL Subcontractors	4-4
4.4	Employee Responsibilities	4-5
4.4.1	Employee Authority.....	4-5
4.5	Client Contractors.....	4-5
5	Standards of Conduct.....	5-1
5.1	Standards of Conduct Violations	5-1
5.2	Disciplinary Actions.....	5-1
5.3	Subcontractor Safety Performance.....	5-1
5.3.1	Observed Hazard Form.....	5-2
5.3.2	Stop Work Order	5-2
5.4	Incentive Program	5-2
5.5	Reporting Unsafe Conditions/Practices	5-3
6	Safety Planning and Change Management.....	6-1
6.1	Daily Safety Meetings and Pre-Task Safety Plans	6-1
6.2	Change Management.....	6-1
7	Project Hazard Analysis.....	7-1
7.1	Activity Hazard Analysis	7-1
7.2	Subcontractor AHAs.....	7-1
8	General Hazards and Controls	8-1
8.1	General Practices and Housekeeping.....	8-1
8.2	Driving Safety	8-2

8.3	Personal Hygiene.....	8-2
8.4	Bloodborne Pathogens.....	8-3
8.5	Hazard Communication.....	8-3
8.6	Substance Abuse.....	8-4
8.7	Shipping and Transportation of Chemical Products.....	8-5
9	Project-Specific Hazard Controls.....	9-1
9.1	Arsenic.....	9-1
9.2	Cadmium.....	9-1
9.3	Chainsaws.....	9-2
9.3.1	Equipment.....	9-2
9.3.2	PPE Requirements.....	9-3
9.3.3	Safe Operation.....	9-3
9.3.4	Refueling the Engine.....	9-4
9.4	Field Vehicles.....	9-4
9.5	Fire Prevention.....	9-5
9.5.1	Fire Extinguishers and General Fire Prevention Practices.....	9-5
9.5.2	Storage of Flammable/Combustible Liquids.....	9-5
9.5.3	Indoor Storage of Flammable/Combustible Liquids.....	9-5
9.5.4	Outside Storage of Flammable/Combustible Liquids.....	9-6
9.5.5	Dispensing of Flammable/Combustible Liquids.....	9-6
9.6	Hand and Power Tools.....	9-6
9.7	Knife Use.....	9-7
9.8	Manual Lifting.....	9-8
9.9	Munitions and Explosives of Concern & Material Potentially Presenting an Explosive Hazard.....	9-8
9.9.1	Hazard Identification.....	9-8
9.10	Visible Lighting.....	9-10
9.11	Working Over Water and Boating Safety.....	9-10
9.11.1	Boat Requirements.....	9-11
9.11.2	Flame Arresters.....	9-11
9.11.3	Sound Signaling Devices.....	9-12
9.11.4	Personal Flotation Devices.....	9-12
9.11.5	Fire Extinguishers.....	9-12
9.11.6	Emergency Planning.....	9-12
9.11.7	Load Capacity.....	9-12
9.11.8	Tool Kit.....	9-12
9.11.9	Communications.....	9-12
9.11.10	Good Housekeeping.....	9-12
9.11.11	Fuel Management.....	9-13
9.11.12	Pollution Control.....	9-13
9.11.13	Training.....	9-13
10	Physical Hazards and Controls.....	10-1
10.1	Noise.....	10-1
10.2	UV Radiation (Sun Exposure).....	10-1
10.3	Temperature Extremes.....	10-2
10.3.1	Heat.....	10-3

10.3.2	Cold	10-6
10.4	Radiological Hazards.....	10-7
11	Biological Hazards and Controls.....	11-1
11.1	Bees and Other Stinging Insects	11-1
11.2	Feral Dogs.....	11-1
11.3	Mosquito Bites	11-1
11.4	Poison Ivy, Poison Oak, and Poison Sumac	11-2
11.5	Snakes.....	11-3
11.6	Spiders - Brown Recluse and Widow	11-4
11.7	Ticks.....	11-5
12	Contaminants of Concern.....	12-1
13	Site Monitoring.....	13-1
13.1	Direct Reading Monitoring Specifications	13-1
13.2	Calibration Specifications.....	13-1
13.3	Integrated Personal Air Sampling.....	13-2
14	Personal Protective Equipment	14-1
14.1	Required Personal Protective Equipment.....	14-1
14.2	Respiratory Protection	14-3
15	Worker Training and Qualification.....	15-1
15.1	CH2M HILL Worker Training.....	15-1
15.1.1	Hazardous Waste Operations Training.....	15-1
15.1.2	First Aid/Cardiopulmonary Resuscitation	15-2
15.1.3	Safety Coordinator Training.....	15-2
15.1.4	Site-specific Training.....	15-2
15.1.5	Project-specific Training Requirements	15-2
16	Medical Surveillance and Qualification.....	16-1
16.1	Hazardous Waste Operations and Emergency Response	16-1
16.2	Job or Site-specific Medical Surveillance.....	16-1
16.3	Respirator User Qualification	16-1
16.4	Hearing Conservation.....	16-1
17	Site-Control Plan	17-1
17.1	Site-Control Procedures.....	17-1
17.2	HAZWOPER Compliance Plan	17-2
18	Decontamination.....	18-1
18.1	Decontamination Specifications	18-1
18.2	Diagram of Personnel-Decontamination Line.....	18-1
19	Emergency Response Plan.....	19-1
19.1	Pre-Emergency Planning.....	19-1
19.2	Emergency Equipment and Supplies	19-1
19.3	Incident Response.....	19-2
19.4	Emergency Medical Treatment.....	19-2
19.5	Evacuation	19-3
19.6	Evacuation Signals	19-3

19.7	Inclement Weather	19-3
20	Spill Containment Procedures.....	20-1
21	Inspections.....	21-1
21.1	Project Activity Self-Assessment Checklists.....	21-1
21.2	Safe Behavior Observations	21-1
22	Incident Notification, Reporting, and Investigation.....	22-1
22.1	General Information.....	22-1
22.2	Section Definitions.....	22-1
22.3	Reporting Requirements.....	22-2
22.4	HITS System and IRF.....	22-2
22.5	Injury Management/Return-to-Work (for CH2M HILL Staff Only)	22-2
22.5.1	Background	22-2
22.5.2	Injury Management/Return-to-Work Notification Process.....	22-3
22.6	Serious Incident Reporting Requirements.....	22-3
22.6.1	Serious Incident Determination.....	22-4
22.6.2	Serious Incident Reporting.....	22-4
22.7	Incident Root Cause Analysis.....	22-6
22.7.1	Personal Factors.....	22-6
22.7.2	Job Factors	22-6
22.7.3	Corrective Actions.....	22-7
23	Records and Reports.....	23-1

Attachments

- 1 Employee Signoff Form – Health and Safety Plan
- 2 Chemical Inventory/Register Form
- 3 Chemical-Specific Training Form
- 4 Project Activity Self-Assessment Checklists/Forms/Permits
- 5 Behavior Based Loss Prevention Forms
- 6 Material Safety Data Sheets and Fact Sheets
- 7 Tick Fact Sheet
- 8 Observed Hazard Form
- 9 Stop Work Order Form

Acronyms and Abbreviations

°C	degrees Celsius
°F	degrees Fahrenheit
µg/m ³	microgram(s) per cubic meter
AHA	activity hazard analysis
APR	air-purifying respirator
CFR	Code of Federal Regulations
COC	contaminant of concern
CPR	cardiopulmonary resuscitation
dBA	decibels, A-weighted
DEET	N,N-diethyl-meta-toluamide
EMM	earth-moving machinery
EOD	Explosive Ordnance Disposal
ERC	Emergency Response Coordinator
ESBG	Environmental Services Business Group
EZ	exclusion zone
GPS	global positioning system
HAZWOPER	hazardous waste operations and emergency response
HITS	Hours and Incident Tracking System
HSE	Health, Safety, and the Environment
HSP	Health and Safety Plan
HSSE	Health, Safety, Security and Environment
IRF	Incident Report Form
lx	lux
MEC	munitions and explosives of concern
mg/m ³	milligrams per cubic meter
MPPEH	material potentially presenting an explosive hazard
MSDS	Material Safety Data Sheet
OSHA	Occupational Safety and Health Administration
PAPR	powered air-purifying respirator
PEL	permissible exposure limit
PFD	personal flotation device
PIM	potentially infectious material
PM	Project Manager
PPE	personal protective equipment

PTSP	Pre-Task Safety Plan
RHSM	Responsible Health and Safety Manager
RMSF	Rocky Mountain spotted fever
SBO	Safe Behavior Observation
SC	Safety Coordinator
SPA	safety program assistant
SPF	sun protection factor
SOP	standard operating procedure
SUXOS	Senior UXO Supervisor
TBD	to be determined
TSD	treatment, storage, and disposal
USCG	U.S. Coast Guard
UV	ultraviolet
UXO	unexploded ordnance
VO	Virtual Office

Approval

This site-specific Health and Safety Plan (HSP) has been written for use by CH2M HILL only. CH2M HILL claims no responsibility for its use by others unless that use has been specified and defined in project or contract documents. The plan is written for the specific site conditions and identified scope(s) of work and must be amended if those conditions or scope(s) of work change.

By approving this HSP, the Responsible Health and Safety Manager (RHSM) certifies that the personal protective equipment has been selected based on the project-specific hazard assessment.

Original Plan

RHSM Approval: Carl Woods/CIN

Date: 11/1/10



Approved By

MR Health & Safety Manager: George DeMetropolis/SDO

Date: 11/5/10



Field Operations Manager Approval:

Date:

Revisions

Revisions Made By:

Date:

Description of Revisions to Plan:

Revisions Approved By:

Date:

1 Introduction

CH2MHILL

HSSE
TargetZero
World-Class Performance



Health, Safety, Security, and Environment Policy

Protection of people and the environment is a CH2M HILL core value. It is our vision to create a culture within CH2M HILL that empowers employees to drive this value into all global operations and achieve excellence in health, safety, security, and environment (HSSE) performance. CH2M HILL deploys an integrated, enterprise-wide behavior-based HSSE management system to fulfill our mission and the expectations of our clients, staff, and communities based on the following principles:

- We require all management and supervisory personnel to provide the leadership and resources to inspire and empower our employees to take responsibility for their actions and for the actions of their fellow employees to create a safe, healthy, secure, and environmentally-responsible workplace.
- We provide value to clients by tailoring HSSE processes to customer needs and requiring all CH2M HILL employees and subcontractors to deliver projects with agility, personal service, and responsiveness and in compliance with HSSE requirements and company standards to achieve health, safety, security, and pollution prevention excellence. Our performance will aspire to influence others and continually redefine world-class HSSE excellence.
- We systematically evaluate our design engineering and physical work environment to verify safe and secure work conditions and practices are established, consistently followed, and timely corrected.
- We continually assess and improve our HSSE program to achieve and maintain world-class performance by setting and reviewing objectives and targets, reporting performance metrics, and routinely reviewing our progress.
- We care about the safety and security of every CH2M HILL employee and expect all employees to embrace our culture, share our core value for the protection of people and the environment, understand their obligations, actively participate, take responsibility, and "walk the talk" on and off the job.

The undersigned pledge our leadership, commitment, and accountability for making this policy a reality at CH2M HILL.

Dated the 1st day of October 2009.

Lee A. McIntire
Chief Executive Officer

Garry Higdon
President, Energy Division

Jacqueline Rast
President, Major Programs Group

Robert C. Allen
Chief Human Resources Officer

Mark Lasswell
President, Transportation Business Group

Catherine Santee
Chief Financial Officer

Bob Card
President, Facilities & Infrastructure Division

Margaret McLean
Chief Legal Officer

Thomas G. Searle
President, International Division

Bill Dehn
Senior Vice President, Special Projects

Michael E. McKelvy
President, Government, Environment,
and Nuclear Division

Nancy R. Tuor
Vice-Chair, International

Keith Christopher
Senior Vice President, Health, Safety,
Security, and Environment

1.1 CH2M HILL Policy and Commitment

1.1.1 Safe Work Policy

It is the policy of CH2M HILL to perform work in the safest manner possible. Safety must never be compromised. To fulfill the requirements of this policy, an organized and effective safety program must be carried out at each location where work is performed.

CH2M HILL believes that all injuries are preventable, and we are dedicated to the goal of a safe work environment. To achieve this goal, every employee on the project must assume responsibility for safety.

Every employee is empowered to:

- Conduct their work in a safe manner
- Stop work immediately to correct any unsafe condition that is encountered
- Take corrective actions so that work may proceed in a safe manner

Safety, occupational health, and environmental protection will not be sacrificed for production. These elements are integrated into quality control, cost reduction, and job performance, and are crucial to our success.

1.1.2 Health and Safety Commitment

CH2M HILL has embraced a philosophy for health and safety excellence. The primary driving force behind this commitment to health and safety is simple: employees are CH2M HILL's most significant asset and CH2M HILL management values their safety, health, and welfare. Also, top management believes that all injuries are preventable. CH2M HILL's safety culture empowers employees at all levels to accept ownership for safety and take whatever actions are necessary to eliminate injury. Our company is committed to world-class performance in health and safety and also understands that world-class performance in health and safety is a critical element in overall business success.

CH2M HILL is committed to the prevention of personal injuries, occupational illnesses, and damage to equipment and property in all of its operations; to the protection of the general public whenever it comes in contact with the Company's work; and to the prevention of pollution and environmental degradation.

Company management, field supervisors, and employees plan safety into each work task in order to prevent occupational injuries and illnesses. The ultimate success of CH2M HILL's safety program depends on the full cooperation and participation of each employee.

CH2M HILL management extends its full commitment to health and safety excellence.

1.1.3 Project-Specific Health, Safety, and the Environment Goals

All management and employees are to strive to meet the project-specific Health, Safety, and the Environment (HSE) goals outlined below. The team will be successful only if everyone makes a concerted effort to accomplish these goals. The goals allow the project to stay focused on optimizing the health and safety of all project personnel and, therefore, making the project a great success.

The project has established 11 specific goals and objectives:

- Create an injury-free environment
- Have zero injuries or incidents
- Provide management leadership for HSE by communicating performance expectations, reviewing and tracking performance, and leading by example
- Ensure effective implementation of the HSP through education, delegation, and team work
- Ensure 100 percent participation in HSE compliance
- Continuously improve our safety performance
- Maintain free and open lines of communication
- Make a personal commitment to safety as a value
- Focus safety improvements on high-risk groups
- Continue strong employee involvement initiatives
- Achieve health and safety excellence

2 Applicability

This HSP applies to:

- All CH2M HILL personnel, including subcontractors and tiered subcontractors of CH2M HILL, working on the site
- All visitors to the construction site in the custody of CH2M HILL (including visitors from the client, the government, the public, and other staff members of any CH2M HILL company)

This HSP does not apply to the third-party contractors, their workers, their subcontractors, their visitors, or any other persons not under the direct control or custody of CH2M HILL.

This HSP defines the procedures and requirements for the health and safety of CH2M HILL staff members and visitors when they are physically on the work site. The work site includes the project area (as defined by the contract documents) and the project offices, trailers, and facilities thereon.

This HSP will be kept onsite during field activities and will be reviewed as necessary. The HSP will be amended or revised as project activities or conditions change or when supplemental information becomes available. The HSP adopts, by reference, the Enterprise-wide Core Standards and Standard Operating Procedures (SOPs), as appropriate. In addition, the HSP may adopt procedures from the project Work Plan and any governing regulations. If there is a contradiction between this HSP and any governing regulation, the more stringent and protective requirement shall apply.

All CH2M HILL staff members and subcontractors must sign the employee sign-off form included in this document as Attachment 1 to acknowledge review of this document. Copies of the signature page will be maintained onsite by the Safety Coordinator (SC).

3 General Project Information

3.1 Project Information and Background

Project Number: 394325.PP.DR

Client: NAVFAC ATLANTIC

Project/Site Name: Naval Support Facility (NSF), Indian Head, Sites 11, 17, and UXO 19

Site Address: Indian Head, Maryland

CH2M HILL Project Manager: Catherine Schripsema (Activity Manager Margaret Kasim)

CH2M HILL Office: WDC

DATE HSP Prepared: 01/11/2011

Date(s) of Site Work: 2011

3.2 Site Background and Setting

See Site Map for work area.

3.3 Description of Tasks

Refer to project documents (i.e., Work Plan) for detailed task information. Tasks other than those listed below require an approved amendment or revision to this plan before tasks begin. Refer to the "Site Control" section of this HSP for procedures related to "clean" tasks that do not involve hazardous waste operations and emergency response (HAZWOPER). To summarize, the tasks are as follows:

Site 11 along the shoreline:

- Surveying
- Identification of surface munitions and explosives of concern (MEC) and material potentially presenting an explosive hazard (MPPEH), assisted by metal detectors
- Removal of safe MEC/MPPEH for consolidation, demilitarization, and disposal
- Navy Explosive Ordnance Disposal (EOD) to deal with items not safe to move
- Trucking to remove metal scrap not associated with explosives manufacturing or production
- Site restoration

Site 11 land side:

- Surveying

- Visual surface MEC/MPPEH identification assisted by metal detector, flagging and global positioning system (GPS) location

Site 17 shoreline:

- Surveying from mean high tide line to mean low tide line
- Vegetation reduction (using weed-eaters/chainsaws)
- Identification of surface MEC/MPPEH, assisted by metal detector
- Removal of safe MEC/MPPEH for consolidation, demilitarization, and disposal
- Navy EOD to deal with items not safe to move
- Trucking to remove metal scrap not associated with explosives manufacturing or production
- Site restoration

Site 17 shallow water:

- Visual survey of shallow water, not to exceed 3 feet in depth, with metal detectors to assist in identification of MEC/MPPEH
- Removal of safe MEC/MPPEH for consolidation, demilitarization, and disposal
- Navy EOD to deal with items not safe to move

UXO 19 shoreline:

- Surveying, from mean high tide line to mean low tide line
- Vegetation reduction (using weed-eaters/chainsaws)
- Identification of surface MEC/MPPEH, assisted by metal detector
- Removal of safe MEC/MPPEH for consolidation, demilitarization, and disposal
- Navy EOD to deal with items not safe to move
- Trucking to remove metal scrap not associated with explosives manufacturing or production
- Site restoration

UXO 19 shallow water:

- Visual survey of shallow water, not to exceed 3 feet in depth, survey with metal detectors to assist identification of MEC/MPPEH
- Removal of safe MEC/MPPEH for consolidation, demilitarization, and disposal
- Navy EOD to deal with items not safe to move

3.3.1 HAZWOPER-Regulated Tasks

- Vegetation clearance
- MEC visual survey, and removal
- Site restoration
- Visual MEC survey in less than 3 feet water
- Removal of safe MEC/MPPEH

3.3.2 Non-HAZWOPER-Regulated Tasks

Under specific circumstances, the training and medical monitoring requirements of federal or state HAZWOPER regulations are not applicable. It must be demonstrated that the tasks can be performed without the possibility of exposure in order to use non-HAZWOPER-trained personnel. **Contact the RHSM prior to using non-HAZWOPER-trained personnel for the following tasks when working on a regulated hazardous waste site.**

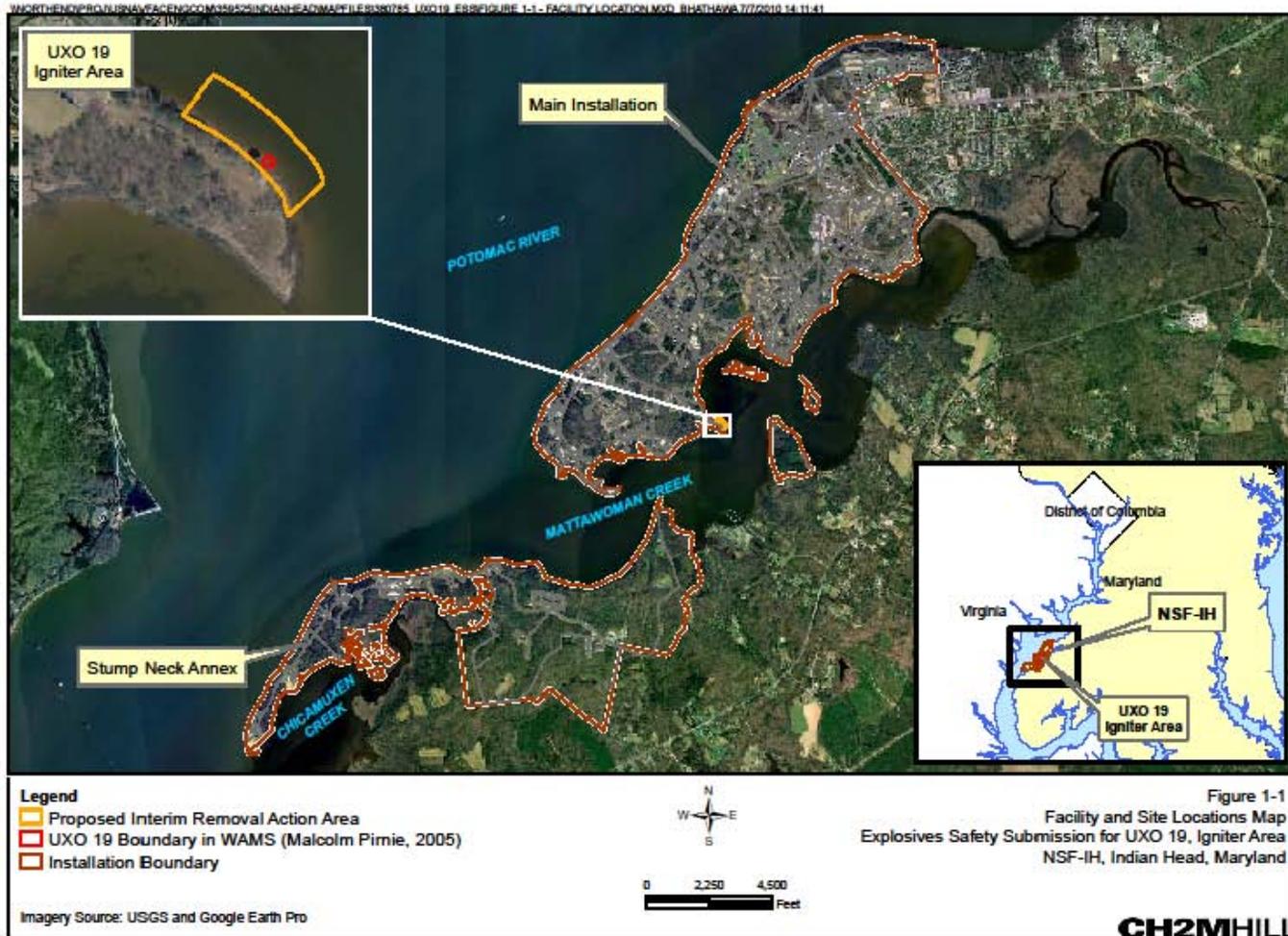
TASKS

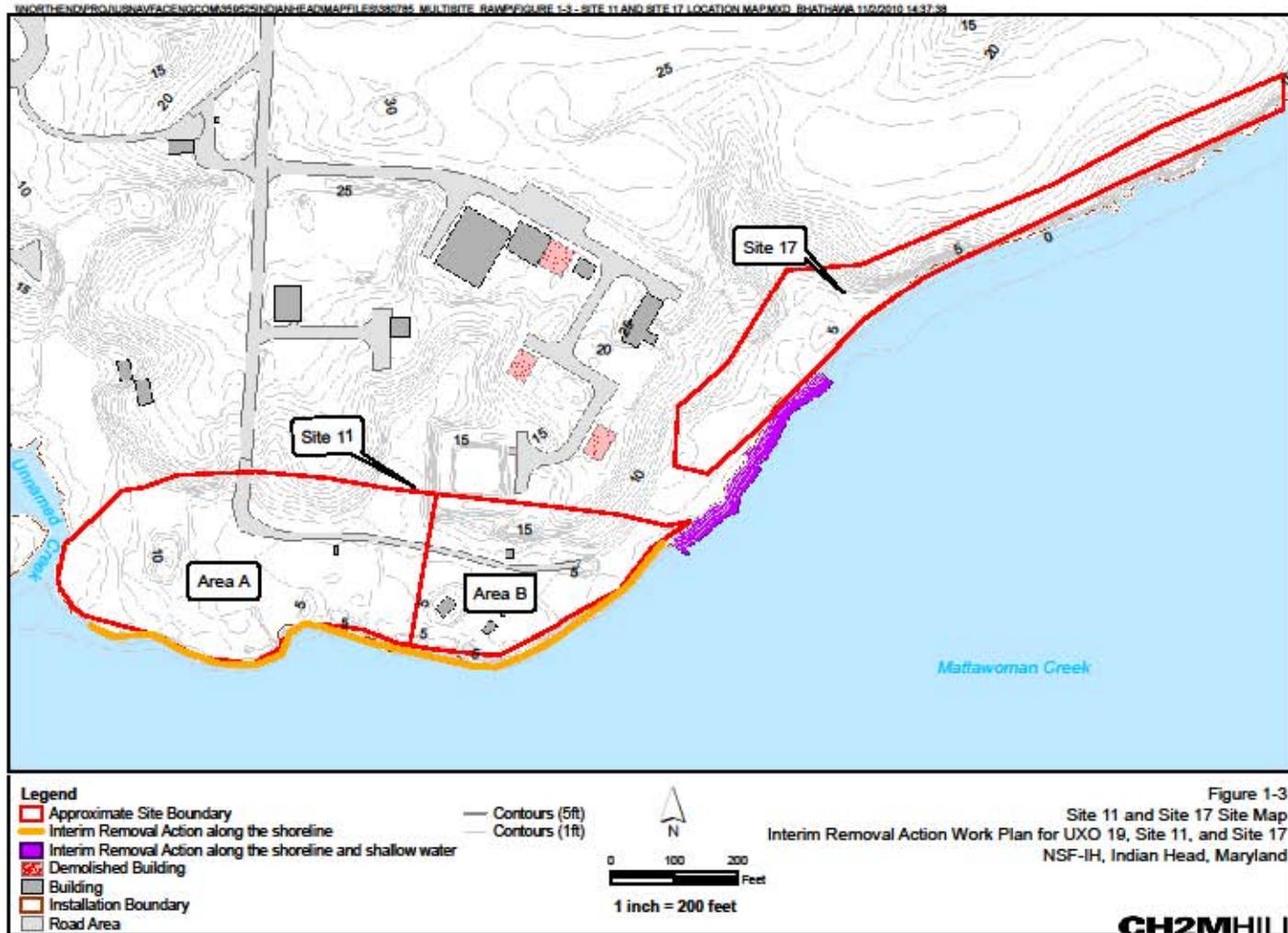
- Surveying
- Trucking to remove metal scrap not associated with explosives manufacturing or production

CONTROLS

- Brief on hazards, limits of access, and emergency procedures.
- Post areas of contamination as appropriate.
- Perform air sampling/monitoring as specified in this HSP.
- Provide unexploded ordnance (UXO) support.

Site Map





4 Project Organization and Responsibilities

4.1 Client

Contact Name: Joseph Rail
Phone: (202) 685-3105
Facility Contact Name: Nick Carros
Phone: 301-744-2263

4.2 CH2M HILL

4.2.1 Project Manager

Project Manager Name: Catherine Schripsema
Job Title: PM
CH2M HILL Office: WDC
Telephone Number: 312-873-9749 / Cellular Number: 773-531-4408

Alternate Project Manager Name: Margaret Kasim
Job Title: Activity Manager
CH2M HILL Office: WDC
Telephone Number: 703-376-5154
Cellular Number: 703-431-8288

Margaret Kasim will be the PM during the Site 11 work, Catherine Schripsema will be PM for the remainder of the project. The project manager (PM) is responsible for providing adequate resources (budget and staff) for project-specific implementation of the HSE management process. The PM has overall management responsibility for the tasks listed below. The PM may explicitly delegate specific tasks to other staff, as described in sections that follow, but retains ultimate responsibility for completion of the following in accordance with this document:

- Incorporate standard terms and conditions, and contract-specific HSE roles and responsibilities in contract and subcontract agreements (including flow-down requirements to lower-tier subcontractors).
- Select safe and competent subcontractors by:
 - Choosing potential subcontractors based on technical ability and HSE performance.
 - Implementing the subcontractor prequalification process.
 - Ensuring that acceptable certificates of insurance, including CH2M HILL as named additional insured, are secured as a condition of subcontract award.
 - Ensuring HSE submittals, subcontract agreements, and appropriate site-specific safety procedures are in place and accepted prior field mobilization.

- Ensure copies of training and medical monitoring records, and site-specific safety procedures are being maintained in the project file accessible to site personnel.
- Provide oversight of subcontractor HSE practices in accordance with the site-specific safety plans and/or procedures.
- Manage the site and interfacing with third parties in a manner consistent with the contract and subcontract agreements and the applicable standard of reasonable care.
- Ensure that the overall, job-specific, HSE goals are fully and continuously implemented.
- Support and implement use of stop-work orders when subcontractor safety performance is not adequate.

4.2.2 CH2M HILL Responsible Health and Safety Manager

RHSM Name: Carl Woods

Job Title: RHSM

CH2M HILL Office: CIN

Telephone Number: (513) 889-5771

Cellular Number: (513) 319-5771

The RHSM is responsible for the following:

- Review and evaluate subcontractor HSE performance using the pre-qualification process.
- Approve HSP and its revisions as well as activity hazard analyses (AHAs).
- Review and evaluate subcontractor site-specific safety procedures for adequacy prior to start of subcontractor's field operations.
- Support the oversight (or SC's direct oversight) of subcontractor and tiered subcontractor HSE practices.
- Permit upgrades/downgrades in respiratory protection after reviewing analytical data.
- Conduct audits as determined by project schedule and coordination with PM.
- Participate in incident investigations, lessons learned, loss/near loss reporting.

4.2.3 CH2M HILL Safety Coordinator

SC Name: Keith Schucker (Site 11 land work only; remainder of SC work is to be determined [TBD])

Job Title: SC

CH2M HILL Office: WDC

Telephone Number: 703-471-1441

Cellular Number: 410-713-0301

The SC is responsible for verifying that the project is conducted in a safe manner, including the following specific obligations:

- Verify this HSP is current and amended when project activities or conditions change.
- Verify CH2M HILL site personnel and subcontractor personnel read the HSP and sign the Employee Sign-Off Form, prior to commencing field activities.

- Verify CH2M HILL site personnel have completed any required specialty training (for example, fall protection, confined space entry, among others) and medical surveillance as identified in this HSP.
- Verify that project files available to site personnel include copies of executed subcontracts and subcontractor certificates of insurance (including CH2M HILL as named additional insured), bond, contractor's license, training and medical monitoring records, and accepted site-specific safety procedures prior to start of subcontractor's field operations.
- Act as the project "Hazard Communication Coordinator" and perform the responsibilities outlined in the HSP.
- Act as the project Emergency Response Coordinator (ERC) and perform the responsibilities outlined in the HSP.
- Post the Occupational Safety and Health Administration (OSHA) job-site poster. The poster is required at sites where project field offices, trailers, or equipment-storage boxes are established.
- Hold and/or verify that safety meetings are conducted and documented in the project file initially and as needed throughout the course of the project (as tasks or hazards change).
- Verify that project health and safety forms and permits are being used as outlined this HSP.
- Perform oversight and assessments of subcontractor HSE practices in accordance with the site-specific safety plan and verify that project activity self-assessment checklists are being used as outlined this HSP.
- Coordinate with the RHSM regarding CH2M HILL and subcontractor operational performance, and third-party interfaces.
- Verify appropriate personal protective equipment (PPE) use, availability, and training.
- Ensure that the overall, job-specific HSE goals are fully and continuously implemented.
- Conduct accident investigations, including root cause analysis.
- Calibrate and conduct air monitoring in accordance with the HSP. Maintain all air monitoring records in project file.
- Maintain HSE records and documentation.
- Facilitate OSHA or other government agency inspections, including accompanying inspector and providing all necessary documentation and follow-up.
- Deliver field HSE training as needed based on project-specific hazards and activities.
- Contact the RHSM and PM in the event of an incident.
- When an apparent imminent danger exists, immediately remove all affected CH2M HILL employees and subcontractors, notify subcontractor safety representative, stop affected work until adequate corrective measures are implemented, and notify the PM and RHSM as appropriate.
- Document all verbal health and safety-related communications in project field logbook, daily reports, or other records.

4.3 CH2M HILL Subcontractors

(Reference CH2M HILL SOP HSE-215, *Contracts and Subcontracts*)

Subcontractor: USA Environmental for UXO

Subcontractor Contact Name: Matt Tucker

Telephone: 813-343-6370

Subcontractor: Scrap trucking removal TBD

Subcontractor Contact Name:

Telephone:

Subcontractor: Surveying TBD

Subcontractor Contact Name:

Telephone:

Subcontractors must comply with the following activities, and are responsible to:

- Comply with all local, state, and federal safety standards.
- Comply with project and owner safety requirements.
- Actively participate in the project safety program and either hold or attend and participate in all required safety meetings.
- Provide a qualified safety representative to interface with CH2M HILL.
- Maintain safety equipment and PPE for their employees.
- Maintain and replace safety protection systems damaged or removed by the subcontractor's operations.
- Notify the SC of any accident, injury, or incident immediately and submit reports to CH2M HILL within 24 hours.
- Install contractually required general conditions for safety (for example, handrail, fencing, fall protection systems, floor opening covers).
- Conduct and document weekly safety inspections of project-specific tasks and associated work areas.
- Conduct site-specific and job-specific training for all subcontractor employees, including review of the CH2M HILL HSP, subcontractor HSPs, and subcontractor AHAs, and sign appropriate sign-off forms.
- Select and implement necessary controls and corrective actions to correct unsafe conditions.

The subcontractors listed above may be required to submit their own site-specific HSP and other plans such as lead or asbestos abatement compliance plans. Subcontractors are responsible for the health and safety procedures specific to their work, and are required to submit their plans to CH2M HILL for review and acceptance before the start of field work.

Subcontractors are also required to prepare AHAs before beginning each activity posing hazards to their personnel. The AHA shall identify the principal steps of the activity, potential health and safety hazards for each step, and recommended control measures for each identified

hazard. In addition, a list of the equipment to be used to perform the activity, inspection requirements, and training requirements for the safe operation of the equipment listed must be identified.

4.4 Employee Responsibilities

All personnel are assigned responsibility for safe and healthy operations. This concept is the foundation for involving all employees in identifying hazards and providing solutions. For any operation, individuals have full authority to stop work and initiate immediate corrective action or control. In addition, each worker has a right and responsibility to report unsafe conditions or practices. This right represents a significant facet of worker empowerment and program ownership. Through shared values and a belief that all accidents are preventable, our employees accept personal responsibility for working safely.

Each employee is responsible for the following performance objectives:

- Perform work in a safe manner and produce quality results
- Perform work in accordance with company policies, and report injuries, illnesses, and unsafe conditions.
- Complete work without injury, illness, or property damage.
- Report all incidents immediately to supervisor, and file proper forms with a human resources representative.
- Report all hazardous conditions and/or hazardous activities immediately to supervisor for corrective action.
- Complete an HSE orientation prior to being authorized to enter the project work areas.

4.4.1 Employee Authority

Each employee on the project has the obligation and authority to shut down any perceived unsafe work, and during employee orientation each employee will be informed of his or her authority to do so.

4.5 Client Contractors

(Reference CH2M HILL SOP HSE-215, *Contracts, Subcontracts and HSE Management Practices*)

Contractor: _____NA_____

Contact Name: _____

Telephone: _____

Contractor Task(s): _____

Contractor: _____NA_____

Contact Name: _____

Telephone: _____

Contractor Task(s): _____

This HSP does not cover contractors that are contracted directly to the client or the owner. CH2M HILL is not responsible for the health and safety or means and methods of the

contractor's work, and we must never assume such responsibility through our actions (such as advising on health and safety issues). In addition to these instructions, CH2M HILL team members should review contractor safety plans so that we remain aware of appropriate precautions that apply to us. Self-assessment checklists are to be used by the SC and CH2M HILL team members to review the contractor's performance only as it pertains to evaluating CH2M HILL exposure and safety. The RHSM is the only person who is authorized to comment on or approve contractor safety procedures.

Health and safety-related communications with contractors should be conducted as follows:

- Request the contractor to brief CH2M HILL team members on the precautions related to the contractor's work.
- When an apparent contractor non-compliance or unsafe condition or practice poses a risk to CH2M HILL team members:
 - Notify the contractor safety representative.
 - Request that the contractor determine and implement corrective actions.
 - If necessary, stop affected CH2M HILL work until contractor corrects the condition or practice.
 - Notify the client, PM, and RHSM as appropriate.

If apparent contractor non-compliance or unsafe conditions or practices are observed, inform the contractor safety representative (CH2M HILL's obligation is limited strictly to informing the contractor of the observation; the contractor is solely responsible for identifying and implementing necessary controls and corrective actions).

If an apparent imminent danger is observed, immediately warn the contractor employee(s) in danger and notify the contractor safety representative (CH2M HILL's obligation is limited strictly to immediately warning the affected individual(s) and informing the contractor of the observation; the contractor is solely responsible for identifying and implementing necessary controls and corrective actions).

All verbal health and safety-related communications will be documented in project field logbook, daily reports, or other records.

5 Standards of Conduct

All individuals associated with this project must work injury-free and drug-free and must comply with the following standards of conduct, the HSP, and the safety requirements of CH2M HILL. Commonly accepted standards of conduct help maintain good relationships between people. They promote responsibility and self-development. Misunderstandings, frictions, and disciplinary action can be avoided by refraining from thoughtless or wrongful acts.

5.1 Standards of Conduct Violations

All individuals associated with this project are expected to behave in a professional manner. Violations of the standards of conduct would include, but not be limited to:

- Failure to perform work
- Inefficient performance, incompetence, or neglect of work
- Willful refusal to perform work as directed (insubordination)
- Negligence in observing safety regulations, poor housekeeping, or failure to report on-the-job injuries or unsafe conditions
- Unexcused or excessive absence or tardiness
- Unwillingness or inability to work in harmony with others
- Discourtesy, irritation, friction, or other conduct that creates disharmony
- Harassment or discrimination against another individual
- Failure to be prepared for work by wearing the appropriate construction clothing or bringing the necessary tools
- Violation of any other commonly accepted reasonable rule of responsible personal conduct

5.2 Disciplinary Actions

The Environmental Services (ES) business group (ESBG) employees, employees working on ESBG projects, and subcontractor employees are subject to disciplinary action for not following HSE rules and requirements. Potential disciplinary action is equally applicable to all employees, including managers and supervisors. Disciplinary action may include denial of access to the worksite, warnings, reprimands, and other actions up to and including termination, depending on the specific circumstances.

5.3 Subcontractor Safety Performance

CH2M HILL should continuously endeavor to observe subcontractors' safety performance and adherence to their plans and AHAs. This endeavor should be reasonable, and include observing for hazards or unsafe practices that are both readily observable and occur in common

work areas. CH2M HILL is not responsible for exhaustive observation for hazards and unsafe practices. CH2M HILL oversight does not relieve subcontractors of their responsibility for effective implementation and compliance with the established plan(s).

5.3.1 Observed Hazard Form

When apparent non-compliance or unsafe conditions or practices are observed, notify the subcontractor's supervisor or safety representative verbally, and document them using the Observed Hazard Form, included as an attachment to this HSP and require corrective action.

If necessary, stop subcontractor's work using the Stop Work Order Form until corrective actions are implemented for observed serious hazards or conditions. Update the Observed Hazard Form to document that corrective actions have been taken. The subcontractor is responsible for identifying and implementing necessary controls and corrective actions.

5.3.2 Stop Work Order

CH2M HILL has the authority, as specified in the contract, and the responsibility to stop work if any CH2M HILL employee observes unsafe conditions or failure of the subcontractor to adhere to its safe-work practices. This authority and action does not in any way relieve the subcontractor of its responsibilities for the means and methods of the work or, therefore, of any corrective actions. Failure to comply with safe work practices can be the basis for restriction or removal of the subcontractor's personnel from the job site, termination of the subcontract, restriction from future work, or all three.

When an apparent imminent danger is observed, immediately stop work and alert all affected individuals. Remove all affected CH2M HILL employees and subcontractor personnel from the danger, notify the subcontractor's supervisor or safety representative, and do not allow work to resume until adequate corrective measures are implemented. Notify the PM, Contract Administrator, and RHSM.

When repeated non-compliance or unsafe conditions are observed, notify the subcontractor's supervisor or safety representative and stop affected work by completing and delivering the Stop Work Order Form (attached to this HSP) until adequate corrective measures are implemented. Consult the Contract Administrator to find out what the contract dictates for actions to pursue in event of subcontractor non-compliance, including work stoppage, back charges, suspension of progress payments, removal of subcontractor manager, monetary penalties, or termination of subcontractor for cause.

5.4 Incentive Program

Each project is encouraged to implement a safety incentive program that rewards workers for exhibiting exemplary safety behaviors. Actions that qualify are those that go above and beyond what is expected. Actions that will be rewarded include spotting and correcting a hazard, bringing a hazard to the attention of your foreman, telling your foreman about an incident, coming up with a safer way to get the work done, or stopping a crew member from doing something unsafe. The program will operate throughout the project, covering all workers. The incentive program will be communicated to all employees during the project employee orientation and project safety meetings.

5.5 Reporting Unsafe Conditions/Practices

Responsibility for effective health and safety management extends to all levels of the project and requires good communication between employees, supervisors, and management.

Accident prevention requires a proactive policy on near misses, close calls, unsafe conditions, and unsafe practices. All personnel must report any situation, practice, or condition which might jeopardize the safety of our projects. All unsafe conditions or unsafe practices will be corrected immediately. CH2M HILL has zero tolerance of unsafe conditions or unsafe practices.

No employee or supervisor will be disciplined for reporting unsafe conditions or practices. Individuals involved in reporting the unsafe conditions or practices will remain anonymous.

The following reporting procedures will be followed by all project employees:

- Upon detection of any unsafe condition or practice, the responsible employee will attempt to safely correct the condition.
- The unsafe condition or practice will be brought to the attention of the worker's direct supervisor, unless the unsafe condition or practice involves the employee's direct supervisor. If so, the SC needs to be notified at once by the responsible employee.
- Either the responsible employee or responsible employee's direct supervisor is responsible for immediately reporting the unsafe condition or practice to the SC.
- The SC will act promptly to correct the unsafe condition or practice.
- Details of the incident or situation will be recorded by the SC in the field logbook or using the Observed Hazard Form if a subcontractor was involved.

6 Safety Planning and Change Management

6.1 Daily Safety Meetings and Pre-Task Safety Plans

Daily safety meetings are to be held with all project personnel in attendance to review the hazards posed and required HSE procedures and AHAs that apply for each day's project activities. The Pre-Task Safety Plans (PTSPs) serve the same purpose as these general assembly safety meetings, but the PTSPs are held between the crew supervisor and their work crews to focus on those hazards posed to individual work crews.

At the start of each day's activities, the crew supervisor completes the PTSP, provided as an attachment to this HSP, with input from the work crew, during their daily safety meeting. The day's tasks, personnel, tools, and equipment that will be used to perform these tasks are listed, along with the hazards posed and required HSE procedures, as identified in the HSP and AHA. The use of PTSPs promotes worker participation in the hazard recognition and control process while reinforcing the task-specific hazard and required HSE procedures with the crew each day.

6.2 Change Management

The evaluation form below should be reviewed on a continuous basis to assess whether the current HSP adequately addresses ongoing project work, and should be completed whenever new tasks are contemplated or changed conditions are encountered.

PROJECT HSE Change Management Form			
Project Task: Project Number:	Survey/MEC Avoidance & Removal 394325	Project/Task Manager: Catherine Schripsema/WDC Project Name: NSF Indian Head, Interim Removal Action	
Evaluation Checklist		Yes	No
1.	Has the CH2M HILL staff listed in the original HSP changed?		
2.	Has a new subcontractor been added to the project?		
3.	Is any chemical or product to be used that is not listed in Attachment 2 of the plan?		
4.	Have additional tasks been added which were not originally addressed in the "Project Information" section of this HSP?		
5.	Have new contaminants or higher than anticipated levels of original contaminants been encountered?		
6.	Has other safety, equipment, activity or environmental hazards been encountered that are not addressed in this HSP?		

If the answer is "YES" to the questions above, HSP revision may be needed. For questions 2-6, contact the RHSM prior to continuing work. In addition to contacting the RHSM, the following actions can be taken for questions 1-3:

- Confirm that staff's medical and training status is current – check training records at: <http://www.int.ch2m.com/hands> (or contact your regional safety program assistant [SPA]), and confirm subcontractor qualifications.
- Confirm with the RHSM that subcontractor safety performance has been reviewed and is acceptable.
- Confirm with the RHSM that subcontractor safety procedures, plans, and/or AHAs have been reviewed and are acceptable.
- Add the new chemical or product information to the Chemical Inventory Form, inform the RHSM, and ensure that personnel handling the chemical or product have been trained, and that training is documented using the Chemical-Specific Training Form included as an attachment to this HSP. Add the Material Safety Data Sheet(s) (MSDS) for chemicals handled or used at the project to this HSP. AHAs may need to be developed or amended to account for new chemicals. The RHSM shall review the AHAs prior to the chemical use.

7 Project Hazard Analysis

A health and safety risk analysis (Table 1) has been performed for each task. In the order listed below, the RHSM considers the various methods for mitigating the hazards. Employees are trained on this hierarchy of controls during their hazardous waste training and reminded of them throughout the execution of projects:

- Elimination of the hazards (use remote sampling methodology to avoid going into a confined space)
- Substitution (reduce exposure to vapors by using of a geoprobe instead of test pitting)
- Engineering controls (ventilate a confined space to improve air quality)
- Warnings (establish EZs to keep untrained people away from hazardous waste work)
- Administrative controls (implement a work-rest schedule to reduce chance of heat stress)
- Use of PPE (use of respirators when action levels are exceeded)

The hazard controls and safe work practices are summarized in the following sections of this HSP:

- General hazards and controls
- Project-specific hazards and controls
- Physical hazards and controls
- Biological hazards and controls
- Contaminants of concern (COCs)

7.1 Activity Hazard Analysis

An AHA defines the activity being performed, the hazards posed, and control measures required to perform the work safely. Workers are briefed on the AHA before doing the work and their input is solicited before, during, and after the performance of work to further identify the hazards posed and control measures required. The AHA shall identify the work tasks required to perform each activity, along with potential HSE hazards and recommended control measures for each hazard. In addition, a list of the equipment to be used to perform the activity, inspection requirements, and training requirements for the safe operation of the equipment listed must be identified. The following hazard controls and applicable CH2M HILL core standards and SOPs should be used as a basis for preparing AHAs.

AHAs must be prepared for CH2M HILL activities and included as an attachment to this HSP.

7.2 Subcontractor AHAs

CH2M HILL subcontractors are required to provide AHAs specific to their scope of work on the project for acceptance by CH2M HILL. Each subcontractor shall submit AHAs for their field

activities, as defined in their scope of work, along with their project-specific safety plan and/or procedures. Additions or changes in field activities, equipment, tools, or material used to perform work or hazards not addressed in existing AHAs requires either a new AHA to be prepared or an existing AHA to be revised.

TABLE 1
General Activity Hazard Analysis

Potential Hazard	Project Activity	Vegetation clearing	Surveying	MEC surveying	Removal of safe MEC and MPPEH	MEC visual surveying in less than 3 feet of water
Arsenic		X	X	X	X	
Biological Hazards		X	X	X	X	X
Cadmium		X	X	X	X	
Chainsaws		X				
Field Vehicles		X	X	X	X	X
Fire Prevention		X				
Hand & Power Tools		X				
Knife Use		X				
Manual Lifting		X	X		X	X
MEC/MMPEH		X	X	X	X	X
Noise		X				
Temperature Extremes		X	X	X	X	X
Traffic Control						
Ultraviolet (UV) Light Exposure (sunburn)		X	X	X	X	X
Utilities (underground/overhead)					X	
Visible Lighting		X	X	X	X	X
Work Over Water/Boating Safety						X

8 General Hazards and Controls

8.1 General Practices and Housekeeping

The following are general requirements applicable to all portions of the work:

- Site work should be performed during daylight hours whenever possible.
- Good housekeeping must be maintained at all times in all project work areas.
- Common paths of travel should be established and kept free from the accumulation of materials.
- Keep access to aisles, exits, ladders, stairways, scaffolding, and emergency equipment free from obstructions.
- Provide slip-resistant surfaces, ropes, or other devices to be used.
- Specific areas should be designated for the proper storage of materials.
- Tools, equipment, materials, and supplies shall be stored in an orderly manner.
- As work progresses, scrap and unessential materials must be neatly stored or removed from the work area.
- Containers should be provided for collecting trash and other debris and shall be removed at regular intervals.
- All spills shall be quickly cleaned up. Oil and grease shall be cleaned from walking and working surfaces.
- Review the safety requirements of each job you are assigned to with your supervisor. You are not expected to perform a job that may result in injury or illness to yourself or to others.
- Familiarize yourself with, understand, and follow jobsite emergency procedures.
- Do not fight or horseplay while conducting the firm's business.
- Do not use or possess firearms or other weapons while conducting the firm's business.
- Report unsafe conditions or unsafe acts to your supervisor immediately.
- Report emergencies, occupational illnesses, injuries, vehicle accidents, and near misses immediately.
- Do not remove or make ineffective safeguards or safety devices attached to any piece of equipment.
- Report unsafe equipment, defective or frayed electrical cords, and unguarded machinery to your supervisor.
- Shut down and lock out machinery and equipment before cleaning, adjustment, or repair. Do not lubricate or repair moving parts of machinery while the parts are in motion.

- Do not run in the workplace.
- When ascending or descending stairways, use the handrail and take one step at a time.
- Do not apply compressed air to any person or clothing.
- Do not wear steel taps or shoes with metal exposed to the sole at any CH2M HILL project location.
- Do not wear finger rings, loose clothing, wristwatches, and other loose accessories when within arm's reach of moving machinery.
- Remove waste and debris from the workplace and dispose of in accordance with federal, state, and local regulations.
- Note the correct way to lift heavy objects (secure footing, firm grip, straight back, lift with legs), and get help if needed. Use mechanical lifting devices whenever possible.
- Check the work area to observe what problems or hazards may exist.

8.2 Driving Safety

Follow the guidelines below when operating a vehicle:

- Cell phone use is not allowed on the restricted side of NSF Indian Head. Turn cell phones off and leave them off till you have exited the restricted side of the facility.
- Refrain from using a cellular phone while driving. Pull off the road, put the vehicle in park, and turn on flashers before talking on a cellular phone.
- Never operate a personal digital assistant or other device with e-mail, internet, or text messaging functions while driving a vehicle.
- Obey speed limits. Be aware of blind spots or other hazards associated with low visibility. Practice defensive driving techniques, such as leaving plenty of room between your vehicle and the one ahead of you.
- Do not drive while drowsy. Drowsiness can occur at any time, but is most likely after 18 hours or more without sleep.
- Maintain focus on driving. Eating, drinking, smoking, or adjusting controls can divert attention from the road. Take the time to park and perform these tasks while parked rather than while driving.
- Ensure vehicle drivers are familiar with the safe operation of vehicles of the type and size to be operated. Large vehicles such as full size vans and pick-ups have different vision challenges and handling characteristics than smaller vehicles.

8.3 Personal Hygiene

Good hygiene is essential for personal health and to reduce the potential of cross-contamination when working on a hazardous waste site. Implement the following:

- Keep hands away from nose, mouth, and eyes during work.
- Keep areas of broken skin (chapped, burned, etc.) covered.

- Wash hands with soap and water before eating, smoking, or applying cosmetics.

8.4 Bloodborne Pathogens

(Reference CH2M HILL SOP HSE-202, *Bloodborne Pathogens*)

Exposure to bloodborne pathogens may occur when rendering first aid or cardiopulmonary resuscitation (CPR), or when coming into contact with landfill waste or waste streams containing potentially infectious material (PIM).

Employees trained in first-aid/CPR or those exposed to PIM must complete CH2M HILL's 1-hour bloodborne pathogens computer-based training module annually. When performing first-aid/CPR, the following shall apply:

- Observe universal precautions to prevent contact with blood or other PIMs. Where differentiation between body fluid types is difficult or impossible, consider all body fluids to be PIMs.
- Always wash your hands and face with soap and running water after contacting PIMs. If washing facilities are unavailable, use an antiseptic cleanser with clean paper towels or moist towelettes.
- If necessary, decontaminate all potentially contaminated equipment and surfaces with chlorine bleach (5.25 percent sodium hypochlorite solution) as soon as possible. Use one part chlorine bleach diluted with 10 parts water for decontaminating equipment or surfaces after initially removing blood or other PIMs. Remove contaminated PPE as soon as possible before leaving a work area.

CH2M HILL will provide exposed employees with a confidential medical examination should an exposure to PIM occur. This examination includes the following procedures:

- Documenting the exposure
- Testing the exposed employee's and the source individual's blood (with consent)
- Administering post-exposure prophylaxis

8.5 Hazard Communication

(Reference CH2M HILL SOPs HSE-107, *Hazard Communication* and HSE-403, *Hazardous Material Handling*)

The hazard communication coordinator is to perform the following:

- Complete an inventory of chemicals brought on site by CH2M HILL using the Chemical Inventory Form included as an attachment to this HSP.
- Confirm that an inventory of chemicals brought on site by CH2M HILL subcontractors is available.
- Request or confirm locations of MSDSs from the client, contractors, and subcontractors for chemicals to which CH2M HILL employees potentially are exposed.

- Before or as the chemicals arrive on site, obtain an MSDS for each hazardous chemical and include on the chemical inventory sheet (attached to this HSP) and add the MSDS to the MSDS attachment section of this HSP.
- Label chemical containers with the identity of the chemical and with hazard warnings, and store properly.
- Give employees required chemical-specific hazard communication training using the chemical-specific training form included as an attachment to this HSP.
- Store all materials properly, giving consideration to compatibility, quantity limits, secondary containment, fire prevention, and environmental conditions.

The following are general guidelines for storing chemicals and other hazardous materials:

- Keep acids away from bases.
- Keep oxidizers (nitric acid, nitrates, peroxides, chlorates) and organics away from inorganic reducing agents (metals).
- Keep flammables and corrosives in appropriate storage cabinets.
- Do not store paper or other combustibles near flammables.
- Use secondary containment and lipped shelving that is secured.
- Have a fire suppression system available.

8.6 Substance Abuse

(Reference CH2M HILL SOP HSE-105, *Drug-Free Workplace*)

Employees who work under the influence of controlled substances, drugs, or alcohol may prove to be dangerous or otherwise harmful to themselves, other employees, clients, the company, the company's assets and interests, or the public. CH2M HILL does not tolerate illegal drug use, or any use of drugs, controlled substances, or alcohol that impairs an employee's work performance or behavior.

Prohibitions onsite include:

- Use or possession of intoxicating beverages while performing CH2M HILL work
- Abuse of prescription or nonprescription drugs
- Use or possession of illegal drugs or drugs obtained illegally
- Sale, purchase, or transfer of legal, illegal or illegally obtained drugs
- Arrival at work under the influence of legal or illegal drugs or alcohol

Drug and/or alcohol testing is applicable under CH2M HILL Constructors, Inc. and munitions response projects performed in the United States. In addition, employees may be required to submit to drug and/or alcohol testing as required by clients. When required, this testing is performed in accordance with SOP HSE-105, *Drug-Free Workplace*. Employees who are enrolled in drug or alcohol testing are required to complete annual training located on the CH2M HILL Virtual Office (VO).

8.7 Shipping and Transportation of Chemical Products

(Reference CH2M HILL's Procedures for Shipping and Transporting Dangerous Goods)

Chemicals brought to the site might be defined as hazardous materials by the U.S. Department of Transportation. All staff members who ship the materials or transport them by road must receive CH2M HILL training in shipping dangerous goods. All hazardous materials that are shipped (e.g., via Federal Express) or are transported by road must be properly identified, labeled, packed, and documented by trained staff members. Contact the RHSM or the Warehouse Coordinator for additional information.

9 Project-Specific Hazard Controls

This section provides safe work practices and control measures used to reduce or eliminate potential hazards. These practices and controls are to be implemented by the party in control of either the work or the particular hazard. Each person onsite is required to abide by the hazard controls. Consult the appropriate CH2M HILL SOP to ensure all requirements are implemented. CH2M HILL employees and subcontractors must remain aware of the hazards affecting them regardless of who is responsible for controlling the hazards. CH2M HILL employees and subcontractors who do not understand any of these provisions should contact the RHSM for clarification.

9.1 Arsenic

(Reference CH2M HILL, SOP HSE-501, *Arsenic*)

Arsenic is considered a confirmed human carcinogen. CH2M HILL is required to control employee exposure to arsenic when exposures are at or above 5.0 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), or if there is the possibility of skin or eye irritation from arsenic. The elements of the CH2M HILL arsenic program include the following:

- Exposure monitoring
- Methods of control, including PPE and respirators
- Medical surveillance
- Training on hazards of arsenic and control measures (includes project-specific training and the computer-based training on CH2M HILL's VO, *Arsenic Exposure*)
- Recordkeeping requirements

If air monitoring indicates there is potential exposure at the action level concentrations, notify the RHSM to ensure the controls above have been adequately addressed. Full implementation of SOP HSE-501, *Arsenic*, will be required. Other exposure control measures include:

- Do not enter regulated work areas unless training, medical monitoring, and PPE requirements established by the competent person have been met.
- Do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in regulated areas.
- Avoid skin and eye contact with liquid and particulate arsenic or arsenic trichloride.
- Respiratory protection and other exposure controls selection shall be based on the most recent exposure monitoring results obtained from the competent person.
- Review the fact sheet included as an attachment to this HSP.

9.2 Cadmium

(Reference CH2M HILL SOP HSE-504, *Cadmium*)

Cadmium is considered a suspected human carcinogen. CH2M HILL is required to control employee workplace exposure to cadmium when personal exposure is at or above 2.5 µg/m³ by implementing a program that meets the requirements of the OSHA cadmium standard, 29 Code of Federal Regulations (CFR) 1926.1127. The elements of the CH2M HILL cadmium program include the following:

- Exposure monitoring
- Methods of control, including PPE and respirators
- Medical surveillance
- Training on hazards of cadmium and control measures (includes project-specific training and the computer-based training on CH2M HILL's VO, *Cadmium*)
- Recordkeeping requirements

If air monitoring indicates there is potential exposure at the action level concentrations above, notify the RHSM to ensure the controls above have been adequately addressed. Other exposure control measures include:

- Do not enter regulated work areas unless training, medical monitoring, and PPE requirements established by the competent person have been met.
- Do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in regulated areas.
- Respiratory protection and other exposure controls selection shall be based on the most recent exposure monitoring results obtained from the competent person.
- Review the fact sheet included as an attachment to this HSP.

9.3 Chainsaws

(Reference CH2M HILL SOP HSE-210, *Hand and Power Tools*)

Below are the hazard controls and safe work practices to follow when working around or operating chainsaws. Ensure the requirements in the referenced SOP are followed.

9.3.1 Equipment

Only chainsaws equipped with a spark arrestor and fully functioning chain brake or "safety chain" shall be used. The following safety equipment shall be readily available while operating a chainsaw:

- Chainsaw operator's manual
- Fully stocked first aid kit
- Multipurpose fire extinguisher
- Grounded extension cord approved for outdoor use and ground fault circuit interrupter for electrically powered chainsaws
- Approved safety gasoline container and funnel or flexible nozzle for refueling gasoline-powered chainsaws
- Sledge hammer and non-metallic wedges when necessary to prevent pinching of the chain

9.3.2 PPE Requirements

The following PPE shall be worn while operating chainsaws:

- Safety glasses with side shields and face shield to prevent injury from wood chips, sawdust, or other flying objects
- Hard hat with properly fitted suspension to prevent head injury from falling debris
- Steel-toed safety shoes or boots to prevent foot injury from falling objects and accidental contact with the moving chain
- Hearing protection to prevent permanent damage to hearing. Ear muffs or plugs will have a decibel noise reduction rating assigned to them. The higher the rating, the greater the protection offered.
- Non-leather, fabric work gloves to prevent hand injury from abrasions, splinters and cuts
- Clothing that is well-fitted and free of loose edges that could become entangled in the saw
- Protective chaps or leggings that cover the area from the groin to about 2 inches (5.08 cm) above the ankles should be used. These chaps are made from synthetic fabrics that are designed to prevent the running saw chain from coming in contact with your legs.

9.3.3 Safe Operation

The following safe operation guidelines shall be followed regardless of the purpose for using a chainsaw:

- Inspect the chainsaw prior to use.
- Chainsaws shall be held firmly with both hands, with thumbs and fingers encircling both chain saw handles.
- Stand slightly to the left side of the saw, out of the plane of the cutting chain and guide bar to reduce the risk of injury in the event of a kickback.
- Position saw so that it is between the waist and mid-chest level. Overreaching or cutting above the mid-chest height shall be avoided.
- Maintain a full throttle setting while cutting. Chainsaws are designed to be run at full speed.
- Always be aware of what is in the saw's downward path after the cut.
- Do not attempt to cut material that is larger than the guide bar of the saw.
- Avoid cuts that will cause the chainsaw to jam. Always cut into the compression wood first until the cut starts to close; then cut from the other side toward the compression cut.
- Use a non-metallic wedge to prevent the compression cut jamming on the blade.
- Chainsaws are designed to feed themselves into the wood and require only light pressure to cut efficiently. If extra force is required to keep cutting, the chain requires sharpening. Additional signs of a dull chain include a saw that is cutting crookedly, results in fine sawdust instead of chips, or exhibits the smell of burnt wood. Do not use a dull chain.
- Bystanders and helpers shall be kept at a safe distance from operation.

- Do not operate a chainsaw when fatigued; take frequent breaks.
- Work slowly; don't rush.
- A fire extinguisher shall be present at all times when operating the chainsaw in forest or brushy areas.

9.3.4 Refueling the Engine

The fuel for gasoline-powered chainsaws shall be mixed in accordance with the manufacturer's recommendations outlined in the chainsaw operator's manual. Fuel shall be stored and transported in an approved safety container. The following precautions should also be followed:

- The engine shall be shut off and allowed to cool before refueling; never refuel a hot engine.
- A fire extinguisher shall be present during fueling and refueling.
- Smoking around fueling or refueling operations is prohibited.
- A funnel or a flexible nozzle shall be used to avoid spilling fuel on the engine.

9.4 Field Vehicles

- Field vehicles may be personal vehicles, rental vehicles, fleet vehicles, or project vehicles.
- Maintain a first aid kit, bloodborne pathogen kit, and fire extinguisher in the field vehicle at all times.
- Utilize a rotary beacon on vehicles if working adjacent to active roadway.
- Car rental must meet the following requirements:
 - Have dual air bags
 - Have antilock brakes
 - Be midsize or larger
- Familiarize yourself with rental vehicle features prior to operating the vehicle:
 - Vision fields and blind spots
 - Vehicle size
 - Mirror adjustments
 - Seat adjustments
 - Cruise control features, if offered
 - Pre-program radio stations and GPS, if equipped
- Always wear seatbelt while operating vehicle.
- Adjust headrest to proper position.
- Tie down loose items if utilizing a van or pickup truck.
- Close car doors slowly and carefully. Fingers can get pinched in doors.
- Park vehicle in a location where it can be accessed easily in the event of an emergency. If not possible, carry a phone.

- Have a designated place for storing the field vehicle keys when not in use.
- Ensure back-up alarms are functioning, if equipped. Before backing a vehicle, take a walk around the vehicle to identify obstructions or hazards. Use a spotter when necessary to back into or out of an area.

9.5 Fire Prevention

(Reference CH2M HILL SOP HSE-403, *Hazardous Material Handling*)

Follow the fire prevention and control procedures listed below.

9.5.1 Fire Extinguishers and General Fire Prevention Practices

- Fire extinguishers shall be provided so that the travel distance from any work area to the nearest extinguisher is less than 100 feet (30.5 meters). When 5 gallons (19 liters) or more of a flammable or combustible liquid is being used, an extinguisher must be within 50 feet (15.2 meters). Extinguishers must:
 - be maintained in a fully charged and operable condition
 - be visually inspected each month
 - undergo an annual maintenance check
- The area in front of extinguishers must be kept clear.
- Post “Exit” signs over exiting doors, and post “Fire Extinguisher” signs over extinguisher locations.
- Combustible materials stored outside should be at least 10 feet (3 meters) from any building.
- Solvent waste and oily rags must be kept in a fire-resistant, covered container until removed from the site.

9.5.2 Storage of Flammable/Combustible Liquids

- Only approved containers and portable tanks shall be used for storage and handling of flammable and combustible liquids.
- Approved safety cans shall be used for the handling and use of flammable liquids in quantities of 5 gallons (22.7 liters) or less. Do not use plastic gas cans.
- For quantities of 1 gallon (4.5 liters) or less, the original container may be used for storage and use of flammable liquids.
- Flammable or combustible liquids shall not be stored in areas used for stairways or normally used for the passage of people.

9.5.3 Indoor Storage of Flammable/Combustible Liquids

- No more than 25 gallons (113.7 liters) of flammable or combustible liquids shall be stored in a room outside of an approved storage cabinet.
- Quantities of flammable and combustible liquids in excess of 25 gallons (113.7 liters) shall be stored in an acceptable or approved cabinet.
- Cabinets shall be conspicuously lettered: "FLAMMABLE: KEEP FIRE AWAY."

- Not more than 60 gallons (272.8 liters) of flammable or 120 gallons (545.5 liters) of combustible liquids shall be stored in any one storage cabinet. Not more than three such cabinets may be located in a single storage area.

9.5.4 Outside Storage of Flammable/Combustible Liquids

- Storage of containers (not more than 60 gallons [272.8 liters] each) shall not exceed 1,100 gallons (5000 liters) in any one area. No area shall be within 20 feet (6.1 meters) of any building.
- Storage areas shall be graded to divert spills away from buildings and surrounded by an earthen dike.
- Storage areas shall be free from weeds, debris, and other combustible materials.
- Outdoor portable tanks shall be provided with emergency vent devices and shall not be closer than 20 feet (6.1 meters) to any building.
- Signs prohibiting smoking shall be posted around the storage area.

9.5.5 Dispensing of Flammable/Combustible Liquids

- Areas in which flammable or combustible liquids are dispensed in quantities greater than 5 gallons (22.7 liters) (shall be separated from other operations by at least 25 feet (7.6 meters).
- Drainage or other means shall be provided to control spills.
- Adequate natural or mechanical ventilation shall be provided to maintain the concentration of flammable vapor at or below 10 percent of the lower flammable limit.
- Dispensing of flammable liquids from one container to another shall be done only when containers are electrically interconnected (bonded).
- Dispensing flammable or combustible liquids by means of air pressure on the container or portable tanks is prohibited.
- Dispensing devices and nozzles for flammable liquids shall be of an approved type.

9.6 Hand and Power Tools

(Reference CH2M HILL, SOP HSE-210, *Hand and Power Tools*)

Below are the hazard controls and safe work practices to follow when personnel or subcontractors are using hand and power tools. Ensure the requirements in the referenced SOP are followed.

- Tools shall be inspected prior to use and damaged tools will be tagged and removed from service.
- Hand tools will be used for their intended use and operated in accordance with manufacturer's instructions and design limitations;
- Maintain all hand and power tools in a safe condition.
- Use PPE (such as gloves, safety glasses, earplugs, and face shields) when exposed to a hazard from a tool.

- Do not carry or lower a power tool by its cord or hose.
- Portable power tools will be plugged into outlets protected by a ground fault circuit interrupter.
- Portable power tools will be Underwriters Laboratories-listed and have a three-wire grounded plug or be double-insulated.
- Disconnect tools from energy sources when they are not in use, before servicing and cleaning them, and when changing accessories (such as blades, bits, and cutters).
- Safety guards on tools must remain installed while the tool is in use and must be promptly replaced after repair or maintenance has been performed.
- Store tools properly in a place where they will not be damaged or come in contact with hazardous materials.
- If a cordless tool is connected to its recharge unit, both pieces of equipment must conform strictly with electrical standards and manufacturer's specifications.
- Tools used in an explosive environment must be rated for work in that environment (that is, intrinsically safe, spark-proof, etc.).
- Working with manual and pistol-grip hand tools may involve highly repetitive movement, extended elevation, constrained postures, and/or awkward positioning of body members (for example, hand, wrist, arm, shoulder, neck, etc.). Consider alternative tool designs, improved posture, the selection of appropriate materials, changing work organization, and sequencing to prevent muscular, skeletal, repetitive motion, and cumulative trauma stressors.

Machine Guarding

- Ensure that all machine guards are in place to prevent contact with drive lines, belts, chains, pinch points or any other sources of mechanical injury.
- Unplugging jammed equipment will only be performed when equipment has been shut down, all sources of energy have been isolated and equipment has been locked/tagged and tested.
- Maintenance and repair of equipment that results in the removal of guards or would otherwise put anyone at risk requires lockout of that equipment prior to work.

9.7 Knife Use

Open-bladed knives (for example, box cutters, utility knives, pocket knives, machetes, and multi-purpose tools with fixed blades such as a Leatherman) are prohibited at worksites except where the following three conditions are met:

- The open-bladed knife is classified as the best tool for the job.
- An approved AHA or written procedure is in place that covers the necessary safety precautions (work practices, PPE, and training).
- Knife users have been trained and follow the AHA.

9.8 Manual Lifting

(Reference CH2M HILL SOP HSE-112, *Manual Lifting*)

Back injuries are the leading cause of disabling work, and most back injuries are the result of improper lifting techniques or overexertion. Use the following to mitigate the hazards associated with lifting:

- When possible, the task should be modified to minimize manual lifting hazards.
- Lifting of loads weighing more than 40 pounds (18 kilograms) shall be evaluated by the SC using the Lifting Evaluation Form contained in SOP HSE-112.
- Using mechanical lifting devices is the preferred means of lifting heavy objects such as forklifts, cranes, hoists, rigging, hand trucks, and trolleys.
- Personnel shall seek assistance when performing manual lifting tasks that appear beyond their physical capabilities.
- In general, the following steps must be practiced when planning and performing manual lifts: Assess the situation before you lift. Follow good lifting and body positioning practices. Follow good carrying and setting down practices.
- All CH2M HILL workers must have training in proper manual lifting training, either through the New Employee Orientation or through Manual Lifting module located on the VO.

9.9 Munitions and Explosives of Concern & Material Potentially Presenting an Explosive Hazard

9.9.1 Hazard Identification

The nature of activities on this project will result in the potential of encountering MEC and MPPEH items that have been fired, disposed, or abandoned, but may still represent a hazard. Non- UXO-trained personnel will avoid all contact with MEC/MPPEH.

Hazard Mitigation/Prevention

All field personnel will be given munitions recognition training before working on the site. The training will be verified by signature on the site training form. Personnel will be instructed to be alert for MEC/MPPEH. The following general precautions concerning suspect MEC will be observed at all times:

- Suspect MEC item(s) WILL NOT be touched or moved regardless of the markings or apparent condition. Only UXO-trained personnel are allowed to handle MEC/MPPEH.
- Radios or cellular phones WILL NOT be used in the vicinity of suspect MEC items.
- Areas where the ground cannot be seen WILL NOT be traveled across without escort.
- Vehicles WILL NOT be driven into suspected MEC areas; clearly marked lanes will be used.
- Matches, cigarettes, lighters, or other flame-producing devices WILL NOT be carried on to a munitions response site.

- Color codes WILL NOT be relied upon for positive identification of MEC items or their contents.
- Suspect MEC items will be approached from the side whenever possible; approaching the front or rear areas will be avoided.
- Personnel will always assume that a MEC item contains a live charge until it can be determined otherwise.
- Earth-moving machinery (EMM) operations within an EZ will be performed under the supervision of a UXO Technician III.
- EMM will not be used to excavate soils within 12 inches of an anomaly.
- Anomaly investigation personnel are not permitted to enter an excavation greater than 4 feet in depth. If an investigation needs to be performed in an excavation deeper than 4 feet, operations at that work area will be halted and the Site Safety & Health Officer will be notified. If further investigation is warranted, the Site Safety & Health Officer will notify the RHSM to select the appropriate safety measures (e.g. sloping, shoring, etc.) to be implemented. The implementation of excavation safety provisions will require an amendment to this HSP.
- When anomaly investigation personnel must be in the area of EMM:
 - Sufficient separation between ground support personnel and operating EMM must be maintained.
 - Wear reflective vests or high visibility clothing to promote visibility of ground personnel by equipment operators.
 - Isolate equipment swing areas from workers, fixed objects, or other equipment. Ground personnel shall avoid positioning themselves between a fixed object and operating equipment.
 - Make/maintain eye contact with operators before approaching equipment. Do not approach equipment from rear or from blind spot of operator. Stay out of the swing radius of operating heavy equipment.
 - Suspended loads shall not be passed over ground personnel, and ground personnel shall not walk under or in front of suspended loads.

The following actions will be taken if munitions are found:

- Personnel who are not UXO-qualified will note the area of concern, and leave the immediate vicinity. They WILL NOT touch, move, or otherwise disturb the item.
- Personnel should not be misled by markings on the munitions item stating or indicating that the item is a practice bomb or inert. Even practice bombs may have explosive charges that are used to mark/spot the point of impact, or the item could be incorrectly marked.
- Immediately upon locating any suspect MEC, the Senior UXO Supervisor (SUXOS) and UXO Safety Officer will be notified. In turn, the SUXOS will notify the PM, who will then provide required notifications to the client.

- Operations in the immediate area of the suspect MEC will be halted and the appropriate procedures (as described below) will be implemented.

Removal and disposal of MEC is part of this scope of work and will be undertaken by a MEC support contractor under the oversight of CH2M HILL UXO-qualified personnel. MEC will be consolidated, demilitarized, and disposed of in accordance with procedures outlined in the approved Work Plan and Explosive Safety Submission.

When MEC is detected and identified as potentially loaded with explosives, chemicals, propellant or pyrotechnics, or when a buried object is exposed and cannot be identified as non-MEC, the MEC support contractor will coordinate with the CH2M HILL SUXOS for assistance. The location of the object will be marked with a yellow survey marker flag, and all investigation activities at that location will cease. The MEC support contractor will maintain site access control and ensure personnel safety until Navy EOD personnel arrive and take control of the site. The contractor must supply the GPS coordinates for each item upon arrival of the Navy EOD emergency response team. The GPS positions must also be noted in the final report. The contractor will allow the government EOD personnel sufficient time to complete field evaluation, render safe, recover and dispose of MEC, per incident, when MEC that cannot be identified is detected.

9.10 Visible Lighting

Lighting shall be evaluated when conducting work inside buildings, confined spaces, or other areas/instances where supplemental light may be needed, such as work before sunrise or after sunset. A light meter can be used to evaluate the adequacy of lighting. The following are common requirements for lighting and the conditions/type of work being performed.

- While work is in progress, outside construction areas shall have at least 33 lux (lx).
- Construction work conducted inside buildings should be provided with at least 55 lx light.
- The means of egress shall be illuminated with emergency and non-emergency lighting to provide a minimum 11 lx measured at the floor. Egress illumination shall be arranged so that the failure of any single lighting unit, including the burning out of an electric bulb, will not leave any area in total darkness.

9.11 Working Over Water and Boating Safety

Working Over or Near Water

If any activities pose a risk to drowning, implement the following during the activity:

- Fall protection should be provided to prevent personnel from falling into water. Where fall protection systems are not provided and the danger of drowning exists, U.S. Coast Guard (USCG) -approved personal flotation devices (PFDs), or a life jacket, shall be worn.
- Provide employees with an approved (USCG for U.S. operations) life jacket or buoyant work vest.
 - Employees should inspect life jackets or work vests daily before use for defects. Do not use defective jackets or vests.

- Post ring buoys with at least 90 feet (27.4 meters) of 3/8-inch solid-braid polypropylene (or equal) line next to the work area. If the work area is large, post extra buoys 200 feet (61 meters) or less from each other.
- Provide at least one life-saving skiff, immediately available at locations where employees are working over or adjacent to water.
 - Ensure the skiff is in the water and capable of being launched by one person and is equipped with both motor and oars.
- Designate at least one employee on site to respond to water emergencies and operate the skiff at times when there are employees above water.
 - If the designated skiff operator is not within visual range of the water, provide him or her with a radio or provide some form of communication to inform him or her of an emergency.
 - The designated employee should be able to reach a victim in the water within 3 to 4 minutes.
- Ensure at least one employee trained in CPR and first aid is on site during work activities.

Boating Safety

Personnel who will operate a boat during the course of a project shall first demonstrate to the site manager that they are experienced in operating boats similar to those used for the project and that they are knowledgeable of the USCG boating safety requirements (33 CFR Subchapter S). Project boats shall be operated by experienced boat operators only. Boat operators shall also possess basic mechanical knowledge necessary to troubleshoot common mechanical problems that can and do occur. The boat operator shall be responsible for the safety of all personnel on board the boat he or she is operating and for the integrity of all boat and safety equipment.

Each designated boat operator shall give a safety briefing to all occupants of the boat before leaving the shore. Boats are to be occupied during use by not less than one qualified operator plus one additional person.

The boat skipper has the final authority with regard to boat safety and navigational safety.

Use the attached boat safety checklist to evaluate and verify necessary equipment prior to leaving shore

9.11.1 Boat Requirements

All project boats will meet or exceed USCG requirements for safety equipment, as applicable to the operation and type of boat. These requirements are summarized below for small craft (less than 40 feet [12 meters] in length).

9.11.2 Flame Arresters

All gasoline engines, except outboard motors, installed in a boat must have an approved flame arrestor (backfire preventer) fitted to the carburetor.

9.11.3 Sound Signaling Devices

Boats shall carry at least one air horn or similar sound-signaling device. Radio or cellular telephone communication must be in place as well.

9.11.4 Personal Flotation Devices

All personnel and passengers shall wear an approved PFD at all times when operating or being transported in a boat. A positively buoyant wet suit or dry suit may be substituted for a PFD. PFDs shall be Type II or higher (capable of turning its wearer in a vertical or slightly backward position in the water). In addition, each boat shall be equipped with at least one Type IV PFD, designed to be thrown to a person in the water and grasped and held by the user until rescued. A buoyant boat cushion equipped with straps and a float ring are two common examples of a Type IV PFD.

9.11.5 Fire Extinguishers

Each boat shall carry at least one Type B-I or B-II fire extinguisher (for use in gasoline, oil and grease fires) approved by Underwriters Laboratories. Each fire extinguisher shall be inspected to ensure that it is sufficiently charged and that the nozzles are free and clear. Discharged fire extinguishers shall be replaced or recharged immediately.

9.11.6 Emergency Planning

As part of the project HSP and AHAs, emergencies and response actions must be addressed for potential emergencies such as fire, sinking, flooding, severe weather, man overboard, or hazardous material incidents.

9.11.7 Load Capacity

Boats shall not be loaded (passengers and gear) beyond the weight capacity printed on the USCG information plate attached to the stern. In addition, several factors must be considered when loading a boat: distribute the load evenly, keep the load low, do not stand up in a small boat or canoe, and do not overload the boat.

9.11.8 Tool Kit

All motorized boats shall carry a tool kit sufficient for the boat operator to troubleshoot common mechanical problems such as fouled spark plugs, flooded carburetor, or electrical shorts. Boats operated in remote areas shall also carry appropriate spare parts (propellers, shear pins, patch kits, air pumps). The tool kit shall be maintained by the boat operator and supplies used up shall be replaced immediately.

9.11.9 Communications

All boats operated shall carry a two-way radio or cellular telephone that enables communication back to the field camp or other pre-established location.

9.11.10 Good Housekeeping

Personnel using a boat shall properly stow and secure all gear and equipment against unexpected shifts when underway. Decks and open spaces must be kept clear and free from clutter and trash to minimize slip, trip, and fall hazards.

9.11.11 Fuel Management

Personnel shall follow the "one-third rule" in boating fuel management. Use one-third of the fuel to get to the destination, one-third to return, and keep one-third in reserve.

No smoking is permitted on board vessels or during refueling operations.

9.11.12 Pollution Control

The Refuse Act of 1989 prohibits the throwing, discharging, or depositing of any refuse matter of any kind (including trash, garbage, oil, and other liquid pollutants) into the waters of the United States. The Federal Water Pollution Control Act prohibits the discharge of oil or hazardous substances in quantities that may be harmful into U.S. navigable waters. No person may intentionally drain oil or oily wastes from any source into the bilge of any vessel. Larger vessels equipped with toilet facilities must be equipped with a USCG-approved marine sanitation device.

Employees shall report any significant oil spills to water to the PM (either AM Margaret Kasim 703-376-5154, or PM Catherine Schripsema 312-873-9749) who calls the base point of contact (Nick Carros 301-744-2263), and the CH2M HILL Navy CLEAN environmental compliance lead (Hope Wilson 678-530-4226) who must report the spill to the USCG or other applicable regulatory agency. The procedure for incident reporting and investigation shall be followed when reporting the spill.

9.11.13 Training

All operators and passengers shall be trained on the requirements outlined above, as well as trained on the HSP/AHA(s), including emergency response actions.

10 Physical Hazards and Controls

10.1 Noise

(Reference CH2M HILL SOP HSE-108, *Hearing Conservation*)

CH2M HILL is required to control employee exposure to occupational noise levels of 85 decibels, A-weighted (dBA) and above by implementing a hearing conservation program that meets the requirements of the OSHA Occupational Noise Exposure standard, 29 CFR 1910.95. A noise assessment may be conducted by the RHSM or designee based on potential to emit noise above 85 dBA and also considering the frequency and duration of the task.

- Areas or equipment emitting noise at or above 90 dBA shall be evaluated to select feasible engineering controls. When engineering controls are not feasible, administrative controls can be developed and appropriate hearing protection will be provided.
- In areas or around equipment emitting noise levels at or above 85 dBA, hearing protection must be worn.
- Employees exposed to 84 dBA or a noise dose of 50% must participate in the Hearing Conservation program, including initial and annual (as required) audiograms.
- The RHSM will evaluate appropriate controls measures and work practices for employees who have experienced a standard threshold shift in their hearing.
- Employees who are exposed at or above the action level of 85 dBA are required to complete the online Noise Training Module located on CH2M HILL's virtual office.
- Hearing protection will be maintained in a clean and reliable condition, inspected before use and after any occurrence to identify any deterioration or damage, and damaged or deteriorated hearing protection repaired or discarded.
- In work areas where actual or potential high noise levels are present at any time, hearing protection must be worn by employees working or walking through the area.
- Areas where tasks requiring hearing protection are taking place may become hearing protection required areas as long as that specific task is taking place.
- High-noise areas requiring hearing protection should be posted, or employees must be informed of the requirements in an equivalent manner.

10.2 UV Radiation (Sun Exposure)

Health effects regarding UV radiation are confined to the skin and eyes. Overexposure can result in many skin conditions, including erythema (redness or sunburn), photoallergy (skin rash), phototoxicity (extreme sunburn acquired during short exposures to UV radiation while on certain medications), premature skin aging, and numerous types of skin cancer. Implement the following controls to avoid sunburn.

Limit Exposure Time

- Rotate the staff so the same personnel are not exposed all of the time.
- Limit exposure time when UV radiation is at peak levels (approximately 2 hours before and after the sun is at its highest point in the sky).
- Avoid exposure to the sun, or take extra precautions when the UV index rating is high.

Provide Shade

- Take lunch and breaks in shaded areas.
- Create shade or shelter through the use of umbrellas, tents, and canopies.
- Fabrics such as canvas, sailcloth, awning material, and synthetic shade cloth create good UV radiation protection.
- Check the UV protection of the materials before buying them. Seek protection levels of 95 percent or greater, and check the protection levels for different colors.

Clothing

- Reduce UV radiation damage by wearing proper clothing; for example, long-sleeved shirts with collars, and long pants. The fabric should be closely woven and should not let light through.
- Head protection should be worn to protect the face, ears, and neck. Wide-brimmed hats with a neck flap or "Foreign Legion" -style caps offer added protection.
- Wear UV-protective sunglasses or safety glasses. These should fit closely to the face. Wrap-around style glasses provide the best protection.

Sunscreen

- Apply sunscreen generously to all exposed skin surfaces at least 20 minutes before exposure, allowing time for it to adhere to the skin.
- Re-apply sunscreen at least every 2 hours, and more frequently when sweating or performing activities where sunscreen may be wiped off.
- Choose a sunscreen with a high sun protection factor (SPF). Most dermatologists advocate SPF 30 or higher for significant sun exposure.
- Waterproof sunscreens should be selected for use in or near water, and by those who perspire sufficiently to wash off non-waterproof products.
- Check for expiration dates, because most sunscreens are only good for about 3 years. Store in a cool place out of the sun.
- No sunscreen provides 100 percent protection against UV radiation. Other precautions must be taken to avoid overexposure.

10.3 Temperature Extremes

Each employee is responsible for the following:

- Recognizing the symptoms of heat or cold stress
- Taking appropriate precautionary measures to minimize their risk of exposure to temperature extremes (see following sections)
- Communicating any concerns regarding heat and cold stress to their supervisor or SC

10.3.1 Heat

Heat-related illnesses are caused by more than just temperature and humidity factors.

Physical fitness influences a person's ability to perform work under heat loads. At a given level of work, the more fit a person is, the less the physiological strain, the lower the heart rate, the lower the body temperature (indicates less retrained body heat—a rise in internal temperature precipitates heat injury), and the more efficient the sweating mechanism.

Acclimatization is the degree to which a worker's body has physiologically adjusted or acclimatized to working under hot conditions. Acclimatization affects one's ability to do work. Acclimatized individuals sweat sooner and more profusely than un-acclimatized individuals. Acclimatization occurs gradually over 1 to 2 weeks of continuous exposure, but it can be lost in as little as 3 days in a cooler environment.

Dehydration reduces body water volume. This reduces the body's sweating capacity and directly affects its ability to dissipate excess heat.

The ability of a body to dissipate heat depends on the ratio of its surface area to its mass (surface area/weight). **Heat dissipation** is a function of surface area, while heat production depends on body mass. Therefore, overweight individuals (those with a low ratio) are more susceptible to heat-related illnesses because they produce more heat per unit of surface area than if they were thinner. Monitor these persons carefully if heat stress is likely.

When wearing **impermeable clothing**, the weight of an individual is not as important in assessing the ability to dissipate excess heat because the primary heat dissipation mechanism, evaporation of sweat, is ineffective.

SYMPTOMS AND TREATMENT OF HEAT STRESS					
	Heat Syncope	Heat Rash	Heat Cramps	Heat Exhaustion	Heat Stroke
Signs and Symptoms	Sluggishness or fainting while standing erect or immobile in heat.	Profuse tiny raised red blister-like vesicles on affected areas, along with prickling sensations during heat exposure.	Painful spasms in muscles used during work (arms, legs, or abdomen); onset during or after work hours.	Fatigue, nausea, headache, giddiness; skin clammy and moist; complexion pale, muddy, or flushed; may faint on standing; rapid thready pulse and low blood pressure; oral temperature normal or low	Red, hot, dry skin; dizziness; confusion; rapid breathing and pulse; high oral temperature.
Treatment	Remove to cooler area. Rest lying down. Increase fluid intake. Recovery usually is prompt and complete.	Use mild drying lotions and powders, and keep skin clean for drying skin and preventing infection.	Remove to cooler area. Rest lying down. Increase fluid intake.	Remove to cooler area. Rest lying down, with head in low position. Administer fluids by mouth. Seek medical attention.	Cool rapidly by soaking in cool—but not cold—water. Call ambulance, and get medical attention immediately!

Precautions

- Drink 16 ounces of water before beginning work. Disposable cups and water maintained at 50 degrees Fahrenheit (°F) (10 degrees Celsius [° C]) to 60°F (15.6°C) should be available. Under severe conditions, drink 1 to 2 cups every 20 minutes, for a total of 1 to 2 gallons (7.5 liters) per day. Do not use alcohol in place of water or other nonalcoholic fluids. Decrease your intake of coffee and caffeinated soft drinks during working hours.
- Acclimate yourself by slowly increasing workloads (do not begin with extremely demanding activities).
- Use cooling devices, such as cooling vests, to aid natural body ventilation. These devices add weight, so their use should be balanced against efficiency.
- Use mobile showers or hose-down facilities to reduce body temperature and cool protective clothing.
- Conduct field activities in the early morning or evening and rotate shifts of workers, if possible.
- Avoid direct sun whenever possible, which can decrease physical efficiency and increase the probability of heat stress. Take regular breaks in a cool, shaded area. Use a wide-brim hat or an umbrella when working under direct sun for extended periods.
- Provide adequate shade to protect personnel against radiant heat (sun, flames, hot metal).
- Maintain good hygiene standards by frequently changing clothing and showering.
- Observe one another for signs of heat stress. PREVENTION and communication is key.

Thermal Stress Monitoring

The following procedures should be implemented when the ambient air temperature exceeds 70° F (21°C), the relative humidity is high (greater than 50 percent), or when the workers exhibit symptoms of heat stress:

- The heart rate should be measured by the radial pulse for 30 seconds, as early as possible in the resting period.
- The heart rate at the beginning of the rest period should not exceed 110 beats per minute, or 20 beats per minute above resting pulse.
- If the heart rate is higher, the next work period should be shortened by 33 percent, while the length of the rest period stays the same.
- If the pulse rate still exceeds 110 beats per minute at the beginning of the next rest period, the following work cycle should be further shortened by 33 percent.
- Continue this procedure until the rate is maintained below 110 beats per minute, or 20 beats per minute above resting pulse.
- Alternately, the oral temperature can be measured before the workers have something to drink.
- If the oral temperature exceeds 99.6°F (37.6°C) at the beginning of the rest period, the following work cycle should be shortened by 33 percent.
- Continue this procedure until the oral temperature is maintained below 99.6°F (37.6°C). While an accurate indication of heat stress, oral temperature is difficult to measure in the field.

Procedures for when Heat Illness Symptoms are Experienced

- **Always** contact the RHSM when any heat illness-related symptom is experienced so that controls can be evaluated and modified, if needed.
- In the case of cramps, reduce activity, increase fluid intake, move to shade until recovered.
- In the case of all other heat-related symptoms (fainting, heat rash, heat exhaustion), and if the worker is a CH2M HILL worker, contact the occupational physician at 1-866-893-2514 and immediate supervisor.
- In the case of heat stroke symptoms, call 911, have a designee give location and directions to ambulance service if needed, follow precautions under the emergency medical treatment of this HSP.
- Follow the directions provided in the Incident Notification, Reporting, and Investigation section of this HSP.

10.3.2 Cold

General

Low ambient temperatures increase the heat lost from the body to the environment by radiation and convection. In cases where the worker is standing on frozen ground, the heat loss is also due to conduction.

Wet skin and clothing, whether because of water or perspiration, may conduct heat away from the body through evaporative heat loss and conduction. As a result, the body cools suddenly when chemical protective clothing is removed if the clothing underneath is perspiration-soaked.

Movement of air across the skin reduces the insulating layer of still air just at the skin's surface. Reducing this insulating layer of air increases heat loss by convection.

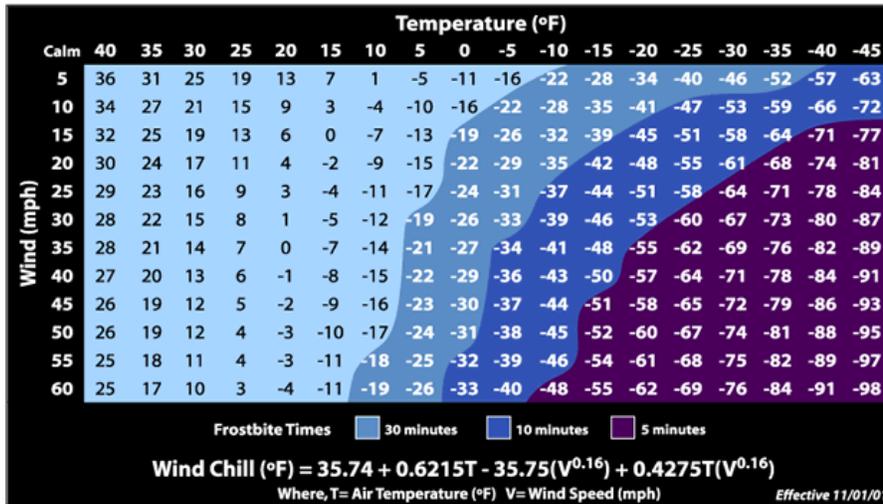
Non-insulating materials in contact or near-contact with the skin, such as boots constructed with a metal toe or shank, conduct heat rapidly away from the body.

Certain common drugs, such as alcohol, caffeine, or nicotine, may exacerbate the effects of cold, especially on the extremities. These chemicals reduce the blood flow to peripheral parts of the body, which are already high-risk areas because of their large surface-area-to-volume ratios. These substances may also aggravate an already hypothermic condition.

Precautions

- Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate rain gear is a must in wet weather.
- Consider monitoring the work conditions and adjusting the work schedule using guidelines developed by the U.S. Army (wind-chill index) and the National Safety Council.
- Wind-Chill Index (see the chart below) is used to estimate the combined effect of wind and low air temperatures on exposed skin. The wind-chill index does not take into account the body part that is exposed, the level of activity, or the amount or type of clothing worn. For those reasons, it should only be used as a guideline to warn workers when they are in a situation that can cause cold-related illnesses.
- National Safety Council *Guidelines for Work and Warm-Up Schedules* can be used with the wind-chill index to estimate work and warm-up schedules for fieldwork. The guidelines are not absolute; workers should be monitored for symptoms of cold-related illnesses. If symptoms are not observed, the work duration can be increased.
- Persons who experience initial signs of immersion foot, frostbite, and/or hypothermia should report it immediately to their supervisor/PM to avoid progression of cold-related illness.
- Observe one another for initial signs of cold-related disorders.
- Obtain and review weather forecast – be aware of predicted weather systems, along with sudden drops in temperature, increase in winds, and precipitation.

SYMPTOMS AND TREATMENT OF COLD STRESS			
	Immersion (Trench) Foot	Frostbite	Hypothermia
Signs and Symptoms	Feet discolored and painful; infection and swelling present.	Blanched, white, waxy skin, but tissue resilient; tissue cold and pale.	Shivering, apathy, sleepiness; rapid drop in body temperature; glassy stare; slow pulse; slow respiration.
Treatment	Seek medical treatment immediately.	Remove victim to a warm place. Re-warm area quickly in warm—but not hot—water. Have victim drink warm fluids, but not coffee or alcohol. Do not break blisters. Elevate the injured area, and get medical attention.	Remove victim to a warm place. Have victim drink warm fluids, but not coffee or alcohol. Get medical attention.



10.4 Radiological Hazards

Refer to CH2M HILL’s *Core Standard, Radiological Control and Radiological Controls Manual* for additional requirements.

Hazards	Controls
None Known	None Required

11 Biological Hazards and Controls

Biological hazards are everywhere and change with the region and season. If you encounter a biological hazard that has not been identified in this plan, contact the RHSM so that a revision to this plan can be made. Whether it is contact with a poisonous plant, a poisonous snake, or a bug bite, do not take such contact lightly. If there is a chance of an allergic reaction or infection, or to seek medical advice on how to properly care for the injury, contact the occupational nurse at 1-866-893-2514.

11.1 Bees and Other Stinging Insects

Bees and other stinging insects may be encountered almost anywhere and may present a serious hazard, particularly to people who are allergic. Watch for and avoid nests. Keep exposed skin to a minimum. Carry a kit if you have had allergic reactions in the past, and inform your supervisor and/or a buddy. If you are stung, contact the occupational nurse at 1-866-893-2514. If a stinger is present, remove it carefully with tweezers. Wash and disinfect the wound, cover it, and apply ice. Watch for an allergic reaction if you have never been stung before. Call 911 if the reaction is severe.

11.2 Feral Dogs

Avoid all dogs – both leashed and stray. Do not disturb a dog while it is sleeping, eating, or caring for puppies. If a dog approaches to sniff you, stay still. An aggressive dog has a tight mouth, flattened ears and a direct stare. If you are threatened by a dog, remain calm, do not scream, and avoid eye contact. If you say anything, speak calmly and firmly. Do not turn and run, try to stay still until the dog leaves, or back away slowly until the dog is out of sight or you have reached safety (for example, vehicle). If attacked, retreat to the nearest vehicle or attempt to place something between you and the dog. If you fall or are knocked to the ground, curl into a ball with your hands over your head and neck and protect your face. If bitten, contact the occupational nurse at 1-866-893-2514. Report the incident to the local authorities.

11.3 Mosquito Bites

Due to the recent detection of the West Nile Virus in various locations throughout the United States, it is recommended that preventative measures be taken to reduce the probability of being bitten by mosquitoes whenever possible. Mosquitoes are believed to be the primary source for exposure to the West Nile Virus as well as several other types of encephalitis. The following guidelines should be followed to reduce the risk of these concerns for working in areas where mosquitoes are prevalent:

- Stay indoors at dawn, dusk, and in the early evening.
- Wear long-sleeved shirts and long pants whenever you are outdoors.
- Spray clothing with repellents containing permethrin or N,N-diethyl-meta-toluamide (DEET) because mosquitoes may bite through thin clothing.

- Apply insect repellent sparingly to exposed skin. An effective repellent will contain 35 percent DEET. Repellents may irritate the eyes and mouth, so avoid applying repellent to the hands.
- Whenever you use an insecticide or insect repellent, be sure to read and follow the manufacturer's DIRECTIONS FOR USE, as printed on the product.

Vitamin B and "ultrasonic" devices are NOT effective in preventing mosquito bites.

Symptoms of Exposure to the West Nile Virus

Most infections are mild, and symptoms include fever, headache, and body aches, occasionally with skin rash and swollen lymph glands. More-severe infections may be marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis, and, rarely, death.

The West Nile Virus incubation period is from 3 to 15 days.

Contact the project RHSM with questions, and immediately report any suspicious symptoms to your supervisor and PM, and contact the occupational nurse at 1-866-893-2514.

11.4 Poison Ivy, Poison Oak, and Poison Sumac

Poison ivy, poison oak, and poison sumac typically are found in brush or wooded areas. They are more commonly found in moist areas or along the edges of wooded areas. Shrubs are usually 12 to 30 inches high, or can also be a tree-climbing vine, with triple leaflets and short, smooth hair underneath. Plants are red and dark green in spring and summer, with yellowing leaves anytime especially in dry areas. Leaves may achieve bright reds in fall, but plants lose their (yellowed, then brown) leaves in winter, leaving toxic stems. All parts of the plant remain toxic throughout the seasons. These plants contain urushiol, a colorless or pale yellow oil that oozes from any cut or crushed part of the plant, including the roots, stems and leaves, and causes allergic skin reactions when contacted. The oil is active year round.

Become familiar with the identity of these plants (see below). Wear protective clothing that covers exposed skin and clothes. Avoid contact with plants and the outside of protective clothing. If skin contacts a plant, wash the area with soap and water immediately. If the reaction is severe or worsens, seek medical attention.

Poison Ivy



Poison Sumac



Poison Oak



Contamination with poison ivy, sumac or oak can happen through several pathways, including:

- Direct skin contact with any part of the plant (even the roots, once the aboveground foliage has been removed).
- Contact with clothing that has been contaminated with the oil.
- Contact from removing shoes that have been contaminated (shoes are coated with urishol oil).
- Sitting in a vehicle that has become contaminated.
- Contact with any objects or tools that have become contaminated.
- Inhalation of particles generated by weed whacking, chipping, vegetation clearing.

If you must work on a site with poison ivy, sumac, or oak, the following precautions are necessary:

- Do not drive vehicles onto the site where it will come into contact with poison ivy, sumac, or oak. Vehicles that need to work in the area, such as drill rigs or heavy equipment, must be washed as soon as possible after leaving the site.
- All tools used in the poison ivy, sumac, or oak area, including those used to cut back poison oak, surveying instruments used in the area, air monitoring equipment, or other test apparatus must be decontaminated before they are placed back into the site vehicle. If onsite decontamination is not possible, use plastic to wrap any tools or equipment until they can be decontaminated.
- PPE, including Tyvek coveralls, gloves, and boot covers, must be worn. PPE must be placed into plastic bags and sealed if they are not disposed immediately into a trash receptacle.
- As soon as possible following the work, shower to remove any potential contamination. Any body part with suspected or actual exposure should be washed with Zanafel, Tecnu, or other product designed for removing urushiol. If you do not have Zanafel or Tecnu, wash with cold water. Do not take a bath because the oils can form an invisible film on top of the water and contaminate your entire body upon exiting the bath.
- Tecnu may also be used to decontaminate equipment.
- Use IvyBlock or similar products to prevent poison ivy, sumac, and oak contamination. Check with the closest CH2M HILL warehouse to see if these products are available. Follow all directions for application.

If you do come into contact with one of these poisonous plants and a reaction develops, contact your supervisor and the occupational nurse 1-866-893-2514.

11.5 Snakes

Snakes typically are found in underbrush and tall grassy areas. If you encounter a snake, stay calm and look around; there may be other snakes. Turn around and walk away on the same path you used to approach the area. If bitten by a snake, wash and immobilize the injured area, keeping it lower than the heart if possible. Call the occupational nurse at 1-866-893-2514 immediately. Do not apply ice, cut the wound, or apply a tourniquet. Try to identify the type

of snake: note color, size, patterns, and markings. Below is a guide to identifying poisonous snakes from non-poisonous snakes.

Identification of Poisonous Snakes

Major Identification Features Non-venomous Snake	Major Identification Features Venomous Snake
<ol style="list-style-type: none"> 1. Round pupils 2. No sensing pit 3. Head slightly wider than neck 4. Divided anal plate 5. Double row of scales on the underside of the tail 	<ol style="list-style-type: none"> 1. Elliptical pupils 2. Sensing pit between eye and nostril 3. Head much wider than neck 4. Single anal plate 5. Single scales on the underside of the tail

If a suspect snake is found call the NSF Indian Head Natural Resources Program Manager (301-744-2273 for its removal.

11.6 Spiders - Brown Recluse and Widow

The brown recluse spider can be found most anywhere in the United States. It varies in size in shape, but the distinguishing mark is the violin shape on its body. They are typically non-aggressive. Keep an eye out for irregular, pattern-less webs that sometimes appear almost tubular, built in a protected area such as in a crevice or between two rocks. The spider will retreat to this area of the web when threatened.

The black widow, red widow, and brown widow spiders are all poisonous. Most have globose, shiny abdomens that are predominantly black with red markings (although some may be pale or have lateral stripes), with moderately long, slender legs. These spiders are nocturnal and build a three-dimensional tangled web, often with a conical tent of dense silk in a corner where the spider hides during the day.

Hazard Controls

- Inspect or shake out any clothing, shoes, towels, or equipment before use.

- Wear protective clothing such as a long-sleeved shirt and long pants, hat, gloves, and boots when handling stacked or undisturbed piles of materials.
- Minimize the empty spaces between stacked materials.
- Remove and reduce debris and rubble from around the outdoor work areas.
- Trim or eliminate tall grasses from around outdoor work areas.
- Store apparel and outdoor equipment in tightly closed plastic bags.
- Keep your tetanus boosters up to date (every 10 years). Spider bites can become infected with tetanus spores.

If you think you have been bit by a poisonous spider, immediately call the occupational nurse at 1-866-893-2514 and follow the guidance below:

- Remain calm. Too much excitement or movement will increase the flow of venom into the blood.
- Apply a cool, wet cloth to the bite or cover the bite with a cloth and apply an ice bag to the bite.
- Elevate the bitten area, if possible.
- Do not apply a tourniquet. Do not try to remove venom.
- Try to positively identify the spider to confirm its type. If the spider has been killed, collect it in a plastic bag or jar for identification purposes. Do not try to capture a live spider – especially if you think it is a poisonous spider.

Black Widow



Red Widow



Brown Widow



Brown Recluse



11.7 Ticks

Every year employees are exposed to tick bites at work and at home, putting them at risk of illness. Ticks typically are in wooded areas, bushes, tall grass, and brush. Ticks are black, black and red, or brown and can be up to one-quarter inch (6.4 mm) in size.

In some geographic areas, exposure is not easily avoided. Wear tightly woven light-colored clothing with long sleeves and pant legs tucked into boots; spray only outside of clothing with permethrin or permanone and spray skin with only DEET; and check yourself frequently for ticks.

Where site conditions (vegetation above knee height, tick endemic area) or when tasks (e.g., having to sit or kneel in vegetation) diminish the effectiveness of the other controls mentioned

above, bug-out suits (check with your local or regional warehouse) or Tyvek shall be used. Bug-out suits are more breathable than Tyvek.

Take precautions to avoid exposure by including pre-planning measures for biological hazards before starting field work. Avoid habitats where possible and reduce the abundance through habitat disruption or application of acaricide. If these controls aren't feasible, contact your local or regional warehouse for preventative equipment such as repellants, protective clothing, and tick removal kits. Use the buddy system and perform tick inspections before entering the field vehicle. If ticks were not planned to be encountered and are observed, do not continue field work until these controls can be implemented.

See the Tick Fact Sheet attached to this HSP for further precautions and controls to implement when ticks are present. If bitten by a tick, follow the removal procedures found in the tick fact sheet, and call the occupational nurse at 1-866-893-2514.

Be aware of the symptoms of Lyme disease or Rocky Mountain spotted fever (RMSF). Lyme disease is a rash that might appear that looks like a bullseye with a small welt in the center. RMSF is a rash of red spots under the skin 3 to 10 days after the tick bite. In both RMSF and Lyme disease, chills, fever, headache, fatigue, stiff neck, and bone pain may develop. If symptoms appear, again contact the occupational nurse at 1-866-893-2514.

Be sure to complete an Incident Report (either use the Hours and Incident Tracking System [HITS] system on the VO if you do come in contact with a tick.

12 Contaminants of Concern

The table below summarizes the potential COCs and their occupational exposure limit and signs and symptoms of exposure. The table also includes the maximum concentration of each COC and the associated location and media that was sampled (groundwater, soil boring, surface soil). These concentrations were used to develop engineering and administrative controls described in Section 9.0, Project-Specific Hazard Controls, of this HSP, as well as PPE and site monitoring requirements.

Contaminants of Concern					
Contaminant	Location and Maximum ^a Concentration (ppm)	Exposure Limit ^b	IDLH ^c	Symptoms and Effects of Exposure	PIP ^d (eV)
Arsenic	GW: SB: SS: 18.3	0.01 mg/m ³	5 Ca	Ulceration of nasal septum, respiratory irritation, dermatitis, gastrointestinal disturbances, peripheral neuropathy, hyperpigmentation	NA
Cadmium	GW: SB: SS: 36	0.005 mg/m ³	9 Ca	Pulmonary edema, coughing, chest tightness/pain, headache, chills, muscle aches, nausea, vomiting, diarrhea, difficulty breathing, loss of sense of smell, emphysema, mild anemia	NA
Copper	GW: SB: SS: 1,500	0.1 mg/m ³	100 mg/m ³	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	NA
Manganese	GW: SB: SS: 533	5 mg/m ³	500 mg/m ³	Manganism; asthenia, insomnia, mental confusion; metal fume fever: dry throat, cough, chest tightness, dyspnea (breathing difficulty), rales, flu-like fever; low-back pain; vomiting; malaise (vague feeling of discomfort); lassitude (weakness, exhaustion); kidney damage	NA
Zinc	GW: SB: SS: SD 450	5 mg/m ³	2500 mg/m ³	Chills, muscle ache, vomiting, fever, lower back pain chest tightening	NA

Contaminants of Concern					
Contaminant	Location and Maximum ^a Concentration (ppm)	Exposure Limit ^b	IDLH ^c	Symptoms and Effects of Exposure	PIP ^d (eV)
<p>Footnotes:</p> <p>^a Specify sample-designation and media: SB (Soil Boring), A (Air), D (Drums), GW (Groundwater), L (Lagoon), TK (Tank), SS (Surface Soil), SL (Sludge), SW (Surface Water), SD (Sediment)</p> <p>^b Appropriate value of permissible exposure limit (PEL), recommended exposure limit (REL), or threshold limit value (TLV) listed.</p> <p>^c IDLH = immediately dangerous to life and health (units are the same as specified "Exposure Limit" units for that contaminant); CA = Potential occupational carcinogen.</p> <p>^d PIP = photoionization potential; NA = Not applicable</p> <p>ppm = parts per million eV = electron volt mg/m³ = milligrams per cubic meter</p>					
Potential Routes of Exposure					
<p>Dermal: Contact with contaminated media. This route of exposure is minimized through use of engineering controls, administrative controls and proper use of PPE.</p>		<p>Inhalation: Vapors and contaminated particulates. This route of exposure is minimized through use of engineering controls, administrative controls, and proper use of respiratory protection when other forms of control do not reduce the potential for exposure.</p>		<p>Other: Inadvertent ingestion of contaminated media. This route should not present a concern if good hygiene practices are followed (e.g., wash hands and face before drinking or smoking).</p>	

13 Site Monitoring

(Reference CH2M HILL SOP HSE-207, *Exposure Monitoring for Airborne Chemical Hazards*)

When performing site monitoring, record all the information, such as in a field logbook. Note the date and time, describe the monitoring location (for example, in breathing zone, at source and site location), and what the reading is. If any action levels are reached, note it in the field logbook and note the action taken.

Exposure records (air sampling) must be preserved for the duration of employment for the monitored employee plus 30 years. Ensure that copies of the field log book are maintained in the project file.

Copies of all project exposure records (e.g., copies of field logbook pages where air monitoring readings are recorded and associated calibration) shall be sent to the regional SPA for retention and maintained in the project files.

13.1 Direct Reading Monitoring Specifications

Instrument	Tasks	Action Levels ^a	Action to be Taken when Action Level reached	Frequency ^b	Calibration
Dust Monitor: DataRAM or equivalent Or Practice Dust Suppression Techniques utilizing Wet Methods	All Activities where Dust is visible, at minimum, first day.	0-2.5 mg/m ³	Level D	Initially and periodically during task	Zero Daily
		2.5-5 mg/m ³	Level D, practice Dust Suppression Techniques		
		5.0 > mg/m ³	Level C		
Nose-Level Monitor^d	All Heavy Equipment Operations	<85 dBA 85-120 dBA 120 dBA	No action required Hearing protection required Stop; re-evaluate	Initially and periodically during task	Daily

^a Action levels apply to sustained breathing-zone measurements above background.

^b The exact frequency of monitoring depends on field conditions and is to be determined by the SC; generally, every 5 to 15 minutes if acceptable; more frequently may be appropriate.

^c If the measured percent of O₂ is less than 10, an accurate LEL reading will not be obtained. Percent LEL and percent O₂ action levels apply only to ambient working atmospheres, and not to confined-space entry. More-stringent percent LEL and O₂ action levels are required for confined-space entry.

^d Noise monitoring and audiometric testing also required.

13.2 Calibration Specifications

(Refer to the respective manufacturer's instructions for proper instrument-maintenance procedures)

Instrument	Gas	Span	Reading	Method
Dust Monitor: DataRAM	Dust-free air	Not applicable	0.00 mg/m ³ in "Measure" mode	Dust-free area OR Z-bag with HEPA filter

Calibrate air monitoring equipment daily (or before use) in accordance with the instrument's instructions. Document the calibration in the field logbook (or equivalent) and include the following information:

- Instrument name
- Serial number
- Owner of instrument (for example, CH2M HILL, HAZCO)
- Calibration gas (including type and lot number)
- Type of regulator (for example, 1.5 lpm)
- Type of tubing (for example, direct or T-tubing)
- Ambient weather condition (for example, temperature and wind direction)
- Calibration/instrument readings
- Operator's name and signature
- Date and time

13.3 Integrated Personal Air Sampling

Sampling, in addition to real-time monitoring, may be required by other OSHA regulations where there may be exposure to certain contaminants. Air sampling typically is required when site contaminants include lead, cadmium, arsenic, asbestos, and certain volatile organic compounds. Contact the RHSM immediately if these contaminants are encountered.

Method Description

Additional air monitoring is not recommended at this time.

Personnel and Areas

Results must be sent immediately to the RHSM. Regulations may require reporting to monitored personnel. Results reported to:

RHSM: Carl Woods/CIN

Other: Mark Orman/MKE

14 Personal Protective Equipment

(Reference CH2M HILL- SOP HSE-117, *Personal Protective Equipment*)

14.1 Required Personal Protective Equipment

PPE must be worn by employees when actual or potential hazards exist and engineering controls or administrative practices cannot adequately control those hazards.

A PPE assessment has been conducted by the RHSM based on project tasks (see PPE specifications below). Verification and certification of assigned PPE by task is completed by the RHSM who approved this plan. Below are items that need to be followed when using any form of PPE:

- Employees must be trained to properly wear and maintain the PPE.
- In work areas where actual or potential hazards are present at any time, PPE must be worn by employees working or walking through the area.
- Areas requiring PPE should be posted or employees must be informed of the requirements in an equivalent manner.
- PPE must be inspected before use and after any occurrence to identify any deterioration or damage.
- PPE must be maintained in a clean and reliable condition.
- Damaged PPE shall not be used and must either be repaired or discarded.
- PPE shall not be modified, tampered with, or repaired beyond routine maintenance.

The table below outlines PPE to be used according to task based on project-specific hazard assessment. If a task other than the tasks described in this table needs to be performed, contact the RHSM so this table can be updated.

Project-Specific PPE Requirements ^a				
Task	Level	Body	Head	Respirator ^b
Vegetation clearance, MEC survey	D	Work clothes; safety toed leather work boots and gloves, PFD when working on water.	Hardhat ^c Safety glasses with side shields Ear protection ^d	None required
Work near vehicular traffic ways or earth moving equipment.	All	Appropriate level of ANSI/ISEA 107-2004 high-visibility safety vests.	Work near vehicular traffic ways or EMM	

Project-Specific PPE Requirements^a

Task	Level	Body	Head	Respirator^b
Equipment decontamination if using pressure washer	Modified D with splash protection	Coveralls: Polycoated Tyvek Boots: 16-inch-high steel-toed rubber boots Gloves: Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat ^c Splash shield ^c over safety glasses with side shields or splash goggles Ear protection ^d	None required
Task Requiring upgrade	C	Coveralls: Polycoated Tyvek Boots: Safety -toe, chemical-resistant boots OR Safety -toe, leather work boots with outer rubber boot covers Gloves: Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat ^c Splash shield ^c Ear protection ^d Spectacle inserts	APR, full face, MSA Ultratwin or equivalent
Tasks requiring upgrade	B	Coveralls: Polycoated Tyvek Boots: Safety -toe, chemical-resistant boots OR Safety -toe, leather work boots with outer rubber boot covers Gloves: Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat ^c Splash shield ^c Ear protection ^d Spectacle inserts	Positive-pressure demand self-contained breathing apparatus (SCBA); MSA Ultralite, or equivalent

Reasons for Upgrading or Downgrading Level of Protection (with approval of the RHSM)

Upgrade^f	Downgrade
<ul style="list-style-type: none"> Request from individual performing tasks. Change in work tasks that will increase contact or potential contact with hazardous materials. Occurrence or likely occurrence of gas or vapor emission. Known or suspected presence of dermal hazards. Instrument action levels in the "Site Monitoring" section exceeded. 	<ul style="list-style-type: none"> New information indicating that situation is less hazardous than originally thought. Change in site conditions that decrease the hazard. Change in work task that will reduce contact with hazardous materials.

^a Modifications are as indicated. CH2M HILL will provide PPE only to CH2M HILL employees.

^b No facial hair that would interfere with respirator fit is permitted.

^c Hardhat and splash-shield areas are to be determined by the SC.

^d Ear protection should be worn when conversations cannot be held at distances of 3 feet (1 meter) or less without shouting.

^{fe} Performing a task that requires an upgrade to a higher level of protection (e.g., Level D to Level C) is permitted only when the PPE requirements have been approved by the RHSM, and an SC qualified at that level is present.

14.2 Respiratory Protection

(Reference CH2M HILL SOP HSE-121, *Respiratory Protection*)

Note: The OSHA nuisance dust PEL is 5 mg/m³; an air-purifying respirator (APR) would be required when total dust reaches this level. Dust is visible at 2 - 3 mg/m³; dust suppression should be applied when dust becomes visible.

Should an upgrade to PPE be warranted and an APR be utilized, see below.

Implement the following when using respiratory protection:

- Respirator users must have completed appropriate respirator training within the past 12 months. Level C training is required for APR use and Level B training is required for supplied-air respirators and self-contained breathing apparatus (SCBA) use. Specific training is required for the use of powered air-purifying respirators (PAPRs).
- Respirator users must complete the respirator medical monitoring protocol and be approved for the specific type of respirator to be used.
- Tight-fitting facepiece respirator (negative or positive pressure) users must have passed an appropriate fit test within past 12 months.
- Respirator use shall be limited to those activities identified in this plan. If site conditions change, altering the effectiveness of the specified respiratory protection, the RHSM shall be notified to amend the written plan.
- Tight-fitting facepiece respirator users shall be clean-shaven and shall perform a user seal check before each use.
- Canisters/cartridges shall be replaced according to the change-out schedule specified in this plan. Respirator users shall notify the SC or RHSM of any detection of vapor or gas breakthrough. The SC shall report any breakthrough events to the RHSM for schedule upgrade.
- Respirators in regular use shall be inspected before each use and during cleaning
- Respirators in regular use shall be cleaned and disinfected as often as necessary to ensure they are maintained in a clean and sanitary condition.
- Respirators shall be properly stored to protect against contamination and deformation.
- Field repair of respirators shall be limited to routine maintenance. Defective respirators shall be removed from service.
- When breathing air is supplied by cylinder or compressor, the SC or RHSM shall verify the air meets Grade D air specifications.
- The SC or designee shall complete the H&S Self-Assessment Checklist – Respiratory Protection, included as an attachment to this plan to verify compliance with CH2M HILL’s respiratory protection program.

15 Worker Training and Qualification

15.1 CH2M HILL Worker Training

(Reference CH2M HILL SOP HSE-110, *Training*)

15.1.1 Hazardous Waste Operations Training

All employees engaging in HAZWOPER activities shall receive appropriate training as required by 29 CFR 1910.120 and 29 CFR 1926.65. At a minimum, the training shall have consisted of instruction in the topics outlined in 29 CFR 1910.120 and 29 CFR 1926.65. Personnel who have not met these training requirements shall not be allowed to engage in hazardous waste operations or emergency response activities.

Initial Training

General site workers engaged in hazardous waste operations shall, at the time of job assignment, have received a minimum of 40 hours of initial health and safety training for hazardous waste site operations, unless otherwise noted in the above-referenced standards.

Employees who may be exposed to health hazards or hazardous substances at treatment, storage, and disposal (TSD) operations shall receive a minimum of 24 hours of initial training to enable them to perform their assigned duties and functions in a safe and healthful manner.

Employees engaged in emergency response operations shall be trained to the level of required competence in accordance with 29 CFR 1910.120.

Three-Day Actual Field Experience

General site workers for hazardous waste operations shall have received three days of actual experience (on-the-job training) under the direct supervision of a trained, qualified supervisor that shall be documented. If the field experience has not already been received and documented at a similar site, this supervised experience shall be accomplished and documented at the beginning of the assignment of the project.

Refresher Training

General site workers and TSD workers shall receive 8 hours of refresher training annually (within the previous 12-month period) to maintain qualifications for fieldwork. Employees engaged in emergency response operations shall receive annual refresher training of sufficient content and duration to maintain their competencies or shall demonstrate competency in those areas at least annually.

Eight-Hour Supervisory Training

Onsite managers or supervisors who will be directly responsible for or supervise employees engaged in hazardous waste site operations will have received at least 8 hours of additional specialized training on managing such operations. Employees designated as Safety Coordinators - Hazardous Waste are considered 8-hour HAZWOPER Site Safety Supervisor -trained.

15.1.2 First Aid/Cardiopulmonary Resuscitation

First aid and CPR training consistent with the requirements of a nationally recognized organization such as the American Red Cross Association or National Safety Council shall be administered by a certified trainer. A minimum of two personnel per active field operation will have first aid and CPR training. Bloodborne pathogen training located on CH2M HILL's VO is also required for those designated as first aid/CPR-trained.

15.1.3 Safety Coordinator Training

SCs are trained to implement the HSE program on CH2M HILL field projects. A qualified SC is required to be identified in the site-specific HSP for CH2M HILL field projects. SCs must also meet the requirements of the worker category appropriate to the type of field project (construction or hazardous waste). In addition, the SCs shall have completed additional safety training required by the specific work activity on the project that qualifies them to implement the HSE program (for example, fall protection, excavation).

15.1.4 Site-specific Training

Before starting field activities, all field personnel assigned to the project will have completed site-specific training that will address the contents of applicable HSPs, including the activities, procedures, monitoring, and equipment used in the site operations. Site-specific training will also include site and facility layout, potential hazards, risks associated with identified emergency response actions, and available emergency services. This training allows field workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and work operations for their particular activity.

15.1.5 Project-specific Training Requirements

Project-specific training for this project includes:

- Training on CH2M HILL HSP and AHAs
- Training on subcontractor AHAs
- Other 3R training for all non-UXO trained personnel, site briefing on hazards

The training listed below is required for CH2M HILL employees, and is computer-based training located on CH2M HILL's VO at

https://www.int.ch2m.com/safety%5Fcounts/Training/Computer_Based_Courses.asp

- Lifting training (part of new employee orientation training or available on the VO)
- Noise training (on the VO)

16 Medical Surveillance and Qualification

All site workers participating in hazardous waste operations or emergency response will maintain an adequate medical surveillance program in accordance with 29 CFR 1910.120 or 29 CFR 1926.65 and other applicable OSHA standards. Documentation of employee medical qualification (e.g., physician's written opinion) will be maintained in the project files and made available for inspection.

16.1 Hazardous Waste Operations and Emergency Response

CH2M HILL personnel expected to participate in onsite hazardous waste operations or emergency response are required to have a current medical qualification for performing this work. Medical qualification shall consist of a qualified physician's written opinion regarding fitness for duty at a hazardous waste site, including any recommended limitations on the employee's assigned work. The physician's written opinion shall state whether the employee has any detected medical conditions that would place the employee at increased risk of material impairment of the employee's health from work in hazardous waste operations or emergency response, or from respirator use.

16.2 Job or Site-specific Medical Surveillance

Due to the nature of hazards for a particular job or work site, specialized medical surveillance may be necessary. This surveillance could include biological monitoring for specific compounds, or specialized medical examinations.

Site-specific medical surveillance includes:

- None

16.3 Respirator User Qualification

Personnel required to wear respirators must have a current medical qualification to wear respirators. Medical qualification shall consist of a qualified physician's written opinion regarding the employee's ability to safely wear a respirator in accordance with 29 CFR 1910.134.

16.4 Hearing Conservation

Personnel working in hazardous waste operations or operations that fall under 29 CFR 1910.95 and exposed to noise levels in excess of the 85dBA time-weighted average shall be included in a hearing conservation program that includes annual audiometric testing.

17 Site-Control Plan

17.1 Site-Control Procedures

(Reference CH2M HILL SOP HSE-218, *Hazardous Waste Operations*)

- The SC will implement site control procedures.
- The SC will conduct a site safety briefing (see below) before starting field activities or as tasks and site conditions change.
- Topics for briefing on site safety: general discussion of HSP, site-specific hazards, locations of work zones, PPE requirements, equipment, special procedures, emergencies.
- The SC records attendance at safety briefings in a logbook and documents the topics discussed.
- Post the OSHA job-site poster in a central and conspicuous location in accordance with CH2M HILL Core Standard, *OSHA Postings*.
- Establish support, contamination reduction, and EZs. Delineate with flags or cones as appropriate. Support zone should be upwind of the site. Use access control at entry and exit from each work zone.
- Establish onsite communication consisting of the following:
 - Line-of-sight and hand signals
 - Air horn
 - Two-way radio or cellular telephone if available
- Establish offsite communication.
- Establish and maintain the “buddy system.”
- Initial air monitoring is conducted by the SC in appropriate level of protection.
- The SC is to conduct periodic inspections of work practices to evaluate the effectiveness of this plan. Deficiencies are to be noted, reported to the RHSM, and corrected.

17.2 HAZWOPER Compliance Plan

(Reference CH2M HILL SOP HSE-218 *Hazardous Waste Operations*)

Certain parts of the site work are covered by state or federal HAZWOPER standards and therefore require training and medical monitoring. Anticipated HAZWOPER tasks listed in the “General Project Information” section of this HSP might occur consecutively or concurrently with respect to non-HAZWOPER tasks (also specified in the “General Project Information” section).

This section outlines procedures to be followed when the approved non-HAZWOPER activities do not require 24- or 40-hour training. Non-HAZWOPER-trained personnel also must be trained in accordance with all other state and federal OSHA requirements.

- In many cases, air sampling, in addition to real-time monitoring, must confirm that there is no exposure to gases or vapors before non-HAZWOPER-trained personnel are allowed on the site, or while the non-HAZWOPER-trained staff is working in proximity to HAZWOPER activities. Other data (e.g., soil) also must document that there is no potential for exposure. The RHSM must approve the interpretation of these data.
- When non-HAZWOPER-trained personnel are at risk of exposure, the SC must post the EZ and inform non-HAZWOPER-trained personnel of the:
 - nature of the existing contamination and its locations
 - limitations of their access
 - emergency action plan for the site
- Periodic air monitoring with direct-reading instruments conducted during regulated tasks also should be used to ensure that non-HAZWOPER-trained personnel (e.g., in an adjacent area) are not exposed to airborne contaminants.
- When exposure is possible, non-HAZWOPER-trained personnel must be removed from the site until it can be demonstrated that there is no longer a potential for exposure to health and safety hazards.
- Remediation treatment system start-ups: Once a treatment system begins to pump and treat contaminated media, the site is, for the purposes of applying the HAZWOPER standard, considered a TSD facility. Therefore, once the system begins operation, only HAZWOPER-trained personnel (minimum of 24 hours of training) will be permitted to enter the site. All non-HAZWOPER-trained personnel must not enter the TSD facility area of the site.

18 Decontamination

(Reference CH2M HILL SOP HSE-218, *Hazardous Waste Operations*)

The SC must establish and monitor the decontamination procedures and their effectiveness. Decontamination procedures found to be ineffective will be modified by the SC. The SC must ensure that procedures are established for disposing of materials generated on the site.

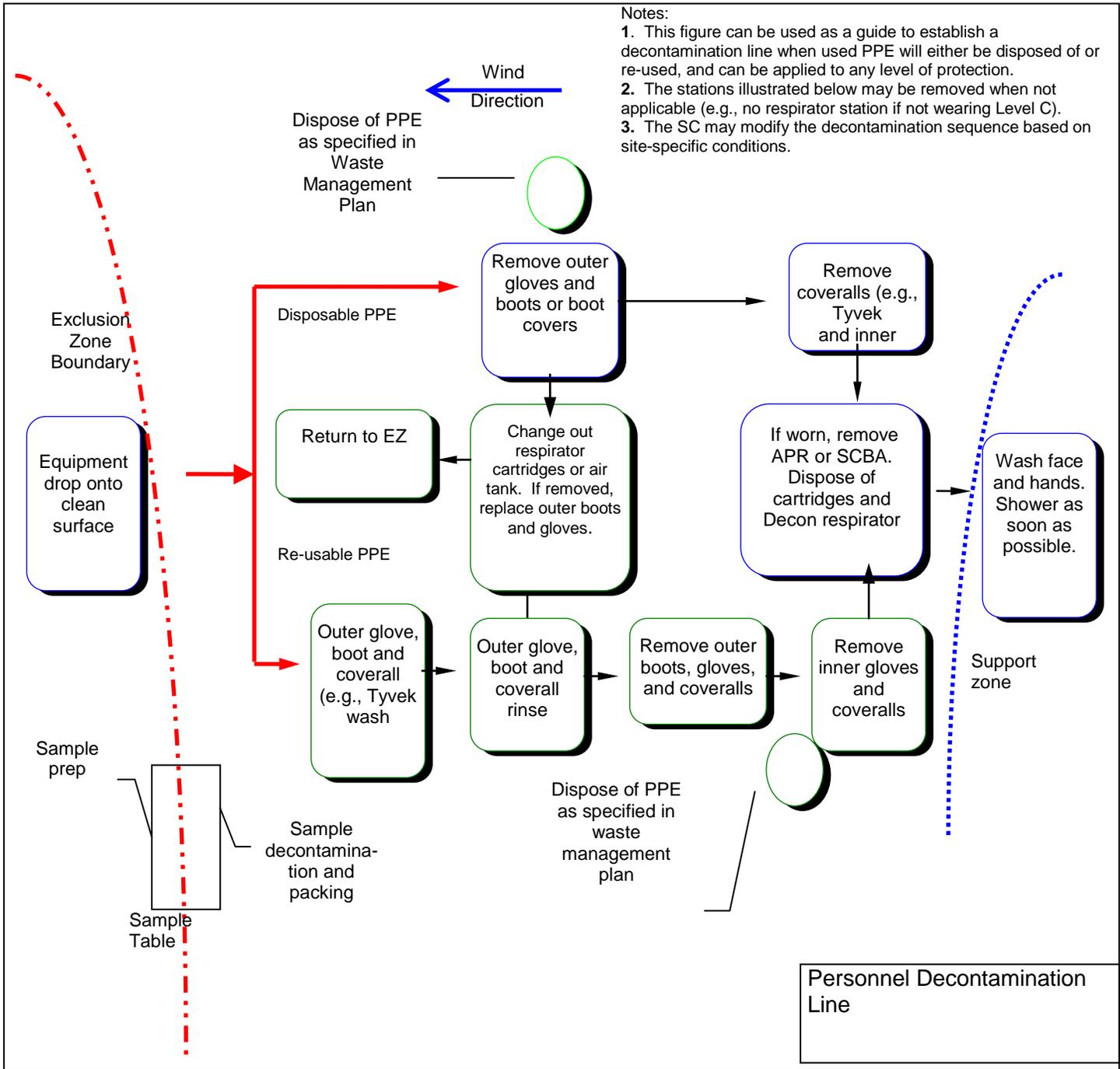
18.1 Decontamination Specifications

Personnel	Sample Equipment	Heavy Equipment
<ul style="list-style-type: none">• Boot wash/rinse• Glove wash/rinse• Outer-glove removal• Body-suit removal• Inner-glove removal• Respirator removal• Hand wash/rinse• Face wash/rinse• Shower ASAP• Dispose of PPE in municipal trash, or contain for disposal• Dispose of personnel rinse water to facility or sanitary sewer, or contain for offsite disposal	<ul style="list-style-type: none">• Wash/rinse equipment• Solvent-rinse equipment• Contain solvent waste for offsite disposal	<ul style="list-style-type: none">• Power wash• Steam clean• Dispose of equipment rinse water to facility or sanitary sewer, or contain for offsite disposal

18.2 Diagram of Personnel-Decontamination Line

No eating, drinking, or smoking is permitted in contaminated areas and in exclusion or decontamination zones. The SC should establish areas for eating, drinking, and smoking.

The following figure illustrates a conceptual establishment of work zones, including the decontamination line. Work zones are to be modified by the SC to accommodate task-specific requirements.



19 Emergency Response Plan

(Reference CH2M HILL SOP HSE-106, *Emergency Planning*)

19.1 Pre-Emergency Planning

- The ERC, typically the SC or designee, performs the applicable pre-emergency planning tasks before starting field activities and coordinates emergency response with CH2M HILL onsite parties, the facility, and local emergency service providers as appropriate. Pre-emergency planning activities performed by the ERC include:
- Review the facility emergency and contingency plans where applicable.
- Determine what onsite communication equipment is available (e.g., two-way radio, air horn).
- Determine what offsite communication equipment is needed (e.g., nearest telephone, cell phone).
- Confirm and post the “Emergency Contacts” page and route to the hospital located in this section in project trailer(s) and keep a copy in field vehicles along with evacuation routes and assembly areas. Communicate the information to onsite personnel and keep it updated.
- Field Trailers: Post “Exit” signs above exit doors, and post “Fire Extinguisher” signs above locations of extinguishers. Keep areas near exits and extinguishers clear.
- Review changed site conditions, onsite operations, and personnel availability in relation to emergency response procedures.
- Where appropriate and acceptable to the client, inform emergency room and ambulance and emergency response teams of anticipated types of site emergencies.
- Designate one vehicle as the emergency vehicle; place hospital directions and map inside; keep keys in ignition during field activities.
- Inventory and check site emergency equipment, supplies, and potable water.
- Communicate emergency procedures for personnel injury, exposures, fires, explosions, and releases.
- Rehearse the emergency response plan before site activities begin, including driving route to hospital. Drills should take place periodically but no less than once a year.
- Brief new workers on the emergency response plan.
- The ERC will evaluate emergency response actions and initiate appropriate follow-up actions.

19.2 Emergency Equipment and Supplies

The ERC should mark the locations of emergency equipment on the site map and post the map.

Emergency Equipment and Supplies	Location
20 (or two 10) class A,B,C fire extinguisher	Field vehicles
First aid kit	Field vehicles
Eye Wash	Field vehicles
Potable water	Field vehicles
Bloodborne-pathogen kit	Field vehicles
Additional equipment (specify):	

19.3 Incident Response

In fires, explosions, or chemical releases, actions to be taken include the following:

- Notify appropriate response personnel.
- Shut down CH2M HILL operations and evacuate the immediate work area.
- Account for personnel at the designated assembly area(s).
- Assess the need for site evacuation, and evacuate the site as warranted.
- Implement HSE-111, *Incident Notification, Reporting and Investigation*.
- Notify and submit reports to clients as required in the contract.

Small fires or spills posing minimal safety or health hazards may be controlled with onsite spill kits or fire extinguishers without evacuating the site. When in doubt, evacuate. Follow the incident reporting procedures in the “Incident Notification, Reporting, and Investigation” section of this HSP.

19.4 Emergency Medical Treatment

Emergency medical treatment is needed when there is a life-threatening injury (such as severe bleeding, loss of consciousness, breathing/heart has stopped). When in doubt if an injury is life-threatening or not, treat it as needing emergency medical treatment.

- Notify 911 or other appropriate emergency response authorities as listed in the “Emergency Contacts” page located in this section.
- The ERC will assume charge during a medical emergency until the ambulance arrives or until the injured person is admitted to the emergency room.
- Prevent further injury, perform decontamination (if applicable) where feasible; lifesaving and first aid or medical treatment takes priority.
- Initiate first aid and CPR where feasible.
- Notify supervisor and if the injured person is a CH2M HILL employee, the supervisor will call the occupational nurse at 1-866-893-2514 and make other notifications as required by HSE SOP-111, *Incident Notification, Reporting and Investigation*.
- Make certain that the injured person is accompanied to the emergency room.

- Follow the serious incident reporting process in HSE SOP-111 and complete the incident report using the HITS system on the VO; or if not feasible, use the hard copy forms provided as an attachment to this HSP.
- Notify and submit reports to client as required in the contract.

19.5 Evacuation

- Evacuation routes, assembly areas, and severe weather shelters (and alternative routes and assembly areas) are to be specified on the site map.
- Evacuation route(s) and assembly area(s) will be designated by the ERC or designee before work begins.
- Personnel will assemble at the assembly area(s) upon hearing the emergency signal for evacuation.
- The ERC and a “buddy” will remain on the site after the site has been evacuated (if safe) to assist local responders and advise them of the nature and location of the incident.
- The ERC will account for all personnel in the onsite assembly area.
- A designated person will account for personnel at alternate assembly area(s).
- The ERC will follow the incident reporting procedures in the “Incident Notification, Reporting and Investigation” section of this HSP.

19.6 Evacuation Signals

Signal	Meaning
Grasping throat with hand	Emergency-help me.
Thumbs up	OK; understood.
Grasping buddy’s wrist	Leave area now.
Continuous sounding of horn	Emergency; leave site now.

19.7 Inclement Weather

Sudden inclement weather can rapidly encroach upon field personnel. Preparedness and caution are the best defenses. Field crew members performing work outdoors should carry clothing appropriate for inclement weather. Personnel are to take heed of the weather forecast for the day and pay attention for signs of changing weather that indicate an impending storm. Signs include towering thunderheads, darkening skies, or a sudden increase in wind. If stormy weather ensues, field personnel should discontinue work and seek shelter until the storm has passed.

Protective measures during a lightning storm include seeking shelter; avoiding projecting above the surrounding landscape (don't stand on a hilltop--seek low areas); staying away from open water, metal equipment, railroad tracks, wire fences, and metal pipes; and positioning people several yards apart. Some other general precautions include:

- Know where to go and how long it will take to get there. If possible, take refuge in a large building or vehicle. Do not go into a shed in an open area.
- The inclination to see trees as enormous umbrellas is the most frequent and most deadly mistake. Do not go under a large tree that is standing alone. Likewise, avoid poles, antennae and towers.
- If the area is wide open, go to a valley or ravine, but be aware of flash flooding.
- If you are caught in a level open area during an electrical storm and you feel your hair stand on end, drop to your knees, bend forward and put your hands on your knees or crouch. The idea is to make yourself less vulnerable by being as low to the ground as possible and taking up as little ground space as possible. Lying down is dangerous, since the wet earth can conduct electricity. Do not touch the ground with your hands.
- Do not use telephones during electrical storms, except in the case of emergency

Remember that lightning may strike several miles from the parent cloud, so work should be stopped/restarted accordingly. The lightning safety recommendation is 30-30: Seek refuge when thunder sounds within 30 seconds after a lightning flash; and do not resume activity until 30 minutes after the last thunder clap.

High winds can cause unsafe conditions, and activities should be halted until wind dies down. High winds can also knock over trees, so walking through forested areas during high-wind situations should be avoided. If winds increase, seek shelter or evacuate the area. Proper body protection should be worn in case the winds hit suddenly, because body temperature can decrease rapidly.

Emergency Contacts

24-hour CH2M HILL Injury Reporting– 1-866-893-2514
24-hour CH2M HILL Serious Incident Reporting Contact – 720-286-4911

Medical Emergency – 911

Facility Medical Response #:301-744-4333 (if in restricted area, use red call boxes-no cell phone usage in restricted area)
Local Ambulance #:911

CH2M HILL- Medical Consultant

WorkCare
 Dr. Peter Greaney M.D.
 300 S. Harbor Blvd, Suite 600
 Anaheim , CA 92805
 800-455-6155/866-893-2514
 714-978-7488

Fire/Spill Emergency – 911

Facility Fire Response #: 301-744-4333
Local Fire Dept #: 911

CH2M HILL Director – Health, Safety, Security & Environment

Andy Strickland/DEN
 (720) 480-0685 (cell) or (720) 286-2393 (office)

Security & Police – 911

Facility Security #:301-744-4333 (if in restricted area, use red call boxes-no cell phone usage in restricted area)
Local Police #: 911

CH2M HILL Responsible Health and Safety Manager (RHSM)

Name: Carl Woods
 Phone: 513-889-5771
 Cell 513-319-5771

Emergency Contacts

24-hour CH2M HILL Injury Reporting– 1-866-893-2514
24-hour CH2M HILL Serious Incident Reporting Contact – 720-286-4911

Utilities Emergency Phone Numbers

On base: Contact Nick Carros, NS-IH
 Phone: 301-744-2263

CH2M HILL Human Resources Department

Name: Sherri Huntley
 Phone: 703-376-5000

CH2M HILL Project Manager

Name: Catherine Schripsema
 Phone: 312-873-9749

CH2M HILL Worker’s Compensation:

Contact Business Group HR dept. to have form completed or contact Jennifer Rindahl after hours: 720-891-5382

CH2M HILL Safety Coordinator

Name: TBD
 Phone: TBD

Media Inquiries Corporate Strategic Communications

Name: John Corsi
 Phone: 720-286-2087

CH2M HILL Project Environmental Manager

Name: Hope Oaks
 Phone: 678-530-4226

Automobile Accidents

Rental: Jennifer Rindahl/DEN: 720-286-2449
 CH2M HILL owned vehicle: Linda George/DEN: 720-286-2057

Federal Express Dangerous Goods Shipping

Phone: 800/238-5355

**CHEMTEL (hazardous material spills)
 Phone: 800/255-3924**

Facility Alarms: Because CH2M HILL personnel will not always be working close to each other, hand signals, voice commands, air horns, and two-way radios will comprise the mechanisms to alert site personnel of an emergency.

All onsite contractors must read and sign the “Hazard Control Briefing for Environmental Division Visitors Naval Support Facility Indian Head (NSF-IH)”, and attend the pre-construction safety briefing from the Safety Department prior to commencing work.

Evacuation Assembly Area(s): If the site must be evacuated, all personnel will immediately stop activities and report to a safe place of refuge at the support zone area. The safe place of refuge may also serve as the telephone communication point because communication with emergency response agencies may be necessary. A telephone communication point and safe place of refuge will be identified before starting activities at each site.

Facility/Site Evacuation Route(s): TBD for each site before start of work on that site.

Emergency Contacts

24-hour CH2M HILL Injury Reporting– 1-866-893-2514
24-hour CH2M HILL Serious Incident Reporting Contact – 720-286-4911
Directions to Local Hospital

Local Hospital: Civista Medical Center

701 East Charles St., LaPlata MD 20646

Start at : Indian Head, MD

1) Head **east** on **Strauss Ave** toward **Ward Rd** 0.6 mi

2) Continue on **MD-210** for 2 mi

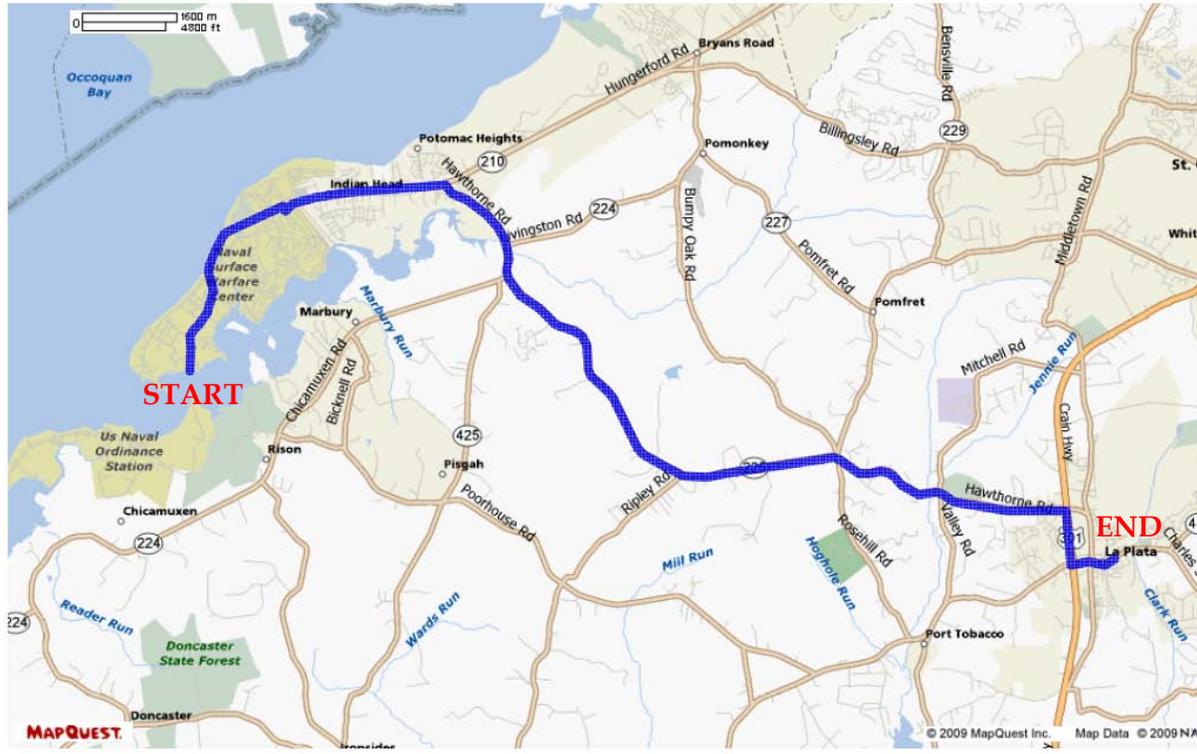
Turn **right** at **Hawthorne Rd/MD-225**. Continue to follow MD-225 for 10.9 mi

Turn **right** at **Kent Ave**. go 0.7 mi

Turn **left** at Charles **St/MD-6** Destination will be on the right go 0.2 mi

Emergency Contacts

24-hour CH2M HILL Injury Reporting– 1-866-893-2514
24-hour CH2M HILL Serious Incident Reporting Contact – 720-286-4911



20 Spill Containment Procedures

CH2M HILL and subcontractor personnel working at the project site shall be knowledgeable of the potential health, safety and environmental concerns associated with petroleum and other hazardous substances that could be released at the project site.

The following criteria must be addressed in CH2M HILL's or the subcontractor's plans in the event of a spill or release. In the event of a large quantity spill, notify emergency services. Personnel discovering a spill shall (only if safe to do so):

- Stop the spill immediately (if possible) or note source. If unsafe conditions exist, leave the area, call emergency services, inform nearby personnel, notify the site supervisors, and initiate incident reporting process. The SC shall be notified immediately.
- Extinguish sources of ignition (e.g., flames, sparks, hot surfaces, cigarettes, etc.)
- Clear personnel from the spill location and barricade the area.
- Utilize available spill control equipment in an effort to ensure that fires, explosions, and releases do not occur, recur, or spread.
- Use sorbent materials to control the spill at the source.
- Construct a temporary containment dike of sorbent materials, cinder blocks, bricks or other suitable materials to help contain the spill.
- Attempt to identify the character, exact source, amount, and extent of the released materials. Identification of the spilled material should be made as soon as possible so that the appropriate cleanup procedure can be identified.
- Assess possible hazards to human health or the environment as a result of the release, fire or explosion.
- A Spill Report shall be completed, including a description of the event, root causes, and corrective actions.

21 Inspections

21.1 Project Activity Self-Assessment Checklists

In addition to the hazard controls specified in this document, Project Activity Self-Assessment Checklists are provided as an attachment to this HSP. The checklists are based on minimum regulatory compliance, and some site-specific requirements may be more stringent. The objective of the self-assessment process is to identify gaps in project safety performance, and prompt for corrective actions in addressing these gaps. The self-assessment checklists, including documented corrective actions, shall be made part of the permanent project records and maintained by the SC.

The self-assessment checklists will also be used by the SC to evaluate the subcontractors and any client contractors' compliance on site.

The self-assessment checklists for the following tasks and exposures are required when the task or exposure is initiated and weekly thereafter while the task or exposure is taking place. The checklists shall be completed by the SC or other CH2M HILL representative and maintained in project files.

- Arsenic
- Cadmium
- Chainsaw Operations
- Hand and Power Tools
- Manual Lifting
- PPE

21.2 Safe Behavior Observations

Safe Behavior Observations (SBOs) shall be conducted by SC or designee for specific work tasks or operations to compare the actual work process against established safe work procedures identified in the project-specific HSP and AHAs. SBOs are a tool to be used by supervisors to provide positive reinforcement for work practices performed correctly, while also identifying and eliminating deviations from safe work procedures that could result in a loss. The SC or designee shall perform at least one SBO each week for tasks/operations addressed in the project-specific HSP or AHA. The SC or designee shall complete the SBO form (attached to this HSP) for the task/operation being observed and submit them weekly to the regional point of contact. For ESBG Federal Sector projects, please email completed forms to: [CH2M HILL ES FED Safe Behavior Observation](#).

22 Incident Notification, Reporting, and Investigation

(Reference CH2M HILL SOP HSE-111, *Incident Notification, Reporting and Investigation*)

22.1 General Information

This section applies to the following:

- All injuries involving employees, third parties, or members of the public
- Damage to property or equipment
- Interruptions to work or public service (e.g., hitting a utility)
- Incidents which attract negative media coverage
- Near misses
- Spills, leaks, or regulatory violations
- Motor vehicle accidents

Documentation, including incident reports, investigation, analysis and corrective measures taken, shall be kept by the SC and maintained onsite for the duration of the project.

22.2 Section Definitions

Incident: an undesired event that results or could have resulted in loss through injury, damage to assets, or environmental harm. This includes all of the definitions below.

Accident: an incident involving actual loss through injury, damage to assets, or environmental harm.

Near Miss: an unsafe act or incident which, in other circumstances, could have resulted in loss through injury, damage to assets, or environmental harm.

Serious Incident:

- All fatalities, including contractors, subcontractors, third parties, or members of the public
- Kidnap/missing person
- Event that involves a fire, explosion, or property damage that requires a site evacuation or is estimated to result in greater than \$ 500,000 in damage.
- Acts or threats of terrorism
- Spill or release of hazardous materials or substances that involves a significant threat of imminent harm to site workers, neighboring facilities, the community, or the environment.

22.3 Reporting Requirements

All employees and subcontractors' employees shall immediately report any incident (including "near misses," as defined in the section above) in which they are involved or witness to their supervisor.

The CH2M HILL or subcontractor supervisor, upon receiving an incident report, shall inform his immediate superior and the CH2M HILL SC.

The SC shall immediately report the following information to the RHSM and PM by phone and e-mail:

- Project Name/Site Manager
- Date and time of incident
- Description of incident
- Extent of known injuries/damage
- Level of medical attention
- Preliminary root cause/corrective actions

The SC shall complete an entry into the HITS database system on CH2M HILL's VO (if the VO is not available, use the hard copy Incident Report Form (IRF) and Root Cause Analysis Form and forward it to the RHSM) within 24 hours and finalize those forms within 3 calendar days.

The PM shall immediately notify the NAVFAC PM. The CH2M HILL team shall comply with all applicable statutory incident reporting requirements such as those to OSHA and the police.

22.4 HITS System and IRF

It is the policy of CH2M HILL to maintain a HITS entry and/or IRF for all work-related injuries and illnesses sustained by its employees in accordance with recordkeeping and insurance requirements. A HITS entry and/or IRF will also be maintained for other incidents (property damage, fire or explosion, spill, release, potential violation, and near misses) as part of our loss prevention and risk reduction initiative.

22.5 Injury Management/Return-to-Work (for CH2M HILL Staff Only)

(Reference CH2M HILL, SOP HSSE-124, Injury Management/Return-to-Work)

22.5.1 Background

The Injury Management Program has been established to provide orderly, effective and timely medical treatment and return-to-work transition for an employee who sustains a work-related injury or illness. It also provides guidance and assistance with obtaining appropriate treatment to aid recovery, keep supervisors informed of employee status, and to quickly report and investigate work-related injury/illnesses to prevent recurrence.

To implement the Injury Management/Return-to-Work Program successfully, supervisors and/or SC should:

- Ensure employees are informed of the Injury Management/Return-to-Work Program.
- Become familiar with the Notification Process (detailed below).
- Post the Injury Management/Return-to-Work Notification Poster.

22.5.2 Injury Management/Return-to-Work Notification Process

- Employee informs his or her supervisor of an injury.
- Employee calls the Injury Management Program toll free number 1-866-893-2514 immediately and speaks with the Occupational Injury Nurse. This number is operable 24 hours per day, 7 days a week.
- Supervisor ensures employee immediately calls the Injury Management Program number. Supervisor makes the call with the injured worker or for the injured worker if needed.
- Nurse assists employee with obtaining appropriate medical treatment, as necessary; schedules clinic visit for employee (calls ahead, and assists with any necessary follow up treatment). The supervisor or SC will accompany the employee to a clinic if a visit is necessary to ensure that employee receives appropriate and timely care.
- Supervisor/SC completes the HITS entry or IRF immediately (within 24 hours) and forwards it to the PM and RHSM.
- Nurse notifies appropriate CH2M HILL personnel by e-mail (supervisor, Health & Safety, Human Resources, Workers' Compensation).
- Nurse communicates and coordinates with and for employee on treatment through recovery.
- Supervisor ensures suitable duties are identified and available for injured/ill workers who are deemed to be medically fit to return to work on transitional duty (temporary and progressive).
- Supervisor ensures medical limitations prescribed (if any) by physician are followed until the worker is released to full duty.

22.6 Serious Incident Reporting Requirements

(Reference CH2M HILL SOP HSE-111, *Incident Reporting, Notification and Investigation*)

The Serious Incident Reporting Requirements ensures timely notification and allows for positive control over flow of information so that the incident is handled effectively, efficiently, and in conjunction with appropriate corporate entities. This standard notification process integrates Health, Safety, Security and Environment (HSSE) and firm-wide security operations requirements for the consistent reporting of and managing of serious events throughout our operations.

22.6.1 Serious Incident Determination

The following are general criteria for determining whether an incident on CH2M HILL-owned or managed facilities or program sites is considered serious and must be immediately reported up to Group President level through the reporting/notification process:

- Work-related death, or life-threatening injury or illness of a CH2M HILL employee, subcontractor, or member of the public
- Kidnap/missing person
- Acts or threats of terrorism
- Event that involves a fire, explosion, or property damage that requires a site evacuation or is estimated to result in greater than \$ 500,000 in damage.
- Spill or release of hazardous materials or substances that involves a significant threat of imminent harm to site workers, neighboring facilities, the community, or the environment.

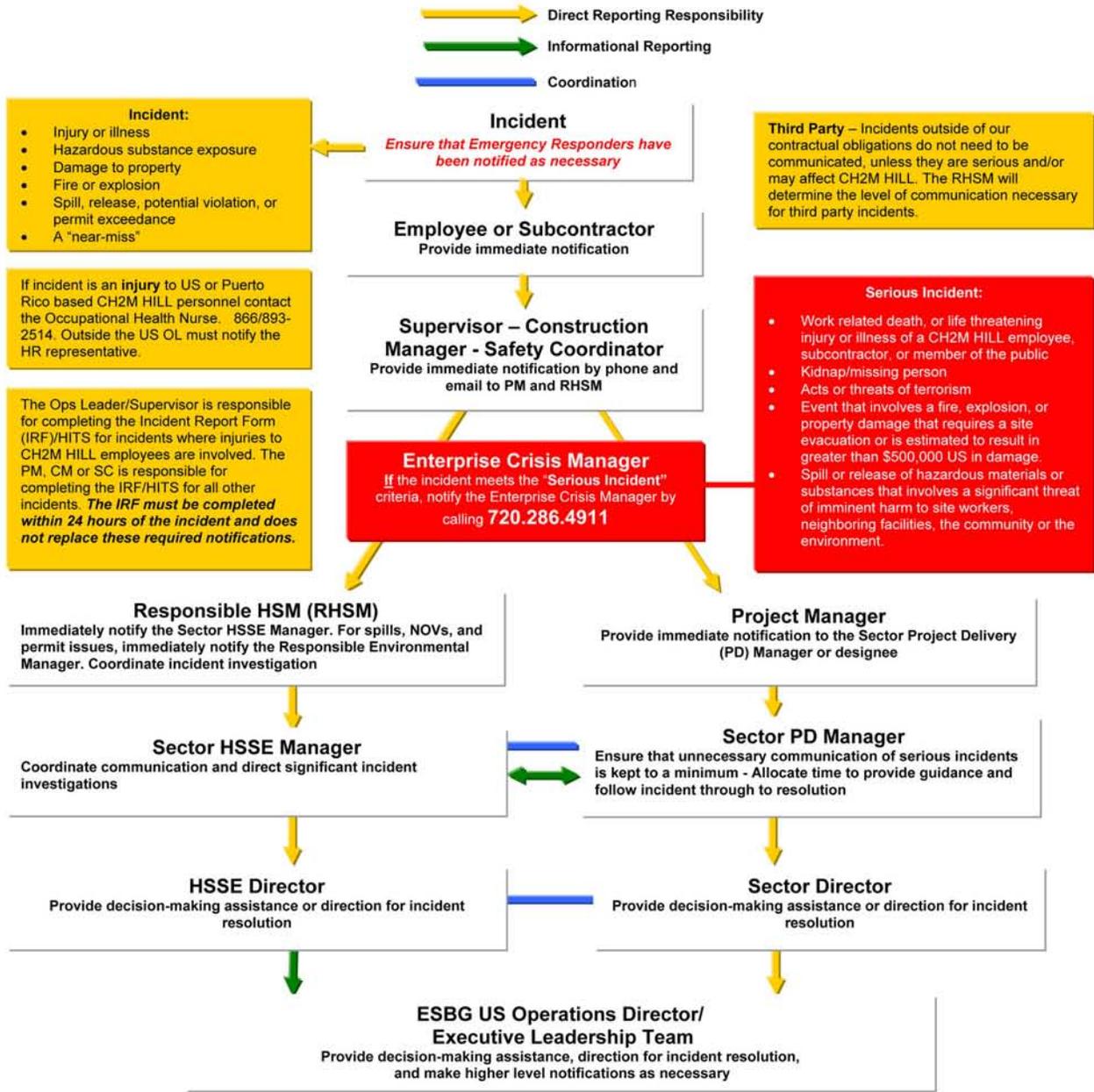
22.6.2 Serious Incident Reporting

If an incident meets the "Serious Incident" criteria, the PM is to immediately contact the Crisis Manager at 720-286-4911, then follow the standard incident reporting procedure.

For all serious incidents, this standard reporting process is implemented immediately so as to achieve notification to the Business Group President within 2 hours of incident onset or discovery, and notification to the appropriate corporate Crisis Management Support Team.

ESBG US Operations Incident Reporting Flow Diagram

Individual Programs may have additional or alternate reporting procedures



Post-emergency incident communications regarding serious incidents at a CH2M HILL office or project (regardless of the party involved) shall be considered sensitive in nature and must be controlled in a confidential manner.

22.7 Incident Root Cause Analysis

The accident analysis is essential if all causes of the incident are to be identified for the correct remedial actions to be taken to prevent the same and similar type of incident from recurring. The investigation team will consist of the SC (with support from RHSM), appropriate subcontractor personnel as necessary, the PM, and the responsible supervisor. More participants may be involved as needed to complete the investigation.

The Root Cause Analysis Form must be completed for all Loss Incidents and Near Loss Incidents. This form must be submitted to the investigation team for review.

For minor losses or near losses, the information may be gathered by the supervisor or other personnel immediately following the loss. Based on the complexity of the situation, this information may be all that is necessary to enable the investigation team to analyze the loss, identify the root cause, and develop recommendations. More complex situations may require the investigation team to revisit the loss site or re-interview key witnesses to obtain answers to questions that may arise during the investigation process.

Photographs or videotapes of the scene and damaged equipment should be taken from all sides and from various distances. This point is especially important when the investigation team will not be able to review the loss scene.

The investigation team must use the Root Cause Analysis Flow Chart to assist in identifying the root cause(s) of a loss. Any loss may have one or more root causes and contributing factors. The root cause is the primary or immediate cause of the incident, while a contributing factor is a condition or event that contributes to the incident happening, but is not the primary cause of the incident. Root causes and contributing factors that relate to the person involved in the loss, his or her peers, or the supervisor should be referred to as "personal factors." Causes that pertain to the system within which the loss or injury occurred should be referred to as "job factors."

22.7.1 Personal Factors

- Lack of skill or knowledge
- Correct way takes more time and/or requires more effort
- Short-cutting standard procedures is positively reinforced or tolerated
- Person thinks there is no personal benefit to always doing the job according to standards

22.7.2 Job Factors

- Lack of or inadequate operational procedures or work standards
- Inadequate communication of expectations regarding procedures or standards
- Inadequate tools or equipment

The root cause(s) could be any one or a combination of these seven possibilities or some other uncontrollable factor. In the vast majority of losses, the root cause is very much related to one or more of these seven factors. Uncontrollable factors should be used rarely and only after a thorough review eliminates all seven other factors.

22.7.3 Corrective Actions

The root cause analysis should include all corrective actions taken or those that should be taken to prevent recurrence of the incident. Include the specific actions to be taken, the employer and personnel responsible for implementing the actions, and a timeframe for completion. Be sure the corrective actions address the causes.

Once the investigation report has been completed, the PM shall hold a review meeting to discuss the incident and provide recommendations. The responsible supervisors shall be assigned to carry out the recommendations, and shall inform the SC upon successful implementation of all recommended actions.

- The RHSM will inform the Responsible Environmental Manager of any environmental incidents.
- Evaluation and follow-up of the IRF will be completed by the type of incident by the RHSM, Responsible Environmental Manager, or firm-wide security operations. The business group HSE Lead will review all business group incidents and modify as required.
- Incident investigations must be initiated and completed as soon as possible but no later than 72 hours after the incident.

23 Records and Reports

An organized project filing system is essential for good documentation and recordkeeping. There are many benefits to an organized filing system:

- Other CH2M HILL employees can easily and quickly find documents.
- Records are readily available for review.
- Records may be needed during OSHA investigations, audits, or other legal matters.
- Records may be needed on short notice in case of an accident, illness, or other emergency.
- Systematic recordkeeping aids in overall project organization.

The project filing system shall be established at the beginning of the project and maintained throughout all project phases and archived in accordance with CH2M HILL's Records Retention Policy. The information contained in the filing system shall be updated regularly and/or as specified in this document. The PM and SC are responsible for collecting documentation, including subcontractor documentation, and maintaining a complete and organized filing system.

Below are examples of records that must be maintained as the project progresses:

- Exposure records, includes air monitoring data (including calibration records), MSDSs, exposure modeling results
- Physical hazard exposure records, including noise, ionizing radiation, non-ionizing radiation, vibration, and lasers exposure assessments and measurements
- Respiratory fit test records
- Training records
- Injury/illness reports and investigations
- Federal or state agency inspection records
- Other records
 - Ergonomic evaluations
 - HSE audits and assessments
 - Project-specific HSE plans
 - Confined space entry permits
 - Equipment inspections
 - Equipment maintenance
 - SBOs
 - Self-assessment checklists

**CH2M HILL Health and Safety Plan
Attachment 1**

Health and Safety Plan Employee Sign-off Form

**CH2M HILL Health and Safety Plan
Attachment 2**

Chemical Inventory/Register Form

CH2M HILL Health and Safety Plan
Attachment 3

Chemical-Specific Training Form

CH2MHILL

CHEMICAL-SPECIFIC TRAINING FORM

Refer to SOP HSE-107 Attachment 1 for instructions on completing this form.

Location:	Project # :
HCC:	Trainer:

TRAINING PARTICIPANTS:

NAME	SIGNATURE	NAME	SIGNATURE

REGULATED PRODUCTS/TASKS COVERED BY THIS TRAINING:

The HCC shall use the product MSDS to provide the following information concerning each of the products listed above.

- Physical and health hazards
- Control measures that can be used to provide protection (including appropriate work practices, emergency procedures, and personal protective equipment to be used)
- Methods and observations used to detect the presence or release of the regulated product in the workplace (including periodic monitoring, continuous monitoring devices, visual appearance or odor of regulated product when being released, etc.)

Training participants shall have the opportunity to ask questions concerning these products and, upon completion of this training, will understand the product hazards and appropriate control measures available for their protection.

Copies of MSDSs, chemical inventories, and CH2M HILL's written hazard communication program shall be made available for employee review in the facility/project hazard communication file.

CH2M HILL Health and Safety Plan

Attachment 4

Project Activity Self-Assessment Checklists/Permits/Forms

Arsenic

Boats

Cadmium

Chainsaw Operations

Hand and Power Tools

Manual Lifting

Personal Protective Equipment

CH2MHILL

HSE Self-Assessment Checklist—Arsenic

This checklist shall be used by CH2M HILL personnel **only** and shall be completed at the frequency specified in the project's HSP/FSI. This checklist is to be used at locations where CH2M HILL employees are exposed to arsenic, or are required to perform oversight of a subcontractor whose personnel are exposed to arsenic.

CH2M HILL staff shall not direct the means and methods of subcontractor arsenic activities nor direct the details of appropriate corrective actions. The subcontractor must determine how to correct deficiencies and CH2M HILL staff must carefully rely on their expertise. Conditions considered to be imminently dangerous (possibility of serious injury or death) must be corrected immediately or all exposed personnel must be removed from the hazard until corrected.

Project Name: _____		Project No.: _____	
Location: _____		PM: _____	
Auditor: _____		Title: _____	
Date: _____			
This specific checklist has been completed to:			
<input type="checkbox"/> Evaluate CH2M HILL compliance with its Arsenic program (SOP HSE-501)			
<input type="checkbox"/> Evaluate a CH2M HILL subcontractor's compliance with its Arsenic program			
Subcontractors Name: _____			

- Check "Yes" if an assessment item is complete/correct.
- Check "No" if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the subcontractor. Section 3 must be completed for all items checked "No."
- Check "N/A" if an item is not applicable.
- Check "N/O" if an item is applicable but was not observed during the assessment.

<u>SECTION 1</u>		<u>Yes</u>	<u>No</u>
N/A		N/O	
PERSONNEL SAFE WORK PRACTICES (5.1)			
COMPLIANCE PROGRAM (5.1.1)			
1.	Where $EL \geq PEL$, a written compliance program is implemented before commencing work	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
2.	The compliance program is based on the most recent air monitoring/sampling results.	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>

3.	The compliance program is updated for new exposure monitoring data or every six months.	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Written compliance program is available to all affected employees.	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Waste generated must be determined if considered hazardous waste.	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EMPLOYEE INFORMATION (5.1.2)			
6.	Training on the Hazard Communication Standard has been met.	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	CH2M HILL personnel have completed the Arsenic Training Module.	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	Training on the Fact Sheet, HSP/FSI, and OSHA standard has been met.	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

CH2MHILL

HS&E Self-Assessment Checklist—Arsenic

		<u>Yes</u>	<u>No</u>
		<u>N/O</u>	
<u>N/A</u>			
9.	The selection of the appropriate respirator is based on the airborne arsenic concentration.	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	Personnel working near arsenic-contaminated soil or material shall use wet methods and work practices to control dust; wear disposable coveralls, and exercise personal hygiene practices.	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	Contact lenses are not to be worn when working with arsenic.	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.	Written or verbal notification is given to owners, contractors, or other personnel working in the area of arsenic work activities.	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.	Storage or shipping containers are properly labeled.	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HOUSEKEEPING (5.1.3)			
14.	All surfaces are free of accumulation of arsenic.	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.	Cleaning methods minimize airborne arsenic activity.	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.	Where vacuuming is used, vacuums are used and emptied to minimize airborne arsenic.	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.	A written housekeeping and maintenance plan is in place and maintained.	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.	Compressed air is not used to remove arsenic from surfaces.	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
REGULATED AREAS (5.1.4)			

- 19. Areas that exceed the PEL have been designated as regulated areas.
-
- 20. Personnel meet medical and training requirements.
-
- 21. No eating, drinking, and/or smoking is allowed in the regulated areas.
-
- 22. Warning signs have been posted at all entrances to the regulated areas.
-
- 23. Shower facilities are installed and used with cleaning agents and towels, where feasible.
-
- 24. Hand washing facilities are provided for use by employees before eating, drinking, smoking, etc.
-
- 25. Eating facilities free of arsenic are provided for employees working in regulated areas.
-
- 26. Change areas are provided where $EL \geq PEL$ or where employees are subject to eye or skin irritation.
-

EXPOSURE ASSESSMENTS (5.2)

- 27. Initial air monitoring is conducted over full shift for each job classification.
-
- 28. Air sampling is conducted every 6 months when exposure limit (EL) \geq AL but $<$ PEL.
-
- 29. Air sampling of employees is conducted quarterly when $EL \geq PEL$.
-
- 30. Additional air monitoring has been collected when there are any changes in operation.
-
- 31. Employees have been informed of air monitoring results within 5 days after receipt of results.
-
- 32. Where PEL is exceeded, affected employees have been notified of results and control measures
-
-
- to be used to reduce exposure below the PEL.

CONTROL METHODS (5.3)

ENGINEERING AND WORK PRACTICE CONTROLS (5.3.1)

- 33. Engineering controls and work practices have been used to reduce exposures below the PEL.
-
- 34. When controls are unable to reduce exposures below the PEL, respiratory protection is used.
- 35.
- Employees do not eat, drink, smoke, chew tobacco/gum, or apply cosmetics in regulated areas.
-
-

RESPIRATORY PROTECTION (5.3.2)

- 36. Respirators are used in areas where $EL \geq PEL$.
-
- 37. Respirator cartridges are replaced at the end of shift or service life indicator, where available.
-

38. PAPRs are provided to employees who request such a respirator.

PERSONAL PROTECTIVE EQUIPMENT (5.3.3)

39. PPE is supplied at no cost to employees.

40. Employee exposed to arsenic tri-chloride wear impervious clothing.

41. Clean and dry protective clothing is provided weekly. Daily if $EL \geq 100 \mu\text{g}/\text{m}^3$.

42. Protective clothing is repaired or replaced if found to be ineffective.

43. Contaminated protective clothing is removed from change areas at the end of the shift.

44. All clothing requiring laundering is packaged in sealed, labeled containers.

45. Personnel or vendors who launder contaminated clothing are formally informed of the hazards.

46. Employee are not allowed to leave workplace wearing clothing worn during work shift.

Health and Safety Self Assessment Checklist-BOATS

This self assessment is only to be used at locations where CH2M HILL controls the work. It is not to be used at locations where others control the work.

Project Name: _____	Project No.: _____

Location: _____	PM: _____

Auditor: _____	Title: _____ Date: _____

If an assessment item is complete/correct the "Yes" box should be checked. If an item is incomplete or deficient the "No" box should be checked. Items that are considered to be imminently dangerous must be corrected immediately or all exposed personnel must be removed from the hazard. All deficiencies shall be brought to the attention of the appropriate party that is responsible for correcting the deficiency. If an item is not applicable, the "N/A" box should be checked. If an item is applicable but was not observed during the assessment, the "N/O" box should be checked.

	NA	N/O	Yes	No
GENERAL				
1. Weather forecast checked.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. At Least one Team Member is trained in First Aid/CPR.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Lights, horn, battery, fuel, steering, bilge pump, anchor & propeller checked.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Daily safety briefing/meeting conducted with crew	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Personal Floatation Devices (PFD's) inspected daily.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Fire extinguisher available, charged and accessible.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. First aid kit available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Project Instructions and H&S Plan available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Potable water available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Sunscreen & Bug Spray available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Distress communications available (flare gun, air horn, Cell phone, CB)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. An oar is available on board the boat in the event of mechanical failure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BOAT TRANSPORT				
13. Boat motor secured prior to boat transport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Turn signals and brake lights verified as operable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Safety chains available on trailer and secured in a criss-cross fashion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Trailer winch engaged	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Ball hitch seated and latch pin installed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Tools and equipment secured prior to boat movement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Personnel not allowed ride on boat as it is being towed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Safe distance is maintained with traveling around power lines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Backup alarm or spotter used when backing boat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

22. Boat is unhitched on a level and stable surface

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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BOAT OPERATION

23. Boat holds appropriate size load

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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24. Personnel cleared during boat start-up

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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25. Kill switch clearly identified and operational

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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26. Personnel wearing appropriate PPE

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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27. All personnel wearing PFD's

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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28. Boat will not be used for recreational purposes

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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29. Float plan filed with designated personnel

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Boat Equipment Checklist

Boat Check List Item	Yes	No	N/A
State Numbering			
Personal Flotation Device			
Throwable PFD/Ring Bouy			
Visual Distress Signal			
Backfire Flame Arrestor			
Sound Producing Device			
Fire Extinguisher			
Navigation/Anchor Lights			
Radio/Communications			
First Aid Kit			
Flashlight			
Tool Kit			
Mooring Lines			
Food and Water			
Binoculars			
Spare Batteries			
Spare Parts			
Spare Fuel			
AM/FM Radio			
Anchor and Tackle			
Alternate Propulsion			
Overall Boat Condition-Satisfactory			
Electrical Systems-Satisfactory			
Fuel Systems-Satisfactory			
File Float Plan			
Weather Forecast			
Inspected By: _____ Boat Operator: _____			
Date: _____			

CH2MHILL

HSE Self-Assessment Checklist—Cadmium

Page 1 of 4

This checklist shall be used by CH2M HILL personnel **only** and shall be completed at the frequency specified in the project's Health and Safety Plan/Federal Safety Instructions (HSP/FSI). This checklist is to be used at locations where CH2M HILL employees are exposed to cadmium or are required to perform oversight of a subcontractor whose personnel are exposed to cadmium.

CH2M HILL staff shall not direct the means and methods of subcontractor cadmium activities nor direct the details of appropriate corrective actions. The subcontractor must determine how to correct deficiencies and CH2M HILL staff must carefully rely on their expertise. Conditions considered to be imminently dangerous (such as, a possibility of serious injury or death) must be corrected immediately, or all exposed personnel must be removed from the hazard until corrected.

Project Name: _____	Project No.: _____	
Location: _____	Project Manager: _____	
Auditor: _____	Title: _____	Date: _____
This specific checklist has been completed for the following:		
<input type="checkbox"/> Evaluate CH2M HILL compliance with its Cadmium Program (SOP HSE-504)		
<input type="checkbox"/> Evaluate a CH2M HILL subcontractor's compliance with its Cadmium Program		
Subcontractors Name: _____		

- Check "Yes" if an assessment item is complete/correct.
- Check "No" if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the subcontractor. Section 3 must be completed for all items checked "No."
- Check "N/A" if an item is not applicable.
- Check "N/O" if an item is applicable but was not observed during the assessment.

<u>SECTION 1</u>		<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>N/O</u>
PERSONNEL SAFE WORK PRACTICES (5.1)					
COMPLIANCE PROGRAM (5.1.1)					
1.	Where $EL \geq PEL$, a written compliance program is implemented before commencing work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	The compliance program is based on the most recent air-monitoring/sampling results.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	The compliance program is updated for new exposure monitoring data.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	A written compliance program is available to all affected employees.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Waste generated must be determined whether considered hazardous waste or not.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EMPLOYEE INFORMATION (5.1.2)					
6.	CH2M HILL personnel have completed the Cadmium Training Module.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	Training on the Fact Sheet, HSP/FSI, and OSHA standard has been met.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>N/O</u>
8. The selection of the appropriate respirator is based on the airborne cadmium concentration.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Personnel working near cadmium-contaminated soil or material shall use wet methods and work practices to control dust; wear disposable coveralls, and exercise personal hygiene practices.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Contact lenses are not worn when working with cadmium.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Written or verbal notification to owners, contractors, or other personnel working in the area of cadmium work activities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Storage or shipping containers have been properly labeled.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
REGULATED AREAS (5.1.3)				
13. Areas that exceed the PEL have been designated as regulated areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Personnel meet medical and training requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Warning signs have been posted at all entrances to the regulated areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Shower facilities are installed and used with cleaning agents and towels, where feasible.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Hand-washing facilities are provided for use by employees before eating, drinking, smoking, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. No eating, drinking, and/or smoking are allowed in the regulated areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Eating facilities provided for employees working in regulated areas are free of cadmium.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Change areas are provided where $EL \geq PEL$.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HOUSEKEEPING (5.1.4)				
21. All surfaces are free of any accumulation of cadmium.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Cleaning methods minimize airborne cadmium activity.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Where vacuuming is used, HEPA vacuums are used and emptied to minimize airborne cadmium.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. A written housekeeping and maintenance plan is in place.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Compressed air not used to remove cadmium from surfaces.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EXPOSURE ASSESSMENTS (5.2)				
26. Initial air monitoring is conducted over full shift for each job classification.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Where historical data is used in the assessment, data was collected within the past 12 months.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. Air sampling is conducted every 6 months when exposure limit (EL) \geq AL but $<$ PEL.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Air sampling of employees is conducted quarterly when $EL \geq PEL$.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Additional air monitoring has been collected when there are any changes in operation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Employees have been informed of air-monitoring results within 5 days after receipt of results.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Where PEL is exceeded, affected employees have been notified of results and control measures to be used to reduce exposure below the PEL.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CONTROL METHODS (5.3)				
ENGINEERING AND WORK PRACTICE CONTROLS (5.3.1)				
33. Engineering controls and work practices have been used to reduce exposures below the PEL.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. When controls are unable to reduce exposures below the PEL, respiratory protection is used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. Employee rotation is not used to control exposures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. Mechanical ventilation used to control exposure must be maintain in an effective operating condition.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

RESPIRATORY PROTECTION (5.3.2)				
	Yes	No	N/A	N/O
37. High-speed abrasive tools are not used, unless fitted with engineering controls.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. Materials containing cadmium are not sprayed on, unless controls limit airborne concentration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. Respirators are used in areas where $EL \geq PEL$.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. Respirator cartridges are replaced at the beginning of a shift or service life indicator, where available.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. PAPRs are provided to employees who request such a respirator.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PERSONAL PROTECTIVE EQUIPMENT (5.3.3)				
42. PPE is supplied at no cost to employees.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43. Clean and dry protective clothing is provided weekly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44. Protective clothing is repaired or replaced if found to be ineffective	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45. Contaminated protective clothing is removed from change areas at the end of the shift.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
46. Employee are not allowed to leave the workplace wearing clothing worn during work shift.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. All clothing requiring laundering is packaged in sealed, labeled containers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48. Personnel or vendors who launder contaminated clothing are formally informed of the hazards.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

23.1 CH2MHILL

HS&E Self-Assessment Checklist—CHAINSAW OPERATIONS

This checklist shall be used by CH2M HILL personnel **only** and shall be completed at the frequency specified in the project's HSP/FSI.

This checklist is to be used at locations where: (1) CH2M HILL employees are operating chainsaws, and/or (2) CH2M HILL is providing oversight of a subcontractor operating a chainsaw.

Safety Coordinators may consult with chainsaw subcontractors when completing this checklist, but shall not direct the means and methods of chainsaw operations nor direct the details of corrective actions. Chainsaw subcontractors shall determine how to correct deficiencies, and we must carefully rely on their expertise. Items considered to be imminently dangerous (possibility of serious injury or death) shall be corrected immediately or all exposed personnel shall be removed from the hazard until corrected.

Project Name: _____	Project No.: _____
Location: _____	PM: _____
Auditor: _____	Title: _____
Date: _____	
This specific checklist has been completed to:	
<input type="checkbox"/> Evaluate CH2M HILL employee exposures to chainsaw hazards	
<input type="checkbox"/> Evaluate a CH2M HILL subcontractor's compliance with chainsaw HS&E requirements	
Subcontractor Name: _____	

- Check "Yes" if an assessment item is complete/correct.
 - Check "No" if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the excavation subcontractor. Section 2 must be completed for all items checked "No."
 - Check "N/A" if an item is not applicable.
 - Check "N/O" if an item is applicable but was not observed during the assessment.
- Numbers in parentheses indicate where a description of this assessment item can be found in Standard of Practice HS-49.

<u>SECTION 1</u>		<u>Yes</u>	<u>No</u>
<u>N/A</u>		<u>N/O</u>	
SAFETY EQUIPMENT (2.3)			
1. Chainsaw equipped with spark arrestor and fully functioning chain brake		<input type="checkbox"/>	<input type="checkbox"/>
2. Chainsaw operator's manual readily available		<input type="checkbox"/>	<input type="checkbox"/>
3. Fully stocked first aid kit and multipurpose fire extinguisher available		<input type="checkbox"/>	<input type="checkbox"/>
4. Appropriate personal protective equipment available and worn		<input type="checkbox"/>	<input type="checkbox"/>
5. Clothing free of loose edges that could become entangled in the saw		<input type="checkbox"/>	<input type="checkbox"/>
PLANNING ACTIVITIES (2.5)			
6. Operators have read the chainsaw operator's manual		<input type="checkbox"/>	<input type="checkbox"/>
7. If aerial lifts to be used, aerial lift training completed		<input type="checkbox"/>	<input type="checkbox"/>
8. Daily safety briefing/meeting conducted with project personnel to discuss planned work		<input type="checkbox"/>	<input type="checkbox"/>
9. Immediate area surrounding operation cleared of obstructions		<input type="checkbox"/>	<input type="checkbox"/>
10. Companion maintained within calling distance of the chainsaw operator		<input type="checkbox"/>	<input type="checkbox"/>

<u>SECTION 1 (Continued)</u>		<u>Yes</u>	<u>No</u>
<u>N/A</u>		<u>N/O</u>	
INSPECTION (3.1.1)			
11. Chain tension, sharpness, condition, and guide gap checked		<input type="checkbox"/>	<input type="checkbox"/>
12. Chainsaw components checked for physical damage		<input type="checkbox"/>	<input type="checkbox"/>
13. Chain does not rotate at idle with chain brake off		<input type="checkbox"/>	<input type="checkbox"/>
14. Chain brake and stop switch operating correctly		<input type="checkbox"/>	<input type="checkbox"/>
15. Throttle trigger can not be engaged until throttle trigger lock out pressed		<input type="checkbox"/>	<input type="checkbox"/>
STARTING THE ENGINE (3.1.2)			
16. Chainsaw operator's manual consulted for proper starting procedures		<input type="checkbox"/>	<input type="checkbox"/>

- 17. Saw placed on level ground with guide bar and chain off the ground
-
- 18. Saw is not drop-started
-

SAFE OPERATION (3.1.3)

- 19. Chainsaw handles kept dry, clean, and free of oil or fuel mixture
- 20. Chainsaws held firmly with both hands and used right-handed
- 21. Operator standing to the left of the saw out of the plane of the chain
- 22. Saw used between the waist and mid-chest level
- 23. Full throttle maintained while cutting
- 24. Operator aware of position of guide bar tip, does not contact tip with anything being cut
- 25. Bumper spikes maintained as close to the object as possible
- 26. Operator aware of what is in the saw's downward path after the cut
- 27. No attempt to made to cut material that is larger than the guide bar of the saw
- 28. Cuts avoided that will cause chain to jam
- 29. Non-metallic wedges used to prevent compression cuts from jamming the blade
- 30. Bystanders and helpers kept at a safe distance from operation
- 31. Chainsaw not operated when fatigued
- 32. Fire extinguisher present when operating the chainsaw in forest or brushy areas

ELECTRICAL CHAINSAW PRECAUTIONS (3.1.3)

- 33. Extension cords approved for outdoor use
- 34. Electrical cords equipped with third-wire grounding
- 35. Ground fault circuit interrupter (GFCI) used
- 36. Electrical cord positioned carefully to avoiding cutting with saw or trip hazard
- 37. Saw switched to the off position before completing electrical connections
- 38. Saw unplugged before making adjustments and when not in use

REFUELING THE ENGINE (3.1.4)

- | | | |
|--|--------------------------|--------------------------|
| 39. Fuel mixed in accordance with the manufacturer's recommendations | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 40. Fuel stored and transported in an approved safety container | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 41. Engine shut off and allowed to cool before refueling | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 42. Fire extinguisher present during fueling and refueling | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 43. Area around refueling site free from combustible materials | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 44. Smoking around fueling or refueling operations prohibited | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 45. Funnel/flexible nozzle used to avoid spilling fuel on the engine | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |

TRANSPORT AND STORAGE (3.1.5)

- | | | |
|---|--------------------------|--------------------------|
| 46. Chainsaws carried with engine off and guide bar pointing to rear | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 47. Chain guard attached or placed in carrying case prior to transporting | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 48. Fuel tank drained and spark plug disconnected for long-term storage | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 49. Chainsaw placed in scabbard or secured to platform prior to transporting in aerial lift | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION 1 (Continued)

N/A

Yes No
N/O

TOPPING UTILITY POLES (3.2.1)

- | | | |
|--|--------------------------|--------------------------|
| 50. CH2M HILL only topping utility poles from an aerial lift platform | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 51. Aerial lifts operated safely (use aerial lift checklist in HS-41) | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 52. Maximum length of pole section cut at one time does not exceed 2' | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 53. Pole tested for stray voltage with foreign voltage detector prior to cutting | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 54. Wiring, staples, nails, and other hardware removed within 4" of cut path | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 55. Saw handled between chest and waist level | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 56. Personnel below pole safe distance from the fall area | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 57. Cutting stopped leaving approximately one half inch of pole uncut | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 58. Pole section removed manually by pulling cut section towards body | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 59. Cut pole sections lowered by rope or placed in aerial lift platform | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |

60. Rough edges hammered over after last cut

TREE FELLING (3.2.2)

61. CH2M HILL not felling trees beyond scope of SOP HS-49

62. Power company contacted prior to felling trees within two tree lengths of power lines

63. Underground services checked that could be damaged when tree strikes the ground

64. Danger zone created two tree lengths from public areas, public removed from danger zone

65. Personnel maintain a distance equal to two tree lengths of the tree being felled

66. Intended direction of fall determined

67. Suitable escape path determined and maintained clear

68. Equipment needed to prevent tree from sitting back on the saw determined and readily available

69. Undercut notch cut on side of the tree in the direction of the fall line

70. Back cut started 1-2" inches above the undercut

71. As tree starts to fall, saw shut off and operator steps into the escape path

71. As tree starts to fall, saw shut off and operator steps into the escape path

LIMBING STANDING TREES (3.2.3)

72. CH2M HILL not operating chainsaws where overhead electrical power lines may be contacted

73. Only subcontractors with special training permitted to work around electrical power lines

74. Branches/limbs not cut above shoulder height

75. If limbing from a ladder, ladder secured in position and operator independently secured

76. Chainsaws not used from rope and harness unless operator has received specific training

76. Chainsaws not used from rope and harness unless operator has received specific training

76. Chainsaws not used from rope and harness unless operator has received specific training

LIMBING FALLEN TREES (3.2.4)

77. No dead branches/other debris hanging above work that may fall

78. Personnel do not attempt to manually pull over elevated trees, mechanical equipment used

78. Personnel do not attempt to manually pull over elevated trees, mechanical equipment used

CH2MHILL

HSE Self-Assessment Checklist—HAND AND POWER TOOLS

This checklist shall be used by CH2M HILL personnel **only** and shall be completed at the frequency specified in the project's HSP/FSI.

This checklist is to be used at locations where: (1) CH2M HILL employees are exposed to hand and power tool hazards and/or (2) CH2M HILL provides oversight of subcontractor personnel who are exposed to hand and power tool hazards.

SC may consult with subcontractors when completing this checklist, but shall not direct the means and methods of hand and power tool use nor direct the details of corrective actions. Subcontractors shall determine how to correct deficiencies and we must carefully rely on their expertise. Items considered to be imminently dangerous (possibility of serious injury or death) shall be corrected immediately or all exposed personnel shall be removed from the hazard until corrected.

Project Name: _____ Project No.: _____ _____
Location: _____ PM: _____ _____
Auditor: _____ Title: _____ Date: _____
This specific checklist has been completed to:
<input type="checkbox"/> Evaluate CH2M HILL employee exposure to hand and power tool hazards.
<input type="checkbox"/> Evaluate a CH2M HILL subcontractor's compliance with hand and power tool requirements. Subcontractors Name: _____

- Check "Yes" if an assessment item is complete/correct.
 - Check "No" if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the subcontractor. Section 3 must be completed for all items checked "No."
 - Check "N/A" if an item is not applicable.
 - Check "N/O" if an item is applicable but was not observed during the assessment.
- Numbers in parentheses indicate where a description of this assessment item can be found in Standard of Practice HSE-210.

<u>SECTION 1</u>		<u>Yes</u>	<u>No</u>
N/A		N/O	
SAFE WORK PRACTICES (5.1)			
1.	All tools operated according to manufacturer's instructions and design limitations.	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	

2.	All hand and power tools maintained in a safe condition and inspected and tested before use.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
3.	Defective tools are tagged and removed from service until repaired.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
4.	PPE is selected and used according to tool-specific hazards anticipated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
5.	Power tools are not carried or lowered by their cord or hose.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
6.	Tools are disconnected from energy sources when not in use, servicing, cleaning, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
7.	Safety guards remain installed or are promptly replaced after repair.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
8.	Tools are stored properly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
9.	Cordless tools and recharging units both conform to electrical standards and specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	Tools used in explosive environments are rated for such use.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		
11.	Knife or blade hand tools are used with the proper precautions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		
12.	Consider controls to avoid muscular skeletal, repetitive motion, and cumulative trauma stressors.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

CH2MHILL
HSE Self-Assessment Checklist—HAND AND POWER TOOLS

<u>SECTION 2</u>	<u>Yes</u>	<u>No</u>
N/A	N/O	
GENERAL (5.2.2)		
13. PPE is selected and used according to tool-specific hazards anticipated. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Tools are tested daily to assure safety devices are operating properly. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Damaged tools are removed from service until repaired. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Power operated tools designed to accommodate guards have guards installed. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Rotating or moving parts on tools are properly guarded. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Machines designed for fixed locations are secured or anchored. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Floor and bench-mounted grinders are provided with properly positioned work rests. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Guards are provided at point of operation, nip points, rotating parts, etc. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Fluid used in hydraulic-powered tools is approved fire-resistant fluid. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ELECTRIC-POWERED TOOLS (5.2.3)		
22. Electric tools are approved double insulated or grounded and used according to SOP HSE-206. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Electric cords are not used for hoisting or lowering tools. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Electric tools are used in damp/ wet locations are approved for such locations or GFCI installed. <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Hand-held tools are equipped with appropriate on/off controls appropriate for the tool. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Portable, power-driven circular saws are equipped with proper guards. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ABRASIVE WHEEL TOOLS (5.2.4)		
27. All employees using abrasive wheel tools are wearing eye protection. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. All grinding machines are supplied with sufficient power to maintain spindle speed. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Abrasive wheels are closely inspected and ring-tested before use. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Grinding wheels are properly installed. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- | | | |
|--|--------------------------|--------------------------|
| 31. Cup-type wheels for external grinding are protected by the proper guard or flanges. | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 32. Portable abrasive wheels used for internal grinding are protected by safety flanges. | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 33. Safety flanges are used only with wheels designed to fit the flanges. | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 34. Safety guards on abrasive wheel tools are mounted properly and of sufficient strength. | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

PNEUMATIC-POWERED TOOLS (5.2.5)

- | | | |
|--|--------------------------|--------------------------|
| 35. Tools are secured to hoses or whip by positive means to prevent disconnection. | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 36. Safety clips or retainers are installed to prevent attachments being expelled. | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 37. Safety devices are installed on automatic fastener feed tools as required. | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 38. Compressed air is not used for cleaning unless reduced to < 30 psi, with PPE, and guarded. | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 39. Manufacturer's safe operating pressure for hoses, pipes, valves, etc. are not exceeded. | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 40. Hoses are not used for hoisting or lowering tools. | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 41. All hoses >1/2-inch diameter have safety device at source to reduce pressure upon hose failure. | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 42. Airless spray guns have required safety devices installed. | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 43. Blast cleaning nozzles are equipped with operating valves, which are held open manually. | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 44. Supports are provided for mounting nozzles when not in use. | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 45. Air receiver drains, handholes, and manholes are easily accessible. | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 46. Air receivers are equipped with drainpipes and valves for removal of accumulated oil and water. | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 47. Air receivers are completely drained at required intervals. | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 48. Air receivers are equipped with indicating pressure gauges. | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 49. Safety, indicating, and controlling devices are installed as required. | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 50. Safety valves are tested frequently and at regular intervals to assure good operating condition. | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION 2 (continued)

N/A

Yes No
N/O

LIQUID FUEL-POWERED TOOLS (5.2.6)

- | | | |
|---|--------------------------|--------------------------|
| 51. Liquid fuel-powered tools are stopped when refueling, servicing, or maintaining. | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | |
| 52. Liquid fuels are stored, handled, and transported in accordance with SOP HSE-403 | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 53. Liquid fuel-powered tools are used in confined spaces in accordance with SOP HSE-203. | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 54. Safe operating pressures of hoses, valves, pipes, filters, and other fittings are not exceeded. | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | |

POWDER-ACTUATED TOOLS (5.2.7)

- | | | |
|--|--------------------------|--------------------------|
| 55. Only trained employee operates powder-actuated tools. | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 56. Powder-actuated tools are not loaded until just prior to intended firing time. | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 57. Tools are not pointed at any employee at any time. | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 58. Hands are kept clear of open barrel end. | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 59. Loaded tools are not left unattended. | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 60. Fasteners are not driven into very hard or brittle materials. | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 61. Fasteners are not driven into easily penetrated materials unless suitable backing is provided. | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 62. Fasteners are not driven into spalled areas. | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 63. Powder-actuated tools are not used in an explosive or flammable atmosphere. | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 64. All tools are used with correct shields, guards, or attachments recommended by manufacturer. | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | |

JACKING TOOLS (5.2.8)

- | | | |
|---|--------------------------|--------------------------|
| 65. Rated capacities are legibly marked on jacks and not exceeded. | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 66. Jacks have a positive stop to prevent over-travel. | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 67. The base of jacks are blocked or cribbed to provide a firm foundation, when required. | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 68. Wood blocks are place between the cap and load to prevent slippage, when required. | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |
| 69. After load is raised, it is cribbed, blocked, or otherwise secured immediately. | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> |

70. Antifreeze is used when hydraulic jacks are exposed to freezing temperatures.	<input type="checkbox"/>	<input type="checkbox"/>
71. All jacks are properly lubricated.	<input type="checkbox"/>	<input type="checkbox"/>
72. Jacks are inspected as required.	<input type="checkbox"/>	<input type="checkbox"/>
73. Repair or replacement parts are examined for possible defects.	<input type="checkbox"/>	<input type="checkbox"/>
74. Jacks not working properly are removed from service and repaired or replaced.	<input type="checkbox"/>	<input type="checkbox"/>
HAND TOOLS (5.2.9)		
75. Wrenches are not used when jaws are sprung to the point of slippage.	<input type="checkbox"/>	<input type="checkbox"/>
76. Impact tools are kept free of mushroomed heads.	<input type="checkbox"/>	<input type="checkbox"/>
77. Wooden handles of tools are kept free of splinters or cracks and are tightly fitted in tool.	<input type="checkbox"/>	<input type="checkbox"/>
CHAIN SAWS (5.2.10)		
	No	N/A
	N/O	Yes
78. Chainsaw equipped with spark arrestor and fully functioning chain brake	<input type="checkbox"/>	<input type="checkbox"/>
79. Chainsaw operator's manual readily available	<input type="checkbox"/>	<input type="checkbox"/>
80. Fully stocked first aid kit and multipurpose fire extinguisher available	<input type="checkbox"/>	<input type="checkbox"/>
81. Appropriate personal protective equipment available and worn	<input type="checkbox"/>	<input type="checkbox"/>
82. Clothing free of loose edges that could become entangled in the saw	<input type="checkbox"/>	<input type="checkbox"/>
83. Chainsaw handles kept dry, clean, and free of oil or fuel mixture	<input type="checkbox"/>	<input type="checkbox"/>
84. Chainsaws held firmly with both hands and used right-handed	<input type="checkbox"/>	<input type="checkbox"/>
85. Operator standing to the left of the saw out of the plane of the chain	<input type="checkbox"/>	<input type="checkbox"/>
86. Saw used between the waist and mid-chest level	<input type="checkbox"/>	<input type="checkbox"/>
87. Full throttle maintained while cutting	<input type="checkbox"/>	<input type="checkbox"/>
88. Operator aware of position of guide bar tip, does not contact tip with anything being cut	<input type="checkbox"/>	<input type="checkbox"/>
89. Bumper spikes maintained as close to the object as possible	<input type="checkbox"/>	<input type="checkbox"/>
90. Operator aware of what is in the saw's downward path after the cut	<input type="checkbox"/>	<input type="checkbox"/>
91. No attempt to made to cut material that is larger than the guide bar of the saw	<input type="checkbox"/>	<input type="checkbox"/>

92. Cuts avoided that will cause chain to jam	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
93. Non-metallic wedges used to prevent compression cuts from jamming the blade	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
94. Bystanders and helpers kept at a safe distance from operation	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
95. Chainsaw not operated when fatigued	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
96. Fire extinguisher present when operating the chainsaw in forest or brushy areas	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>

CH2MHILL

23.2 HSE Self-Assessment Checklist—Lifting

This checklist shall be used **only** by CH2M HILL personnel and shall be completed at the frequency specified in the project’s HSP/FSI.

This checklist is to be used at locations where: (1) CH2M HILL employees perform manual lifting activities (office or projects), and/or (2) CH2M HILL provides oversight of a subcontractor performing manual lifting activities.

SC or Office Safety Coordinators/Committee members may consult with subcontractors (if applicable) when completing this checklist but shall not direct the means and methods of activities nor direct the details of corrective actions. Subcontractors shall determine how to correct deficiencies, and we must carefully rely on their expertise. Conditions considered imminently dangerous (possibility of serious injury or death) shall be corrected immediately or all exposed personnel shall be removed from the hazardous area until corrected.

Complete the appropriate project or office information:

<p><i>Project Information</i> Project Name: _____ Project No.: _____ _____ Location: _____ PM: _____ _____ Auditor: _____ Title: _____ Date: _____</p>
<p><i>Office Information</i> Office Location: _____ _____ Auditor: _____ Title: _____ Date: _____ _____</p>
<p>This specific checklist has been completed to:</p> <ul style="list-style-type: none"><input type="checkbox"/> Evaluate CH2M HILL employee manual lifting activities.<input type="checkbox"/> Evaluate a CH2M HILL subcontractor’s manual lifting activities. Subcontractor Name: _____ <ul style="list-style-type: none">• Check “Yes” if an assessment item is complete/correct.• Check “No” if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the subcontractor.• Check “N/A” if an item is not applicable.• Check “N/O” if an item is applicable but was not observed during the assessment. <p>Numbers in parentheses indicate where a description of this assessment item can be found in Standard of Practice HSE-112.</p>

Planning Activities		<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>N/O</u>
1.	Efforts have been made to inquire about receiving equipment or supplies in containers weighting less than 50 pounds (23 kilograms).	o	o	o	o
2.	Equipment or supplies are being delivered as close as possible to their use point.	o	o	o	o
3.	Heavy equipment or supplies are being stored off the ground and no lower than knee height.	o	o	o	o
4.	Adequate space has been provided to access and lift equipment or supplies without reaching or twisting.	o	o	o	o
Safe Work Practices (5.1)		<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>N/O</u>
5.	Tasks or activities have been modified to reduce or minimize manual lifting.	o	o	o	o
6.	All employees performing manual lifting have received training on how to lift safely.	o	o	o	o
7.	Manual lifting control measures are evaluated during assessments.	o	o	o	o
8.	Manual lifting incidents are reviewed as part of the HSE Program reviews.	o	o	o	o
9.	Manual lifting incidents are reviewed as part of the HSE Program reviews.	o	o	o	o
Office Environments (5.1.1)		<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>N/O</u>
10	Employees have received lifting training.	o	o	o	o
11	Mechanical devices are readily available to employees handling equipment or supplies weighing more than 40 pounds (18 kilograms).	o	o	o	o
Field Projects (5.1.2)		<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>N/O</u>
12	All manual lifting tasks or activities have been addressed in the written site safety plan.	o	o	o	o
13	Employees have received safe lifting training as required by the written site safety plan.	o	o	o	o

Mechanical Lifting (5.2)		<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>N/O</u>
14	Hand trucks and trolleys are visually inspected before use. .	0	0	0	0
15	Hand trucks and trolleys do not have any broken or damaged parts. .	0	0	0	0
16	Hand truck and trolley paths are free of uneven surfaces, water, oil, or cracks and holes. .	0	0	0	0
17	Loads carried by hand trucks are balanced and sturdy. .	0	0	0	0
18	Hand trucks or dollies are being pushed when on level ground. .	0	0	0	0
19	When going up or down a slope using a hand truck or trolley, the load is downslope of the person. .	0	0	0	0
20	Employees using hand trucks or dollies are moving slowly and cautiously. .	0	0	0	0
21	Employees using hand trucks or trolleys are able to see over the load. .	0	0	0	0
Assisted Lifting (5.3)		<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>N/O</u>
22	Personnel are not performing manual lifting beyond their physical capabilities. .	0	0	0	0
23	Loads are evenly distributed when being handled by multiple people. .	0	0	0	0
Manual Lifting (5.4)		<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>N/O</u>
24	Before the lift, the load and path was assessed. .	0	0	0	0
25	Loads being lifted are free of sharp edges, slivers, or wet or greasy spots. .	0	0	0	0
26	Gloves are used for manual lifts of loads with sharp or splintered edges. .	0	0	0	0
27	Employees performing manual lifts use the proper lifting techniques. .	0	0	0	0
28	Special tools fabricated for lifting grates or manhole covers are used. .	0	0	0	0

CH2MHILL

HS&E Self-Assessment Checklist: PPERSONAL PROTECTIVE EQUIPMENT

Page 1 of 3

This checklist shall be used by CH2M HILL personnel **only** and shall be completed at the frequency specified in the project's HSP/FSI.

This checklist is to be used at locations where CH2M HILL employees are required to wear PPE or are required to perform oversight of a subcontractor using PPE or both.

CH2M HILL staff shall not direct the means and methods of subcontractor use of PPE nor direct the details of corrective actions. The subcontractor must determine how to correct deficiencies and CH2M HILL staff must carefully rely on their expertise. Conditions considered to be imminently dangerous (possibility of serious injury or death) must be corrected immediately or all exposed personnel must be removed from the hazard until corrected.

Project Name: _____ Project No.: _____

Location: _____ PM: _____

Auditor: _____ Title: _____

Date: _____

This specific checklist has been completed to (check only one of the boxes below):

- Evaluate CH2M HILL compliance with its PPE program (SOP HSE-117)
- Evaluate a CH2M HILL subcontractor's compliance with its PPE program

Subcontractor's Name: _____

Check the appropriate box, as follows:

- Check "Yes" if an assessment item is complete or correct.
- Check "No" if an item is incomplete or deficient. Section 2 must be completed for all items checked "No."
- Check "N/A" if an item is not applicable.
- Check "N/O" if an item is applicable but was not observed during the assessment.

Numbers in parentheses indicate where a description of this assessment item can be found in Standard of Practice HSE-121.

SECTION 1

GENERAL

- | | <u>Yes</u> | <u>No</u> | <u>N/A</u> | <u>N/O</u> |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Required PPE listed in HSP FSI or AHA. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. PPE available for use by employees. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. PPE cleaning supplies available for use. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. PPE stored appropriately to prevent deformation or distortion. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. PPE written certification has been completed. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

EYEWEAR (Glasses/Goggles/Face Shields)

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 6 Eyewear cleaning supplies available. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7 Safety glasses in good condition and lenses free of scratches. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8 Goggles adjustment strap not cracked or frayed, not deformed, or lenses not | | | | |

scratched.

9. Face shields in good condition, including adjustment band, and free of scratches or chips.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

CH2MHILL

HS&E Self-Assessment Checklist: PERSONAL PROTECTIVE EQUIPMENT

Page 2 of 3

SECTION 1 (Continued)	Yes	No	N/A	N/O
HEAD PROTECTION				
10. Hard hat bill and suspension attached as allowed by manufacturer. fraying, torn headband, adjustment strap workable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 11.
14. Electrical hard hat matched to hazard classification.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Dated to determine whether within manufacturer's allowable 5-year use time period.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HAND PROTECTION				
16. Available in sizes matched to employee.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Gloves free of rips tears, abrasions, or holes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Matched to manufacturer's specification for chemicals used onsite.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Electrical gloves matched to hazard and periodically inspected for insulating rating.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Maintained in a clean and sanitary condition, decontaminated or disposed properly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BODY PROTECTION				
21. Available in sizes matched to employee.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Maintained in a clean and sanitary condition, decontaminated or disposed properly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Vapor-tight fully encapsulated suits tested at required periodic intervals.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Flame-resistant clothing matched to electrical hazard and arc flash rating.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Welding gear matched to degree of hazard and free of cuts, tears or burn holes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Flotation gear available for work near or on water and in good condition.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HOT AND COLD BODY PROTECTION				
27. Cooling gear available based on degree of heat stress hazard.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. Cooling gear in operable, clean, and sanitary condition.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Cold-weather gear provided based on needs assessment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Cold-weather gear available in sizes to match employees.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Cold-weather gear is in free of tears, rips, or holes and in maintained in a clean condition.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TRAINING				
32. Initial PPE training completed by employees.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Training conducted when new types or styles of PPE are issued.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. PPE selection, use, and maintenance reviewed at daily safety briefings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

CH2M HILL Health and Safety Plan

Attachment 5

Behavior Based Loss Prevention System Forms

Activity Hazard Analysis

Pre-Task Safety Plans

Safe Behavior Observation

Incident Report and Investigation

(use electronic form when possible)

[HITS](#)

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Safe Behavior Observation Form			
<input type="checkbox"/> Federal or <input type="checkbox"/> Commercial Sector (check one)		<input type="checkbox"/> Construction or <input type="checkbox"/> Consulting (check one)	
Project Number:		Client/Program:	
Project Name:		Observer:	Date:
Position/Title of worker observed:		Background Information/ comments:	
Task/Observation Observed: _____			
<ul style="list-style-type: none"> ❖ Identify and reinforce safe work practices/behaviors ❖ Identify and improve on at-risk practices/acts ❖ Identify and improve on practices, conditions, controls, and compliance that eliminate or reduce hazards ❖ Proactive PM support facilitates eliminating/reducing hazards (do you have what you need?) ❖ Positive, corrective, cooperative, collaborative feedback/recommendations 			
Actions & Behaviors	Safe	At-Risk	Observations/Comments
Current & accurate Pre-Task Planning/Briefing (Project safety plan, STAC, AHA, PTSP, tailgate briefing, etc., as needed)			Positive Observations/Safe Work Practices:
Properly trained/qualified/experienced			
Tools/equipment available and adequate			
Proper use of tools			Questionable Activity/Unsafe Condition Observed:
Barricades/work zone control			
Housekeeping			
Communication			
Work Approach/Habits			
Attitude			
Focus/attentiveness			Observer's Corrective Actions/Comments:
Pace			
Uncomfortable/unsafe position			
Inconvenient/unsafe location			
Position/Line of fire			
Apparel (hair, loose clothing, jewelry)			Observed Worker's Corrective Actions/Comments:
Repetitive motion			
Other...			

For ES Federal Sector projects please email completed forms to: [CH2M HILL ES FED Safe Behavior Observation](#)
 For ES Commercial Sector projects please email completed forms to: [CH2M HILL ES COM Safe Behavior Observation](#)
 For CNR ES staff please email completed forms to: cnressafe@ch2m.com

Activity:	Date:
	Project:
Description of the work:	Site Supervisor:
	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)

Equipment to be used (List equipment to be used in the work activity)	Inspection Requirements (List inspection requirements for the work activity)	Training Requirements (List training requirements including hazard communication)

PRINT NAME

SIGNATURE

Supervisor Name: _____

Date/Time: _____

Safety Officer Name: _____

Date/Time: _____

Employee Name(s): _____

Date/Time: _____

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Pre-Task Safety Plan (PTSP)

Project: _____ Location: _____ _____ Date: _____ Supervisor: _____ Job _____ Activity: _____ _____ _____		
Task Personnel: _____ _____ _____ _____ _____		
List Tasks: _____ _____ _____ _____ _____		
Tools/Equipment Required for Tasks (ladders, scaffolds, fall protection, cranes/rigging, heavy equipment, power tools): _____ _____ _____ _____		
Potential H&S Hazards, including chemical, physical, safety, biological and environmental (check all that apply):		
<input type="checkbox"/> Chemical burns/contact	<input type="checkbox"/> Trench, excavations, cave-ins	<input type="checkbox"/> Ergonomics
<input type="checkbox"/> Pressurized lines/equipment	<input type="checkbox"/> Overexertion	<input type="checkbox"/> Chemical splash
<input type="checkbox"/> Thermal burns	<input type="checkbox"/> Pinch points	<input type="checkbox"/> Poisonous plants/insects
<input type="checkbox"/> Electrical	<input type="checkbox"/> Cuts/abrasions	<input type="checkbox"/> Eye hazards/flying projectile
<input type="checkbox"/> Weather conditions	<input type="checkbox"/> Spills	<input type="checkbox"/> Inhalation hazard
<input type="checkbox"/> Heights/fall > 6 feet	<input type="checkbox"/> Overhead Electrical hazards	<input type="checkbox"/> Heat/cold stress
<input type="checkbox"/> Noise	<input type="checkbox"/> Elevated loads	<input type="checkbox"/> Water/drowning hazard
<input type="checkbox"/> Explosion/fire	<input type="checkbox"/> Slips, trip and falls	<input type="checkbox"/> Heavy equipment

<input type="checkbox"/> Radiation	<input type="checkbox"/> Manual lifting	<input type="checkbox"/> Aerial lifts/platforms
<input type="checkbox"/> Confined space entry	<input type="checkbox"/> Welding/cutting	<input type="checkbox"/> Demolition
Other Potential Hazards (Describe):		
<hr/>		

23.3 CH2MHILL

23.4

Hazard Control Measures (Check All That Apply):			
PPE <input type="checkbox"/> Hard Hat <input type="checkbox"/> Thermal/lined <input type="checkbox"/> Eye <input type="checkbox"/> Dermal/hand <input type="checkbox"/> Hearing <input type="checkbox"/> Respiratory <input type="checkbox"/> Reflective vests <input type="checkbox"/> Flotation device	Protective Systems <input type="checkbox"/> Sloping <input type="checkbox"/> Shoring <input type="checkbox"/> Trench box <input type="checkbox"/> Barricades <input type="checkbox"/> Competent person <input type="checkbox"/> Locate buried utilities <input type="checkbox"/> Daily inspections	Fire Protection <input type="checkbox"/> Fire extinguishers <input type="checkbox"/> Fire watch <input type="checkbox"/> Non-spark tools <input type="checkbox"/> Grounding/bonding <input type="checkbox"/> Intrinsically safe equipment	Electrical <input type="checkbox"/> Lockout/tagout <input type="checkbox"/> Grounded <input type="checkbox"/> Panels covered <input type="checkbox"/> GFCI/extension cords <input type="checkbox"/> Power tools/cord inspected
Fall Protection <input type="checkbox"/> Harness/lanyards <input type="checkbox"/> Adequate anchorage <input type="checkbox"/> Guardrail system <input type="checkbox"/> Covered opening <input type="checkbox"/> Fixed barricades <input type="checkbox"/> Warning system	Air Monitoring <input type="checkbox"/> PID/FID <input type="checkbox"/> Detector tubes <input type="checkbox"/> Radiation <input type="checkbox"/> Personnel sampling <input type="checkbox"/> LEL/O2 <input type="checkbox"/> Other	Proper Equipment <input type="checkbox"/> Aerial lift/ladders/scaffolds <input type="checkbox"/> Forklift/heavy equipment <input type="checkbox"/> Backup alarms <input type="checkbox"/> Hand/power tools <input type="checkbox"/> Crane with current inspection <input type="checkbox"/> Proper rigging <input type="checkbox"/> Operator qualified	Welding & Cutting <input type="checkbox"/> Cylinders secured/capped <input type="checkbox"/> Cylinders separated/upright <input type="checkbox"/> Flash-back arrestors <input type="checkbox"/> No cylinders in CSE <input type="checkbox"/> Flame retardant clothing <input type="checkbox"/> Appropriate goggles
Confined Space Entry <input type="checkbox"/> Isolation <input type="checkbox"/> Air monitoring <input type="checkbox"/> Trained personnel <input type="checkbox"/> Permit completed <input type="checkbox"/> Rescue	Medical/ER <input type="checkbox"/> First-aid kit <input type="checkbox"/> Eye wash <input type="checkbox"/> FA-CPR trained personnel <input type="checkbox"/> Route to hospital	Heat/Cold Stress <input type="checkbox"/> Work/rest regime <input type="checkbox"/> Rest area <input type="checkbox"/> Liquids available <input type="checkbox"/> Monitoring <input type="checkbox"/> Training	Vehicle/Traffic <input type="checkbox"/> Traffic control <input type="checkbox"/> Barricades <input type="checkbox"/> Flags <input type="checkbox"/> Signs
Permits <input type="checkbox"/> Hot work <input type="checkbox"/> Confined space <input type="checkbox"/> Lockout/tagout <input type="checkbox"/> Excavation <input type="checkbox"/> Demolition <input type="checkbox"/> Energized work	Demolition <input type="checkbox"/> Pre-demolition survey <input type="checkbox"/> Structure condition <input type="checkbox"/> Isolate area/utilities <input type="checkbox"/> Competent person <input type="checkbox"/> Hazmat present	Inspections: <input type="checkbox"/> Ladders/aerial lifts <input type="checkbox"/> Lanyards/harness <input type="checkbox"/> Scaffolds <input type="checkbox"/> Heavy equipment <input type="checkbox"/> Cranes and rigging	Training: <input type="checkbox"/> Hazwaste <input type="checkbox"/> Construction <input type="checkbox"/> Competent person <input type="checkbox"/> Task-specific (THA) <input type="checkbox"/> Hazcom
Field Notes: _____ _____ _____ _____			

Name (Print): _____

Signature: _____

Date: _____

CH2M HILL Health and Safety Plan
Attachment 6

Material Safety Data Sheets
&
Fact Sheets

CH2MHILL

Arsenic

Standard of Practice HSE-501

23.5 Arsenic Fact Sheet

Uses and Occurrences

The manufacture and transportation of arsenic compounds; used in the manufacture of herbicide, pesticide, fungicides, and defoliants; used in the manufacture and handling of calcium arsenate; used in the manufacture of electrical semiconductors, diodes, and solar batteries; used as an additive for food and drinking water for animals; used as a preharvest desiccant, sugarcane ripener, soil sterilant, or for timber thinning; used as a bronzing or decolorizing addition in glass manufacturing; used in the production of opal glass and enamels; used as an addition to alloys to increase hardening and heat resistance; used during smelting of ores; used during the cleanup of soil contaminated with arsenic; used military applications; and used in the general handling, storage, and use of arsenic.

Physical Characteristics

Appearance:	Gray metal or white powder
Odor:	Odorless solid, garlic-like when heated
Flammable:	None
Flash Point:	None
Flammable Range:	None
Specific Gravity:	5.73 for arsenic metal, 3.74 for arsenic trioxide
Stability:	Stable
Incompatibilities:	Heat, hydrogen gas, and oxidizing agents
Melting Point:	Sublimes at 613°C (1135°F); 315°C (599 °F) for arsenic trioxide
Boiling Point:	Sublimes at 613°C (1135°F); 465°C (869 °F) for arsenic trioxide

Signs and Symptoms of Exposure

- Short-term (Acute): Nausea, vomiting, diarrhea, weakness, loss of appetite, cough, chest pain, giddiness, headache, and breathing difficulty.
- Long-term (Chronic): Numbness and weakness in the legs and feet, skin and eye irritation, hyperpigmentation, thickening of palms and soles (hyperkeratosis), contact dermatitis, skin sensitization, warts, ulceration, perforation of the nasal septum, and lung and lymphatic cancer.

Modes of Exposure

Inhalation: Dusts and Vapors

Absorption: Liquid

Ingestion: Dusts and Liquid

Exposure Limits

Action level (AL) 5 $\mu\text{g}/\text{m}^3$

PEL 10 $\mu\text{g}/\text{m}^3$

STEL None

TLV 10 $\mu\text{g}/\text{m}^3$

Exposure Level vs. Regulatory Requirements

EXPOSURE LEVEL (EL)	REGULATORY REQUIREMENTS
EL < AL	Maintain exposure as low as reasonably achievable.
AL > EL, EL < PEL	Implement portions of the OSHA Arsenic Standard and training.
EL > PEL	Implement all portions of the OSHA Arsenic Standard, including training, medical surveillance, engineering controls, establishment of work areas, etc.

PPE

Eye: Safety glasses; contact lenses should **not** be worn.

Skin: Chemical protective gloves and body protection.

Respiratory: Air purifying respirators and supplied air respirators, depending on the exposure.

First Aid

Inhalation: Move to fresh air; seek medical attention promptly.

Skin: Quick drenching with water; wash skin with soap and water; seek medical attention promptly.

Eyes: Flush with water for 15 minutes, lifting the lower and upper lids occasionally; seek medical attention promptly.

Ingestion: Seek medical attention promptly.

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Cadmium Standard of Practice HSE-504

23.6 Cadmium Fact Sheet

Uses and Occurrences

The manufacture and transportation of cadmium compounds; coatings on metals; nickel-cadmium storage batteries; nickel plating, power transmission wire; pigments in ceramic glazes, enamels, and fungicides; corrosion-resistant coatings on marine, aircraft, and motor vehicles; manufacture of nuclear reactor rods; and welding electrodes and solder.

Physical Characteristics

Appearance:	Soft, blue-white, malleable, lustrous metal or grayish-white powder; some compounds may appear as a brown, yellow, or red powdery substance
Odor:	Odorless
Flammable:	Severe fire hazard, such as dust
Flash Point:	Not Applicable
Flammable Range:	Not Applicable
Specific Gravity:	8.64 (metal dust)
Stability:	Very stable
Incompatibilities:	Nitric acid, boiling concentrated hydrochloric and sulfuric acids; contact of cadmium metal dust with strong oxidizers or with elemental sulfur, selenium, and tellurium may cause fires and explosion.
Melting Point:	321°C (610°F)
Boiling Point:	765°C (1,409°F)

Signs and Symptoms of Exposure

Short-Term (Acute):	<u>Dust and Fume:</u> Irritation of nose and throat; inhalation may cause a delayed onset of cough, chest pain, sweating, chills, shortness of breath, and weakness. Death may occur. <u>Dust:</u> Ingestion may cause nausea, vomiting, diarrhea, and abdominal cramps.
Long-Term (Chronic):	<u>Dust and Fume:</u> Repeated or prolonged exposure may cause loss of sense of smell, ulceration of the nose, shortness of breath (emphysema), kidney damage, and mild anemia. Exposure to cadmium has been reported to cause an increase incidence of lung cancer.

Modes of Exposure

Inhalation:	Dusts and fumes
Absorption:	None
Ingestion:	Dusts and solids

Exposure Limits

Action level (AL)	2.5 µg/m ³
PEL	5 µg/m ³
STEL	None
TLV	10 µg/m ³ , 2µg/m ³ (respirable)

Exposure Level versus Regulatory Requirements

EXPOSURE LEVEL (EL)	REGULATORY REQUIREMENTS
EL < AL	Maintain exposure as low as reasonably achievable
AL > EL, EL < PEL	Implement portions of the OSHA Cadmium standard and Training
EL > PEL	Implement all portions of the OSHA Cadmium Standard including training, medical surveillance, engineering controls, establishment of work areas, etc.

PPE

Eye:	Splash-proof or dust-resistant goggles; face shield
Skin:	Protective coveralls, gloves, and footwear
Respiratory:	Air-purifying respirators and supplied air respirators, depending on the exposure

First Aid

Inhalation:	Move to fresh air; seek medical attention immediately.
Skin:	Remove clothing and shoes; wash with large amounts of water.
Eyes:	Flush with water immediately, lifting the upper and lower eyelids; seek medical attention immediately.
Ingestion:	DO NOT INDUCE VOMITING; seek medical attention immediately.

CH2M HILL HEALTH AND SAFETY PLAN

Attachment 7

Tick Fact Sheet

Tick-Borne Pathogens — A Fact Sheet

Most of us have heard of Lyme disease or Rocky Mountain Spotted Fever (RMSF), but there are actually six notifiable tick-borne pathogens that present a significant field hazard. In some areas, these account for more than half of our serious field incidents. The following procedures should be applied during any field activity—even in places that are predominantly paved with bordering vegetation.

Hazard Recognition

An important step in controlling tick related hazards is understanding how to identify ticks, their habitats, their geographical locations, and signs and symptoms of tick-borne illnesses.

Tick Identification

There are five varieties of hard-bodied ticks that have been associated with tick-borne pathogens. These include:

- Deer (Black Legged) Tick (eastern and pacific varieties)
- Lone Star Tick
- Dog Tick
- Rocky Mountain Wood Tick

These varieties and their geographical locations are illustrated on the following page.

Tick Habitat

In eastern states, ticks are associated with deciduous forest and habitat containing leaf litter. Leaf litter provides a moist cover from wind, snow, and other elements. In the north-central states, is generally found in heavily wooded areas often surrounded by broad tracts of land cleared for agriculture.

On the Pacific Coast, the bacteria are transmitted to humans by the western black-legged (deer) tick and habitats are more diverse. For this region, ticks have been found in habitats with forest, north coastal scrub, high brush, and open grasslands. Coastal tick populations thrive in areas of high rainfall, but ticks are also found at inland locations.

Illnesses and Signs & Symptoms

There are six notifiable tick-borne pathogens that cause human illness in the United States. These pathogens may be transmitted during a tick bite—normally hours after attachment. The illnesses, presented in approximate order of most common to least, include:

- Lyme (bacteria)
- RMSF (bacteria)
- Ehrlichiosis (bacteria)
- STARI (Southern Tick-Associated Rash Illness) (bacteria)
- Tularemia (Rabbit Fever) (bacteria)
- Babesia (protozoan parasite)

Symptoms will vary based on the illness, and may develop in infected individuals typically between 3 and 30 days after transmission. Some infected individuals will not become ill or may develop only mild symptoms. These illnesses present with some or all of the following signs & symptoms: fever, headache, muscle aches, stiff neck, joint aches, nausea, vomiting, abdominal pain, diarrhea, malaise, weakness, small solid, ring-like, or spotted rashes. The bite site may be red, swollen, or develop ulceration or

lesions. For Lyme disease, the bite area will sometimes resemble a target pattern. A variety of long-term symptoms may result if the illness is left untreated, including debilitating effects and death.



Deer Tick



Distribution of Deer Tick (dark green)



From Left: adult female, adult male, nymph, and larvae Deer Tick (cm)



Distribution of Pacific Deer Tick (dark green)



Lone Star Tick



Distribution of Lone Star Tick (Green)



Dog Tick



Rocky Mountain Wood Tick



Hazard Control

The methods for controlling exposure to ticks include, in order of most- to least-preferred:

- Avoiding tick habitats and ceasing operations in heavily infested areas
- Reducing tick abundance through habitat disruption or application of acaricide
- Personal protection through use of repellants and protective clothing
- Frequent tick inspections and proper hygiene

Vaccinations are not available and preventative antibiotic treatment after a bite is generally not recommended.

Avoidance and Reduction of Ticks

To the extent practical, tick habitats should be avoided. In areas with significant tick infestation, consider stopping work and withdrawing from area until adequate tick population control can be achieved. Stopping and withdrawing should be considered as seriously as entering an area without proper energy control or with elevated airborne contaminants—tick-borne pathogens present risk of serious illness!

In areas where significant population density or infestation exists, tick reduction should be considered. Tick reduction can be achieved by disrupting tick habitats and/or direct population reduction through the use of tick-toxic pesticides (Damminix, Dursban, Sevin, etc.).

Habitat disruption may include only simple vegetative maintenance such as removing leaf litter and trimming grass and brush. Tick populations can be reduced by between 72 and 100 percent when leaf litter alone is removed. In more heavily infested areas, habitat disruption may include grubbing, tree trimming or removal, and pesticide application (Damminix, Dursban, Sevin, etc.). This approach is practical in smaller, localized areas or perimeter areas that require occasional access. Habitat controls are to be implemented with appropriate health and safety controls, in compliance with applicable environmental requirements, and may be best left to the property owner or tenant or to a licensed pesticide vendor. Caution should be exercised when using chemical repellents or pesticides in or around areas where environmental or industrial media samples will be collected for analysis.

Personal Protection

After other prevention and controls are implemented, personal protection is still necessary to control exposure to ticks. Personal protection must include all of the following steps:

- So that ticks may be easily seen, wear light-colored clothing. Full-body New Tyvek (paper-like disposable coveralls) may also be used
- To prevent ticks from getting underneath clothing tuck pant legs into socks or tape to boots
- Wear long-sleeved shirts, a hat, and high boots
- Apply DEET repellant to exposed skin or clothing per product label
- Apply permethrin repellant to the outside of boots and clothing before wearing, per product label
- Frequently check for ticks and remove from clothing
- At the end of the day, search your entire body for ticks (particularly groin, armpits, neck, and head) and shower

- To prevent pathogen transmission through mucous membranes or broken/cut skin, wash or disinfect hands and/or wear surgical-style nitrile gloves any time ticks are handled

Pregnant individuals and individuals using prescription medications should consult with their physician and/or pharmacists before using chemical repellents. Because human health effects may not be fully known, use of chemical repellents should be kept to a minimum frequency and quantity. Always follow manufacturers' use instructions and precautions. Wash hands after handling, applying, or removing protective gear and clothing. Avoid situations such as hand-to-face contact, eating, drinking, and smoking when applying or using repellents.

Remove and wash clothes per repellent product label. Chemical repellents should not be used on infants and children.

Vaccinations are generally not available for tick-borne pathogens. Although production of the LYMERix™ Lyme disease vaccination has been ceased, vaccination may still be considered under specific circumstances and with concurrence from the consulting physician.

Tick Check

A tick check should be performed after field survey before entering the field vehicle (you do not want to infest your field vehicle with ticks). Have your field partner check your back; the backs of your legs, arms, and neck; and your hairline. Shake off clothing as thorough as possible before entering the vehicle. Once the field day is complete, repeat this procedure and perform a thorough self check.

If a tick has embedded itself into the skin, remove the tick as described below.

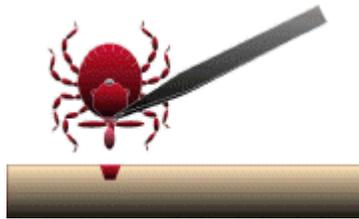
Tick Removal

1. Use the tick removal kit obtained through the CH2M HILL Milwaukee warehouse, or a fine-tipped tweezers or shield your fingers with a tissue, paper towel, or nitrile gloves.



Tick Bites\Tick Remover.pdf

2. Grasp the tick as close to the skin surface as possible and pull upward with steady, even pressure. Do not twist or jerk the tick; this may cause the mouthparts to break off and remain in the skin. If this happens, remove mouthparts with tweezers. Consult your healthcare provider if infection occurs.



3. Avoid squeezing, crushing or puncturing the body of the tick because its fluids (saliva, hemolymph, gut contents) may contain infectious organisms. Releasing these organisms to the outside of the tick's body or into the bite area may increase the chance of infectious organism transmission.

4. Do not handle the tick with bare hands because infectious agents may enter through mucous membranes or breaks in the skin. This precaution is particularly directed to individuals who remove ticks from domestic animals with unprotected fingers. Children, elderly persons, and immunocompromised persons may be at greater risk of infection and should avoid this procedure.

5. After removing the tick, thoroughly disinfect the bite site and wash your hands with soap and water.

6. Should you wish to save the tick for identification, place it in a plastic bag, with the date of the tick bite, and place in your freezer. It may be used at a later date to assist a physician with making an accurate diagnosis (if you become ill).

Note: Folklore remedies such as petroleum jelly or hot matches do little to encourage a tick to detach from skin. In fact, they may make matters worse by irritating the tick and stimulating it to release additional saliva, increasing the chances of transmitting the pathogen. These methods of tick removal should be avoided. In addition, a number of tick removal devices have been marketed, but none are better than a plain set of fine tipped tweezers.

First-Aid and Medical Treatment

Tick bites should always be treated with first-aid. Clean and wash hands and disinfect the bite site after removing embedded tick. Individuals previously infected with Lyme disease does not confer immunity—re-infection from future tick bites can occur even after a person has contracted a tick-borne disease.

The employee should contact the Injury Management/Return To Work provider (IMRTW), WorkCare using the toll-free number 866-893-2514 to report the tick bite. WorkCare will follow-up with each CH2M Hill employee who reports a tick bite and is at risk of developing Lyme disease by monitoring for symptoms up to 45 days, and will refer the employee to a medical provider for evaluation and treatment as necessary.

CH2M HILL HEALTH AND SAFETY PLAN
Attachment 8

Observed Hazard Form

OBSERVED HAZARD FORM

Name/Company of Observer (*optional*):

Date reported: _____

Time reported: _____

Contractor/s performing unsafe act or creating unsafe condition:

1. _____

2. _____

3. _____

Unsafe Act or Condition:

Location of Unsafe Act or Condition:

Name of CH2M HILL Representative:

Corrective Actions Taken:

Date: _____

Project Safety Committee Evaluation:

Date: _____

CH2M HILL HEALTH AND SAFETY PLAN

Attachment 9

Stop Work Order Form

Stop Work Order

REPORT PREPARED BY:

Name:	Title:	Signature:	Date:

ISSUE OF NONPERFORMANCE:

Description:	Date of Nonperformance:

SUBCONTRACTOR SIGNATURE OF NOTIFICATION:

Name:	Title:	Signature:	Date:

** Corrective action is to be taken immediately. Note below the action taken, sign and return to CCI.* Work may not resume until authorization is granted by CH2M HILL Constructors, Inc. Representative,*

SUBCONTRACTOR'S CORRECTIVE ACTION

Description:	Date of Nonperformance:

SUBCONTRACTOR SIGNATURE OF CORRECTION

Name:	Title:	Signature:	Date: