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ST JULIENS CREEK
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Final

Work Plan for Additional Waste Delineation at Site 2

St. Juliens Creek Annex
Chesapeake, Virginia

NAVFAC
Naval Facilities Engineering Command
NAVFAC MID-ATLANTIC

Prepared for

Department of the Navy

Naval Facilities Engineering Command
Mid-Atlantic

Contract No. N62470-02-D-3052
CTO-0054

December 2010

Prepared by

CH2MHILL

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St. Juliens Creek Annex
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Contract Task Order 0054

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Department of the Navy
Naval Facilities Engineering Command
Mid-Atlantic Division

Under the

NAVFAC CLEAN III Program
Contract N62470-02-D-3052

Prepared by

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Virginia Beach, Virginia

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Acronyms and Abbreviations

ABM	abrasive blast material
CLEAN	Comprehensive Long-term Environmental Action—Navy
ERI	Expanded Remedial Investigation
ESS	Explosives Safety Submission
ft	feet, foot
GIS	Geographic Information System
GPS	global positioning system
MEC	munitions and explosives of concern
MPP	Master Project Plan
NOSSA	Naval Ordnance Safety and Security Activity
SJCA	St. Juliens Creek Annex
SOP	standard operating procedure
UXO	unexploded ordnance
yd^3	cubic yard

SECTION 1

Introduction

This work plan describes the rationale and approach for waste delineation activities to be completed at Site 2, at St. Juliens Creek Annex (SJCA), Chesapeake, Virginia. This work plan has been prepared under Navy Contract N62470-02-D-3052, Comprehensive Long-term Environmental Action—Navy (CLEAN) III, Contract Task Order 0054.

Previous investigations characterizing the nature and extent of contamination at Site 2 are documented in the Final Expanded Remedial Investigation (ERI) Report (CH2M HILL, 2008, Revised 2010). Waste delineation was conducted during the Remedial Investigation (RI) and ERI; however, portions of the eastern boundary remained uncertain. Based on the findings of the ERI, an FS was conducted to identify and analyze remedial alternatives to mitigate potential risks associated with soil and waste, shallow groundwater, sediment, and surface water (CH2M HILL, 2009, Revised 2010). To address potential risks associated with the waste, a cover will be implemented over the extent of the waste. The limit of the cover is currently based on the approximate extent of waste and the extent of soil and sediment that exceed cleanup levels. To refine the extent of the cover necessary to ensure protection of human health and the environment from direct contact with the waste, the Navy will perform additional delineation along the eastern boundary of the site. The waste delineation data will be incorporated into the Site 2 Remedial Design. All delineation activities will be conducted according to applicable standard operating procedures (SOPs) as outlined in the SJCA Master Project Plan (MPP) (CH2M HILL, 2003).

SECTION 2

Background

2.1 Facility Description and History

SJCA comprises approximately 490 acres at the confluence of St. Juliens Creek and the Southern Branch of the Elizabeth River in the City of Chesapeake, southeastern Virginia (**Figure 1**). Most of the surrounding area is developed and includes residences, schools, recreational areas, and shipping facilities for several large industries.

SJCA began operations as a naval ammunition facility in 1849. The facility was one of the largest ammunition depots in the United States involving wartime transfer of ammunitions to other naval facilities. Decontamination was performed in, around, and under ordnance-handling facilities at SJCA in 1977 after ordnance operations had ceased. The SJCA facility has also provided non-ordnance services, including degreasing; operation of paint shops, machine shops, vehicle and locomotive maintenance shops, pest control shops, battery shops, print shops, electrical shops, boiler plants, wash racks, and potable water and salt water fire-protection systems; fire fighter training; and storage of oil and chemicals.

Activity at SJCA has decreased in recent years, and many of the aging structures are being demolished. The current primary mission of SJCA is to provide a radar-testing range and various administrative and warehousing facilities and light industrial shops for nearby Norfolk Naval Shipyard and other local naval activities. Defense Reutilization and Marketing Office storage; Space and Naval Warfare Systems Command; Fleet and Industrial Supply Center, Norfolk Integrated Logistics Support; and a cryogenics school are currently located within SJCA.

2.2 Site 2 Description and History

Site 2 is a former waste disposal area covering approximately 5.7 acres at the corner of St. Juliens Road and Cradock Street, in the southern portion of SJCA (**Figure 2**). In earlier documents, Site 2 was referred to as "Dump B" or "Landfill B." Mixed municipal wastes, abrasive blast media (ABM), waste ordnance, organics (including solvents), and inorganics were reportedly disposed of at Site 2. Operations at Site 2 began in 1921 and continued until some time after 1947. Initially, refuse was burned openly on site and was used to fill in the adjacent swampy area (Site 2 inlet). The total volume of waste accumulated prior to burning was estimated to be 35,000 cubic yards (yd^3). In 1942, an incinerator was installed to replace the open burning practices. The total volume of waste burnt in the incinerator was estimated to be 15,000 yd^3.

Former Buildings 278/279, located just north of and adjacent to the Site 2 inlet, were designated as IR Site 17 (**Figure 3**). Lead-acid battery maintenance reportedly began at Buildings 278/279 in 1954, and the waste acid electrolyte was collected and hauled offsite for disposal. Buildings 278/279 were demolished in 2003 but the concrete foundation remains in place. In 1989, the site was used to store heavy equipment and machinery. Construction debris (concrete, brick, and wood), as well as ABM, are visible on the ground

surface. Because of its proximity to Site 2, the SJCA Project Management team agreed to close Site 17 with no further action under the IR program and expand the Site 2 boundary to include its extent.

Four revetted aboveground storage tanks and one underground storage tank are located east of Site 2 (**Figure 3**). Fuel oil and diesel may have been stored in these tanks. The Site 2 inlet has historically received discharges from vehicle and equipment wash racks and ordnance degreasing operations, located north of Site 2. Upgradient buildings were historically used as machine, vehicle, and locomotive maintenance shops; electrical shops; and munitions loading facilities.

Currently, the site is bounded to the north by a parking lot, to the east by a grass-covered field, to the west by a storm water drainage ditch and Cradock Street, and to the south by St. Juliens Road and St. Juliens Creek (**Figure 3**). A water body (inlet) surrounded by brush, trees, and grass that is directly connected to St. Juliens Creek through a 36-inch culvert is located in the center of Site 2. This inlet is tidally influenced and drains surface water from adjoining land into the creek. Grass-lined drainage ditches (approximately 2 to 3 feet [ft] deep) originate north of Site 2 along Cradock Street and discharge storm water runoff to the inlet. An underground storm drainage system originates approximately 1,000 ft northeast of the Site 2 area, within IR Site 21, and outlets to the north end of the inlet.

The subsurface geology at Site 2 consists of the fine to coarse silty and clayey sands of the Columbia aquifer, underlain by the high plasticity clay of the Yorktown confining unit. The Columbia aquifer extends to a depth of between 15 and 25 ft below ground surface (bgs). The Yorktown confining unit is approximately 30 ft thick at Site 2 and lies above the fine to coarse shelly sands of the Yorktown aquifer.

2.3 Extent of Waste

A review of historic aerial photographs, electromagnetic and magnetometer geophysical surveys, and test pitting were conducted during the RI with additional soil borings advanced during the ERI to delineate the extent of waste present at the site. The RI test pit and ERI soil boring locations are shown on **Figure 4** and the logs are provided in the RI (CH2M HILL, 2004) and ERI (CH2M HILL, 2008, Revised 2010). Based on these investigations, the areal extent of the waste covers approximately 3.9 acres (**Figure 4**). The horizontal extent of waste beneath the parking lot to the west is inferred. Based on interpretation of historical aerial photographs of former site activities and locations of physical features (e.g., current or former buildings or roads), it is not likely that the waste extends much farther west of this area. The horizontal extent of waste along the site's eastern boundary is also inferred. It is likely the shallow debris (brick and concrete) observed within and adjacent to the Former Building 130 footprint is demolition debris resulting from the buildings removal and not historic waste disposal activity. There are no signs that waste disposal activities took place south of St Juliens Road.

Test pits and soil borings revealed the layer of waste material is as thick as 10 to 11 ft in some locations and is present within the unsaturated zone and the saturated zone. Vertical delineation of the waste continued until waste was no longer encountered or test pitting could no longer continue (e.g., water table was encountered); therefore, it is possible that waste may be present deeper than the bottom of the test pits. Subsurface waste consists of

ABM, burnt/stained soil, concrete, asphalt, brick, metal, glass, wood, solvents, and munitions and explosives of concern (MEC)-related scrap (one shell and three Mark 5 cartridge cases were found during test pitting).

SECTION 3

Technical Approach and Investigation Procedures

This section provides a description of the field activities for the waste delineation. The SJCA MPP addresses the protocols and SOPs used for all investigations at SJCA (CH2M HILL, 2003). An Accident Prevention Plan is provided as **Appendix A** to this work plan.

3.1 Fieldwork Support

3.1.1 Utility Clearance

Prior to initiating any subsurface investigation activities at the site, underground utility clearance will be performed for the entire area of investigation (**Figure 5**). CH2M HILL will coordinate subsurface utility clearances with the Miss Utility and a third party utility locating subcontractor.

3.1.2 UXO Construction Support

Based on the site history and findings during investigations conducted to-date, there is a low probability of encountering MEC during the activities proposed in this work plan. To address these concerns, NAVFAC Mid-Atlantic submitted an Explosives Safety Submission (ESS) Determination request to Naval Ordnance Safety and Security Activity (NOSSA) for Site 2. The ESS Determination request was written to cover the disposal waste delineation activities. The determination that an ESS is not required is based on the low probability of encountering MEC during these activities because no MEC were encountered on the eastern side of the Site 2 inlet during the previous investigation activities and the excavation approach will limit exposure to waste, thereby lowering the likelihood of encountering MEC. The ESS Determination request and NOSSA response letter indicating that an ESS is not required are provided in **Appendix B**.

On-site construction support will be provided by a trained unexploded ordnance (UXO) Technician III. Additionally, all onsite personnel will receive MEC awareness training and a daily UXO Health and Safety briefing will be provided by the UXO Technician. The UXO Technician will observe all intrusive activities to identify any suspect MEC. The steps to be taken in the event that suspect MEC are encountered are provided in the NOSSA response letter provided in **Appendix B**.

3.2 Delineation Activities

3.2.1 Test Pitting

To determine the eastern extent of waste identified at Site 2, a series of test pits will be excavated along the eastern boundary of the site (**Figure 5**). To minimize contact with waste and potential MEC, test pitting will begin at the currently estimated waste boundary, which is believed to be conservative, and proceed west toward the inlet. No material for

serviceable roadways or work surfaces (asphalt or concrete) will be disturbed. Test pits will be excavated using a backhoe or similar excavation equipment. If waste is encountered, excavation will stop and a new test pit will be excavated approximately 20 feet (adjustable based on field observations) to the east (away from the Site 2 inlet). This process will continue until no waste is observed. Because it is possible that waste may be present under a clean fill layer, test pitting will continue vertically until the water table is reached, or to a maximum of 5 feet bgs, before a test pit will be considered free of waste. Road materials (e.g., asphalt or gravel) and concrete that is clearly associated with the former building foundation will not be considered waste. Following identification of a waste-free test pit, the field crew will refine the waste boundary and excavate a new test pit approximately 10 feet (adjustable based on field observations) to the west (toward the Site 2 inlet). Following identification of waste, the field crew will refine the waste boundary and excavate a new test pit approximately 10 feet (adjustable based on field observations) to the east (away from the Site 2 inlet). Test pitting will continue until the waste boundary has been refined to closest extent practicable. Following delineation, the revised waste boundary will be marked in the field with pin flags.

Test pit documentation will include the date, time, weather, test pit depth, depth at which water is encountered, soil descriptions, amount and type of waste encountered, odors, staining and any other pertinent observations.

3.2.2 Surveying

Test pit locations at the site will be horizontally located using a global positioning system (GPS) following field activities. The survey data will be tied in to the Virginia State Plane coordinate system. Vertical measurements of test pits will reference the existing ground surface. These data will be converted into an electronic format that can be readily incorporated into the Navy's Geographic Information System (GIS) Data Management system for SJCA.

3.2.3 Site Restoration

Following test pit activities at each location, the material excavated will be placed back into the excavated pit. Following completion of all activities, the site will be restored to its original condition, including seeding of disturbed areas with native grasses.

3.3 Reporting

A report documenting the investigation activities will not be prepared under this project. The data will be provided to the Site 2 Remedial Design team for incorporation into the design. An update to the Navy's GIS will be made and a figure depicting the new waste boundary will be generated. The data and figure will be provided to the SJCA Partnering Team and Site 2 Remedial Design team for incorporation into future reporting.

SECTION 4

References

CH2M HILL. 2003. *Final Master Project Plan, Naval Station Norfolk, St. Juliens Creek Annex, Chesapeake, Virginia.* July.

CH2M HILL. 2004. *Final Remedial Investigation/Human Health Risk Assessment/Ecological Risk Assessment Report for Site 2. St. Juliens Creek Annex, Chesapeake, Virginia.* February.

CH2M HILL. 2008, Revised 2010. *Final Expanded Remedial Investigation Report, St. Juliens Creek Annex, Chesapeake, Virginia. Master Project Plans Naval Amphibious Base Little Creek, Virginia Beach, Virginia.* November, January revision.

CH2M HILL. 2009, Revised 2010. *Final Feasibility Study Report for Site 2, St. Juliens Creek Annex, Chesapeake, Virginia.* October, January revision.

Figures

Legend

St. Juliens Creek Annex

N
W E
S

0 1,250 2,500
Feet

Figure 1
Location of St. Juliens Creek Annex
Site 2 Waste Delineation Work Plan
St. Juliens Creek Annex
Chesapeake, Virginia

CH2MHILL

Legend

St. Juliens Creek Annex

Site 2

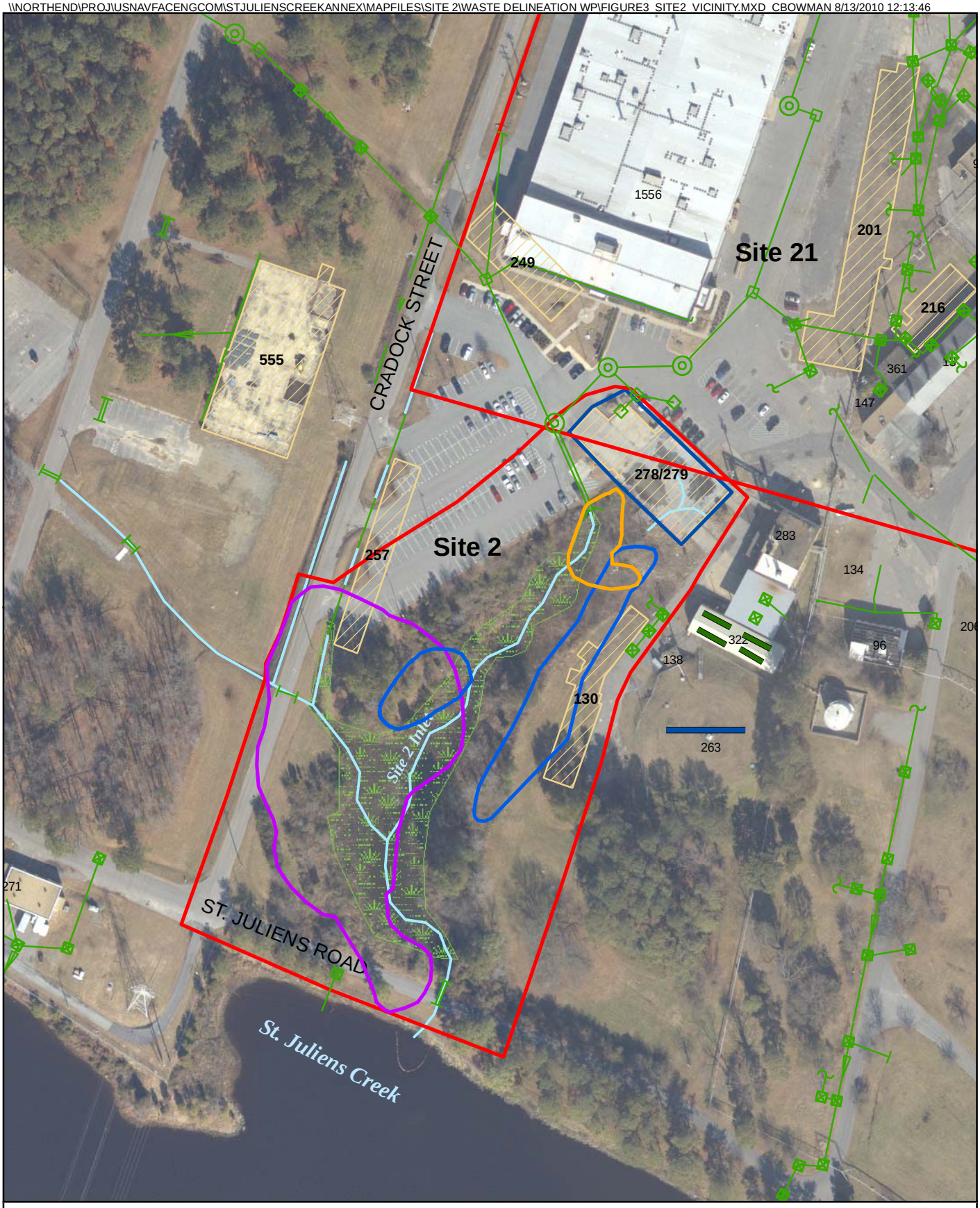
N
W E
S

0 450 900
Feet

Figure 2
Site 2 Location Map
Site 2 Waste Delineation Work Plan
St. Juliens Creek Annex
Chesapeake, Virginia

CH2MHILL

\\NORTHEND\PROJ\USNAVFACENGCOM\STJULIENSCREEKANNEX\MAPFILES\SITE 2\WASTE DELINEATION WP\FIGURE3_SITE2_VICINITY.MXD CBOWMAN 8/13/2010 12:13:46



Legend

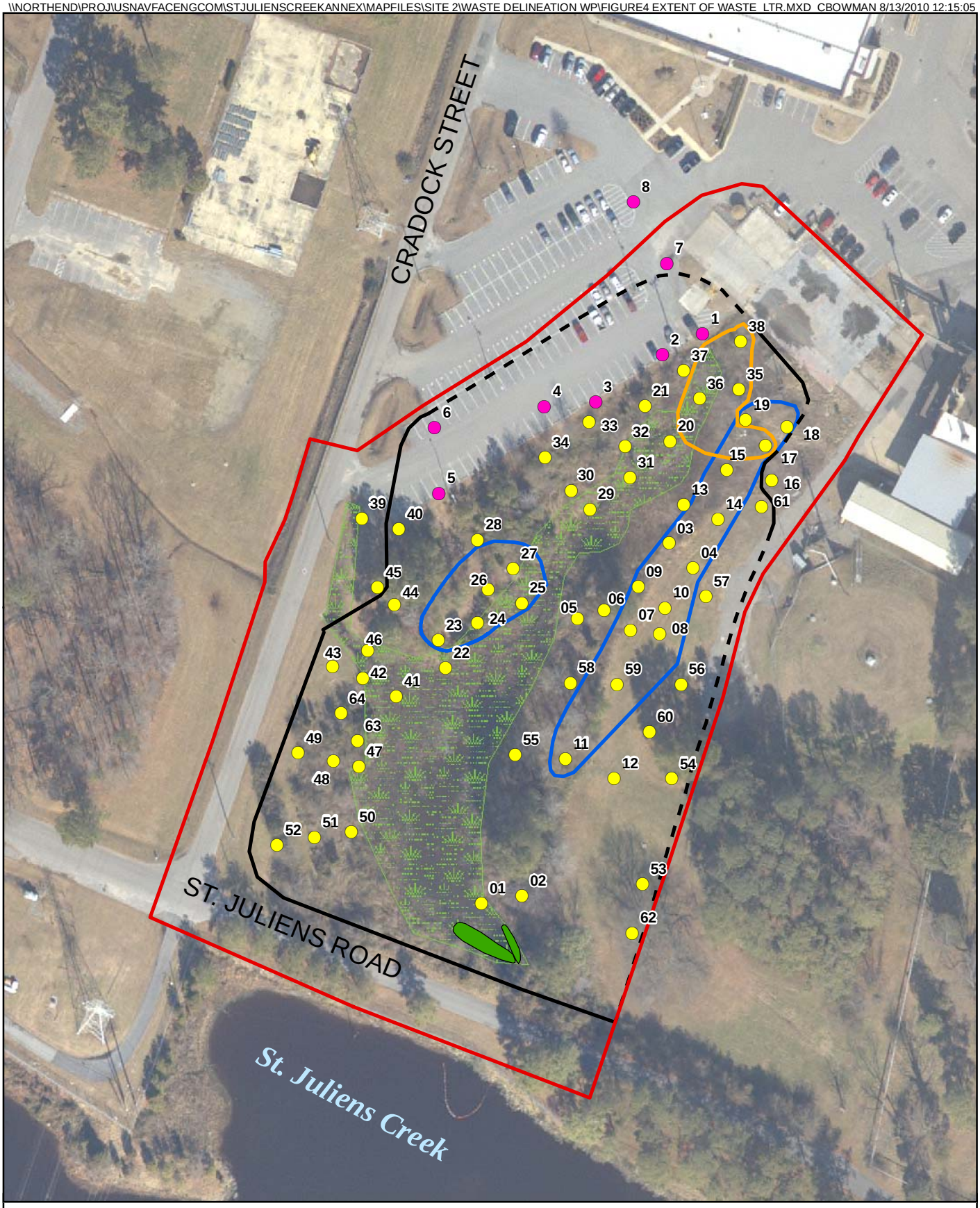
- Site Boundary
- Former Site 17 Boundary
- Demolished Building
- Wetland
- Approximate Location of Former AST
- Approximate Location of Former UST
- Extent of Blast Grit (ABM)
- Extent of Petroleum Impact
- Chlorinated VOC-Impacted Area
- Storm Water Sewer
- Drainage

0 75 150 Feet

N W E S

Figure 3
Site 2 Vicinity
Site 2 Waste Delineation Work Plan
St. Juliens Creek Annex
Chesapeake, Virginia

CH2MHILL



Legend

- Site Boundary
- Extent of Blast Grit (ABM)
- Extent of Petroleum Impact
- Extent of Waste (3.85 acres)
- Wetland
- Extent of Wetland Surface Debris
- Test Pit (RI - 1999)
- DPT Soil Boring (ERI - 2004)

N
W E
S

0 55 110
Feet

Figure 4
Extent of Waste
Site 2 Waste Delineation Work Plan
St. Juliens Creek Annex
Chesapeake, Virginia

CH2MHILL

Note: Preliminary test pit locations are a starting point for waste delineation. Test pits will continue east or west of the preliminary locations based on visual observations.

N
W E
S

0 55 110
Feet

Figure 5
Preliminary Test Pit Locations
Site 2 Waste Delineation Work Plan
St. Juliens Creek Annex
Chesapeake, Virginia

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Appendix A
Accident Prevention Plan

Final

Accident Prevention Plan
Site 2 Waste Delineation

St. Juliens Creek Annex
Chesapeake, Virginia

Contract Task Order 0129

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Prepared by

CH2MHILL®

Virginia Beach, Virginia

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Signature Page

ACCIDENT PREVENTION PLAN
SITE 2 WASTE DELINEATION
ST. JULIENS CREEK ANNEX
CHESAPEAKE, VIRGINIA

December 2010

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Appendix A Site Safety and Health Plan

Acronyms and Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
AHA	Activity Hazard Analysis
APP	Accident Prevention Plan
CFR	Code of Federal Regulations
CO/COR	Contracting Officer/Representative
CPR	cardiopulmonary resuscitation
CSHO	Corporate Safety and Health Officer
CSP	Certified Safety Professional
EAP	Employee Assistance Program
EMR	Experience Modification Rate
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSM	Health and Safety Manager
IARC	International Agency for Research on Cancer
IIPP	Injury and Illness Prevention Program
IDW	investigation-derived waste
MSDS	Material Safety Data Sheet
OSHA	Occupational Safety and Health Administration
PPE	personal protective equipment
PTSP	Pre-Task Safety Planning
SJCA	St. Juliens Creek Annex
SSC	Site Safety Coordinator
SSHP	Site Safety and Health Plan
USACE	U.S. Army Corps of Engineers

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SECTION 1

Background Information

This Accident Prevention Plan (APP) has been developed to protect and guide the personnel conducting waste delineation at St. Juliens Creek Annex (SJCA). The site covered in this investigation is Installation Restoration Site 2. This APP has been prepared to meet applicable requirements of the U.S. Army Corps of Engineers (USACE) Safety and Health Requirements Manual EM 385-1-1 (USACE, 2008), the *Code of Federal Regulations*, 29 CFR 1910.1200 Hazard Communication Standard, Hazardous Waste Operations or emergency response as required by 29 CFR 1910.120 and 29 CFR 1926.65 and the corporate safety and health policies of CH2M HILL, Inc. Various portions of this work shall also be conducted under Non-Hazardous Waste site protocols. The Site Safety and Health Plan (SSHP) for this project is included as Appendix A of this APP.

1.1 Contractor

CH2M HILL, Inc.

1.2 Contract Number

Navy Contract N62470-02-D-3052

1.3 Project Name

CTO-0054/St. Juliens Creek Annex/Site 2 Waste Delineation

1.4 Project Description and Location

This APP presents the hazards known or anticipated to be present at Site 2, SJCA, Chesapeake, VA. This plan also outlines the health and safety procedures that will be used to conduct waste delineation activities at Site 2, SJCA, Chesapeake, VA. The waste delineation is expected to be performed in the fall of 2010. This Project-Specific APP will be used by CH2M HILL and its subcontractors to identify and mitigate task-specific hazards and to select appropriate health and safety protective measures not otherwise covered in the SJCA Master Health and Safety Plan (HASP).

Onsite personnel must review both the Master-HASP and the site-specific APP and sign an agreement to comply with its provisions prior to commencing onsite work. The Master-HASP and site-specific APP are considered operational documents that are subject to revisions in response to various site-specific conditions that may be encountered. However, these documents may be modified or updated only with the approval of the Health and Safety Manager (HSM) and Project Manager.

Specific work activities requiring activity hazard analyses (AHAs) are listed in Section 1.5.

1.5 Contractor Accident Experience

CH2M HILL's exceptional safety performance greatly exceeds the industry average. Our injury and illness rates and our Experience Modification Rate (EMR) have decreased dramatically over the past 5 years.

Following are examples of our achievements:

- An EMR of less than 1.0 over the past 5 years, which is the average accident injury experience for the industry, with a 2009 EMR of 0.72 (or 72 percent) of the industry average (NAICS 54133).

Category	2005	2006	2007	2008	2009
Employee Hours	11,443,595	11,997,887	13,744,013	15,290,819	14,673,402
Experience Modification Rate (EMR)	0.83	0.76	0.74	0.66	0.72
Fatalities	0	0	0	0	0
Recordable Incidents	46	31	27	48	20
Recordable Incident Rate *	0.80	0.52	0.39	0.63	0.27
Recordable Incident Rate Average *	1.5	1.5	1.4	1.4	1.1
Lost Workday (LWD) Incidents (DART) **	12	12	7	11	3
LWD Incident Rate (DART)	0.21	0.20	0.10	0.14	0.04

* SIC code 871 (Engineering and Management Services) used for rate averages prior to 2003. Thereafter, NAICS code 54133 (Engineering Services) used for rate averages.
** Lost Workday incidents include cases involving days away from work (DAW) or Restricted Duty (RD). This is also known as DART (Days Away, Restricted or Transferred cases).

1.6 Work Requiring Activity Hazard Analysis

The planned field tasks requiring AHAs are as follows.

- 01 Utility clearance of excavation site oversight
- 02 Excavation and visual inspection of test pits (subcontractor task specific to excavation portion, CH2M HILL portion will address hazards of visual inspection)
- Backfilling and grading of test pits (subcontractor task)

AHAs for each of the above field tasks are included in Appendix A.

SECTION 2

Statement of Safety and Health Policy and Compliance Procedures

CH2M HILL is committed to providing a safe and healthful workplace for employees. These conditions will be ensured through an aggressive and comprehensive worker safety and health program that is integrated with other site worker protection activities. We regard employee protection as a priority and are committed to developing, implementing, and improving safety and health practices that will afford optimal protection to employees and enable continuous improvement of the quality of worker protection performance. The safety and health of employees will take precedence whenever conflicts with production or other objectives arise.

Managers and supervisors are held accountable for worker safety and health. Accountability is achieved by assigning worker protection responsibilities, evaluating personnel performance, and holding personnel accountable for worker protection performance.

In addition to complying with this APP and their corporate safety and health program, persons working under the SSHP are encouraged to be active participants in their workplace safety and health activities, and to actively take advantage of the worker rights in a responsible manner, without reprisal.

The following activities may result in disciplinary action, up to and including discharge of any employee from their corporation:

- Violation of the safety and health requirements of their corporation's policy or of this APP
- Unauthorized or illegal possession, use or sale of alcohol or controlled substances on work premises, during working hours, while engaged in corporate activities, or in corporate vehicles
- Use or sale of firearms or explosives on work premises

See Appendix A, Section 4.0, for further details.

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SECTION 3

Responsibilities and Lines of Authorities

This section identifies the personnel who have specific safety responsibilities on the project.

3.1 Personnel with Safety Responsibilities

Participating personnel are responsible for complying with safety procedures and for proactively making safety awareness part of their day-to-day conduct.

The following positions have specific corporate and project safety responsibilities:

- Health and Safety Manager (HSM)
- Corporate Safety and Health Officer (CSHO)
- Project Manager
- Site Safety Coordinator (SSC)
- Other project field staff

Appendix A (the SSHP) lists the specific personnel that will fill the stated positions for this project. Lines of authority are also detailed in Appendix A. See Section 4 of Appendix A for details.

All work is conducted under a Behavior Based and Loss Prevention System program. AHAs are a vital part of this work, as well as using Pre-Task Safety Planning (PTSP). All staff are accountable for their own health and safety, and have the authority to request a work stoppage when they feel unsafe behaviors, actions, or situations are occurring.

All work requiring a competent person per OSHA definition (29 CFR 1926.32(f)), will not be started until that competent person is designated and on site. *Competent person* means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Also refer to Appendix A, starting at Section 8.4.

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SECTION 4

Subcontractors and Suppliers

Subcontractors and suppliers providing services onsite will be subject to the safety provisions of this APP and those included in Appendix A. See Section 5.0 of Appendix A for details.

This APP has been constructed to directly track with the EM 385-1-1 2008 Appendix A "Minimum Basic Outline for Accident Prevention Plan."

CH2M HILL and any identified subcontractors shall conduct site work in accordance with this APP and associated documents. CH2M HILL shall address compliance with specific safety and health requirements, including those listed in Section 9, through safety meetings at the start of each shift. The specific safety and health requirements and site conditions will be reviewed with field personnel during these meetings. All parties shall also comply with the requirements of their respective Injury and Illness Prevention Programs (IIPPs).

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SECTION 5

Training

Site workers, supervisors, and managers will have training appropriate to their assigned duties and as specified in the SSHP and AHAs that are applicable to the work being performed. As specified in Section 4.0 of Appendix A, the SSC (who will also conduct the project safety and health inspections), will meet the training and indoctrination requirements prescribed in this APP and Appendix A, as well as the Hazardous Waste Operations and Emergency Response (HAZWOPER) supervisory training. All employees engaging in hazardous waste operations or emergency response 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 related to general excavation safety. As there is no entry planned into the excavations, competent person level training is not required. Personnel who have not met these training requirements shall not be allowed to engage in hazardous waste operations or emergency response activities.

Details of required training are specified in Section 6.0 of Appendix A.

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SECTION 6

Safety and Health Inspections

6.1 Inspection Details

The project SSC (specifically identified in the attached SSHP) will provide onsite safety and health inspections for this project. The SSC will meet the training and indoctrination requirements as prescribed in this APP and Appendix A, including HAZWOPER supervisory training, cardiopulmonary resuscitation (CPR), first aid, and blood-borne pathogen awareness training. The SSC will also have hands-on experience overseeing test pit excavation tasks. A designated competent person provided by the subcontractor will be present during excavation activities.

See Section 7.0 of Appendix A for further inspection details.

6.2 Recordkeeping

Project safety and health documentation will be maintained by the CSHOs for the respective companies. Records to be maintained (both in project files of each of the respective companies, and in the onsite field trailer) will include:

- HAZWOPER training certificates
- First aid and CPR training certificates
- Documentation of medical surveillance.
- Daily safety and health briefing acknowledgment forms
- Deficiency identification, correction, and follow-up documentation
- Accident reports and investigation records
- Respirator usage and fit training, as applicable
- Material Safety Data Sheet (MSDS) for sample preservatives

6.3 External Inspection/Certifications

External inspections or certifications will not be required for this work.

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SECTION 7

Accident Reporting

The SSC and HSM are responsible for all incidents reporting. Specific details are found in Section 9.0 of Appendix A.

Also, all major accidents shall be reported as soon as possible, but not more than 24 hours afterwards to the Contracting Officer/Representative (CO/COR). The contractor shall thoroughly investigate the incident and submit the findings of the investigation along with appropriate corrective actions to the CO/COR in the prescribed format as soon as possible, but no later than 5 working days following the incident. Implement corrective actions as soon as reasonably possible.

The following occurrences require immediate accident notification:

- A fatal injury
- A permanent total disability
- A permanent partial disability
- The hospitalization of three or more people resulting from a single occurrence
- Property damage of $200,000 or more

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SECTION 8

Plans Required By the EM 385-1-1 Safety Manual

Plans required by the EM 385-1-1 Safety Manual are presented below. Plans and procedures that are not applicable to this project are indicated as such with the nonapplicability rationale.

8.1 Layout Plan

Site layout will be provided prior to start of work.

8.2 Hospital Addresses and Route

Information on the nearest medical facility with emergency care is discussed in Section 8.6 of this APP, as well as in the front portion of Appendix A.

8.3 Emergency Response Plan

Details are provided in Section 12.1 of Appendix A. Medical support for this project will be provided onsite and offsite.

8.4 Man Overboard/Abandon Ship (Section 19.A.04)

NOT APPLICABLE: No work will be conducted aboard a ship or on water.

8.5 Onsite Medical Support

When two or more field staff are present onsite, at least two will have current certification in basic first aid and CPR, along with Blood-borne Pathogens annual training. Unless injured, the SSC will be the lead person to initiate any required first aid until offsite medical support can be engaged.

8.6 Offsite Medical Support

In the event of a medical emergency or if follow up to basic first aid is required, request emergency medical transport as opposed to transporting the injured person in a private or company vehicle where practical. The contact and location information for the nearest offsite medical support is presented below. A map indicating the travel route to the nearest medical facility with emergency care is presented in the SSHP.

Medical facility: **Maryview Medical**, 757-398-2200
3636 High Street
Portsmouth, VA 23707

Emergency #: In case of emergency contact the police, fire, and medical emergency dispatch at **757-396-3333.**

Further specific details are provided in Section 12.0 of Appendix A.

8.7 Alcohol and Drug Abuse Prevention

In order to maintain a drug and alcohol free workplace, the respective parties have established a drug and alcohol free awareness program to educate employees on 1) the danger of drug abuse and alcohol in the workplace; 2) the corporate drug and alcohol free workplace policy; 3) the availability of any drug and alcohol counseling, rehabilitation, and employee assistance programs; and 4) the penalties that may be imposed upon employees for drug abuse and alcohol violations and violations of the corporation's drug and alcohol free workplace. Such education includes the distribution of the drug- and alcohol-free workplace policy at the employment interview; a discussion of the drug- and alcohol-free workplace policy at the new employee orientation session; and inclusion of the company's drug- and alcohol-free workplace policy in the employee handbook and any other personnel policy publications.

CH2M HILL

The corporation has vital interests in ensuring a safe, healthy, and efficient working environment for our employees, their coworkers and clients we serve. The unlawful or improper use of controlled substances or alcohol in the workplace presents a danger to everyone. In addition, as a federal contractor we have a duty to comply with the requirement of the Drug-Free Workplace Act of 1988. For these reasons, we have established as a condition of employment and continued employment with the corporation the following drug- and alcohol-free workplace policy.

Employees are prohibited from reporting to work or working while using illegal or unauthorized substances. Employees are prohibited from reporting to work or working when the employee uses any drugs, except when the use is pursuant to a doctor's orders and the doctor has advised the employee that the substance does not adversely affect the employee's ability to safely perform his or her job duties. This does not include the authorized use of alcohol at corporate-sponsored functions or activities.

In addition, employees are prohibited from engaging in the unlawful or unauthorized manufacture, distribution, sale, or possession of illegal or unauthorized substances and alcohol in the workplace including on client paid time, on client premises, in client vehicles, or while engaged in client activities.

In accordance with the Drug-Free Workplace Act of 1988, employees must notify their supervisor of any criminal drug statute conviction for a violation occurring within the workplace within 5 days of such conviction.

Employment with the corporation is conditioned upon an employee's full compliance with the foregoing drug and alcohol free workplace policy. Any violation of this policy may result in disciplinary action, up to and including discharge. Furthermore, any employee who violates this policy who is subject to termination may be permitted in lieu of termination, at the corporation's sole discretion, to participate in and successfully complete

an appropriate treatment, counseling, or rehabilitation program as recommended by a substance abuse professional as a condition of continued employment and in accordance with applicable federal, state, and local laws.

Consistent with its fair employment policy, the corporation maintains a policy of nondiscrimination and reasonable accommodation with respect to recovering addicts and alcoholics, and those having a medical history reflecting treatment for substance abuse conditions. We encourage employees to seek assistance before their drug and alcohol use renders them unable to perform their essential job functions or jeopardizes the health and safety of themselves or others. The corporation will attempt to assist its employees through referrals to rehabilitation, appropriate leaves of absence, and other measures consistent with the corporation's policies and applicable federal, state, or local laws.

The corporation further reserves the right to take any and all appropriate and lawful actions necessary to enforce this drug and alcohol free workplace policy including, but not limited to, the inspection of corporation-issued lockers, desks, or other suspected areas of concealment. Employees are required to submit for "post accident" and "for cause" drug and alcohol screening following any incident. Random drug and/or alcohol screening is not a requirement of CH2M HILL unless required by a client.

8.7.1 Employee Assistance Program

Employees may participate in CH2M HILL's Employee Assistance Program (EAP) immediately upon hire. The EAP helps eligible employees and their immediate families with a wide range of problems, including marriage and family problems; emotional problems; alcoholism and alcohol abuse; drug abuse and dependency; financial problems; compulsive gambling; and eating disorders. Employee conversations and records under the EAP are strictly confidential. The administrative cost of this program is fully paid by the company.

8.8 Site Sanitation Plan (Section 02)

The following constitutes the Site Sanitation Plan for this project.

8.8.1 Drinking Water

A cooler containing an adequate supply of drinking water will be available at the site for the site workers and replenished each day. The cooler will be stored outside the exclusion zone on or near the field vehicles.

8.8.2 Toilets

Access to toilets is available on the facility within Building 1556.

8.8.3 Washing Facilities

Access to washing facilities is available at the same location as the toilets.

8.8.4 Food Service

No food service will be provided onsite. Site workers will either bring their food to the site to be consumed outside of the exclusion zone and only after proper decontamination, or will go offsite for food.

8.8.5 Waste Disposal

Any investigation-derived waste (IDW) will be stored, profiled, and disposed of in accordance with the project Work Plan.

Nonhazardous waste materials and rubbish will be contained in a garbage bag and disposed of with regular site sanitary service disposal or at an offsite disposal facility.

8.8.6 Vermin Control

No enclosed spaces are being constructed for this project and waste materials will be securely stored and transported offsite to provide vermin control.

8.9 Access and Haul Road Plan (Section 4.B)

NOT APPLICABLE. No access or haul roads are being constructed for this work.

8.10 Respiratory Protection Plan (Section 05.G)

Exposure to respiratory hazards is not anticipated for the scope of work being performed under this APP. Tasks related to excavation of test pits are not expected to generate hazardous dusts, fogs, fumes, mists, gases, smokes, or sprays. However, air monitoring of worker breathing zones during test pit activities will be conducted to confirm these conditions.

If air monitoring determines vapor concentrations exceed permissible exposure limits, workers, under the direct supervision of the SSC, will implement engineered controls to mitigate exposure. If engineered controls are not sufficient, work will be suspended, and Appendix A will be amended to include a specific Respiratory Protection Plan.

Only field personnel who have been medically cleared, fit-tested, and trained in the use and maintenance of the appropriate respiratory protection will be allowed to proceed with work under conditions requiring respiratory protection.

See Section 12.5 of Appendix A for specific details if required due to site hazards.

8.11 Health Hazard Control Plan (Section 06.A)

Safety and health hazards for performing work covered under this APP are identified through the preparation of AHAs (provided in Appendix A). Each AHA also indicates recommended controls for each identified potential safety/health hazard.

Appropriate personal protective equipment shall be supplied and used at all times for this project. Personal protective equipment (PPE) selection is based on the selected hazard control measures specified in the AHAs (Section 12.6 of Appendix A).

8.12 Hazard Communication Program

Chemical products may occasionally be stored and used on the project site, and/or stored on field vehicles. Examples of chemicals include hydrogen peroxide, gases used to calibrate sensing equipment, and lubricants. Other chemicals may be used as well. These chemicals

may pose hazards including flammability, corrosiveness, reactivity and incompatibility, and toxicity. Because of these potential hazards, special precautions must be taken including:

- Tracking and controlling hazardous chemical products received and stored.
- A hazard evaluation of each chemical product, using such sources as MSDSs.
- Informing workers of the potential hazards through training, MSDSs, and appropriate labeling of containers.
- Air monitoring in the case of potential respiratory hazards.
- Design and implementation of engineering controls such as ventilation and source control.
- Developing storage, handling, housekeeping, and decontamination procedures.
- Assigning appropriate personal protective equipment such as eye and face protection, gloves, body protection, and respirators. Respirator usage by CH2M HILL or subcontractor employees will be in accordance with the employees' IIPP.
- Training personnel handling chemicals on safe handling procedures, personal protective equipment, and emergency and spill cleanup procedures.

Hazardous substances that may be encountered in soil on the project site are not covered by this program. Appendix A addresses chemical and other hazard assessment and mitigation associated with site contaminants including investigation and remediation of waste materials.

8.12.1 Chemicals Covered by this Project Program

For the purposes of this program, chemicals considered to be hazardous are those:

- Listed in the OSHA Permissible Exposure Limits.
- Included in the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values for Chemical Substances (2007).
- Found to be suspected or confirmed carcinogens by the National Toxicology Program in the latest edition of the Annual Report on Carcinogens, or by the International Agency for Research on Cancer (IARC) in the latest edition of the IARC monographs.

No chemicals are expected to be used during field activities as part of this scope of work.

Exceptions to this policy, by OSHA definition, include consumer products that are used in a consumer fashion and pose no more of an exposure hazard than a consumer would face.

8.12.2 Training

Employees who work with or are potentially exposed to hazardous chemicals will receive initial training on the elements of this Hazard Communication Program, including the following:

- Content and requirements of this Program and the OSHA Hazard Communication Standard

- The potential physical and toxic hazards of the chemicals used in their work location, and especially the hazards of non-routine tasks
- Chemical inventory and tracking procedures
- Location of this Hazard Communication Program, the chemical inventory, and the MSDSs
- How to read Material Safety Data Sheets
- Methods to detect the release of or exposure to chemicals in their area
- Content and interpretation of labels
- Safe use and handling of chemicals
- Required personal protective equipment
- Basic emergency procedures

Additional training will be provided on an annual basis, whenever a new chemical is added to the workplace, and when non-routine tasks are planned.

8.12.3 Labeling

The SSC will ensure that hazardous chemicals brought onto the site are properly labeled with at least the following information, in English, as a minimum, and the language of non-English-speaking employees who may use the product, as appropriate. This labeling includes the following:

- The identity of the product and chemical components
- Appropriate hazard warnings
- Name and address of the manufacturer, importer or other responsible party

Hazard warnings will also be transmitted in the form of the National Fire Prevention Agency (NFPA) or Hazardous Materials Information System (HMIS) color-coded warnings, which are ranked on a 0 to 4 scale. When chemicals are transferred to a portable container, labels containing chemical identification and hazard warnings must be affixed to the portable container.

8.12.4 Current Onsite Inventory

There is currently no inventory of hazardous materials stored on site for this project.

8.13 Process Safety Management Plan (Section 06.B.04)

NOT APPLICABLE. This work does not include chemical management.

8.14 Lead Abatement Plan

NOT APPLICABLE. Lead is not known to be an exposure concern for this project.

8.15 Asbestos Hazard Control Plan

NOT APPLICABLE. Asbestos is not known to be an exposure concern for this project.

8.16 Radiation Safety Program (Section 06.E.03.a)

NOT APPLICABLE. Radiation hazards not anticipated for this work.

8.17 Abrasive Blasting (Section 06.H.01)

NOT APPLICABLE. This work does not involve abrasive blasting.

8.18 Heat/Cold Stress Monitoring Plan (Section 06.I.02)

See Sections 13.2.4 and 13.2.5 of Appendix A.

8.19 Crystalline Silica Monitoring Plan (Section 06.M)

NOT APPLICABLE. Crystalline silica is not known to be an exposure concern for this project.

8.20 Night Operations Lighting Plan

NOT APPLICABLE. Work will not be conducted at night.

8.21 Fire Prevention Plan

See Section 12.10 of Appendix A for more details.

8.22 Wildland Fire Management Plan

NOT APPLICABLE. Wildland fires are not anticipated as a risk for this work.

8.23 Hazardous Energy Control Plan

NOT APPLICABLE. Servicing or maintenance on a system where the unexpected energizing, startup, or release of kinetic or stored energy that could cause injury or damage to occur is not part of this project.

8.24 Critical Lift Procedures

NOT APPLICABLE. No critical lifts will be performed under this scope of work.

8.25 Contingency Plan for Severe Weather

NOT APPLICABLE. Development of a severe weather contingency plan is related to marine operations and therefore does not apply to this scope of work. However, field work on this project will be suspended in the event of severe weather that could impact field activities. Such work suspension will be communicated immediately to the Project Manager.

8.26 Float Plan (Section 19.F.04)

NOT APPLICABLE. This work is not over water or requiring use of a boat.

8.27 Fall Protection Plan

See Section 13.1.6 of Appendix A for controls in place related to fall exposures during the excavation work.

8.28 Demolition Plan (Engineering and Asbestos Surveys)

NOT APPLICABLE. This work does not involve demolition.

8.29 Excavation/Trenching Plan (Section 25.A.01)

See Section 13.1.6 of Appendix A related to excavation hazards and controls.

8.30 Emergency Rescue (Tunneling)

NOT APPLICABLE. Tunneling and other underground construction is not necessary for this work.

8.31 Compressed Air Plan

NOT APPLICABLE. Compressed air usage is not necessary for this work, except for calibration gases of very small amounts.

8.32 Formwork and Shoring Erection and Removal Plans

NOT APPLICABLE. This work does not involve forming or shoring.

8.33 Jacking Plan (Lift) Slab Plans

NOT APPLICABLE. These plans are associated with concrete masonry work, which is not part of this project.

8.34 Steel Erection Plan

NOT APPLICABLE. This work does not involve steel erection.

8.35 Safety and Health Plan

An SSHP is attached to this APP as Appendix A. The SSHP meets the requirements for work on hazardous waste sites in accordance with 29 CFR 1910.120 and 29 CFR 1926.65.

Detailed site-specific hazards and controls are provided in Appendix A and AHAs.

8.36 Blasting Plan

NOT APPLICABLE. This work does not involve blasting.

8.37 Diving Plan

NOT APPLICABLE. This work does not involve diving.

8.38 Workplace Fire Hazards

8.38.1 Potential Ignition Sources

The only potential ignition source is dry vegetation or other combustible material contacting hot engine or exhaust parts of the support vehicles.

8.38.2 Fire Suppression Equipment

The field vehicles will be supplied with a Class ABC fire extinguisher.

8.38.3 Responsibility Assignments

Equipment maintenance (truck, fire extinguisher, and sampling equipment) falls under the responsibility of the field staff and will be overseen by the SSC including an inspection of vehicles and fire extinguishers to ensure they are in proper condition.

The SSC will ensure that vehicles are not brought into immediate proximity to dried vegetation that could come in contact with vehicle ignition sources (that is, the undercarriage). The SSC will also ensure proper site housekeeping including collection and disposal of any rubbish.

8.39 Confined Space

NOT APPLICABLE. Entry or proximity to confined space is not required for this project.

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SECTION 9

Risk Management Processes

The specific processes are addressed in multiple sections of Appendix A, depending on whether classified as physical, chemical, or other type (see Sections 12 through 15), as well as the task-specific AHAs included in Appendix A.

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Appendix A
Site Safety and Health Plan

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Final

Site Safety and Health Plan
St. Juliens Creek Annex Site 2

St. Juliens Creek
Chesapeake, Virginia

Contract Task Order 0129

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3 Chemical Specific Training Form
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5 Project Activity Self-Assessment Checklists
6 Project-Specific Material Safety Data Sheets
7 Initial Medical Treatment Form
8 Project Activity Hazard Analyses
9 Pre-Task Safety Plan
10 Safe Work Observation Form
11 Loss/Near-Loss Investigations
12 Employee Training Records

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Acronyms and Abbreviations

µg/L	microgram(s) per liter
AHA	activity hazard analysis
APP	Accident Prevention Plan
APR	Air Purifying Respirator
BBLPS	Behavior Based Loss Prevention System
bgs	below ground surface
CIH	Certified Industrial Hygienist
CGI	Combustible Gas Indicator
CFR	Code of Federal Regulations
cm	centimeter(s)
COC	contaminant of concern
COR	Contracting Officers Representative
CPR	cardiopulmonary resuscitation
CSE	Confined Space Entry
CSHO	Compliance Safety and Health Officer
CSIR	Contractor Safety Incident Report
CSP	Certified Safety Professional
dBA	decibel(s) (A-weighted scale)
DEET	N,N-diethylmetatoluamide
DFARS	Defense Federal Acquisition Regulation Supplement
DOT	Department of Transportation
ECC	Environmental Compliance Coordinator
EMR	Experience Modification Rate
ESSD	Explosives Safety Submission Determination
ERP	Emergency Response Plan
°F	degrees Fahrenheit
FA	first aid
FEAD	Field Engineering and Architecture Department
FID	flame ionization detector
FSI	Field Safety Instructions
ft	foot(feet)
GFCI	ground fault circuit interrupter
GPR	ground penetrating radar
GW	groundwater
H&S	Health and Safety
HAZCOM	Hazard Communication
HAZWOPER	Hazardous Waste Operations and Emergency Response

HR	Human Resources
HS&E	Health, Safety, and Environment
HSE&Q	health, safety, environment, and quality
HSM	Health and Safety Manager
IDW	investigation-derived waste
IRF	Incident Report Form
kV	kilovolt(s)
LEL	Lower Explosive Limit
LPO	Loss Prevention Observation
MEC	munitions and explosives of concern
mg/kg	milligram(s) per kilogram
mm	millimeter(s)
MPPEH	Material Presenting a Potential Explosive Hazard
MSA	Mine Safety Association
MSDS	Material Safety Data Sheet
MSHA	Mine Safety and Health Administration
NAICS	North American Industry Classification System
NIOSH	National Institute for Occupational Safety and Health
NLI	Loss and Near Loss Investigation
NOSSA	Naval Ordnance Safety and Security Activity
NSC	National Safety Council
OE	ordnance and explosives
OSHA	Occupational Safety and Health Administration
PAH	polycyclic aromatic hydrocarbons
PEL	Permissible Exposure Limit established by OSHA
PID	photo ionization detector
PM	Project Manager
PPE	personal protective equipment
ppm	part(s) per million
PTSP	Pre-Task Safety Planning
RCA	Root Cause Analysis
RF	radio frequency
RPM	Remedial Project Manager
SB	soil boring
SOP	standard operating procedure
SOW	Scope of Work
SPA	Safety Program Assistant
SSC	Site Safety Coordinator
SSHO	Site Safety & Health Officer
SSHP	Site Safety and Health Plan
STS	standard threshold shift

TBD	to be determined
TLV	Threshold Limit Value
USACE	U.S. Army Corps of Engineers
UST	Underground Storage Tank
UXO	unexploded ordnance

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Health and Safety Plan Statement

Site Safety and Health Plan

Introduction

This Site Safety and Health Plan (SSHP) presents the hazards known or anticipated to be present during the contracted tasks (see Section 2.4). The scoped activities are planned for completion by December 31, 2010. This SSHP will be used by CH2M HILL to identify and mitigate task-specific hazards and select appropriate health and safety protective measures.

The SSHP contains information pertinent to the general conditions at the excavation sites, such as general site information, hazard evaluation and control, personnel responsibilities and requirements, a general description of personal protective equipment, customary decontamination procedures, and emergency response procedures. Onsite personnel must review the SSHP and sign an agreement to comply with its provisions prior to commencing onsite work. The SSHP is considered an operational document that is subject to revisions in response to various site-specific conditions that may be encountered. However, these documents may be modified or updated only with the approval of the Health and Safety Manager (HSM) and Project Manager (PM).

Policy

This document was written based on the anticipated hazards and expected work conditions, and applies to field activities to be performed under the Work Plan. Applicability of this SSHP extends to all CH2M HILL employees, subcontractors and visitors entering the site.

This project-specific SSHP will, at a minimum, meet the requirements under Occupational Safety and Health Administration (OSHA) Standard *29 Code of Federal Regulations* (CFR) 1910 & 1926, and the U.S. Army Corps of Engineers (USACE) EM 385-1-1 (USACE, 2008), Safety - Safety and Health Requirements.

Pre-entry Requirements

During site mobilization, the Site Safety Coordinator (SSC) will perform a reconnaissance of each site as identified in the site-specific Work Plan to evaluate and determine the chemical, physical, and environmental hazards; establish or confirm emergency points of contact and procedures; and review any other issues deemed necessary to address site health and safety. The SSC will then conduct a health and safety briefing with the site personnel to discuss data obtained from the previous site reconnaissance, provisions outlined in this SSHP, and appropriate health and safety procedures and protocols.

CH2MHILL

Project HS&E Change Management Form

*This evaluation form should be reviewed on a **continuous** basis to determine whether the current site health and safety plan adequately addresses ongoing project work, and should be completed whenever new tasks are contemplated or changed conditions are encountered.*

Project Task: St. Juliens Creek Annex

Project Number: 314790 Project/Task Manager: Janna Staszak

	Evaluation Checklist	Yes	No
1.	Has the CH2MHILL staff listed in the original SSHP/FSI changed?		
2.	Has a new subcontractor been added to the project?		
3.	Is any chemical or product to be used not listed in Attachment 2 of the plan?		
4.	Have additional tasks been added to the projects that were not originally addressed in Section 2.6 of the plan?		
5.	Have new contaminants or higher than anticipated levels of original contaminants been encountered?		
6.	Has other safety, equipment, activity, or environmental hazard been encountered that are not addressed in Section 2.7 of the plan?		

If the answer is "YES" to Questions 1-3, an SSHP revision is NOT needed. Please take the following actions:

- 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 project contract administrator that subcontractor safety performance has been reviewed and is acceptable
- Confirm with the CH2M HILL Health, Safety, and Environment (HS&E) Manager that subcontractor safety procedures have been reviewed and are acceptable.

If the answer is "YES" to Questions 4-6, an SSHP revision MAY BE NEEDED. To determine if revision is needed please contact HS&E directly or complete the field project start-up form at http://www.int.ch2m.com/hsdocgen/fppricing.asp.

Route to Hospital Map

In case of an emergency **contact the police, fire, and medical emergency dispatch for the facility by dialing 757-396-3333**. If medical care is needed, but it is not an emergency, the name, address, phone number, and map to the nearest hospital is provided below.

Maryview Medical
3636 High Street
Portsmouth, VA
(757) 398-2200

The route from the gate to the hospital is as follows:

1. Leave main gate of Annex and take left onto Victory Blvd.
2. At route 17 (George Washington Highway) take a right and go north.
3. Make left onto Frederick Blvd, and continue on Frederick until it dead ends.
4. Make left onto High Street, the Maryview Medical Center is on the right at the first light.

See reverse for the hospital route map.

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0
800 m
2400 ft
High St
London Blvd
London Blvd
Crawford Pkwy
Portsmouth
City Park
Airline Blvd
Bart St
Wary St
Lincoln St
Norfolk Naval Shipyard
Greenwood Dr
Greenwood Dr
Elmhurst Ln
Victory Blvd
Victory Blvd
Ride-A-Wee Golf Course
Cavalier Blvd
St Julien Naval Depot

Project Contacts List

This form shall be completed and updated as necessary by the Site Safety Coordinator. A copy of the completed form shall be posted in a prominent location onsite.

Client: Department of the Navy

Project/Site Name: CTO-0054/St. Juliens Creek Annex

Project Number: 314790

Project Contacts	Name	Phone Number	Cell Number
CH2M HILL Project Manager	Janna Staszak	757-671-6256	(757) 268-6136
CH2M HILL Site Safety Coordinators	Mark Ost	757-671-6247	
Principal Technologist/Sr. Project Engineer	N/A		
CH2M HILL Health and Safety Manager (HSM)	Mark Orman	414-847-0597	414-712-4138
CH2M HILL Environmental Compliance Coordinator (ECC)	Nancy Ballantyne	303-885-9954	

CH2M HILL Subcontractors Contact List

Subcontractor	Primary Task	Site Manager	Phone	Safety Rep.	Phone
Agviq,LLC	Excavation of test pits	Jason Chebetar	757-318-9426	Jason Chebetar	757-318-9426
TBD	Investigation-derived waste (IDW)	TBD	TBD	TBD	TBD

Client Contractors Contact List

Contractor Name	Primary Task	Contact	Phone
None			

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SECTION 1

Signature Sheet

This Site Safety and Health Plan 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, purposes, dates, and personnel specified, and must be amended if those conditions change.

1.1 Original Plan

Written By: Date: 10 December 2010

Approved By: Date: 10 December 2010

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SECTION 2

Background Information

2.1 Project Information and Description

Project Number:	314790
Contract Number:	N62470-02-D-3052
Client:	Department of the Navy
Project Name and Address:	CTO-0054/St. Juliens Creek Annex
Project Manager:	Janna Staszak
CH2M HILL Office:	VBO
Date (SSHP) Prepared:	03 September 2010
Dates of Site Work:	TBD

2.2 Site Description and History

Site 2 is a former waste disposal area covering approximately 5.7 acres. Mixed municipal wastes, abrasive blast media (ABM), waste ordnance, organics (including solvents), and inorganics were reportedly disposed of at Site 2. Operations at Site 2 began in 1921 and continued until sometime after 1947. Initially, refuse was burned openly on site and was used to fill in the adjacent swampy area (Site 2 inlet). In 1942, an incinerator was installed to replace the open burning practices.

Former Buildings 278/279, located just north of and adjacent to the Site 2 inlet, were designated as IR Site 17. Lead-acid battery maintenance reportedly began at Buildings 278/279 in 1954, and the waste acid electrolyte was collected and hauled offsite for disposal. Buildings 278/279 were demolished in 2003 but the concrete foundation remains in place. In 1989, the site was used to store heavy equipment and machinery. Construction debris (concrete, brick, and wood), as well as ABM, are visible on the ground surface. Because of its proximity to Site 2, the SJCA Project Management team agreed to close Site 17 with no further action under the IR program and expand the Site 2 boundary to include its extent.

Currently, the site is bounded to the north by a parking lot, to the east by a grass-covered field, to the west by a storm water drainage ditch and Cradock Street, and to the south by St. Juliens Road and St. Juliens Creek. A water body (inlet) surrounded by brush, trees, and grass that is directly connected to St. Juliens Creek through a 36-inch culvert is located in the center of Site 2. This inlet is tidally influenced and drains surface water from adjoining land into the creek. Grass-lined drainage ditches (approximately 2 to 3 feet [ft] deep) originate north of Site 2 along Cradock Street and discharge storm water runoff to the inlet. An underground storm drainage system originates approximately 1,000 ft northeast of the Site 2 area, within IR Site 21, and outlets to the north end of the inlet.

2.3 Contractor Accident Experience (EMR)

CH2M HILL's exceptional safety performance greatly exceeds the industry average. Our injury and illness rates and our Experience Modification Rate (EMR) have decreased dramatically over the past 5 years.

Following are examples of our achievements:

- An EMR of less than 1.0 over the past 5 years, which is the average accident injury experience for the industry, with a 2009 EMR of 0.72 (or 72 percent) of the industry average (NAICS 54133).

Category	2005	2006	2007	2008	2009
Employee Hours	11,443,595	11,997,887	13,744,013	15,290,819	14,673,402
Experience Modification Rate (EMR)	0.83	0.76	0.74	0.66	0.72
Fatalities	0	0	0	0	0
Recordable Incidents	46	31	27	48	20
Recordable Incident Rate *	0.80	0.52	0.39	0.63	0.27
Recordable Incident Rate Average *	1.5	1.5	1.4	1.4	1.1
Lost Workday (LWD) Incidents (DART) **	12	12	7	11	3
LWD Incident Rate (DART)	0.21	0.20	0.10	0.14	0.04

* SIC code 871 (Engineering and Management Services) used for rate averages prior to 2003. Thereafter, NAICS code 54133 (Engineering Services) used for rate averages.
** Lost Workday incidents include cases involving days away from work (DAW) or Restricted Duty (RD). This is also known as DART (Days Away, Restricted or Transferred cases).

2.4 Description of Work

2.4.1 General Overview

Utility clearance will be performed prior to test pit excavation at Site 2. Test pits will be excavated to waste or groundwater, whichever is encountered first, visually inspected for debris, and backfilled with excavated soils.

As this site is listed as a Superfund site, all work related to soil disturbance will be completed under hazardous waste operations or emergency response 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. As there is no entry planned into the excavations, competent person level training is not required. Personnel who have not met these training requirements shall not be allowed to engage in hazardous waste operations or emergency response activities.

All solid and liquid material generated during investigation will be backfilled into trench and compacted. During the field investigation, CH2M HILL personnel will be responsible for placing all IDW in labeled storage containers, preparing wastes for shipment, and arranging for transportation for the waste. CH2M HILL will provide waste characterization results to the Navy. The Navy will determine the ultimate disposal method. The Navy will sign all shipping manifests.

2.5 Tasks Requiring Activity Hazard Analysis

Activity hazard analyses (AHAs) are required for all definable work tasks. As the project gets closer to initiation of field operations, additional information such as identification of subcontractor, specific equipment and/or tools is obtained; the AHAs will be updated accordingly. The planned field tasks requiring AHAs are as follows:

- 02 Excavation and visual inspection of test pits (subcontractor task specific to excavation portion, CH2M HILL portion will address hazards of visual inspection)
- Backfilling and grading of test pits (subcontractor task)

Refer to Section 17.1 for information regarding AHA preparation, training, and use for Utility clearance, Excavation and visual inspection and all other tasks associated with this project. The project AHAs for the hazardous work operations listed above are included in Attachment 8.

2.6 Tasks to be Performed under This Plan

2.6.1 Description of Tasks

Excavation and Visual Survey of Waste Materials

Test pits will be excavated in order to further delineate the waste boundary at the site. The test pits will be excavated using a backhoe or similar excavation equipment. To minimize contact with waste and potential MEC, test pitting will begin at the currently estimated waste boundary, which is believed to be conservative, and proceed west toward the inlet. If waste is encountered, excavation will stop and a new test pit will be excavated approximately 20 feet (adjustable based on field observations) to the east (away from the Site 2 inlet). This process will continue until no waste is observed. Because it is possible that waste may be present under a clean fill layer, test pitting will continue vertically until the water table is reached, or to a maximum of 5 feet below ground surface (bgs), before a test pit will be considered free of waste. Road materials (for example, asphalt or gravel) and concrete that is clearly associated with the former building foundation will not be considered waste. Following identification of a waste-free test pit, the field crew will refine the waste boundary and excavate a new test pit approximately 10 feet (adjustable based on field observations) to the west (toward the Site 2 inlet). Following identification of waste, the field crew will refine the waste boundary and excavate a new test pit approximately 10 feet (adjustable based on field observations) to the east (away from the Site 2 inlet). Test pitting will continue until the waste boundary has been refined to the closest extent practicable. Following test pit activities at each location, the material excavated will be placed back into the excavated pit. Following completion of all activities, the site will be restored to its original condition, including seeding of disturbed areas with native grasses.

2.7 Task Hazard Analysis

The following table identifies the specific task to be performed on this project and the potential significant hazards associated with each task. Additional “general” hazards are identified in Section 13.

Potential Hazards	Project Activities		
	Excavation and visual survey	Utility Clearance	Grading and Backfill
Biological hazards	X	X	X
Buried/Overhead Utilities	X		X
Chemical Hazard-Dermal/ Inhalation	X		X
Dust Hazard (Silica/Metals)	X		X
Excavation/trenching	X		
Fire/Explosion Hazards	X		X
Hand & Power Tools		X	
Heavy Equipment	X		X
Manual Lifting		X	
MEC	X		
Noise	X		X
Pressure Washing/ Equipment Decontamination			X
Suspended Loads	X		
Vehicle Traffic	X	X	X
Visible Lighting	X	X	X
Weather	X	X	X

SECTION 3

Statement of Safety & Health Policy

CH2M HILL Companies, Ltd.
Health, Safety, Environment, and Quality Policy

It is CH2M HILL's vision to achieve excellence in and be a leader of health, safety, environment, and quality (HSE&Q) performance throughout our global operations. We fulfill the expectations of our clients, staff, and communities through safe, innovative, environmentally sound practices in all our operations.

The following core principles guide us and create a work place that encourages participation from all staff:

- Our management provides leadership and resources that enhance employee awareness and participation and that create a safe and environmentally sound work environment.
- We integrate HSE&Q processes in our business management and project delivery systems, ensuring systematic recognition and reduction of risks to people and the environment, including pollution prevention.
- We require our subcontractors to achieve excellence in HSE&Q.
- We have established occupational health and safety regulations and environmental laws as our minimum acceptable criteria.
- We continuously improve the effectiveness of our HSE&Q programs by setting and reviewing objectives and targets, and report performance metrics to our clients and staff.
- We believe that each employee is responsible for HSE&Q and accountable for its success or failure.
- We encourage staff to exercise sound HSE&Q practices in all aspects their lives, not just at work.

R.R. Peterson, President and CEO CH2M HILL Companies, Ltd.

J. A. Ahgam, President Transportation Business Group

K.F. Durant, President Industrial Design Corporation

D. S. Evans, President Operations Management International/Water Business Group

J.J. Ferris, President, Energy, Environment and Systems Business Group

M. D. Kennedy, President Regional Operations

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SECTION 4

Responsibilities and Lines of Authority

4.1 Client

Client Name	Department of the Navy
Contact Name	Walter Bell
Job Title	Remedial Project Manager (RPM)
Phone Number	757-341-0484

4.2 Project Management Staff

4.2.1 Project Manager

PM Name	Janna Staszak
Office	Virginia Beach, VA
Phone Number	757-671-6256

The project manager is responsible for providing adequate resources (budget and staff) for project-specific implementation of the HS&E 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 HS&E roles and responsibilities in contract and subcontract agreements (including flow-down requirements to lower-tier subcontractors)
- Select safe and competent subcontractors
- Obtain, review, and accept or reject subcontractor prequalification questionnaires
- Ensure that acceptable certificates of insurance are secured as a condition of subcontract award
- Incorporate HS&E information in subcontract agreements, and ensure that appropriate site-specific safety procedures, training, and medical monitoring records are reviewed and accepted prior to the start of subcontractor's field operations
- Maintain copies of subcontracts and subcontractor certificates of insurance, bond, contractor's license, training and medical monitoring records, and site-specific safety procedures are in the project file accessible to site personnel
- Provide full-time oversight of subcontractor HS&E practices per the site-specific safety plan
- Manage the site and interface with third parties in a manner consistent with our contract and subcontract agreements and the applicable standard of reasonable care

- Ensure that the overall, job-specific HS&E goals are fully and continuously implemented
- Issue Site Safety Rules consistent with this plan

4.2.2 Project Certified Safety Professional and Health and Safety Manager

Name	Mark Orman
Office	Milwaukee, WI
Phone Number	414-847-0597

The project-certified Certified Safety Professional/Health and Safety Manager (CSP/HSM) is responsible for the following:

- Review and accept or reject subcontractor prequalification questionnaires
- Review and accept or reject subcontractor training records and site-specific safety procedures prior to start of subcontractor's field operations
- Support the Site Safety Coordinator's oversight of subcontractor (and lower-tier subcontractors) HS&E practices and interfaces with onsite third parties per this site specific SSHP/Accident Prevention Plan.
- Provide project oversight to assess site conditions and review HS&E program implementation
- Assist project team with program implementation

4.2.3 Project Site Safety Coordinator Responsibilities

Name	Mark Ost
Office	Virginia Beach, VA
Phone Number	757-671-6247

The SSC will have completed at least an OSHA, or equivalent, 30-hour construction safety course. The project SSC shall be onsite for the duration of construction activity and share in the responsibility to:

- Make safety integral to each operation by promoting worker involvement in the work planning and hazard identification process.
- Maintain active and visible involvement using open communication with employees regarding safety items on the project.
- Review and understand contractual obligations regarding HS&E.
- Manage the site and interface with third parties in a manner consistent with our contract agreements and the applicable standard of reasonable care.
- Verify this SSHP is current and amended when project activities or conditions change.
- Verify site personnel and subcontractor supervision read this SSHP and sign the Employee Signoff Form in Attachment 1 prior to commencing field activities.

- Verify and document that team members have completed any required specialty training (for example, fall protection, confined space entry) and medical surveillance.
- Assure that the workforce is trained and qualified.
- Conduct an HS&E orientation for all team members prior to entering the project work areas.
- Verify compliance with the requirements of this SSHP and applicable contractor SSHP, USACE EM 385-1-1 Manual, and federal, state, and local regulations.
- Act as the project "Hazard Communication Coordinator" and perform the responsibilities outlined in this plan.
- Act as the project "Emergency Response Coordinator" and perform the responsibilities outlined in this plan.
- Post required information and job-site posters as required at sites where project field offices, trailers, or equipment-storage boxes are established.
- Verify that safety meetings are conducted and documented in the project file as needed throughout the course of the project (for example, as tasks or hazards change).
- Verify that project health and safety forms and permits are being used as outlined in this plan.
- Perform assessments of contractor HS&E practices per the task specific AHAs, this plan and verify that project activity self-assessment checklists are being used. Provide weekly HS&E project reports to the Project Manager.
- Verify that project files available to site personnel include copies of executed contracts and certificates of insurance, bond, contractor's license, training and medical monitoring records, and site-specific safety procedures prior to start of subcontractor's field operations.
- Verify appropriate PPE use, availability, and training.
- Conduct safety briefings weekly for team members and subcontractor supervisors.
- Notify a Human Resources representative and Program Certified Industrial Hygienist (CIH)/HSM of injuries and follow up on injured employee's progress.
- Conduct accident investigations including root cause analysis.
- Maintain HS&E records and documentation.
- Facilitate USACE inspector or other government agency inspections including accompanying inspector and providing all necessary documentation and follow-up.
- Deliver field HS&E training as needed based on project-specific hazards and activities.
- Ensure that programs are effectively functioning to prevent and control hazards on the project.

4.2.4 Subcontractor Site Safety Coordinator Responsibilities

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

- Provide appropriately trained personnel to serve as Site Safety Coordinators.
- Comply with this Accident Prevention Plan (APP), USACE EM 385-1-1 Manual, Recognized Safety Rules, or other local safety standards.
- Comply with project and owner safety requirements.
- Actively participate in the project safety program and attend all required safety meetings.
- Maintain a first aid kit onsite.
- Maintain and replace safety protection systems damaged or removed by the subcontractor's operations.
- Notify the HSM of any accident, injury, and/or incident immediately and submit reports to the prime contractor within 24 hours.
- Install contractually required general conditions for safety (for example, handrail, fencing, fall protection systems, floor opening covers, etc.).
- Conduct and document weekly safety inspections of project-specific tasks and associated work areas.
- Conduct daily employee safety toolbox meetings and provide copies to the HSM.
- Conduct site-specific orientations for all subcontractor and client employees as requested.

4.2.5 Subcontractor Site Safety Coordinator

The subcontractor will provide an SSC who will have completed at least an OSHA, or equivalent, 10-hour construction safety course. Each SSC is responsible for the following as a minimum:

- Make safety integral to each operation by promoting worker involvement in the work planning and hazard identification process.
- Maintain active and visible involvement using open communication with employees regarding safety items on the project site.
- Coordinate with the HSM regarding subcontractor operational performance, and third party interfaces.
- Verify appropriate PPE use, availability, and training.
- Conduct and document weekly safety inspections of project-specific tasks and associated work areas.
- Conduct daily employee safety toolbox meetings and provide copies to the HSM.

- Verify that project health and safety forms and permits are being used as outlined in the SSHP and APP.
- Attend daily health and safety meetings to discuss new issues, health and safety compliance, lessons learned, and any open deficiencies noted on the project.

4.2.6 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 and 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.

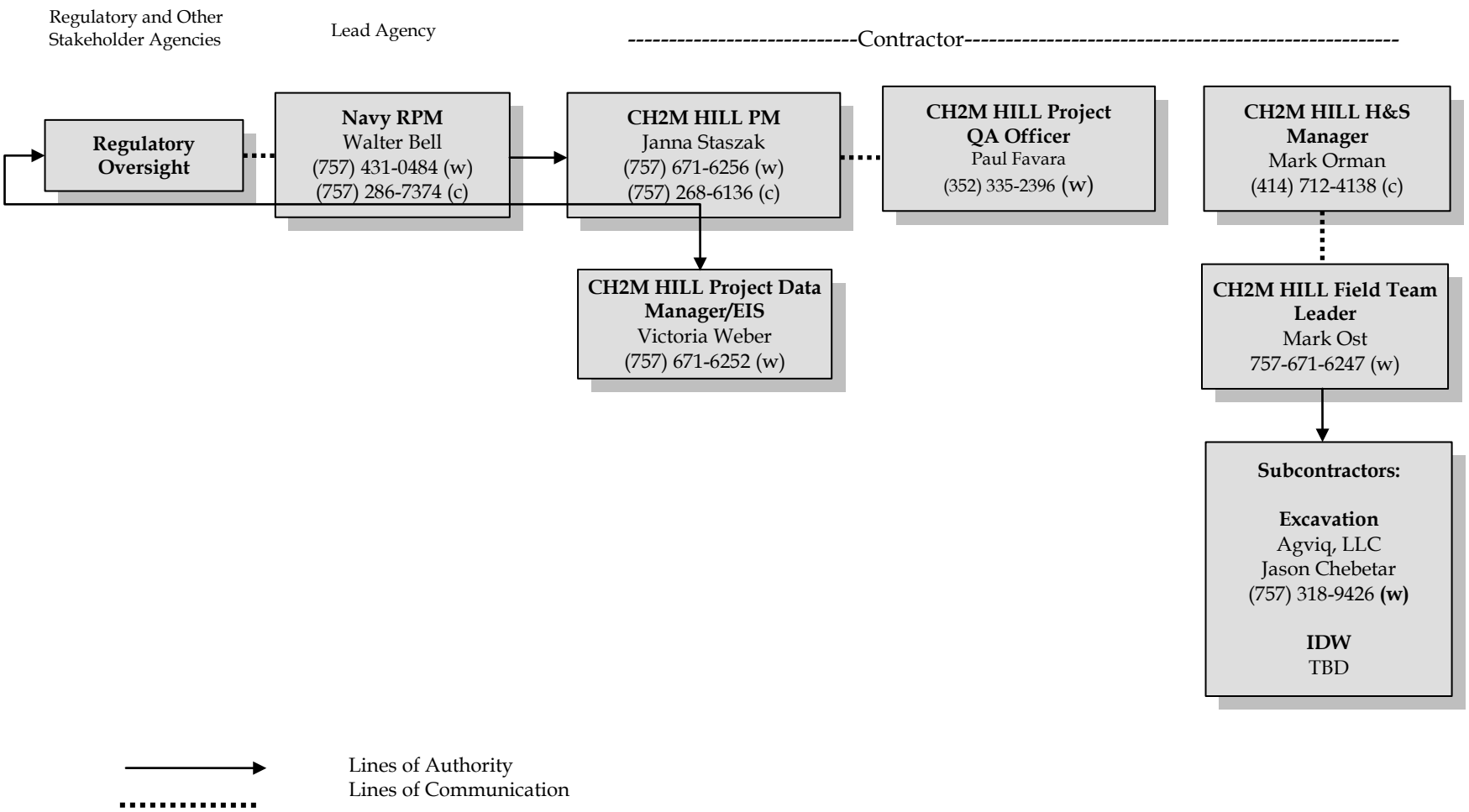
Each employee is responsible for the following performance objectives:

- 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 HS&E orientation prior to being authorized to enter the project work areas.

4.2.7 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 their authority to do so.

4.3 Lines of Authority



SECTION 5

Subcontractors and Suppliers

(Reference CH2M HILL Standard Operation Procedure [SOP] HSE-215, *Contracts, Subcontracts and HSE&Q Management Practices*)

5.1 Subcontractors

Excavation

Subcontractor:	Agviq, LLC
Contact Name:	Jason Chebetar
Telephone:	(757) 318-9426

IDW

Subcontractor:	TBD
Contact Name:	TBD
Telephone:	TBD

5.2 Subcontractor Responsibilities

The subcontractor listed above is covered by this SSHP and APP and must be provided a copy of this document. If subcontractors have specific hazards associated with their type of work that are not covered by this SSHP and APP, the subcontractors are responsible to submit the procedures to cover these hazards to the prime contractor for review before the start of field work. Minimal submittals are specific AHAs related to the subcontractor tasks.

Subcontractors must comply with the established SSHP(s) of the project. The HSM should verify that subcontractor employee training, medical clearance, and fit test records are current and must monitor and enforce compliance with the established plan(s). The prime contractor's oversight does not relieve subcontractors of their responsibility for effective implementation and compliance with the established plan(s).

5.3 Health and Safety Interaction with Subcontractor

Team members should continuously endeavor to observe subcontractors' safety performance. This endeavor should be reasonable, and include observation of hazards or unsafe practices that are both readily observable and occur in common work areas. The prime contractor is not responsible for exhaustive observation for hazards and unsafe practices. In addition to this level of observation, the SSC is responsible for confirming subcontractor performance against both the subcontractor's task-specific safety procedures (that is, AHAs) and applicable self-assessment checklists. Self-assessment checklists, provided in this document in Attachment 5, are to be used by the HSM and designated SSCs to review performance.

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

- Brief subcontractor and employees on the provisions of this plan, and require them to sign the Employee Signoff Form, included in Attachment 1.
- Request the subcontractor to brief project team on the hazards and precautions related to their work.
- When apparent non-compliant or unsafe conditions or practices are observed, notify the subcontractor safety representative and require corrective action—the subcontractor is responsible for determining and implementing necessary controls and corrective actions.
- When repeat noncompliant or unsafe conditions are observed, notify the subcontractor safety representative and stop affected work until adequate corrective measures are implemented.
- When an apparent imminent danger exists, immediately remove all affected personnel, notify the subcontractor safety representative, stop affected work until adequate corrective measures are implemented, and notify the PM and HSM as appropriate.
- Document all verbal health and safety-related communications in project field logbook, daily reports, or other records.

SECTION 6

Training

6.1 Employee Training

The intent of employee training program is to ensure that employees receive the appropriate level of training to conduct their work in a safe manner and to comply with applicable regulations. All employees are required to maintain the training qualification necessary to perform their assigned duties and job functions. Guidance on required courses can be obtained from the HSM and CH2M HILL SOP HSE-110, *Health, Safety, and Environment Training*. Employee training records are provided in Attachment 12.

6.1.1 Training Requirements

Employees designated as the SSC have completed a 12-hour SSC course, and have documented requisite field experience. In addition, the designated SSC has completed an OSHA 30-hour construction course. Employees designated "FA-CPR" are currently certified by the American Red Cross, or equivalent, in first aid (FA) and cardiopulmonary resuscitation (CPR).

All employees engaging in hazardous waste operations or emergency response 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 related to general excavation safety. However, as there is no entry planned into the excavations, competent person level training is not required. Personnel who have not met these training requirements shall not be allowed to engage in hazardous waste operations or emergency response activities. Annual medical clearances will be confirmed prior to start of work.

Munitions and explosives of concern (MEC) awareness training is required, in accordance with the Explosives Safety Submission Determination (ESSD) (Appendix B of the *Final Work Plan for Additional Waste Delineation at Site 2*). The training will be provided prior to conducting the waste delineation activities.

Pregnant employees are to be informed of and are to follow the procedures in CH2M HILL's standard operating procedure (SOP), *Reproduction Protection*, including obtaining a physician's statement of the employee's ability to perform the assigned activities before being assigned fieldwork.

Employee Name	Office	Responsibility	Qualifications
Janna Staszak	VBO	Project Manager	Level C, FA-CPR
Mark Orman	MKE	HSM	Level C, SSC/FA-CPR
Mark Ost	VBO	Site Safety Coordinator	Level C, SSC/FA-CPR
Ted Dingle	VBO	Field Team Member	Level C, SSC/FA-CPR

6.2 Subcontractor Personnel Qualifications

All subcontractors will provide the HSM with a list certifying the training and qualifications of competent persons and qualified operators for the following activities/equipment.

6.2.1 Competent Persons/Qualified Operators

- Excavation equipment operator – Thomas Cherrix (Agviq, LLC)

6.2.2 Activity/Equipment List

- TBD

6.3 Project Employee Orientation

Employees expecting to access the site are required to have the project employee orientation. The training will be provided by the SSC. The training provided to the employees in the employee orientation shall include the following:

- Review the SSHP and APP
- Present an overall site safety briefing (general site safety)
- Review employee responsibilities
- Review AHA policies and procedures
- Review emergency procedures and evacuation plan
- Review injury and incident reporting procedures
- Review reporting procedures for hazardous conditions and/or hazardous activities

6.4 Personal Protective Equipment Training

OSHA requires each personal protective equipment (PPE) user to receive training on the proper care, maintenance, limitations, and instructions on how to wear and adjust PPE. The proper use of PPE will also be included in project safety briefings and toolbox meetings.

6.5 Safety Meetings and Toolbox Meetings

Safety meetings provide a method for maintaining safety awareness and providing safety-related information and training to employees. Safety meetings for project supervisory personnel and project employees shall be held at least daily, and include relevant information for on- and off-the-job safety.

6.6 Activity Hazard Analysis Training

Each supervisor will review task-specific AHAs with all workers assigned to perform that task prior to the beginning of that task anywhere on the job site. All workers will sign the AHA document signifying they have been trained and understand the task steps, hazards, and hazard controls to be used.

6.7 Safety Pre-Task Planning and Training

Each day, the onsite supervisors shall hold informational safety training with each member of their crew. Information discussed and training performed shall pertain to current project activities and scope of work. The subcontractor is encouraged to use this time for employee input and task-specific training.

6.8 Vendor Training

Vendors that supply equipment to the project will be required to perform a training session to review and explain the safe operation procedures to the parties that will be using or operating the equipment (excavation operation).

6.9 Emergency Response Plan Training

Emergency Response Plan (ERP) training will occur during the employee orientation and retraining will occur periodically in safety meetings. The ERP training will include evacuation alarms, site evacuation, designated evacuation assembly areas, and route to emergency medical facility. Emergency drills will be performed initially, but at least twice per year. See Section 12 for the Emergency Preparedness procedures.

6.10 Conduct of Training

6.10.1 Instructor/Trainer Requirements

All personnel who will conduct training will have documented expertise in the areas of which they will be conducting the training, and knowledge of the regulatory and other requirements. They will also be listed as a competent person in that area by the employer or contractor.

6.10.2 Initial Training

All employees will have documentation of initial training required to perform their assigned duties with their assigned tools and equipment. If previous documentation or subcontractor certification is not available, then initial training will take place onsite prior to the employee commencing work.

6.10.3 Re-Training

Retraining will be required under the following conditions:

- There is a change in operations or equipment capabilities.
- An employee is seen performing an unsafe act, or operating equipment or machinery in an unauthorized manner.
- There is an incident or accident on the job site.
- Anytime the regulatory requirements require refresher training due to time periods, such as Hazardous Waste Operations and Emergency Response (HAZWOPER), etc.

6.10.4 Demonstrated Competency

For all training conducted for equipment, machinery, or hazardous activities, the trainer will document in writing that the individual has "demonstrated competency" in the areas required to perform their assigned tasks safely and in compliance with the regulatory and other guidance.

6.11 Documentation

All training shall be documented. Documentation and certificates verifying completion will be maintained onsite by the employer and copies of the training documentation will be submitted to the HSM. Training documentation will be made available for review at all times.

SECTION 7

Health and Safety Inspections

7.1 General Requirements

In addition to the hazard controls specified in this document, Project Activity Self-Assessment Checklists are contained in Attachment 5. Any site-specific requirements outlined in this SSHP and APP that are more stringent than those contained in the Project-Activity Self-Assessment Checklists are to take precedence. The Project Activity Self-Assessment Checklists are based upon minimum regulatory compliance and some site-specific requirements may be more stringent. The subcontractor shall use these checklists to assess the adequacy of site-specific safety requirements and determine whether employees will be safe. 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 SSC.

The self-assessment checklists will also be used by the SSC in evaluating the subcontractors' compliance onsite.

If hazardous conditions exist or are apparent during the self-assessment, immediately notify the employees in the area and do not continue work in that area. If an imminent danger situation exists that is immediately life threatening or would cause serious injury, immediately stop work and warn the contractor employee(s) in danger and notify the contractor safety representative and report it to the SSC.

Self-assessment checklists should be completed and permit-to-work reviewed prior to exposure of the activities outlined below. Self-assessments shall be completed prior to subjecting personnel to hazardous operations for any reason. Follow-up self-assessments shall be conducted on a weekly basis and more frequent if conditions warrant.

The following list of hazardous activities identifies those most commonly found on construction sites. Each of the following Project Activity Self-Assessment Checklists are found in Attachment 5. The SSC is responsible for identifying site-specific hazardous activities not included in this list (for example, chlorine safety, tunneling, traffic control, etc.) and integrate methods for verifying compliance with established safe work practices, regulations, and industry standards pertaining to those additional site-specific hazardous activities.

- Excavation

7.2 Conduct of Inspections

7.2.1 Personnel Authorized to conduct inspections

All onsite supervisors are authorized to perform informal inspections of any project activity and make corrections as required. If anyone witnesses an unsafe act or what they believe to be an unsafe act they are obligated to intercede and prevent the act from occurring. Once they have accomplished that, they will immediately notify the SSC or HSM, who will conduct a formal review of the actions.

The following individuals are authorized to conduct formal Health and Safety inspections onsite for CH2M HILL:

- CH2M HILL SSC – Mark Ost
- CH2M HILL HSM – Mark Orman

7.2.2 Observed Hazard Form/Safe Work Observation Form

The SSC will perform daily site safety inspections to verify that the project is conducted in a safe manner. The SSC will keep a daily log to track the health and safety observations. In addition to the SSC's daily log, hazards that are discovered by the SSC will be documented on the Safe Work Observation Form (Attachment 10).

7.2.3 Self Assessment Checklists

The SSC will be responsible for conducting formal inspections of the work site(s) periodically throughout the work week. These inspections will focus on activities covered by self-assessment checklists, but can be expanded to cover all aspects of health and safety on the work site(s).

The self-assessment checklists (attached) will be used as a guide to determine compliance with recognized health and safety standards. There are four entries that can be entered on the checklists:

- **YES**—In compliance
- **NO**—Not in compliance
- **N/A**—Not Applicable to current operation
- **N/O**—Not observed during this period

7.3 Deficiency Tracking System

7.3.1 Observed Hazard Forms

All observed hazard forms will be completed onsite at the time of the observed hazard, or activity inspection. Both good behaviors and questionable or unsafe behaviors will be annotated on the form and discussed with the observed worker(s). Any unsafe behavior or acts observed will be documented in writing to the subcontractor's project manager for action. All observed hazard forms will become a permanent part of the project files.

7.3.2 Self-Assessment Checklists

Any item that is annotated with a "NO" must be explained on the last sheet of the checklist, and followed up for corrective action. The last page of each checklist has a column for recording the date the deficiency was corrected. These self-assessment checklists—once completed and signed by the inspector, reviewed with the applicable supervisor and/or employee, and signed by the project manager—will become a permanent record of inspection and part of the project files.

7.3.3 Open Deficiencies

All self-assessment checklists with open deficiencies or stop work orders will be the top priority for the SSC each work day to ensure they are corrected, any training accomplished, or the situation corrected to close out the deficiency. If the deficiency is not handled in a timely manner, the SSC will report the problem in writing to the Prime Contractor Project Manager.

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SECTION 8

Health and Safety Expectations, Incentive Program, and Compliance

8.1 Safe Work Policy

It is policy 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 is 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 project success.

8.2 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 the company's most significant asset and management values their safety, health, and welfare. Also, top management believes that all injuries are preventable. The 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. CH2M HILL management extends its full commitment to health and safety excellence.

8.3 Project-Specific Health, Safety, and Environment Goals

All management and employees are to strive to meet the project-specific Health, Safety, and Environment (HS&E) 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 eleven specific goals and objectives:

- Create an injury-free environment.
- Have zero injuries or incidents.
- Provide management leadership for HS&E by communicating performance expectations, reviewing and tracking performance, and leading by example.
- Ensure effective implementation of the SSHP and APP through education, delegation, and team work.
- Ensure 100-percent participation in training programs, PPE use, and HS&E compliance.
- Continuously improve 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.

8.4 Standards of Conduct Violations

All individuals associated with this project must work injury-free and drug-free and must comply with the following Standards of Conduct, the SSHP and APP, and the site safety requirements. 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. 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 PPE, or bringing the necessary tools
- Violation of any other commonly accepted reasonable rule of responsible personal conduct

8.5 Intolerable Offenses

Certain employee conduct may be so intolerable as to justify removal from the project. Intolerable offenses and actions will include, but not be limited to, the following:

- Any manager, supervisor, foreman, or other person in charge of the work being performed who requires requests, asks, threatens with their job, allows, or condones employees to work in or around unsafe acts or conditions.
- Any employee, supervisor, or manager who knowingly falsifies any investigative documents or testimony involving an investigation.
- Any employee, supervisor, or manager who openly exhibits disregard, defiance, or disrespect for the safety program.
- Any employee who violates established safety rules, regulations, or codes that endanger themselves or other employees.
- Any and all parties involved in workplace violence, including physical encounters (fighting) or threats of violence, theft, or destruction of property.
- Any employee, supervisor, or manager failing to comply with procedures contained in the subcontract, SSHP and APP, USACE EM 385-1-1 Manual, or local safety laws and regulations that create the potential for serious or costly consequences.
- Any employee who commits repeated minor offenses and shows a lack of responsible effort to correct these offenses.

8.6 Enforcement and Discipline

CH2M HILL's Enforcement and Discipline procedures, the Standards of Conduct, the Intolerable Offenses, and the Drug-Free Workplace policy will be thoroughly reviewed with each employee during the employee project orientation.

8.6.1 Intolerable Offenses

CH2M HILL practices zero tolerance for intolerable offenses. Those individuals found participating in such offenses will be:

- Suspended from work for 3 days without pay, or
- Immediately discharged and not allowed to return

8.6.2 Other Violations

Other violations will be handled accordingly:

- First offense—employee will receive a written warning
- Second offense—employee will receive a 2-day suspension without pay
- Third offense—employee will be discharged

8.7 Subcontractor Default

If the subcontractor fails to comply with any of the requirements of the subcontract, SSHP and APP, or local safety laws and regulations, the prime contractor may issue a stop work order to the subcontractor. Thereupon, the subcontractor shall immediately cease all work or portion of work that may be specifically designated in the stop work order until the prime contractor has concluded in writing that the subcontractor has corrected its failure of performance. No adjustments will be made to the subcontractor price or schedule as a result of any stop work orders being issued by the prime contractor. A stop work order will be given to the noncompliant subcontractor on the date of deficiency. If the subcontractor fails to correct the deficiencies noted in the stop work order within 3 working days following the written notice from the prime contractor, the prime contractor may, without prejudice to any other rights or remedies under the subcontract or at law or equity, suspend all further payments to subcontractor and/or terminate subcontractor's right to continue performance of the work.

8.8 Incentive Program

The prime contractor will encourage the subcontractor to implement a safety incentive program for the project that rewards workers for exhibiting exemplary safety behaviors. Actions that qualify are those that go above and beyond what is expected, like wearing your own safety equipment, seatbelt, etc. 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, stopping a crew member from doing something unsafe, etc. The program will operate throughout the project, covering all craft workers. The incentive program will be communicated to all employees during the project employee orientation and project safety meetings.

8.9 Posting of Health and Safety Information

There will be a posting area, accessible by all workers onsite, and in clear view for the posting of site-specific health and safety information. The posted information will be protected from the environment and kept updated as project information changes.

SECTION 9

Accident Reporting

9.1 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
- Incidents that attract negative media coverage
- Near misses
- Spills, leaks, or regulatory violations
- Motor vehicle accidents

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

9.2 Section Definitions

Incident: an undesired event that results or could have resulted in loss through injury, damage to assets, or environmental harm. This includes "near misses," "accidents," and "dangerous occurrences."

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

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

Dangerous Occurrence: A dangerous occurrence complies in most respects with the definition of an accident, with the important difference being that, in a dangerous occurrence, there are no injuries suffered by personnel.

Major Incidents

- All fatalities, including contractors, subcontractors, third parties, or members of the public
- Serious injuries (see definition below) requiring hospitalization in excess of 24 hours, unless detained solely for observation
- Major stoppage of work for more than 24 hours
- Property damage in excess of $2,000
- Accidents that result or are likely to result in negative media or authorities' attention
- Near misses with a high potential to result in any of the above losses

Serious Injury

- Fracture of a bone, including the skull, spine, or pelvis
- The loss of sight or an eye
- Any other injury, excluding occupational disease, that results in the person being hospitalized for more than 24 hours, unless detained solely for observation

Minor Injury: An injury that does not cause the injured person to lose any normal job time beyond the day or shift upon which the injury occurs.

Lost Time Injury: Any injury that causes the injured person to lose normal job time beyond the day or shift upon which the injury occurred.

9.3 Reporting Requirements

All employees and subcontractors' employees shall immediately report any incident (this includes "near misses," "accidents," and "dangerous occurrences" as defined in Section 9.2 above) in which they are involved or witness to their supervisor.

The supervisor, upon receiving an incident report, shall inform his immediate superior and the SSC.

The SSC shall immediately report the following information to the Program CSP/HSM and PM by phone, in person, and/or e-mail:

- Project name/site manager
- Date and time of incident
- Description of incident
- Extent of injuries/damage
- Level of medical attention
- Preliminary root cause/corrective actions

The SSC shall complete and forward the initial hard copy Incident & Near Loss Investigation Report Form ("Incident Report Form") and Root Cause Analysis Form to the Program CSP/HSM within 24 hours and finalize those forms within 3 calendar days. Examples of these forms are included in Attachment 11, Loss/Near-Loss Investigations.

Major accidents include any occupational hazard exposure or physical injury that requires more than basic first aid (physical injury/exposure) or fire, explosion, or property damage exceeding $200,000. Major accidents require immediate notification of appropriate personnel as discussed below and must be done within 24 hours to the Contracting Officer/ Representative.

In the event of an injury that constitutes an OSHA-recordable incident, the Site Safety & Health Officer (SSHO) will notify the Navy Remedial Project Manager (RPM), Field Engineering and Architecture Department (FEAD), Project Manager, Compliance Safety and Health Officer (CSHO), and HSM as soon as practical after the incident. The reporting form shall be Contractor Safety Incident Report (CSIR), found in Attachment 11.

9.4 Investigation Requirements

The supervisor or SSC shall proceed to the scene of the incident, take charge of the situation to prevent further injury or damage, and arrange first aid or medical treatment for the injured.

The supervisor shall ensure that no equipment, material, or other evidence of the incident is removed unless essential to prevent further injury or damage. The supervisor will also carry out an initial investigation of the incident.

The causes of loss and near loss incidents are similar, so by identifying and correcting the causes of near loss incidents, future loss incidents may be prevented. The following is the Loss/Near Loss Investigation Process:

- Gather all relevant facts, focusing on fact-finding, not fault-finding.
- Answer the "who, what, when, where, why, and how" questions.
- Put facts together into a probable scenario.
- Determine incident root cause(s), which are basic causes on why an unsafe act/ condition existed.
- Develop and implement solutions, matching all identified root causes with solutions.
- Communicate incident as a lesson learned to all project personnel.
- Follow up on implemented corrective active action to confirm solution is appropriate.

The supervisor and/or SSC shall perform an incident investigation, as soon as practical after the incident, for all Loss and Near Loss Incidents that occur on the project. Loss incident investigations shall be performed in accordance with the SOP HSE-111, *Incident Notification, Reporting and Investigation.* The following forms must be completed:

- Incident Report Form (Attachment 11)
- Root Cause Analysis Form (Attachment 11)

Provide a description of the event and the sequence of events and actions that took place prior to the incident. Start with the incident event and work backwards in time through all of the preceding events that directly contributed to the accident.

A preliminary Incident Report Form and Root Cause Analysis Form shall be submitted to the PM and Program CSP/HSM within 24 hours of incident occurrence. The final Incident Report From and Root Cause Analysis shall be submitted after completing a comprehensive investigation of the incident.

The Project Manager and SSC shall evaluate the supervisor's investigation report and ensure that the report adequately addresses the facts and circumstances of the incident, the causes, and recommended corrective actions. If the initial investigation is considered inadequate, the Project Manager shall appoint the SSC to carry out further investigation.

For a major incident, the senior management shall convene a committee of inquiry to conduct a thorough investigation into the incident. The team shall be provided with proper terms of reference to guide the scope of their investigation. The team shall include the Project Manager, responsible Supervisor, SSC, and subcontractor if applicable. The Program CSP/HSM reserves the right to participate in the investigation.

9.5 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 SSC, the responsible supervisor, and Project Manager.

The Root Cause Analysis Form (Attachment 11) 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, determine 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 (Attachment 11) 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.”

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

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.

9.6 Corrective Actions

In the investigation report, include all corrective actions taken or those that should be taken to prevent recurrence of the incident. In addition, include the specific actions to be taken, the employer and personnel responsible for implementing the actions, and a time frame 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 SSC upon successful implementation of all recommended actions.

9.7 Monthly Reports

The SSC will compile the information and prepare a report in accordance with Paragraph 01.D.05 (c), of the EM 385-1-1, which accurately reflects the employee-hours worked each month for all site workers, both prime and subcontractor. This report will be prepared on the form provided by the Contracting Officers Representative (COR) and attached to the monthly billing request submitted to the COR.

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SECTION 10

Medical Support and Training

10.1 Personnel Qualified in First Aid and CPR

The following CH2M HILL individuals hold current certifications from the American Red Cross, American Heart Association, or other organization whose training is deemed equivalent.

- Mark Ost—Field Team Leader
- Mark Ost—SSC
- Ted Dingle—Site Worker
- Thomas Cherrix—Subcontractor

There will be a minimum of two staff on site at all times trained in FA/CPR and annual Blood-borne Pathogens training.

10.2 First Aid Kits

There will be at least one Type III first aid kit available that meets the requirements of EM 385-1-1, paragraph 03.B.01 and Table 3-1, on each individual work site during hours of operation.

10.3 Emergency Medical Treatment

The procedures listed below may also be applied to nonemergency incidents. Injuries and illnesses (including overexposure to contaminants) must be reported to HSM/Human Resources. If there is doubt about whether medical treatment is necessary, or if the injured person is reluctant to accept medical treatment, contact the CSP/HSM. During non-emergencies, follow these procedures as appropriate:

- Get medical attention immediately by notifying the supervisor, SSC, or HSM.
- Prevent further injury.
- Initiate first aid and CPR (if needed) where feasible.
- The SSC will assume charge during a medical emergency until the ambulance or EMT arrives or until the injured person is transported to the offsite medical facility.
- If the injured is a CH2M HILL employee, the SSC or PM must accompany the injured employee to the emergency room and to any follow-up appointments until the injured is released to full duty. Make certain that the injured person is accompanied to the emergency room.
- Report incident as outlined in Section 16, Incident Notification and Reporting.

10.4 Emergency Medical Support

In the event of an injury or illness requiring emergency medical attention the police, fire, and medical emergency dispatch will be immediately contacted at 757-396-3333 for assistance in stabilizing the situation and personnel.

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 (for example, physician's written opinion) will be maintained in the project files and made available for inspection.

10.5 Hazardous Waste Operations and Emergency Response

CH2M HILL personnel expected to participate in onsite hazardous waste operations and emergency response (HAZWOPER) 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.

For the purposes of this Scope of Work (SOW), CH2M HILL employees are not expected to be involved in emergency response.

SECTION 11

Personal Protective Equipment

(References: EM 385-1-1 Section 5, *Personal Protective and Safety Equipment*; CH2M HILL SOPs HSE-117, *Personal Protective Equipment*, and HSE-121, *Respiratory Protection*)

11.1 General Information

When actual or potential hazards exist and engineering controls or safe work practices cannot eliminate the hazard, employees shall use PPE. The employer shall provide field personnel with the required disposable and project-specific PPE and training.

Employees are responsible to:

- Acquire the necessary PPE from the employer.
- Complete the appropriate training to learn the proper use and care.
- Use PPE as required in the project-specific written safety plan.
- Inspect PPE prior to use and maintain it in a clean and safe condition.
- Refrain from modifying, tampering with, or repairing PPE beyond routine maintenance.
- Inform the employer of equipment that is damaged.
- Inform the employer of equipment that they believe does not adequately protect them from actual or potential hazards.

11.2 Hazard Assessment for Determining PPE Levels

The employer shall identify actual or potential hazards and the need for PPE. Two conditions typically dictate the necessity for PPE: general hazards present in the work area, and hazards created by the tasks being performed. Some work areas have actual or potential hazards that can be present at any time, thereby potentially exposing any personnel working or walking through the area. Such areas should be posted as PPE-required areas, or personnel should be informed of the requirements in an equivalent manner. In addition, the actual task being performed may create a hazard and require personnel who perform this task to wear appropriate PPE. The areas where these tasks are taking place may become PPE-required areas as long as that specific task is taking place. The completed PPE Requirements per task assessment is reflected in Table 11-1. Specific hazardous assessments are conducted through the AHA process, and thus AHAs become the daily tool for proper hazard assessment and mitigation. The following table should be used as a general minimum guideline, with the specific task AHA having the final required protocol for PPE. AHAs are a living document, and should reflect changing site conditions.

See also the table in Section 2.7 for a more detailed hazard assessment for task. Basic minimum safety guidelines are further defined in Sections 12 and 13.

11.3 PPE Requirements

Personnel must comply with the PPE requirements as specified in Table 11-1.

TABLE 11-1
PPE Specifications/Requirements

Task	Level	Body	Head	Respirator [b]
General site uniform Site walkover Land survey Utility Clearance Observation of test pit excavation and backfilling /monitoring	D[a]	**Coveralls:** Work clothes-long pants, shirt with at least a 3-inch sleeve. High visibility reflective vest while working around Heavy Equipment. **Boots:** ANSI Z41 approved steel-toe, leather work boots or equivalent. **Gloves:** Work glove while material handling.	ANSI Z89 approved hardhat[c] ANSI Z87 approved safety glasses with side shields. Hearing protection if necessary [d]	None required.
Excavation / backfill – contact w/soil or dust	Modified D[a]	**Coveralls:** Work clothes-long pants, shirt with at least a 3-inch sleeve. High visibility reflective vest while working around Heavy Equipment. Tyvek if soils and GW are contaminated and exceeding action limits on monitoring **Boots:** ANSI Z41 approved steel-toe, leather work boots. **Gloves:** Nitrile glove while handling sampling materials. See AHA for this task for specific guidelines	ANSI Z89 approved hardhat [c] ANSI Z87 approved safety glasses with side shields. Hearing protection when within 50 feet of excavator, with NRR of 27 dB [d]	None required. Voluntary use of a dust mask is optional.
Tasks requiring upgrade	C	**Coveralls:** Polycoated Tyvek® **Boots:** Steel-toe, chemical-resistant boots OR steel-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; with GME-H cartridges or equivalent[e].

[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 SSC.
[d] Ear protection should be worn when conversations cannot be held at distances of 3 feet or less without shouting.
ANSI = American National Standards Institute

TABLE 11-2
Reasons for Upgrading or Downgrading Level of Protection

Upgrade [a]	Downgrade
• 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 (see Section 15) exceeded.	• 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] Performing a task that requires an upgrade to a higher level of protection (for example, Level D to Level C) is permitted only when the PPE requirements have been approved by the HSM, and an SSC qualified at that level is present.

11.4 Training

CH2M HILL requires each PPE user to receive training on the proper care, maintenance, limitations, and instructions on how to wear and adjust PPE. The proper use of PPE should also be included in project safety briefings and toolbox meetings.

PPE Certification

I certify that the PPE requirements listed in the table above for the associated tasks are based upon the project-specific hazard assessment I performed.

Rick Cavil	09/2010	3 Sept. 2010
Name	Date of Certification	Date(s) of Project Hazard Assessment

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SECTION 12

Plans Required by the Safety Manual

12.1 Emergency Response Plans

12.1.1 Emergency Preparedness Training

The emergency response plan and contacts is in Attachment 4 and will be reviewed during the initial arrival to the jobsite and occasionally during site safety briefings. The briefings should include:

- Emergency procedures for fires, explosions, chemical and vapor releases, personnel injuries, and suspected overexposure as they apply to the site
- Location of onsite emergency equipment and supplies of clean water
- Local emergency contacts, evacuation routes, and assembly points
- Site communication and location of phone and radio nearest
- Names of onsite personnel trained in first aid and CPR

12.1.1.1 Emergency Equipment and Supplies

The SSC will verify that these supplies are available, as needed, and in proper working order, and mark the locations of emergency equipment on the site map when a map is provided.

TABLE 12-1
Emergency Equipment and Supplies

Emergency Equipment and Supplies	Location
2 fire extinguishers (A, B, and C classes)	Field vehicle
First aid kit	Field vehicle
Eye wash	Field vehicle
Potable water	Field vehicle
Blood-borne pathogen kit	Field vehicle
Additional equipment (specify):	Cell phone: SSC

12.1.1.2 Incident Response

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

- Shut down operations and evacuate the immediate area
- Notify the SSC and PM by the fastest means available.
- Account for personnel at the designated assembly area(s)
- Assess the need for site evacuation, and evacuate the site as warranted
- Instead of implementing a work-area evacuation, note that small fires or spills posing minimal safety or health hazards may be controlled

12.1.1.3 Emergency Medical Treatment

The procedures listed below may also be applied to nonemergency incidents. Injuries and illnesses (including overexposure to contaminants) must be reported to CH2M HILL HSM/Human Resources. If there is doubt about whether medical treatment is necessary, or if the injured person is reluctant to accept medical treatment, contact the CH2M HILL medical consultant (see Emergency Contacts List in Attachment 4). During non-emergencies, follow these procedures as appropriate.

- Notify appropriate emergency response authorities. **Contact the police, fire, and medical emergency dispatch by dialing 757-396-3333**.
- The SSC 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.
- Initiate first aid and CPR (if needed) where feasible.
- Get medical attention immediately.
- Perform decontamination where feasible; lifesaving and first aid or medical treatment take priority.
- Make certain that the injured person is accompanied to the emergency room.
- When contacting the medical consultant, state that the situation is a CH2M HILL matter, and give your name and telephone number, the name of the injured person, the extent of the injury or exposure, and the name and location of the medical facility where the injured person was taken.

12.1.1.4 Evacuation Procedures

- Evacuation routes and assembly areas will be designated by the SSC before work begins.
- Personnel will assemble at the assembly area(s) upon hearing the emergency signal for evacuation.
- The SSC and a “buddy” will remain on the site after the site has been evacuated (if safe) to inform local responders of the nature and location of the incident.

- Each supervisor will account for their personnel at the assembly area, and report to the PM or CSP/HSM that either all personnel are accounted for, or the number of personnel unaccounted for.
- The SSC will write up the incident as soon as possible after it occurs and submit a report to the PM and/or CSP/HSM.

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.

12.2 Spill Plans

In the event that any hazardous materials are spilled, the onsite employees will take immediate action to prevent further release as appropriate by turning off the source, uprighting the container, or other immediate actions that can be safely performed.

Employees will only perform defensive actions to prevent further spread or release. Defensive actions are actions that can be performed without actual contact with the released materials and without the use of additional levels of PPE protection. These actions include, but are not limited to the following:

- Turning off a nozzle or valve
- Uprighting a knocked over container
- Applying loose sorbent materials to a spill
- Placing sorbent booms or pads around the spilled materials to prevent further spread

Employees will immediately notify the SSC, who will notify the CSP/HSM, as to the location of the spill and any defensive measures taken to reduce its impact of further release.

Employees who have come into contact with any spilled hazardous materials will immediately seek emergency decontamination. Emergency decontamination includes the following actions:

- Remove any contaminated clothing.
- Immediately drench affected body areas with water.
- Seek medical attention as required.
- Maintain sorbent material in the support zone. Incidental spills will be contained with sorbent and disposed of properly.

- Keep a spill kit consisting of sorbent material and an absorbing barrier on the drill rig during monitoring well installation activities.
- Place plastic sheeting underneath the drill rig to contain oil and/or hydraulic fluid leaks during drilling activities.
- Plastic sheeting shall be considered IDW for disposal purposes.

All spills will be reported to the client, PM and CSP/HSM as required.

Spills of hazardous materials will be cleaned up, containerized, and disposed of in compliance with the local city/state/municipality directives and information provided by the USACE.

12.3 Site Control Plan/Site Control Procedures

(Reference CH2M HILL SOP HSE-510, *Site Control)*

- The SSC will conduct a site safety briefing (see below) before starting field activities or as tasks and site conditions change.
- Topics for briefing onsite safety: general discussion of the SSHP, site-specific hazards, locations of work zones, PPE requirements, equipment, special procedures pertaining to emergencies.
- The SSC records attendance at safety briefings in a logbook and documents the topics discussed.
- Post the OSHA jobsite poster in a central and conspicuous location in accordance with CH2M HILL, OSHA Postings.
- 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 SSC in appropriate level of protection.
- The SSC is to conduct periodic inspections of work practices to determine the effectiveness of these procedures. Deficiencies are to be noted, reported to the HSM, and corrected.

An exclusion zone (size TBD pending site configuration) will be maintained around work areas where hand-augering, drilling and sampling activities are occurring or with any activity where chemical materials may be encountered. Protective clothing and equipment are to be worn by any personnel working within the exclusion zone. At a minimum, Level D PPE is required. The purpose of the exclusion zone is to limit outside personnel from entering the work area and potentially injuring themselves or exposing themselves to

hazardous work conditions or chemicals. The exclusion zone will include a limited access ingress and egress for personnel and equipment. The zone is to be demarcated with caution/hazard tape and barricades (or similar restricting material). The exclusion zone is to be clearly labeled as such. All personnel are required to log in/out of exclusion zones daily.

12.3.1 Decontamination

(Reference CH2M HILL SOP HSE-506, *Decontamination*)

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

The SSC must establish and monitor the decontamination procedures and their effectiveness. Decontamination procedures found to be ineffective will be modified by the SSC. The SSC must ensure that procedures are established for disposing of materials generated on the site. All rinse waters and materials shall be contained, and shall be disposed of according to client and/or site protocols.

Decontamination Specifications

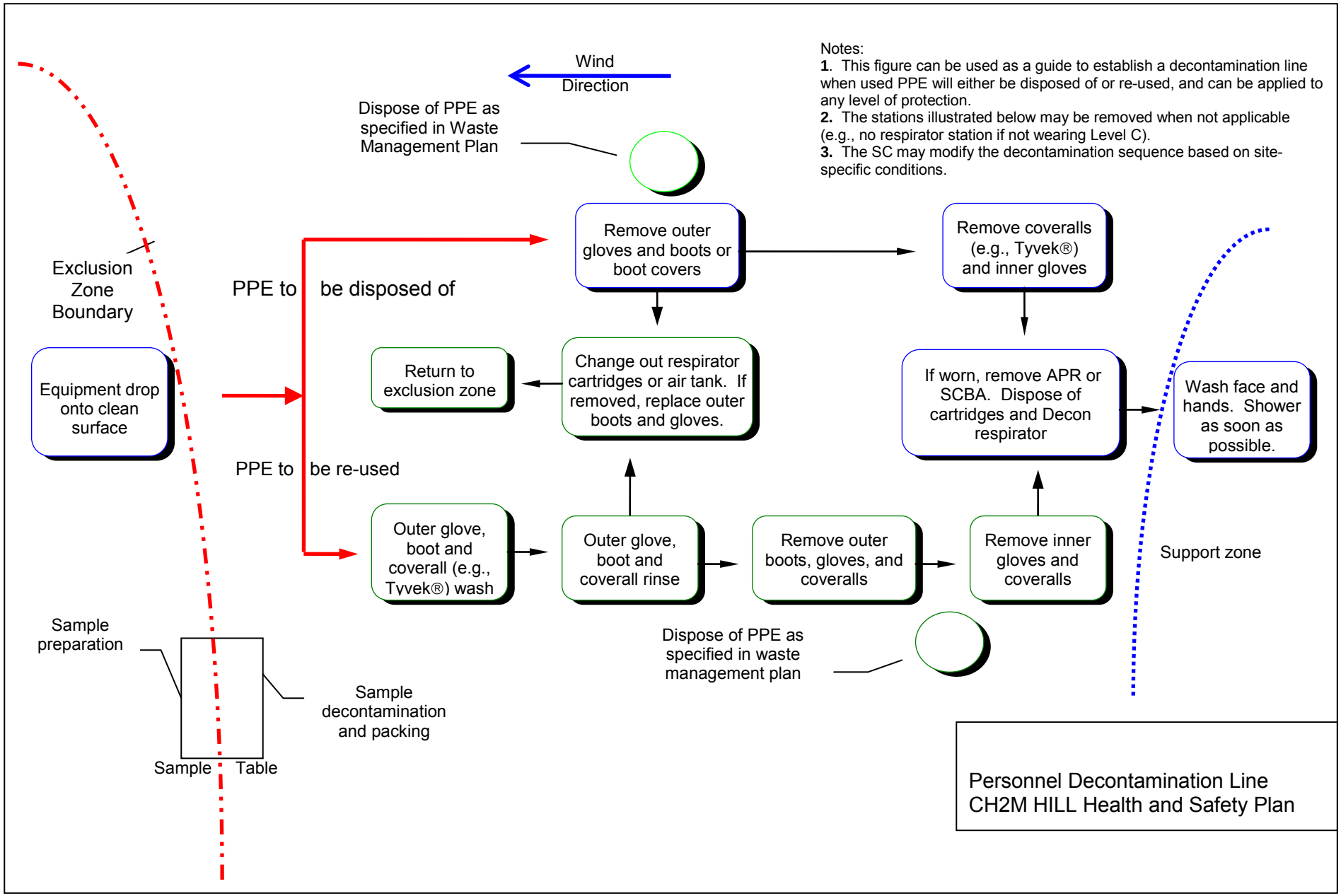
Personnel	Sample Equipment	Heavy Equipment
Boot wash/rinse Glove wash/rinse Outer-glove removal Body-suit removal Inner-glove removal Respirator removal Hand wash/rinse Face wash/rinse Shower ASAP Dispose of PPE in municipal trash, or contain for disposal Dispose of personnel rinse water to facility or sanitary sewer, or contain for offsite disposal	Wash/rinse equipment Solvent-rinse equipment Contain solvent waste for offsite disposal	Power wash Steam clean Dispose of equipment rinse water to facility or sanitary sewer, or contain for offsite disposal

Diagram of Personnel-Decontamination Line

No eating, drinking, or smoking is permitted in contaminated areas and in exclusion or decontamination zones. The SSC should establish areas for eating, drinking, and smoking. Contact lenses are not permitted in exclusion or decontamination zones.

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

No smoking is permitted in the work area. The SSC should establish areas for eating, drinking, and smoking.


Notes:
1. This figure can be used as a guide to establish a decontamination line when used PPE will either be disposed of or re-used, and can be applied to any level of protection.
2. The stations illustrated below may be removed when not applicable (e.g., no respirator station if not wearing Level C).
3. The SC may modify the decontamination sequence based on site-specific conditions.
Wind Direction
Dispose of PPE as specified in Waste Management Plan
Exclusion Zone Boundary
PPE to be disposed of
PPE to be re-used
Equipment drop onto clean surface
Remove outer gloves and boots or boot covers
Remove coveralls (e.g., Tyvek®) and inner gloves
Return to exclusion zone
Change out respirator cartridges or air tank. If removed, replace outer boots and gloves.
If worn, remove APR or SCBA. Dispose of cartridges and Decon respirator
Wash face and hands. Shower as soon as possible.
Outer glove, boot and coverall (e.g., Tyvek®) wash
Outer glove, boot and coverall rinse
Remove outer boots, gloves, and coveralls
Remove inner gloves and coveralls
Support zone
Dispose of PPE as specified in waste management plan
Sample preparation
Sample decontamination and packing
Sample Table
Personnel Decontamination Line
CH2M HILL Health and Safety Plan

12.3.2 Firefighting Plan

(References: Section 01.E.01 & 06.A.02, EM 385-1-1 and CH2M HILL SOP HSE-208, *Fire Prevention*)

The decision on whether or not to try to extinguish a fire using available site personnel and equipment will be made by the SSC, and is based on whether the fire is small or large, and involves explosives or flammable liquids/gases.

12.3.2.1 Location of Fire Extinguishers

Fire extinguishers will be located around the project sites as required. These will be located in the following places at a minimum:

- In each vehicle
- Near areas where flammable materials are stored or in use

All fire extinguishers will be kept clearly visible, marked, and placed where they are easily accessible.

12.4 Hazard Communication Program

(References: Section 01.B.06, EM 385-1-1 and CH2M HILL SOP HSE-107, *Hazard Communication*)

- Effective information and training on hazardous chemicals shall be given to project employees by their employer at the time of initial assignment and/or whenever a new physical or health hazard the employees have not been previously trained about is introduced into their work area.
- All onsite hazardous chemicals shall have an accompanying Material Safety Data Sheet (MSDS) available to employees for reference.
- The subcontractor shall submit a copy of the MSDS sheet to the SSC for all onsite hazardous chemicals and when a new hazardous chemical is introduced to the project.
- The SSC will complete the Chemical Specific Training Form, included in Attachment 3, to verify that training is provided on the hazards associated with these chemicals and the control measures to be used to prevent exposure to personnel are implemented.
- The subcontractor shall provide documentation (see the Chemical-Specific Training Form in Attachment 3 for an example) to the SSC to verify that they have provided adequate employee training for the onsite hazardous chemicals.
- All chemical containers shall be labeled with the identity of the chemical and with hazard warnings.

All hazardous materials will be properly stored. The SSC will give consideration to compatibility, quantity limits, secondary containment, fire prevention, and environmental conditions.

12.4.1 HAZWOPER Compliance Plan

(Reference CH2M HILL, SOP HSE-220, *Written Plans)*

This SSHP complies with a HAZWOPER program and requires staff to comply with hazardous waste operations or emergency response as required by 29 CFR 1910.120 and 29 CFR 1926.65.

12.5 Respiratory Protection Program

(References: Section 05.E.03, EM 385-1-1 and CH2M HILL SOP HSE-121, R*espiratory Protection*)

12.5.1 General

Respiratory protection is not anticipated to be required at this project site based on the current scope of work. If these parameters change, or unforeseen circumstances dictate the use of respiratory protection, the following guidelines will be adhered to.

12.5.2 Voluntary Usage

CH2M HILL has a regulatory compliant Voluntary Usage Program for employees and workers who feel that they may want to wear a respirator, even when the situation and conditions do not require their use for protection. Any employee or worker can approach their supervisor or SSC to have a respirator provided if so desired. Additional training and medical screening will be required to be performed in the event the user does want to wear a respirator.

12.5.3 Air Purifying Respirators

CH2M HILL employees and subcontractors will be required to utilize air purifying respirators (APRs) under the following conditions and operations:

- Operations where the concentration of substance or vapor is known
- There is a filter available that is National Institute of Occupational Safety and Health (NIOSH)/Mine Safety and Health Administration (MSHA) rated for the substance or material that poses the hazard

12.5.4 Filter Selection and Change Schedule

If, during the course of the project, the situation arises that would require the use of APRs, the SSC will contact CH2M HILL corporate Health & Safety to acquire the appropriate atmospheric monitoring equipment to determine the type of respirator cartridges needed. Once determined, a cartridge change schedule will be established based upon the analytical data collected.

12.5.5 Fit Testing

All personnel required to wear either a self-contained breathing apparatus (SCBA) or APR during the project will be fit tested and perform fit testing in accordance with the CH2M HILL SOP. An operator seal check will be performed each time the respirator is placed on the operator's face for use.

12.6 Health Hazard Control Program

(Reference: EM 385-1-1 Section 01.B.06)

The Health Hazard Control Program will be conducted by the use of the Activity Hazard Analysis process. This section outlines the process that will be utilized by the SSC onsite to determine the presence of hazardous environments or whether hazardous or toxic agents could be released into the work environment.

12.6.1 General Information

AHAs shall be developed during the preparation stage for each definable work task. An AHA is a procedure that integrates accepted health and safety principles and practices into a particular operation. In an AHA, each basic step of the overall task is examined to identify potential hazards and to determine the safest way to do the job.

Four basic stages in conducting an AHA are:

- Selecting the task to be analyzed
- Breaking the task down into a sequence of steps
- Identifying potential hazards
- Determining preventive measures to overcome these hazards

AHAs are intended to be a starting point and must be reviewed (and modified as appropriate) by the entire work team prior to initially conducting the task.

The AHA process will identify previously undetected hazards and increase the job knowledge of those participating. Safety and health awareness is raised, communication between workers and supervisors is improved, and acceptance of safe work procedures is promoted. The completed AHA will be the basis for regular contact between supervisors and workers on health and safety. It will serve as a teaching aid for initial job training. The AHA will also be used as a standard for health and safety observations and assist in completing comprehensive accident investigations.

All AHAs will be documented, reviewed, and signed by the SSC, Site Supervisor, and all workers involved in the task. All AHAs will be maintained onsite by the SSC.

12.6.2 Tasks Requiring Activity Hazard Analyses

Activity Hazard Analyses are required for all definable work tasks. The following hazardous work operations are examples of those requiring AHAs, but not inclusive:

- Utility clearance
- Excavation and visual inspection of test pits
- Backfilling and grading of test pits

12.6.3 Detailed Activity Hazard Analysis Procedures

To complete a detailed AHA form, the responsible supervisor obtains an AHA form (an example is given in Attachment 8) and identifies individuals who will be performing the task. With the assistance of those employees performing the task, the responsible supervisor should:

- Define the task and describe the work activity, including the tools, equipment, materials, and personnel to perform the activity.
- Identify the sequence of work or principal steps that are required to perform the activity.
- Identify and analyze the chemical, physical, safety, and biological/environmental hazards posed by each step in the activity.
- Identify the main hazard control measures for each hazard identified—hazard control measures shall follow the hierarchy of 1) implementing engineering control, 2) instituting safe work practices, and 3) providing PPE.
- List equipment, tools, and materials that will be used to perform the activity, along with the equipment/tool inspection and training requirements for workers and supervisors.
- Ensure employees have training qualifications necessary to perform their assigned duties and job functions.
- Identify and summarize relevant SOPs, as part of the hazard control measure identified for each work task.
- Review the AHA form in a safety briefing with all project personnel who will be performing the task prior to task performance (ensure that their signature is on the AHA form).
- Brief any new members to the crew prior to performing the task.
- Verify that the control measures recommended are implemented during execution of the work by assigning responsibilities to the appropriate team members.

The responsible supervisor must review all AHAs with all project personnel who will be performing the task in a safety briefing, prior to task performance. Any new crew members shall be briefed on the AHA prior to performing the activity. In addition, the responsible supervisor shall oversee subcontractor implementation of this AHA process for their work.

12.6.4 Activity Hazard Analysis Planning Tools

The following are planning tools that shall be utilized when preparing detailed AHAs.

12.6.4.1 Activity/Task Hazard Analysis Table

The Task Hazard Analysis Table, Section 2.7, details potential health and safety hazards for each project phase or task. Relevant safety procedures must be reviewed to identify the applicable hazard control procedures in the AHA.

12.6.4.2 Subcontractor Activity-Specific Safety Procedures

Subcontractor Activity-Specific Safety Procedures are not intended to be all-inclusive, but are provided as a tool to facilitate development and review of safe work procedures. Subcontractors are expected to address each outlined criterion as part of their AHA planning.

12.6.4.3 Project Activity Self-Assessment Checklists

Project Activity Self-Assessment Checklists, Attachment 5, have been provided as a method of verifying compliance with established safe work practices, regulations, and industry standards pertaining to various activities. Project activity self-assessments shall be performed at the start of specific hazardous work activity, then at least weekly and at intervals appropriate for the nature of work site activities. Checklists provided in Attachment 5 are for CH2M HILL employee use only. Each subcontractor shall provide their own checklists to be used to assess the adequacy of site-specific safety requirements and determine whether control measures identified in the AHA are adequate for each work task.

12.6.5 Pre-Task Safety Planning

Pre-Task Safety Planning (PTSP) ensures that daily tasks are performed with safety integrated into the daily work routine. PTSP requires that the team identify that day's tasks to be performed; required equipment, tools, and materials to perform these tasks; the potential hazards posed; and required HS&E procedures.

A PTSP Form, Attachment 9, shall be completed for each work crew performing field activities. The PTSP shall be completed before work begins each morning throughout the course of the project. The supervisor/foreman and their crew complete the PTSP. The supervisor/foreman reviews the PTSP with each crew member during that day's safety briefing, using the following process:

- List all task personnel and the tasks that will be performed by the work crew for the workday.
- Review the overall task planning outlined in the AHA for this activity.
- List the tools and equipment required for that day's tasks.
- Identify and check the potential health and safety hazards posed by that day's tasks on the PTSP.
- Identify and check the hazard control procedures that will be employed to control the identified health and safety hazards posed by that day's tasks on the PTSP.
- Provide appropriate site-specific training to ensure employees can perform their job in a safe manner.
- Keep the PTSP in the work area, revise it, and brief the work crew when additional tasks are to be performed or when unanticipated hazards are encountered that were not listed on that day's PTSP.

- Monitor work crew compliance with the hazard control measures listed in the PTSP.
- Each work crew's daily PTSP shall be signed by the crew members and the supervisor/foreman. The supervisor/foreman shall submit the PTSP to the HSM at the end of the workday for review

The SSC shall review each work crew's daily PTSP, confirm that the potential health and safety hazards and control measures are identified for the listed tasks in that day's PTSP, and maintain them as part of the onsite project files to document compliance with this process.

12.7 Hazardous Energy Control Program

(References: EM 385-1-1 Section 12.A.07, and CH2M HILL SOP HSE-310, *Lock Out / Tag Out)*

Prior to working on any energized equipment or circuits, the designated "competent person" for lockout/tagout will complete the Electrical Work Permit. If a lockout/tagout procedure is not available for the work to be accomplished or the equipment to be worked on, the competent person will complete the lockout/tagout worksheet. The following is a brief description of the lockout/tagout program that will be enforced on the project. Specific procedures will be developed and enforced by the competent person for each individual work site and electrical permit issued.

- Do not work on equipment when the unexpected operation could result in injury, unless lockout/tagout procedures are implemented.
- Employees working under a lockout/tagout procedure must complete sufficient training to acquire the understanding, knowledge, and skills necessary for the safe performance of their assigned duties within the plan.
- When available from the facility or equipment owner, equipment-specific lockout/tagout procedures shall be followed. When equipment-specific lockout/tagout procedures are not available, or when the existing procedures are determined to be insufficient (such as not addressing all energy sources), then the authorized employee shall be required to develop a procedure specific to the equipment being serviced.
- Standard lockout/tagout procedures include the following steps:
  - Notify all personnel in the affected area of the lockout/tagout.
  - Shut down the equipment using normal operating controls.
  - Isolate all energy sources.
  - Apply an individual lock and tag to each energy-isolating device.
  - Relieve or restrain all potentially hazardous stored or residual energy.
  - Verify that isolation and de-energization of the equipment has been accomplished.
  - Once verified that the equipment is at the zero energy state, work may begin.

- All safeguards must be put back in place, all affected personnel notified that lockout/ tagout has been removed, and controls positioned in the safe mode prior to lockout/ tagout removal.
- Do not remove another person's lock or tag.

12.8 Contingency Plan for Severe Weather

12.8.1 Inclement Weather

- Work may proceed in light rain—wear rain gear.
- Exposure to slips, trips, and falls is increased during rainy conditions.
- Take cover in a sheltered location during adverse weather conditions (high winds, heavy rain).
  - Work shall cease and cover shall be taken in the event of lightning or tornado warnings.
  - Identify "Take Shelter" areas before starting the project.
  - Work may proceed in light rain—wear rain gear.
- Notify the Project Manager and Client Representative after shelter has been sought.

Adverse weather conditions requiring immediate suspension of field work activities are defined as the following:

- Thunder or lightning. Thunderstorm watches or warning, as the situation warrants, will be used as an alert to potential electrical activity. Typically, a 30-minute stand-down occurs to allow the storm cell to pass the area. If lightning or thunder is observed within the stand down period, the 30-minute time frame is extended until electrical activity ceases.
- Sustained wind gusts of 25 mph for boating activities.
- Sustained wind speeds of 25 mph or wind gusts of 35 mph for high profile work where wind chill is not a factor, that is, greater than 60°F.
- Sustained wind speeds of 40 mph or wind gusts of 45 mph for non-high profile work.
- Moderate rain and/or snow fall of 0.11 to 0.3 inch per hour during hoisting activities. Freezing rain is also cause for suspending hoist use.
- An equivalent wind chill factor of -24°F on the wind chill factor chart (see Section 13.2.5) will trigger systematic shut down of all non-emergency work activities.
- A tornado or hurricane warning for the general area or county will suffice in requiring a general work stoppage.
- If you are inadvertently caught outside in a thunder/lightning storm, take the following precautions:
  - Move away from the drill rig

12.9 Prevention of Alcohol and Drug Abuse

(References: DFARS, Subpart 252.223-7004 and CH2M HILL SOP HSE-105, *Drug Free Workplace Program)*

12.9.1 Drug-Free Workplace

CH2M HILL does not tolerate illegal drugs, or any use of drugs, controlled substances, or alcohol that impairs an employee's work performance or behavior. CH2M HILL has established a policy that its employees and subcontractors shall not be involved in any manner with the unlawful manufacture, distribution, dispensation, possession, sale, or use of illegal drugs in the workplace. The use or possession of alcohol in the workplace is also prohibited. Any violation of these prohibitions may result in discipline or immediate discharge. Please reference CH2M HILL SOP HSE-105, *Drug-Free Workplace Standard of Practice*, for more information. The following sections describe mandatory program requirements.

12.9.2 Policy Statement

A policy statement is included in the corporate Drug-Free Workplace Program. This policy statement details prohibited conduct and ramifications, and:

- Prohibits drug, alcohol, and/or controlled substances use or abuse.
- Prohibits involvement in the manufacture, distribution, dispensation, possession, sale, or use of illegal drugs in the workplace.
- Describes disciplinary actions that may be taken.

12.9.3 Subcontractor Management

The subcontractor must comply with the provisions of this program. As a minimum the subcontractor must provide a written statement that their drug-free workplace program meets the minimum requirements outlined in CH2M HILL's program.

The prime contractor Project Manager and SSC can request to be provided copies of any subcontractors employees last negative screening results. These results cannot be over 12 months old.

It is the responsibility of subcontractors to transfer this plan to the lower-tiered subcontractors.

12.9.4 Prescription and Nonprescription Drugs

Employees using prescription or nonprescription drugs that could impair their functions on the project are required to notify the employer in advance of such drug use.

Failure to report prescription and nonprescription drugs as required above, illegally obtaining the substance, or use that is inconsistent with the prescription or label may be subject to disciplinary action.

The subcontractor is required to document that all of their employees have also been provided with a drug-free workplace and alcohol education program.

12.10 Fire Prevention Plan

(References: EM 385-1-1 Section 09.A.01, and CH2M HILL SOP HSE-208, *Fire Prevention*)

- A fire extinguisher, rated not less than 2A, shall be provided for each 280 square meters of a combustible building area, or major fraction thereof. Travel distance from any point of the protection area to the nearest fire extinguisher shall not exceed a horizontal distance of 50 feet or 15 meters.
- When 10 liters or more of a flammable or combustible liquid is being used, an extinguisher must be within 15 meters.
- Extinguishers must:
  - Be maintained in a fully charged and operable condition.
  - Be visually inspected each month.
  - Undergo a maintenance check and certification each year.
- The area in front of fire extinguishers must be kept clear.
- Solvent waste and oily rags must be kept in a fire resistant, covered container until removed from the site.
- Flammable/combustible liquids must be kept in approved containers, and must be stored in an approved storage cabinet.

Fire extinguishers can represent an important segment of any overall fire protection program. However, their successful functioning depends upon the following conditions having been met:

- The extinguisher is properly located and in working order.
- The extinguisher is of proper type and for a fire which may occur.
- The fire is discovered while still small enough for the extinguisher to be effective.
- The fire is discovered by a person ready, willing, and able to use the extinguisher.
- Class C fires (see below for fire classifications) can be readily extinguished by quenching-cooling with water or a water-mixture agent. Class B fires are more effectively extinguished by an agent that blankets-smothers the fire through exclusion of oxygen surrounding the fire area. Those extinguishers containing bromochlorodifluoromethane, monobromotrifluoromethane, carbon dioxide, or dry chemical are generally best suited for extinguishing Class B fires. For Class C fires, the primary consideration in extinguishing this type of fire is the selection of nonconductive extinguishing agent to prevent dangerous electrical shock and possible death to user.
- Due to its corrosive nature, dry chemical is not recommended for use on computerized, electronic, or other equipment with extensive circuitry.

- The following chart defines/explains classes of fires:

A	Common Combustibles	Wood, paper, cloth etc.
B	Flammable liquids and gases	Gasoline, propane and solvents
C	Live electrical equipment	Computers, fax machines (see note!)
D	Combustible metals	Magnesium, lithium, titanium
K	Cooking media	Cooking oils and fats

Fires are classified into five groups:

- Class A: Class A fires involve common combustibles such as wood, paper, cloth, rubber, trash and plastics. They are common in typical commercial and home settings, but can occur anywhere these types of materials are found.
- Class B: Class B fires involve flammable liquids, gases, solvents, oil, gasoline, paint, lacquers, tars and other synthetic or oil-based products. Class B fires often spread rapidly and, unless properly secured, can reflash after the flames are extinguished.
- Class C: Class C fires involve energized electrical equipment, such as wiring, controls, motors, data processing panels or appliances. They can be caused by a spark, power surge or short circuit and typically occur in locations that are difficult to reach and see.
- Class D: Class D fires involve combustible metals such as magnesium and sodium. Combustible metal fires are unique industrial hazards which require special dry powder agents.

(NOTE: Although ABC and BC dry chemical extinguishers can control a fire involving electronic equipment, the National Fire Code specifically advises against dry-chemical extinguishers for fires involving computers or other delicate electronic equipment due to the potential damage from residues).

Fire fighting shall only be conducted by those trained and certified in this practice. The commonly accepted practice is the PASS method. This means, pull the pin, aim, squeeze the handle and sweep the base of the fire area. The SSC shall verify that at least two staff are on site that have the required training for use of Fire Extinguishers.

12.11 Site Sanitation Plan

Housekeeping: all work areas shall be maintained free and clear of clutter, tools and debris that may pose a trip, slip, or fall hazard to staff. Each work area shall be evaluated prior to work starting in that location.

Restrooms and drinking water: Each site shall have suitable potable water for drinking supplied by the client, contractor, or employer. Access to sanitary restrooms shall be supplied for staff, as well as suitable washing facilities. Proper industrial hygiene practices shall be conducted on this site.

This program will comply with EM-383-1-1 Sept 2008, Section 02 of the manual.

SECTION 13

Contractor Information/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 site or the particular hazard. 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 SSC for clarification.

In addition to the controls specified in this section, Project-Activity Self-Assessment Checklists are contained in Attachment 5. These checklists are to be used to assess the adequacy of CH2M HILL and subcontractor site-specific safety requirements. The objective of the self-assessment process is to identify gaps in project safety performance, and prompt for corrective actions in addressing these gaps. Self-assessment checklists should be completed early in the project, when tasks or conditions change, or when otherwise specified by the HSM. The self-assessment checklists, including documented corrective actions, should be made part of the permanent project records, and be promptly submitted to the HSM.

13.1 Project-Specific Physical (Safety) Hazards

13.1.1 Field Vehicles

- Ensure a rental car meets the following requirements.
  - Dual air bags.
  - Antilock brakes.
  - Midsize or larger.
- Familiarize yourself with rental vehicle features.
  - Mirror adjustments.
  - Seat adjustments.
  - Cruise control features, if offered.
  - Preprogram radio stations.
- Always wear the seatbelt while operating the vehicle.
- Adjust the headrest to proper position.
- Tie down loose items if utilizing a van.
- Pull off the road, put the car in park, and turn on flashers before talking on a mobile phone.
- Maintain both a first aid kit and fire extinguisher in the field vehicle at all times.
- Close car doors slowly and carefully. Fingers can get pinched in doors or the trunk.

- Take shelter in the field vehicle in the event of heavy rain.
  - Listen to car radio for predictions of tornado or lightning.
- Park vehicle in a location where it can be accessed easily in the event of an emergency.

13.1.2 Cell Phones

Cell phones, earpieces, and/or headphones shall not be used while operating company vehicles, rental vehicles, or personal vehicles for company business, including traveling to/from the project site.

Cell phones can be used in designated safe zones, away from operating equipment. Cell phones shall also be used for emergency support operations.

Key personnel cell numbers are listed in Attachment 4 under Emergency contacts.

13.1.3 Hand and Power Tools

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

- The employee is responsible for complying with all applicable HS&E training requirements relating to hand and power tool safety and for providing any additional training necessary to complete their tasks safely.
- Operate all tools according to the manufacturer's instructions and within design limitations.
- All hand and power tools shall be maintained in a safe condition.
- Tools are to be inspected and tested before use—if a tool is found to be defective it is to be tagged "Do Not Use" and removed from service until repaired.
- Personal protective equipment, such as gloves, safety glasses, earplugs, and face shields, are to be used when exposed to a hazard from the tool (see Section 11, Personal Protective Equipment).
- Power tools are not to be carried or lowered by the cord or hose.
- Disconnect tools from energy sources when not in use, before servicing and cleaning, and when changing accessories such as blades, bits, and cutters.
- Safety guards on tools are to remain installed while the tool is in use and promptly replaced after repair or maintenance has been performed.
- Tools are to be stored properly, 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 (that is, intrinsically safe, spark proof, etc.) for work in that environment.

- When using a knife or blade tool, stroke or cut away from the body with a smooth motion taking care not use excessive force that could damage tool, material being cut, or unprotected hands.
- As alternatives to manual and pistol-grip hand tools that involve work with highly repetitive movement, extended elevation, constrained postures, or positioning of body members (for example, hand, wrist, arm, shoulder, neck, etc.):
  - Consider alternative tool design
  - Improve posture
  - Select appropriate materials
  - Organize work—sequencing to prevent muscular skeletal, repetitive motion, and cumulative trauma stressors
- Only employees who have been trained in the operation of the particular tool in use shall be allowed to operate a powder-actuated tool—training and certification must be provided to the SSC before using the tool.
- Ground fault circuit interrupters (GFCI) protection shall be used on all electrical tools within the vicinity of water.

13.1.4 Excavation Activities

(Reference CH2M HILL SOP HSE-307, *Excavations*)

Excavation Entry

This section applies to all excavation entry regardless of the party in control of the excavation. Entry is not part of this SOW, and not authorized, this is provided strictly for informational purposes.

Do not enter the excavations unless completely necessary, and only after the excavation competent person has completed their daily inspection and has authorized entry. An inspection shall be conducted by the competent person prior to the start of work, as needed throughout the shift, after every rainstorm, and after any hazard increasing occurrence. Documentation of the inspection must be maintained onsite at all times.

Follow all excavation entry requirements established by the excavation competent person and any excavation permit being used.

Sloping, benching, shoring, shielding, or other protective systems are required to protect personnel from cave-ins except when the excavation is made entirely in stable rock or is less than 5 feet deep and there is no indication of possible cave-in, as determined by the excavation competent person. Protective systems for excavations deeper than 20 feet must be designed or approved by a registered professional engineer.

Trenches greater than 4 feet deep shall be provided with a ladder, stairway, or ramp positioned so that the maximum lateral travel distance is no more than 25 feet.

Excavations shall not be entered when:

- Protective systems are damaged or unstable.
- Objects or structures above the work location may become unstable and fall into the excavation.

- The potential for a hazardous atmosphere exists, unless the air has been tested and found to be at safe levels.
- Accumulated water exists in the excavation, unless precautions have been taken to prevent excavation cave-in.

The Excavation HSE Self-Assessment Checklist may be used to evaluate excavations prior to entry.

Excavation Operations

All work is to be conducted from the upwind direction. Backhoe excavator shall place themselves upwind and work in that direction to open of trenches for visual observations. Spoils shall be placed on downwind side of opening. All staff shall monitor wind directions and maintain their placement always upwind of work area.

Staff shall not approach trench from the spoils side of the opening, and shall maintain a safe distance from the edge.

Refer to the Excavation Entry section when entering excavations controlled by other parties. Refer to the Earthmoving Equipment section for additional requirements applicable to operating earthmoving equipment.

CH2M HILL shall provide an excavation competent person that will oversee all excavation operations and entry into excavations. The competent person shall:

- Complete the CH2M HILL Excavation Permit to ensure HSE requirements have be satisfied during excavation activities.
- Complete the CH2M HILL Daily Excavation Inspection Checklist to ensure HSE requirements have be satisfied, document that an inspection has been conducted, and to authorize entry into the excavation. A new Checklist shall be completed each day, authorizing excavation entry.
- Conduct daily safety briefings prior to excavation entry.

13.1.5 Utilities (Underground)

Do not begin subsurface construction activities (for example, trenching, excavation, drilling, etc.) until a check for underground utilities and similar obstructions has been conducted. The use of as-built drawings and utility company searches must be supplemented with a geophysical or other survey by a qualified, independent survey contractor to identify additional and undiscovered buried utilities.

Examples of the type of geophysical technologies include:

- **Ground penetrating radar (GPR)** can detect pipes, including gas pipes, tanks, conduits, cables, etc., both metallic and non-metallic, at depths up to 30 feet (9.1 meters) depending on equipment. Sensitivity for both minimum object size and maximum depth detectable depends on equipment selected, soil conditions, etc.
- **Radio frequency (RF)** involves inducing an RF signal in the pipe or cable and using a receiver to trace it. Some electric and telephone lines emit RF naturally and can be

detected without an induced signal. This method requires knowing where the conductive utility can be accessed to induce RF field if necessary.

- **Dual RF** is a modified version of RF detection using multiple frequencies to enhance sensitivity but with similar limitations to RF.
- **Ferromagnetic detectors** are metal detectors that will detect ferrous and non-ferrous utilities. Sensitivity is limited, for example, a 100-millimeter (mm) iron disk to a depth of about one meter or a 25-mm steel paper clip to a depth of about 20 centimeters (cm).
- **Electronic markers** are emerging technologies that impart a unique electronic signature to materials such as polyethylene pipe to facilitate location and tracing after installation. Promising for future installations but not of help for most existing utilities already in place.

Procedure

The following procedures shall be used to identify and mark underground utilities during subsurface construction activities on the project:

- The survey contractor shall determine the most appropriate geophysical technique or combinations of techniques to identify the buried utilities on the project, based on the survey contractor's experience and expertise, types of utilities anticipated to be present, and specific site conditions.
- The survey contractor shall employ the same geophysical techniques used on the project to identify the buried utilities, to survey the proposed path of subsurface construction work, and to confirm no buried utilities are present.
- Identify customer specific permit and/or procedural requirements for excavation and drilling activities. For military installations contact the Base Civil Engineer and obtain the appropriate form to begin the clearance process.
- Contact utility companies or the state/regional utility protection service at least two (2) working days prior to excavation activities to advise of the proposed work, and ask them to establish the location of the utility underground installations prior to the start of actual excavation.
- Schedule the independent survey.
- Obtain utility clearances for subsurface work on both public and private property.
- Clearances are to be in writing, signed by the party conducting the clearance.
- Underground utility locations must be physically verified by hand digging using wood or fiberglass-handled tools when any adjacent subsurface construction activity (for example, mechanical drilling, excavating) work is expected to come within 5 feet (1.5 meters) of the marked underground system. If subsurface construction activity is within 5 feet (1.5 meters) and parallel to a marked existing utility, the utility location must be exposed and verified by hand digging every 100 feet (30.5 meters).
- Protect and preserve the markings of approximate locations of facilities until the markings are no longer required for safe and proper excavations. If the markings of utility locations are destroyed or removed before excavation commences or is

completed, the PM must notify the utility company or utility protection service to inform them that the markings have been destroyed.

- Conduct a site briefing for employees regarding the hazards associated with working near the utilities and the means by which the operation will maintain a safe working environment. Detail the method used to isolate the utility and the hazards presented by breaching the isolation.

13.1.6 Utilities (Overhead)

Proximity to Power Lines

No work is to be conducted within 50 feet (15.2 meters) of overhead power lines without first contacting the utility company to determine the voltage of the system. No aspect of any piece of equipment is to be operated within 50 feet (15.2 meters) of overhead power lines without first making this determination.

Operations adjacent to overhead power lines are PROHIBITED unless one of the following conditions is satisfied:

- Power has been shut off, positive means (such as lockout) have been taken to prevent the lines from being energized, lines have been tested to confirm the outage, and the utility company has provided a signed certification of the outage.
- The minimum clearance from energized overhead lines is as shown in the table below, or the equipment will be repositioned and blocked to ensure that no part, including cables, can come within the minimum clearances shown in the following table.

Minimum Distances from Powerlines

Powerlines Nominal System kV	Minimum Required Distance, feet (meters)
0-50	10 (3.0)
51-100	12 (3.7)
101-200	15 (4.6)
201-300	20 (6.1)
301-500	25 (7.6)
501-750	35 (10.7)
751-1000	45 (13.7)

(These distances have been determined to eliminate the potential for arcing based on the line voltage.)

- The power line(s) has been isolated through the use of insulating blankets which have been properly placed by the utility. If insulating blankets are used, the utility will determine the minimum safe operating distance; get this determination in writing with the utility representative's signature.
- All inquiries regarding electric utilities must be made in writing and a written confirmation of the outage/isolation must be received by the PM prior to the start of work.

13.1.7 Polycyclic Aromatic Hydrocarbons

- Polycyclic aromatic hydrocarbons (PAHs) are a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances. PAHs are usually found as a mixture containing two or more of these compounds.
- The Department of Health and Human Services (DHHS) has determined that some PAHs may reasonably be expected to be carcinogens.
- Animal studies have also shown that PAHs can cause harmful effects on the skin, body fluids, and ability to fight disease after both short- and long-term exposure. But these effects have not been seen in people.
- In soils, PAHs are most likely to stick tightly to particles; protective gloves should be worn when contacting potentially contaminated sediment/soil.
- No eating, drinking or smoking while working in potentially contaminated areas.

13.1.8 Manual Lifting

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

Back injuries are the leading cause of disabling work injuries, 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 SSC 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, and 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; ensure good lifting and body positioning practices; ensure 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.

13.1.9 Noise

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

CH2M HILL is required to control employee exposure to occupational noise levels of 85 decibels (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 determine feasible engineering controls. When engineering controls are not feasible, administrative controls can be developed and appropriate hearing protection will be provided.
- Areas or 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 percent 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 (STS) 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 prior to 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.

13.1.10 Heavy Equipment (Earthmoving/Excavating Machinery)

(Reference CH2M HILL, SOP HSE-306, *Earthmoving Equipment*)

- CH2M HILL authorizes only those employees qualified by training or previous experience to operate material handling equipment. CH2M HILL employees who operate equipment must be evaluated prior to operating earthmoving equipment by a CH2M HILL earthmoving equipment operator evaluation designated person. This evaluation will be documented according to SOP HSE-306.
- Equipment must be checked at the beginning of each shift to ensure the equipment is in safe operating condition and free of apparent damage. The check should include: service brakes, parking brakes, emergency brakes, tires, horn, back-up alarm, steering mechanism, coupling devices, seat belts and operating controls. All defects shall be corrected before the equipment is placed in service. Documentation of this inspection must be maintained onsite at all times.
- Equipment must be on a stable foundation such as solid ground or cribbing; outriggers are to be fully extended.
- Equipment must not be used to lift personnel; loads must not be lifted over the heads of personnel.

- Equipment, or parts thereof, which are suspended must be substantially blocked or cribbed to prevent shifting before personnel are permitted to work under or between them. All controls shall be in a neutral position, with the motors stopped and brakes set.
- Equipment which is operating in reverse must have a reverse signal alarm distinguishable from the surrounding noise or a signal person when the operators view is obstructed.
- When equipment is used near energized powerlines, the closest part of the equipment must be at least 10 feet from the powerlines <50 kilovolts (kV). Provide an additional 4 feet for every 10 kV over 50 kV. A person must be designated to observe clearances and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means. All overhead powerlines must be considered to be an energized until the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded.
- Underground utility lines must be located before excavation begins.
- Operators loading/unloading from vehicles are responsible for seeing that vehicle drivers are in the vehicle cab or in a safe area.
- The parking brake shall be set whenever equipment is parked; wheels must be chocked when parked on inclines.
- When not in operation, the blade/bucket must be blocked or grounded; the master clutch must be disengaged when the operator leaves the cab. When equipment is unattended, power must be shut off, brakes set, blades/buckets landed and shift lever in neutral.

13.1.11 Munitions and Explosives of Concern

Due to the site history, the potential for exposure to munitions and explosives of concern (MEC) exist. The Naval Ordnance Safety and Security Activity (NOSSA) has concurred with the determination that the probability of encountering MEC is low. A MEC hazards awareness safety brief should be included as part of the site-specific briefing and discussed at daily tailgate briefings. Additionally, as a conservative measure on-site construction support will be provided during the waste delineation activities. Each individual on site is responsible for identifying the possibility of MEC presence. If MEC is identified, work will be halted, the area evacuated, and notification made to the client that suspected MEC/material presenting a potential explosive hazard (MPPEH) has been encountered. Work will not resume at the site until the item has been identified by military Explosive Ordnance Disposal and the hazard has been eliminated. Further, if MEC/MPPEH is encountered, NOSSA must be contacted for guidance regarding the need for an ESS before operations can be continued. MEC awareness training is required for all field personnel in accordance with the ESSD provided as Appendix B in the *Final Work Plan for Additional Waste Delineation at Site 2*.

13.2 General Hazards

13.2.1 General Practices and Housekeeping

(Reference CH2M HILL SOP HSE-209, *General Practices*)

- Site work should be performed during daylight hours whenever possible. Work conducted during hours of darkness requires enough illumination intensity to read a newspaper without difficulty.
- 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, and/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.

13.2.2 Hazard Communication

(Reference CH2M HILL SOP HSE-107, *Hazard Communication)*

The SSC is to perform the following:

- Complete an inventory of chemicals brought onsite by CH2M HILL using Attachment 2.
- Confirm that an inventory of chemicals brought onsite by CH2M HILL subcontractors is available.
- Request or confirm locations of Material Safety Data Sheets (MSDSs) from the client, contractors, and subcontractors for chemicals to which CH2M HILL employees potentially are exposed.
- Before or as the chemicals arrive onsite, obtain an MSDS for each hazardous chemical.
- Label chemical containers with the identity of the chemical and with hazard warnings, and store properly.
- Give employees the required chemical-specific Hazard Communication (HAZCOM) training using Attachment 3.

- Store all materials properly, giving consideration to compatibility, quantity limits, secondary containment, fire prevention, and environmental conditions.

13.2.3 Shipping and Transportation of Chemical Products

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

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

13.2.4 Heat Stress

(Reference CH2M HILL SOP HSE-211, *Heat and Cold Stress*)

- Drink 16 ounces of water before beginning work. Disposable cups and water maintained at 50 degrees Fahrenheit (°F) to 60°F should be available. Under severe conditions, drink 1 to 2 cups every 20 minutes, for a total of 1 to 2 gallons 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, as caffeine is a diuretic (that is, increases the rate of urination and therefore fluid loss).
- Acclimate yourself by slowly increasing workloads (for example, 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. Direct sun 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 shelter/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. Persons who experience signs of heat syncope, heat rash, or heat cramps should consult the SSC to avoid progression of heat-related illness.

TABLE 13-1
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!

Monitoring Heat Stress

These procedures shall be considered when the ambient air temperature exceeds 70°F, the relative humidity is high (>50 percent), or when 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 100 beats/minute, or 20 beats/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 100 beats/minute at the beginning of the next rest period, the work cycle should be further shortened by 33 percent. The procedure is continued until the rate is maintained below 100 beats/minute, or 20 beats/minute above resting pulse.

Temperature (°F)

Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution Extreme Caution Danger Extreme Danger

13.2.5 Cold Stress

(Reference CH2M HILL SOP HSE-211, *Heat and Cold Stress*)

- 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 cool 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 (NSC).
- Wind-chill index 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.
- NSC 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 consult the SSC 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.

TABLE 13-2
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. Rewarm 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.

Wind Chill Chart

Wind (mph) \ Temperature (°F)	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times: 30 minutes, 10 minutes, 5 minutes

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T= Air Temperature (°F) V= Wind Speed (mph)

Effective 11/01/01

13.3 Biological Hazards and Controls

(Reference CH2M HILL SOP HSE-202, *Biological Hazards*)

13.3.1 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 a person is bitten by a snake, wash and immobilize the injured area, keeping it lower than the heart if possible. Seek medical attention 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.

13.3.2 Poison Ivy 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. Become familiar with the identity of these plants. 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

13.3.3 Tick-Borne Pathogens

There are six notifiable tick-borne pathogens that present a significant field hazard, and in some areas account for more than half of our serious field incidents. These procedures should be applied during any field activity – even those field efforts that are predominantly paved but with bordering vegetation.

Hazard Control

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

- Avoiding tick habitats and ceasing operations in heavily infested areas
- Reducing tick abundance through habitat disruption or application of acracide
- 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 – tickborne 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 between 72 percent 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 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 in controlling exposure to ticks. Personal protection must include all of the following steps:

- So that ticks may be seen on your clothing 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 N,N-diethylmetatoluamide (DEET) repellent to exposed skin or clothing per product label.
- Apply permethrin repellent 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 anytime ticks are handled.

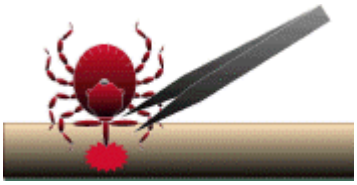
Pregnant individuals and individuals using prescription medications should consult with their physician and/or pharmacists before using chemical repellents. Because human health effects may not be fully known, use of chemical repellents should be kept to a minimum frequency and quantity. Always follow manufacturers' use instructions and precautions. Wash hands after handling, applying, or removing protective gear and clothing. Avoid hand-to-face contact, eating, drinking, smoking, etc. when applying or using repellents. Remove and wash clothes per repellent product label. Chemical repellents should not be used on infants and children.

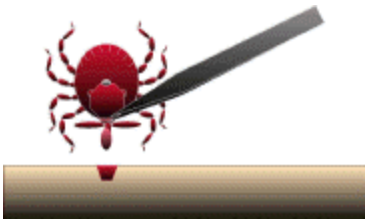
Vaccinations are generally not available for tick-borne pathogens. Although production of the LYMErix™ lyme disease vaccination has been ceased, vaccination may still be considered under specific circumstances and with concurrence from the consulting physician. Preventative antibiotic treatment in non-ill individuals who have had a recent tick bite is recommended in specific cases only.

Tick Removal

1. Use fine-tipped tweezers or shield your fingers with a tissue, paper towel, or nitrile gloves.

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. Do not squeeze, crush, or puncture the body of the tick because its fluids (saliva, hemolymph, and 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. You may wish to save the tick for identification in case you become ill. Your doctor can use the information to assist in making an accurate diagnosis. Place the tick in a plastic bag and put it in your freezer. Write the date of the bite on a piece of paper with a pencil and place it in the bag.

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. Consult a healthcare professional if infection or symptoms and effects of tick-borne illnesses develop.

Medical treatment for tick-borne infections includes antibiotics and other medical interventions. Diagnosis of specific illness involves both clinical and laboratory confirmations. Preventative antibiotic treatment in non-ill individuals who have had a recent tick bite is recommended in specific cases only.

Previously infected individuals are not conferred immunity – re-infection from future tick bites can occur even after a person has contracted a tick-borne disease.

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 several varieties of hard-bodied ticks that have been associated with tick-borne pathogens. These tick varieties 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. Here, 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 and 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)
- Rocky Mountain Spotted Fever (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 and symptoms: fever, headache, muscle aches, stiff neck, joint aches, nausea, vomiting, abdominal pain, diarrhea, malaise, weakness, and/or small solid, ring-like, or spotted rashes. The bite site may be red, swollen, or develop ulceration or lesions. A variety of long-term symptoms may result when untreated, including debilitating effects and death.

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 back of your legs, arms, and neck as well as your hairline. Shake off clothing as thorough as possible before entering into the vehicle. Once the field day is complete, repeat this procedure as well as performing a thorough self check.

If a tick is found and embedded itself into the skin, use the tick removal method described above. Once the tick is removed preserve the specimen in a small air tight bag and send the tick to Clongen Laboratories, LLC located in Germantown, Maryland for analysis. The laboratory will have results within 1 to 3 days. A tick testing submission form (attached) should be properly completed and submitted with the tick.

Deer Tick

Distribution of Deer Tick (dark green)

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

Distribution of Pacific Deer Tick (dark green)

Lone Star Tick

Distribution of Lone Star Tick (Green)

Rocky Mountain Wood Tick

Dog Tick

Internal Use Only
SAMPLE SUBMISSION FORM
Client ID _____ *Date Received:*_____
Job # _____ *Logged by:*___ _____

Clongen laboratories, LLC
Committed to Scientific Excellence
301-916-0173 (Phone)
1-877-CLONGEN 301-916-0175 (Fax)

Tick Testing (For Lyme's Disease) Submission Form

Please complete the form below. **All ticks should be sent to:**
Clongen Laboratories, LLC; 12321 Middlebrook Road, Suite 120, Germantown, MD 20874

Patient's Name:
Address:

E-mail:
Phone:
Fax:
Physician's Name (Optional):
Physician's Phone: (Optional):
Physician's Fax (Optional):

☐ Check ☐ Credit Card (We accept all major credit cards: VISA, MC, AMEX & Discover)

Name on Credit Card:
Credit Card Number:
Expiration Date:
Authorized Amount ($75 for Tick Testing Test 124C):

Frequently Asked Questions:

Q: I removed a tick one week ago and it has been stored at room temperature. Would the test still be valid?
A: Yes. Our assay tests DNA and DNA is stable at room temperature. The results will not be impacted.

Q: I stored the tick in alcohol. Would the test still be valid?
A: Yes. Alcohol is a preservative and the tick can be tested.

Q: While removing the tick, I lost the body and trunk of the tick and have only the legs left. Would that be good enough for the test?
A: No. The bacteria is usually in the digestive tract and it is necessary that we receive the entire tick in order to get reliable results.

Q: I was bitten by a tick and there is a red spot/rash. What do I do?
A: See your doctor immediately.

Q: What is the turnaround time for test 124C?
A: Turnaround time is 1-3 days. We usually send results by e-mail as soon as they become available and hard copies along with a receipt follow two to three days later.

Thank you for Choosing Clongen – We appreciate your business.

13.3.4 Bees and Other Stinging Insects

Bee 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 the SSC and/or buddy. If a stinger is present, remove it carefully with tweezers. Wash and disinfect the wound, cover it, and apply ice. Watch for allergic reaction; seek medical attention if a reaction develops.

13.3.5 Blood-borne Pathogens

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

Exposure to blood-borne pathogens may occur when rendering first aid or CPR, or when coming into contact with landfill waste or waste streams containing potentially infectious material. Exposure controls and personal protective equipment are required as specified in CH2M HILL SOP HSE-202, *Blood-borne Pathogens*. Hepatitis B vaccination must be offered before the person participates in a task where exposure is a possibility.

13.3.6 Mosquito Bites

Due to the recent detection of the West Nile Virus in the southwestern United States it is recommended that **preventative measures** be taken to reduce the probability of being bitten by mosquitoes whenever possible. Mosquito's 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.
- Repellents may irritate the eyes and mouth, so avoid applying repellent to the hands. Spray clothing with repellents containing permethrin or DEET since mosquitoes may bite through thin clothing.
- Apply insect repellent sparingly to exposed skin. An effective repellent will contain 35% DEET. DEET in high concentrations (greater than 35%) provides no additional protection.
- 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.

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

13.3.7 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 infection 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.

If you have any questions or to report any suspicious symptoms, contact the project Health and Safety Manager.

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SECTION 14

Contaminants of Concern

Table 14-1 summarizes the potential contaminants of concern (COCs) and their occupational exposure limit and signs and symptoms of exposure. This table serves as general information regarding the specific compounds. These concentrations were used to determine engineering and administrative controls as well as PPE and site monitoring requirements. As a precaution, air monitoring will be conducted to prevent exposure from any potential inhalation pathway during the course of this investigation. See section 15.0 for specific details. Also, strict industrial hygiene practices will be enforced to prevent any other type of exposure pathway from occurring.

TABLE 14-1
Contaminants of Concern
(Refer to Project Files for additional contaminant information)

Contaminant	Location and Maximum[a] Concentration	Exposure Limit[b]	IDLH[c]	Symptoms and Effects of Exposure	PIP[d] (eV)
Metals					
Arsenic	SB: 15.5 mg/kg SJS17-SS04-000	0.01 mg/m^3	5 Ca	Ulceration of nasal septum, respiratory irritation, dermatitis, gastrointestinal disturbances, peripheral neuropathy, hyperpigmentation	NA
Barium	SB: 470 mg/kg SJS02-SS20-000	0.5 mg/m^3	50	Irritation eyes, skin, upper respiratory system; skin burns; gastroenteritis	NA
Beryllium	SB: 2.5 mg/kg SJS02-SS03-000	0.00005 mg/m^3	4 Ca	Eye irritation; dermatitis; chronic exposure: berylliosis, chest pain, cough,	NA
Cadmium	SB: 3.02 mg/kg SJS02-SS20-000	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
Chromium	SB: 230 mg/kg SJ02-SS03-000	0.005 mg/m^3	15 Ca	Irritated respiratory system, nasal septum perforation, liver and kidney damage, leucytosis, leupen, monocytosis, eosinophilla, eye injury, conjunctivitis, skin ulcer, sensitization dermatitis	NA
Lead	SB: 793 mg/kg SJS02-SS20-000	0.05 mg/m^3	100	Weakness lassitude, facial pallor, pal eye, weight loss, malnutrition, abdominal pain, constipation, anemia, gingival lead line, tremors, paralysis of wrist and ankles, encephalopathy, kidney disease, irritated eyes, hypertension	NA
Mercury	SB: 0.42 mg/kg SJS02-SS05-000	0.025 mg/m^3	10	Skin and eye irritation, cough, chest pain, difficult breathing, bronchitis, pneumontitis, tremors, insomnia, irritability, indecision, headache, fatigue, weakness, GI disturbance	NA

TABLE 14-1
Contaminants of Concern
(Refer to Project Files for additional contaminant information)

Contaminant	Location and Maximum[a] Concentration	Exposure Limit[b]	IDLH[c]	Symptoms and Effects of Exposure	PIP[d] (eV)
Pesticides					
DDT (skin)	SB: 12000 µg/kg SJS02-SS20-000	1.0 mg/m^3	500 mg/m^3	Numb face, lips & tongue, tremors, apprehension, headache	NA
PCB's	SB: 150 ug/kg SJS17-SS01-00011SS01	0.5 mg/m^3	5 mg/m^3 Ca	Eye and skin irritation, acne-form dermatitis, liver damage, reproductive effects	NA
SVOCs					
Benzo (a) Anthracene	2000 ug/kg SJS17-SS04-000	NL	NL	Skin irritation and dermititis; questionable carcinogen	UK
Benzo-pyrene	2100 ug/kg SJS17-SS04-000	0.2 mg/m^3	NL Ca	Skin irritation, carcinogen	UK
Chrysene	2700 ug/kg	0.2 mg/m^3	NL Ca	Skin irritation	UK
Naphthalene	GW: 250 µg/kg SJS17-SS04-000	10 ppm	250 ppm	Eye irritant; headache, confusion, excitement, malaise; nausea, vomiting, abdominal pain; bladder irritation; profuse sweating; jaundice; hematuria, hemoglobinuria, renal shutdown; dermatitis; optical neuritis, corneal damage	8.12

Footnotes:
[a] Specify sample-designation and media: SB (Soil Boring), A (Air), D (Drums), GW (Groundwater), L (Lagoon), TK (Tank), S (Surface Soil), SL (Sludge), SW (Surface Water).
[b] Appropriate value of PEL, REL, or TLV listed.
[c] IDLH = immediately dangerous to life and health (units are the same as specified "Exposure Limit" units for that contaminant); NL = No limit found in reference materials; CA = Potential occupational carcinogen.
[d] PIP = photoionization potential; NA = Not applicable; UK = Unknown.

Potential Routes of Exposure		
Dermal: Contact with contaminated media. This route of exposure is minimized through proper use of PPE, as specified in Section 4.	**Inhalation:** Vapors and contaminated particulates. This route of exposure is minimized through proper respiratory protection and monitoring, as specified in Sections 4 and 5, respectively.	**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).

SECTION 15

Air Monitoring/Sampling

15.1 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 date and time, describe monitoring location (for example, in breathing zone, at source, etc. 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 plus thirty years. Ensure that copies of the field log book are maintained in the project file.

Copies of all project exposure records (for example, 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.

As the background information on COCs shows low to moderate levels, and the tasks involved in this SSHP do pose an exposure potential, the action limits are set for work to proceed in Level D only. If any action limit is exceeded, the work will be halted and the HSM shall be notified to assess and determine what further action is necessary.

15.2 Direct Reading Monitoring Specifications

Instrument	Tasks	Action Levels [a]	Action to be Taken when Action Level Reached	Frequency [b]	Calibration
Toxic Gas Monitor: MultiRAE Plus with 10.6 eV lamp (VOCs, O_2, LEL, CO, H_2S)	All sampling tasks	< 1 ppm >1 ppm	Level D Contact HSM, stop work.	Real time during all tasks	Daily
Dust Monitor: visible dust at 2 mg/m^3	all soil intrusive tasks, implement dust control if visible dust present	2 mg/m^3 or visible dust	Level D Halt work, contact HSM or use dust suppression techniques	Full time, action limit exceedance in breathing zone shall halt work	Zero Daily
Nose-Level Monitor [d]	not required, as Hearing protection is implemented when within 50 feet of operating equipment.	<85 dB(A) 85-120 dB(A) 120 dB(A)	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 SSC; generally, every 5 to 15 minutes if acceptable; more frequently may be appropriate.
[c] If the measured percent of O_2 is less than 10, an accurate LEL reading will not be obtained. Percent LEL and percent O_2 action levels apply only to ambient working atmospheres, and not to confined-space entry. More-stringent percent LEL and O_2 action levels are required for confined-space entry.
[d] Noise monitoring with either Type I or II meter set for A scale, slow response and audiometric testing also required.

15.3 Calibration Specifications

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

Instrument	Gas	Span	Reading	Method
PID: OVM, 10.6 or 11.8 eV bulb	100 ppm isobutylene	RF = 1.0	100 ppm	1.5 lpm reg T-tubing
PID: MiniRAE, 10.6 eV bulb	100 ppm isobutylene	CF = 100	100 ppm	1.5 lpm reg T-tubing
CGI: MSA 260, 261, 360, or 361	0.75% pentane	N/A	50% LEL ± 5% LEL	1.5 lpm reg direct tubing
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 prior to 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

SECTION 16

Incident Notification and Reporting

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

- In case of an emergency immediately contact the Police, Fire, and Medical Emergency dispatch by dialing 757-396-3333.
  - Severe Bleeding.
  - Loss of consciousness.
  - Chest Pain.
  - Broken bones.
- All other injuries or illnesses (even those that are minor and may only require first aid) that occur at work or while on business travel or commute must be reported to your supervisor immediately.
- After informing their supervisor, the injured employee calls CH2M HILL's contracted Occupational Nurse.
  - 24-hour CH2M HILL Emergency Nurse Assistance—800/756-1130
- The Occupational Injury Nurse listens to the injured employee to understand the injury/illness.
- Employee is provided guidance on appropriate treatment options (triage).
- If instructed to visit a medical facility by the Occupational Injury Nurse, the Supervisor is responsible for instructing the injured employee to take a copy of the CH2M HILL Initial Medical Treatment Form (Attachment # 7) with them to the physician, clinic or hospital.
- Appropriate treatment details are handled by the Occupational Injury Nurse, and Workers Compensation Groups.
- Nurse communicates and troubleshoots with and for employee through full recovery.
- Upon any project incident (fire, spill, injury, near miss, death, etc.), immediately notify the PM and HSM. Call emergency beeper number if HSM is unavailable.
- For CH2M HILL work-related injuries or illnesses, contact and help Human Resources administrator complete an Incident Report Form (IRF). IRF must be completed within 24 hours of incident.
- For CH2M HILL subcontractor incidents, complete the Subcontractor Accident/Illness Report Form and submit to the HSM.
- Notify and submit reports to client as required in contract.

Additionally:

- Upon any project incident (fire, spill, injury, near miss, death, hospitalization of three or more employees, etc.), immediately notify the PM and HSM. Call emergency beeper number if HSM is unavailable.
- For CH2M HILL work-related injuries or illnesses, contact and help Human Resources administrator complete an IRF. IRF must be completed within 24 hours of incident.
- For CH2M HILL subcontractor incidents, complete the Subcontractor Accident/Illness Report Form and submit to the HSM.
- Notify and submit reports to client as required in contract.

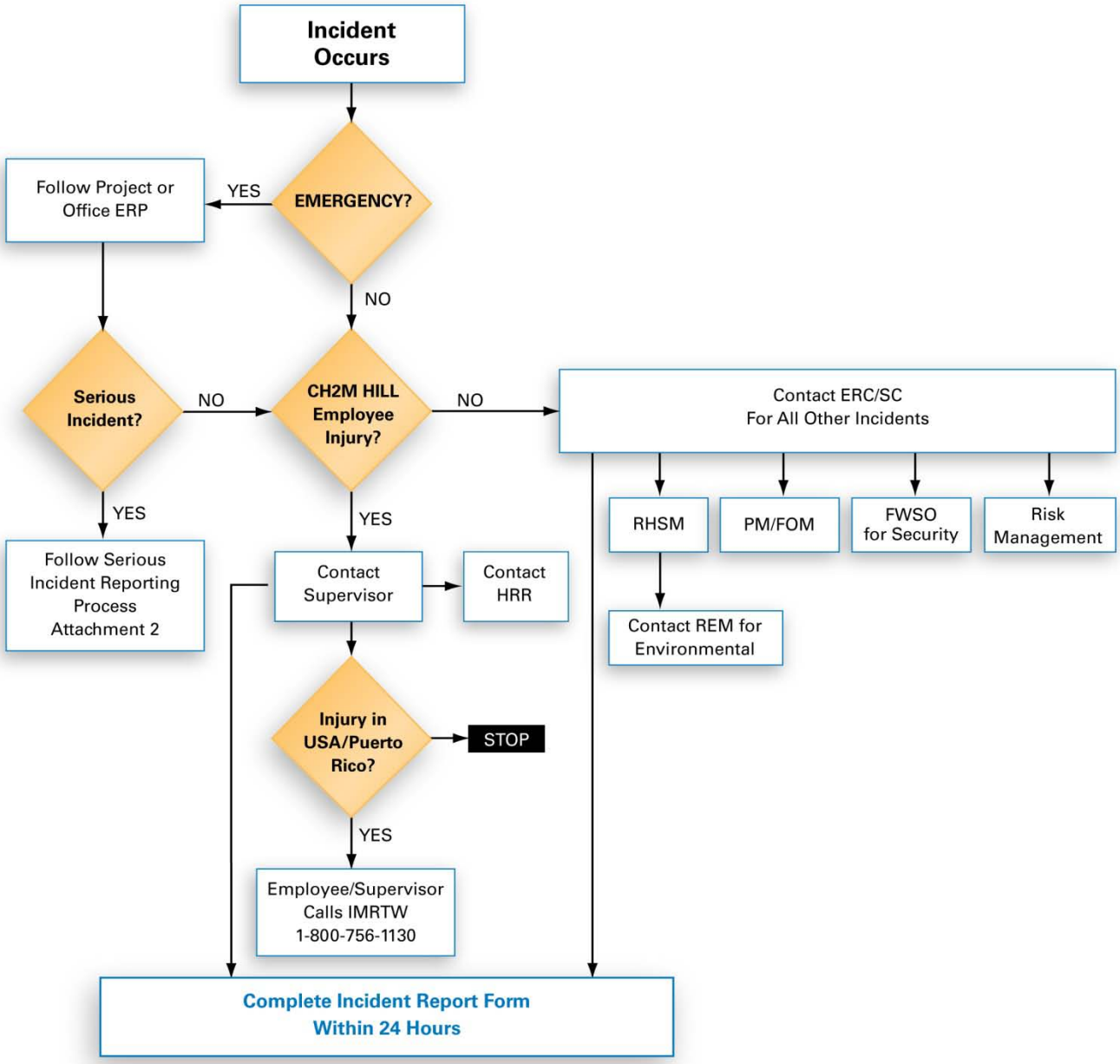
16.1 Serious Incident Reporting

Serious Incidents must be reported in accordance with CH2M HILL Standard of Practice HSE-601, *Serious Incident Reporting Process,* immediately. Serious incidents are those that involve any of the following:

- 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
- Where 3 or more employee's are injured and/or admitted to a hospital, OSHA notification is required.
- Per USACE reporting requirements, the dollar threshold for property damage is $2,000 or more (Est.) requiring reporting and $200,000 and greater warrants a Board of Investigation.

Note: See the following Incident Notification flowcharts

CH2M HILL Immediate Incident Notification



ERC = Emergency Response Coordinator (designated in Emergency Response Plan)
ERP = Emergency Response Plan
FOM = Facility Office Manager
FWSO = Firm Wide Security Operations
HRR = Human Resources Representative
IMRTW = Injury Management/Return-to-Work
PM = Project Manager
REM = Responsible Environmental Manager
RHSM = Responsible Health & Safety Manager
SC = Safety Coordinator

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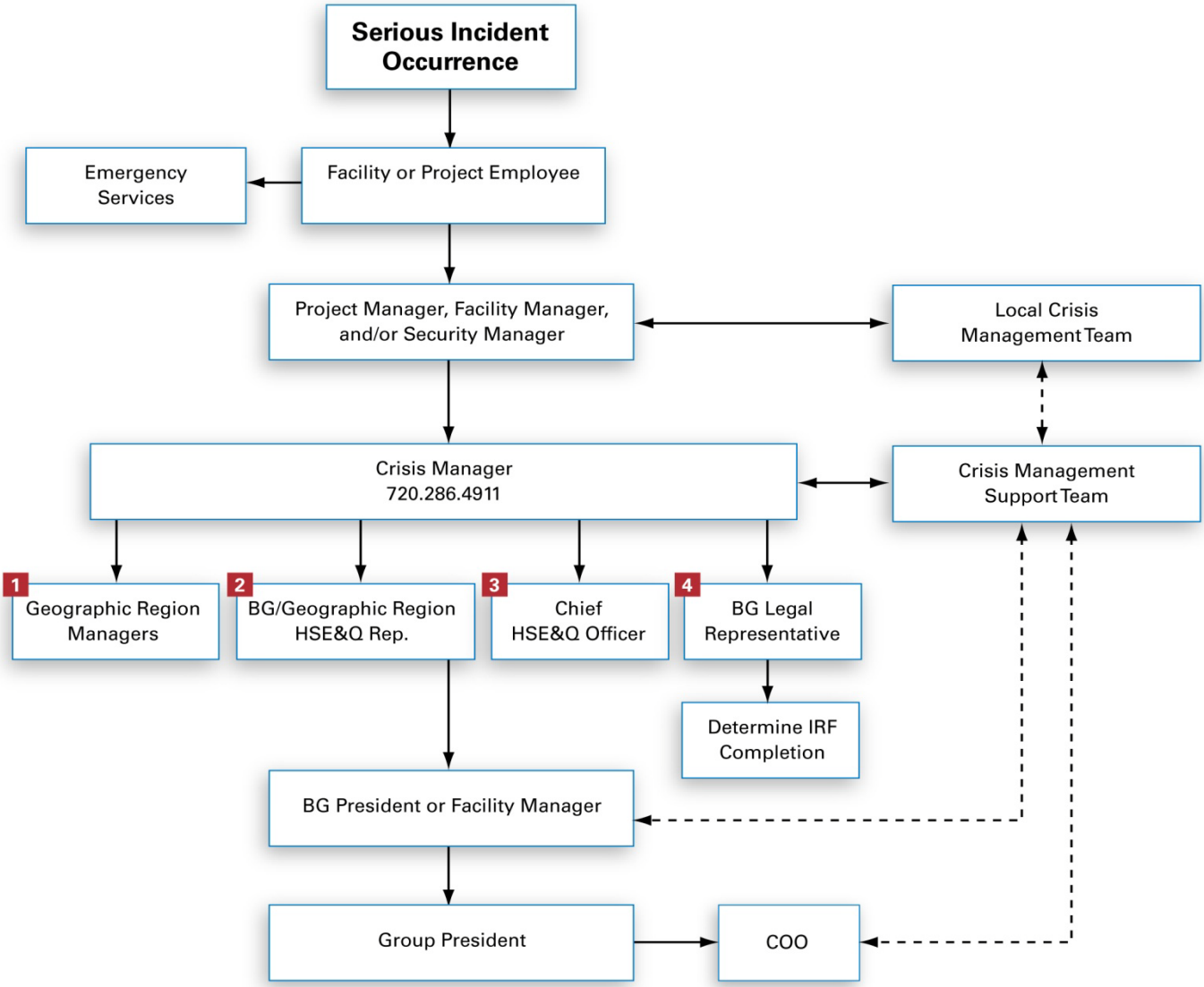
CH2MHILL

CH2M HILL Serious Incident Notification



LEGEND:

Direct line of communication

Indirect line of communication

DEFINITIONS:

Local Crisis Management Team: Team comprised of key facility, project and/or business group personnel. Team is assembled as necessary and as appropriate to effectively manage and respond to a crisis situation (serious incident) at/on scene.

Crisis Management Support Team: Team comprised of key corporate personnel. Team is assembled as necessary and as appropriate to effectively support, direct, and /or supplement a Local Crisis Management Team.

Crisis Manager: Corporate based Crisis Manager, contactable by pager 24/7.

HS052007002MKT

SECTION 17

Behavioral Based Loss Prevention

Research shows that 90% of incidents are related to unsafe acts and 10 percent are related to unsafe conditions. This means 90 percent of incidents are self inflicted.

A Behavior Based Loss Prevention System (BBLPS) is a system to prevent or reduce losses using behavior-based tools and proven management techniques to focus on behaviors or acts that could lead to losses.

The four basic Loss Prevention tools that will be used during the Former Wilkins Air Force Station field investigation to implement the BBLPS include:

- Activity hazard analysis (AHA)
- Pre-Task Safety Plans (PTSP)
- Loss Prevention Observations (LPOs)
- Loss and Near Loss Investigations (NLI)

The Site Supervisor serves as the Site Safety Coordinator (SSC) and is responsible for implementing the BBLPS on this site. When a separate individual is assigned as the SSC, the SSC is delegated authority from the Site Supervisor to implement the BBLPS on the project site, but the Site Supervisor remains accountable for its implementation. The Site Supervisor/Safety Coordinator shall only oversee the subcontractor's implementation of their AHAs and PTSPs processes on the project.

17.1 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 prior, during and after the performance of work to further identify the hazards posed and control measures required.

The Project AHAs are provided in Attachment 8. The AHAs identify the work tasks required to perform each activity, along with potential H&S hazards and recommended control measures for each work task. In addition, a listing 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.

AHAs are prepared for all field activities performed by CH2M HILL and subcontractor during the course of the project by the Site Supervisor/SSC. The Project-Specific and General Hazards of the SSHP, the Task Hazard Analysis Table, and applicable CH2M HILL Standards of Practice (SOPs) are used as a basis for preparing CH2M HILL's 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 work plan/scope of work, along with their project-specific SSHP. Additions or changes in CH2M HILL or subcontractor field activities, equipment,

tools or material to perform work or additional/different hazard encountered that require additional/different hazard control measures requires either a new AHA to be prepared or an existing AHA to be revised.

17.2 Pre-Task Safety Plans

Daily safety meetings shall be held with all project personnel in attendance to review the hazards posed and required H&S procedures/AHAs that apply for each day's project activities. The 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 in Attachment 9, 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 H&S procedures, as identified in the AHA. The use of PTSPs better promotes worker participation in the hazard recognition and control process, while reinforcing the task-specific hazard and required H&S procedures with the crew each day. The use of PTSPs is a common safety practice in the construction industry.

17.3 Loss Prevention Observations/Safe Work Observations

Loss Prevention Observations (LPOs) shall be conducted by Site Supervisor/SSC for specific work tasks or operations comparing the actual work process against established safe work procedures identified in this SSHP (Drilling Self Checklist, Hand and Power Tool Self Checklist, and other relevant self checklists) and AHAs. LPOs 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. Site Supervisor/SSC shall perform at least one LPO each week for tasks/operations addressed in this SSHP and AHAs. The Site Supervisor/SSC shall complete the LPO form in Attachment 10 for the task/operation being observed.

17.4 Loss/Near Loss Investigations

Loss/Near Loss Investigations shall be performed for the all CH2M HILL and subcontractor incidents involving:

- Person injuries/illnesses and near miss injuries
- Equipment/property damage
- Spills, leaks, regulatory violations
- Motor vehicle accidents

The causes of loss and near loss incidents are similar, so by identifying and correcting the causes of near loss causes, future loss incidents may be prevented. The following is the Loss/Near Loss Investigation Process:

- Gather all relevant facts, focusing on fact-finding, not fault-finding, while answering the who, what, when, where, and how questions.

- Draw conclusions, pitting facts together into a probable scenario.

- Determine incident root cause(s), which are basic causes on why an unsafe act/condition existed.
- Develop and implement solutions, matching all identified root causes with solutions.
- Communicate incident as a Lesson Learned to all project personnel.
- File follow-up on implemented corrective active action to confirm solution is appropriate.

Site Supervisors/SSC shall perform an incident investigation, as soon as practical after incident occurrence during the day of the incident, for all Loss and Near Loss Incidents that occur on the project. Loss and Near Loss incident investigations shall be performed using the following incident investigation forms provided in Attachment 11:

- Incident Report Form (IRF)
- Root Cause Analysis Form

All Loss and Near Loss incident involving personal injury, property damage or near loss incidents that could have resulted in serious consequences shall be investigated by completing the incident investigation forms and submitting them to the PM and HSM within 24 hours of incident occurrence. A preliminary Incident Investigation and Root Cause Analysis shall be submitted to the Project Manager and HSM within 24 hours of incident occurs. The final Incident Investigation and Root Cause Analysis shall be submitted after completing a comprehensive investigation of the incident.

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Attachments

Attachment 1: Employee Signoff Sheet
Attachment 2: Project-Specific Chemical Product Hazard Communication Form
Attachment 3: Chemical Specific Training Form
Attachment 4: Emergency Contacts List and Emergency Response Plan
Attachment 5: Project Activity Self-Assessment Checklists
Attachment 6: Project-Specific Material Safety Data Sheets
Attachment 7: Initial Medical Treatment Form
Attachment 8: Project Activity Hazard Analyses
Attachment 9: Pre-Task Safety Plan
Attachment 10: Safe Work Observation Form
Attachment 11: Loss/Near-Loss Investigations

Employee Signoff Sheet

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CH2MHILL

EMPLOYEE SIGNOFF FORM

Health and Safety Plan

- The CH2M HILL project employees and subcontractors listed below have been provided with a copy of this SSHP, have read and understood it, and agree to abide by its provisions.

Project Name: **Project Number:**

EMPLOYEE NAME (Please print)	**EMPLOYEE SIGNATURE**	**COMPANY**	**DATE**

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Project-Specific Chemical Product Hazard Communication Form

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CH2MHILL

Project-Specific Chemical Product Hazard Communication Form

This form must be completed prior to performing activities that expose personnel to hazardous chemicals products. Upon completion of this form, the SSC shall verify that training is provided on the hazards associated with these chemicals and the control measures to be used to prevent exposure to CH2M HILL and subcontractor personnel. Labeling and MSDS systems will also be explained.

Project Name: **Project Number:**

MSDSs will be maintained at the following location(s):

Hazardous Chemical Products Inventory

Chemical	Quantity	**Chemical**	Quantity	**Chemical**	

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Chemical Specific Training Form

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CH2MHILL

CHEMICAL-SPECIFIC TRAINING 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.

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Emergency Contacts List

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Emergency Contacts

24-hour CH2M HILL Serious Incident Reporting Contact/Pager – 720-286-4911

If injured on the job, notify your supervisor and then call 1-866-893-2514 to contact CH2M HILL's Occupational Nurse

Medical Emergency – 911
Facility Medical Response #: 757-396-3333
Local Ambulance #: 757-396-3333

Note: Do not call 911 while in the SJCA boundary.

CH2M HILL Medical Consultant
CH2M HILL- Medical Consultant
WorkCare
Dr. Peter Greaney M.D.
300 S. Harbor Blvd, Suite 600
Anaheim , CA 92805
800-455-6155
714-978-7488

Fire/Spill Emergency -- 911
Facility Fire Response #: 757-396-3335
Local Fire Dept #: 757-382-6297

CH2M HILL Director Security Operations
Thomas Horton/DEN
720/273-3100 (cell) or 720/286-0022 (office)

Security & Police – 911
Facility Security #: 757-396-7266
Local Police #: 757-382-6161

CH2M HILL Regional Health, Safety & Environmental Manager
Name: Mark Orman/MKE
Phone: 414-847-0597

Utilities Emergency
Water: 757-382-3550
Gas: 1-877-572-3342
Electric: 1-888-667-3000

CH2M HILL Regional Environmental Compliance Coordinator
Name: Nancy Ballantyne/DEN
Phone: 303- 885-9954

Site Safety Coordinator (SSC)
Name: Mark Ost
Phone: 757-671-6247

CH2M HILL Human Resources Department
Name: Sherri Huntley
Phone: 703-376-5192

Project Manager
Name: Janna Staszak/VBO
Phone: 757-671-6256

CH2M HILL Media Inquiries Corporate Strategic Communications
Name: John Corsi
Phone: 720-286-2087

Federal Express Dangerous Goods Shipping
Phone: 800/238-5355
CH2M HILL Emergency Number for Shipping Dangerous Goods
Phone: 800/255-3924

Worker's Compensation:
Contact Business Group Human Resources (HR) dept. to have form completed or contact Jennifer Rindahl after hours: (720) 891-5382
Automobile Accidents
Rental: Linda Anderson/COR 720/286-2401
CH2M HILL owned vehicle: Linda George 720-286-2057

Contact the Project Manager. Generally, the Project Manager will contact relevant government agencies.

Facility Alarms: Sound Field Vehicle Horn (3x)

Evacuation Assembly Area(s): Field Vehicle

Facility/Site Evacuation Route(s): See Site Map

Hospital Name/Address: **Hospital Phone #:** 757-398-2200

Maryview Medical
3636 High Street
Portsmouth, VA 23707

Directions to Hospital

Leave main gate of Annex and take left onto Victory Blvd.
At route 17 (George Washington Highway) take a right and go north.
Make left onto Frederick Blvd, and continue on Frederick until it dead ends.
Make left onto High Street, the Maryview Medical Center is on the right at the first light.

Emergency Response Plans

Emergency Preparedness Training

The emergency response plan will be reviewed during the initial arrival to the jobsite and occasionally during site safety briefings. The briefings should include:

- Emergency procedures for fires, explosions, chemical and vapor releases, personnel injuries, and suspected overexposure as they apply to the site
- Location of onsite emergency equipment and supplies of clean water
- Local emergency contacts, evacuation routes, and assembly points
- Site communication and location of phone and radio nearest
- Names of onsite personnel trained in first-aid and CPR

Emergency Equipment and Supplies

The SSC will verify that these supplies are available, as needed, and in proper working order, and mark the locations of emergency equipment on the site map when a map is provided.

Emergency Equipment and Supplies

Emergency Equipment and Supplies	Location
2 fire extinguishers (A, B, and C classes)	Field vehicle
First aid kit	Field vehicle
Eye wash	Field vehicle
Potable water	Field vehicle
Blood-borne pathogen kit	Field vehicle
Additional equipment (specify):	Cell phone: SSC

Incident Response

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

- Shut down operations and evacuate the immediate area
- Notify the SSC and PM by the fastest means available.
- Account for personnel at the designated assembly area(s)
- Assess the need for site evacuation, and evacuate the site as warranted
- Instead of implementing a work-area evacuation, note that small fires or spills posing minimal safety or health hazards may be controlled

Emergency Medical Treatment

The procedures listed below may also be applied to nonemergency incidents. Injuries and illnesses (including overexposure to contaminants) must be reported to CH2M HILL HSM/Human Resources. If there is doubt about whether medical treatment is necessary, or if the injured person is reluctant to accept medical treatment, contact the CH2M HILL medical consultant (see Emergency Contacts List in Attachment 4). During non-emergencies, follow these procedures as appropriate.

- Notify appropriate emergency response authorities. **Contact the police, fire, and medical emergency dispatch by dialing 757-396-3333**.
- The SSC 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.
- Initiate first aid and CPR (if needed) where feasible.
- Get medical attention immediately.
- Perform decontamination where feasible; lifesaving and first aid or medical treatment take priority.
- Make certain that the injured person is accompanied to the emergency room.
- When contacting the medical consultant, state that the situation is a CH2M HILL matter, and give your name and telephone number, the name of the injured person, the extent of the injury or exposure, and the name and location of the medical facility where the injured person was taken.

Evacuation Procedures

- Evacuation routes and assembly areas will be designated by the SSC before work begins.
- Personnel will assemble at the assembly area(s) upon hearing the emergency signal for evacuation.
- The SSC and a “buddy” will remain on the site after the site has been evacuated (if safe) to inform local responders of the nature and location of the incident.
- Each supervisor will account for their personnel at the assembly area, and report to the PM or CSP/HSM that either all personnel are accounted for, or the number of personnel who are unaccounted.

- The SSC will write up the incident as soon as possible after it occurs and submit a report to the PM and/or CSP/HSM.

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.

17.4.1 Firefighting Plan

(References: Section 01.E.01 & 06.A.02, EM 385-1-1 and CH2M HILL SOP HSE-208, *Fire Prevention*)

The decision on whether or not to try to extinguish a fire using available site personnel and equipment will be made by the SSC, and is based on whether the fire is small or large, and involves explosives or flammable liquids/gases.

Location of Fire Extinguishers

Fire extinguishers will be located around the project sites as required. These will be located in the following places at a minimum:

- In each vehicle
- Near areas where flammable materials are stored or in use
- Locations where HOT Work permits are in place

All fire extinguishers will be kept clearly visible, marked, and placed where they are easily accessible.

Project Activity Self-Assessment Checklists

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CH2MHILL

HS&E Self-Assessment Checklist - EARTHMOVING EQUIPMENT

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 potentially exposed to the hazards of earthmoving equipment operations, 2) CH2M HILL employees are operating earthmoving equipment, and/or 3) CH2M HILL provides oversight of a subcontractor operating earthmoving equipment.

The CH2M HILL Site Safety Coordinator may consult with subcontractors operating earthmoving equipment when completing this checklist, but shall not direct the means and methods of equipment operations nor direct the details of corrective actions. Earthmoving equipment 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:

☐ Evaluate CH2M HILL employee exposures to earthmoving equipment hazards (complete Section 1).
☐ Evaluate CH2M HILL employees operating earthmoving equipment (complete entire checklist).
☐ Evaluate CH2M HILL subcontractor's compliance with earthmoving equipment safety requirements (complete entire checklist). 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 earthmoving equipment 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-306.

SAFE WORK PRACTICES (5.1) **SECTION 1**	**Yes**	**No**	**N/A**	**N/O**
1. Personnel maintaining safe distance from operating equipment	☐	☐	☐	☐
2. Positioning personnel in close proximity to operating equipment is avoided	☐	☐	☐	☐
3. Personnel wearing high-visibility and/or reflective vests when close to operating equipment ☐		☐	☐	☐
4. Personnel approach operating equipment safely	☐	☐	☐	☐
5. Personnel riding only in seats of equipment cab and using seat belts	☐	☐	☐	☐
6. Personnel not positioned under elevated portions of equipment	☐	☐	☐	☐
7. Personnel not positioned under hoisted loads	☐	☐	☐	☐
8. Personnel not hoisted by equipment	☐	☐	☐	☐
9. Personnel do not to approach equipment that has become electrically energized	☐	☐	☐	☐
10. Personnel wearing appropriate PPE, per HSP/FSI	☐	☐	☐	☐

EQUIPMENT SAFETY REQUIREMENTS **SECTION 2**	**Yes**	**No**	**N/A**	**N/O**
PRIOR TO OPERATING EQUIPMENT (5.2.1)				
11. Only qualified and authorized personnel operating equipment	☐	☐	☐	☐
12. Daily safety briefing/meeting conducted with equipment operators	☐	☐	☐	☐
13. Daily inspection of equipment conducted and documented	☐	☐	☐	☐
14. Modifications and attachments used approved by equipment manufacturer	☐	☐	☐	☐
15. Backup alarm or spotter used when backing equipment	☐	☐	☐	☐
16. Operational horn provided on bi-directional equipment	☐	☐	☐	☐
17. Seat belts are provided and used	☐	☐	☐	☐
18. Rollover protective structures (ROPS) provided	☐	☐	☐	☐
19. Braking system capable of stopping full payload	☐	☐	☐	☐
20. Headlights and taillights operable when additional light required	☐	☐	☐	☐
21. Brake lights in operable condition	☐	☐	☐	☐
22. Cab glass provides no visible distortion to the operator	☐	☐	☐	☐
23. All machine guards are in place	☐	☐	☐	☐
24. Hauling equipment (dump trucks) provided with cab shield or canopy	☐	☐	☐	☐
25. Dump truck beds provided with positive means of support during maintenance or inspection	☐	☐	☐	☐
26. Dump truck operating levers provided with latch to prevent accidental dumping	☐	☐	☐	☐
27. Air monitoring conducted per HSP/FSI for hazardous atmospheres	☐	☐	☐	☐
EQUIPMENT PLACEMENT (5.2.2)				
28. Equipment position on firm/level surface, outriggers used	☐	☐	☐	☐
29. Location of underground utilities identified	☐	☐	☐	☐
30. Safe clearance distance maintained while working under overhead power lines	☐	☐	☐	☐
31. Safe distance is maintained while traveling under power lines	☐	☐	☐	☐
32. Warning system used to remind operator of excavation edge	☐	☐	☐	☐
33. Unattended equipment visibly marked at night	☐	☐	☐	☐
34. Tools lowered/parking brake set when not in use, wheels chocked when parked on incline ☐		☐	☐	☐
EQUIPMENT OPERATION (5.2.3)				
35. Equipment operated on safe roadways and grades	☐	☐	☐	☐
36. Equipment operated at safe speed	☐	☐	☐	☐
37. Operators maintain unobstructed view of travel path	☐	☐	☐	☐
38. Equipment not operated during inclement weather, lightning storms	☐	☐	☐	☐
39. Equipment started and moved safely	☐	☐	☐	☐
40. Operators keep body parts inside cab during operation	☐	☐	☐	☐
41. Vehicle occupants in safe position while loading/unloading	☐	☐	☐	☐
42. Signal person visible to operator when required	☐	☐	☐	☐
43. Equipment used for hoisting done according to equipment manufacturer specifications	☐	☐	☐	☐
44. Lifting and hauling capacities are not exceeded	☐	☐	☐	☐
EQUIPMENT MAINTENANCE (5.2.4)				
45. Defective components repaired immediately	☐	☐	☐	☐
46. Suspended equipment or attachments supported prior to work under or between	☐	☐	☐	☐
47. Lockout/tagout procedures used prior to maintenance	☐	☐	☐	☐
48. Tires on split rims removed using safety tire rack or cage	☐	☐	☐	☐
49. Good housekeeping maintained on and around equipment	☐	☐	☐	☐

HS&E Self-Assessment Checklist—Excavations

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/Field Safety Instruction (HSP/FSI).

This checklist is to be used at locations where: 1) CH2M HILL employees enter excavations (complete Sections 1 and 3), and/or 2) CH2M HILL oversight of an excavation subcontractor is required (complete entire checklist).

The SSC may consult with excavation subcontractors when completing this checklist, but shall not direct the means and methods of excavation operations nor direct the details of corrective actions. Excavation subcontractors shall determine how to correct deficiencies and we must 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 the situation is corrected.

Project Name: _____ Project No.: _____

Location: _____ PM: _____

Auditor: _____ Title: _____ Date: _____

This specific checklist has been completed to:

☐ Evaluate CH2M HILL employee exposures to excavation hazards

☐ Evaluate a CH2M HILL subcontractor's compliance with excavation 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 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.

SECTION 1	**Yes**	**No**	**N/A**	**N/O**
EXCAVATION ENTRY REQUIREMENTS (4.1)				
1. Personnel have completed excavation safety training	☐	☐	☐	☐
2. Competent person has completed daily inspection and has authorized entry	☐	☐	☐	☐
3. Personnel are aware of entry requirements established by competent person	☐	☐	☐	☐
4. Protective systems are free from damage and in stable condition	☐	☐	☐	☐
5. Surface objects/structures secured from falling into excavation	☐	☐	☐	☐
6. Potential hazardous atmospheres have been tested and found to be at safe levels	☐	☐	☐	☐
7. Precautions have been taken to prevent cave-in from water accumulation in the excavation	☐	☐	☐	☐
8. Personnel wearing appropriate, PPE per HSP/SI	☐	☐	☐	☐

SECTION 2	Yes	No	N/A	N/O
GENERAL (4.2.1)				
9. Daily safety briefing/meeting conducted with personnel	☐	☐	☐	☐
10. Excavation and protective systems adequately inspected by competent person	☐	☐	☐	☐
11. Defective protective systems or other unsafe conditions corrected before entry	☐	☐	☐	☐
12. Guardrails provided on walkways over excavation 6 ft (1.8m) or deeper	☐	☐	☐	☐
13. Barriers provided at excavations 6 ft or deeper when excavation not readily visible	☐	☐	☐	☐
14. Barriers or covers provided for wells, pits, shafts, or similar excavation 6 ft (1.8 m) or deeper	☐	☐	☐	☐
15. Earthmoving equipment operated safely (use earthmoving equipment checklist in HSE-306)	☐	☐	☐	☐
PRIOR TO EXCAVATING (4.2.2)				
16. Dig Permit obtained where required by client/facility	☐	☐	☐	☐
17. Location of underground utilities and installations identified	☐	☐	☐	☐
EXCAVATING ACTIVITIES (4.2.3)				
26. Rocks, trees, and other unstable surface objects removed or supported	☐	☐	☐	☐
27. Exposed underground utility lines supported	☐	☐	☐	☐
28. Undermined surface structures supported or determined to be in safe condition	☐	☐	☐	☐
29. Warning system used to remind equipment operators of excavation edge	☐	☐	☐	☐
EXCAVATION ENTRY (4.2.4)				
32. Trenches > 4 ft (1.2 m) deep provided with safe means of egress within 25 ft (7.6 m)	☐	☐	☐	☐
33. Structure ramps designed and approved by competent person	☐	☐	☐	☐
34. Potential hazardous atmospheres tested prior to entry	☐	☐	☐	☐
35. Rescue equipment provided where potential for hazardous atmosphere exists	☐	☐	☐	☐
36. Ventilation used to control hazardous atmosphere and air tested frequently	☐	☐	☐	☐
37. Appropriate respiratory protection used when ventilation does not control hazards	☐	☐	☐	☐
38. Precautions taken to prevent cave-in resulting from water accumulation in excavation	☐	☐	☐	☐
39. Precautions taken to prevent surface water from entering excavation	☐	☐	☐	☐
40. Protection provided from falling/rolling material originating from excavation face	☐	☐	☐	☐
41. Spoil piles, equipment, materials restrained or kept at least 2 ft (61 cm) from excavation edge	☐	☐	☐	☐

EXCAVATION PROTECTIVE SYSTEMS (4.2.5)				
42. Protective systems used for excavations 5 ft (1.5 m) or deeper, unless in stable rock	☐	☐	☐	☐
43. Protective systems for excavation deeper than 20 ft (6.1 m) designed by registered PE	☐	☐	☐	☐
44. If soil unclassified, maximum allowable slope is 34 degrees	☐	☐	☐	☐
45. Protective systems free from damage	☐	☐	☐	☐
46. Protective system used according to manufacturer's recommendations and not subjected to loads exceeding design limits	☐	☐	☐	☐
47. Protective system components securely connected to prevent movement or failure	☐	☐	☐	☐
48. Cave-in protection provided while entering/exiting shielding systems	☐	☐	☐	☐
49. Personnel removed from shielding systems when installed, removed, or if vertical movement	☐	☐	☐	☐

	Yes	No	N/A	N/O
PROTECTIVE SYSTEM REMOVAL AND BACKFILLING (4.2.6)				
50. Protective system removal starts and progresses from excavation bottom	☐	☐	☐	☐
51. Protective systems removed slowly and cautiously	☐	☐	☐	☐
52. Temporary structure supports used if failure of remaining components observed	☐	☐	☐	☐
53. Backfilling takes place immediately after protective system removal	☐	☐	☐	☐

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Project-Specific Material Safety Data Sheets

Project specific MSDS's will be added as chemicals are identified

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Initial Medical Treatment Form

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Initial Medical Treatment Form

To be completed by CH2M HILL Supervisor—Send with employee visiting medical facility or forward within 24 hours.

Employee name: _____
Date of Injury:_____
Supervisor: _____
HS Representative:_____
Visit Authorized by: _____
Phone #;_____

CH2M HILL Workers Compensation Administrator: Cambridge

Send Bills to: CH2M HILL
Attn: Jennifer Rindahl
P.O. Box 22508
Denver, Colorado 80222-0508

To be completed by medical provider:

Physician's name: _____ Phone #: _____
Address: _____
CH2M HILL employee: _____ has been treated for:_____

It is the policy of CH2M HILL to provide temporary modified duty whenever possible for employees with physical restrictions resulting from an occupational injury or illness.

☐ Released to full duty

☐ Released to restricted duty only (list restrictions below)

☐ Out of work until _____(date)

Please list any physical restrictions:
_____
_____

Expected duration of restricted duty? _____

CH2M HILL would like the best and most efficient care extended to all our employees. Please recommend over-the-counter (OTC) medication as a suitable alternative when medically feasible.

☐ Prescribed medication:_____

☐ Recommended OTC alternative:_____

Date of follow-up appointment:_____

Physician's signature: _____ Date: _____

Please return this form to the injured employee and FAX to Health Resources at 1-800-853-2641. If you want to discuss the employee's work restrictions, please call the person listed in the "Visit Authorized by" field

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PROJECT ACTIVITY HAZARD ANALYSES

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Insert AHAs

- 01 Excavation and visual inspection of test pits (subcontractor task specific to excavation portion, CH2M HILL portion will address hazards of visual inspection)

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Test Pitting Services, St. Julien's Creek Annex (SJCA) - Site 2 AGVIQ, LLC, Working Under CH2M HILL Prime Contract # N62470-02-D-3052, Contract Task Order 54 ACTIVITY HAZARD ANALYSIS – Test Pitting Services				
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**RAC**	**Personal Protective Clothing and Equipment**
Subsurface Excavation/Test Pitting	Chemical Exposure	• All personnel performing this task shall be trained in accordance with 29CFR1910.120 and been rolled in a medical monitoring program. • CH2M HILL will perform Air Monitoring as identified in Appendix A, Section 15.2 of the project APP. Follow PPE and action level requirements identified in Appendix A, Section 11 of the project APP. • Where site conditions change or action levels are exceeded contact the PM & H&S representative for consultation. • Do not allow dermal contact or incidental ingestion of potentially impacted soil, or groundwater. Skin contact with contaminated water, soils, debris, or equipment shall be avoided at all times. Do not kneel or step in potentially contaminated media (soil/sediment or ground water) without first donning proper PPE. • Exercise good hygiene practices. Always wash hands before eating, drinking, smoking and leaving site. Only eat, drink, smoke or chew tobacco in designated areas. • Where unknown or unanticipated buried objects or site conditions (i.e. drums, tanks, cylinders, munitions of explosive concern) are encountered during site operations, ongoing activities shall be immediately suspended.	L	Level D Modified (D_1 or D_2) PPE * D_1: Work clothes, reflective vests, hard hat, safety glasses and sturdy hard toed work boots, hearing and hand protection as necessary for task, hand protection (inner and outer chemical resistant gloves) D_2: D_1+ chemical resistant suits and boot covers, face protection (as needed) to prevent against splash hazards during Decon. activities.
	Stuck by/Pinched Caught in Between	• Wear reflective vests or high visibility clothing to promote visibility of ground personnel by equipment operators. • Maintain sufficient separation between ground support personnel and the operating heavy equipment. Ground personnel shall avoid positioning themselves between fixed objects, 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. • Operators must operate equipment in a manner that isolates swing areas from workers, fixed objects or other equipment. • Understand and review hand signals. Designate one person to provide hand signals to equipment operators performing lifting/excavation operations, as applicable. • Ensure equipment has operable back-up alarms. • Step away from heavy equipment when adjustments (positioning) are made. • Ensure heavy equipment operator has spotter for obstructed views and backing up.	M	Level D Modified (D_1 or D_2) PPE *
	Fire Prevention	• Use only metal safety cans for storage and transfer of fuel. • Use funnels and nozzles during fueling operations. • Appropriately sized, easily accessible ABC fire extinguisher in work area. • Fire Extinguishers shall have annual and monthly inspection tags. • Review and be cognizant of SJCA Fire Prevention Procedures and requirements.	L	Level D Modified (D_1 or D_2) PPE *

Test Pitting Services, St. Julien's Creek Annex (SJCA) - Site 2 AGVIQ, LLC, Working Under CH2M HILL Prime Contract # N62470-02-D-3052, Contract Task Order 54 ACTIVITY HAZARD ANALYSIS – Test Pitting Services				
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**RAC**	**Personal Protective Clothing and Equipment**
Subsurface Excavation/Test Pitting (cont.)	Sharp Objects/Cuts or Abrasions	• Wear cut resistant work gloves when the possibility of lacerations, cuts or other injury to hands may occur may be caused by sharp edges or object or when using hand tools.	L	Level D Modified (D_1 or D_2) PPE *
	Low Ambient Temperature	• 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 cool weather. • Frequent intake of non-caffeinated fluids to maintain body core temperature. • Frequent intake of non- caffeinated to prevent dehydration. • Obtain and review weather forecast— be aware of predicted weather systems. • Observe one (buddy system) another for initial signs of cold-related disorders. • Frequent observance of Wind Chill Chart (APP) to assist with work warming regiment determination and frostbite avoidance	L	Level D Modified (D_1 or D_2) PPE * plus warm multi-layered clothing including hard hat liners and foul weather gear, as necessary
	Cave In/Engulfment	• All overburden soil removed during test pit operations shall be stockpiled a minimum of 2' horizontal feet away from any open edge of the excavation. Increased distances are preferable. Material shall also be placed in such a manner to prevent excessive loading on the face of the cut. • No person shall stand adjacent to a vertical excavation edge. Inspection and soil logging and photographic documentation shall occur from a safe distance or from cab of excavator, such that employee exposure to fall or engulfment hazards are eliminated. • Personnel will not enter test pit excavations under any circumstance. Position bearing weight of excavator away from edges of open trenches.	M	Level D Modified (D_1 or D_2) PPE *
	Slips, Trips, Falls	• Be aware of poor footing, potential slipping/tripping hazards in the work area, such as wet/steep slopes, stumps/roots, unprotected holes, ditches, rip rap, utilities, and other ground protrusions. Observe, mark and/or avoid these identified hazards. Use sturdy hard toe work boots with sufficient ankle support. • Institute and maintain good housekeeping practices. Clean Work Areas as activities proceed. Clear/removed materials and debris from pathways and commonly traveled areas as soon as possible. • Three points of contact when enter/exiting equipment. • Test pits shall be backfilled as soon as it has fulfilled its intended purpose. Sufficient perimeter protection and warning identification shall be placed around open test pits (buffer around opening) when the test pit locations are unattended.	L	Level D Modified (D_1 or D_2) PPE *

Test Pitting Services, St. Julien's Creek Annex (SJCA) - Site 2 AGVIQ, LLC, Working Under CH2M HILL Prime Contract # N62470-02-D-3052, Contract Task Order 54 ACTIVITY HAZARD ANALYSIS – Test Pitting Services				
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**RAC**	**Personal Protective Clothing and Equipment**
Subsurface Excavation/Test Pitting (cont.)	Heavy Equipment	• Seat belts or other restraint system shall be used by heavy equipment operators. • Perform daily maintenance and inspections on operating equipment. Keep documentation on site. • Use caution around pressurized lines/hoses. Inspect hoses daily for cuts, abrasions and wear. • Equipment shall only be operated by personnel qualified by prior training or experience. • Ensure that a stable ground surface is available for the operation of heavy equipment. • Inspect heavy equipment daily before use.	L	Level D Modified (D_1 or D_2) PPE *
	Biological	• Observe ground surfaces, enclosed structures, ground water well heads, surrounding vegetation other site features for presence of spiders, bee/wasp hives, snakes etc. • Where potential exposure to venomous snakes, use snake guards. • Where exposure to poison ivy, oak or sumac is high use disposable coveralls for protection. • Observe areas for presence of stinging insects. Prior to starting field activities, **notify supervisors of known allergies to stinging insects and location of antidotes.** • Use insect repellant or permethrin (clothes). Tape pant legs to boots and ensure there are no open seams between boots and pant legs. Frequently check body and clothing for ticks, spiders, chiggers and fire ants. Where tick or chigger exposure is likely, the use of disposable coveralls shall be evaluated. • Avoid exposure to blood borne pathogens. Use universal precautions against exposure.	L	Level D Modified (D_1 or D_2) PPE *
	Overhead Utilities	• Maintain proper separation between Power Transmission Lines and over overhead utilities. Proper separation between operating equipment and power transmission lines/overhead utilities are as follows:. ▪ 0-50 kV: 10 ft separation ▪ 51 - 200 kV: 15 ft separation ▪ 201 - 300 kV: 20 ft separation ▪ 301 – 500 kV: 25 ft. separation ▪ 501 – 750 kV: 35 ft. separation ▪ 751 – 1000 kV: 45 ft separation • Do not swing excavator boom toward overhead utilities. Be cognizant of utility pole guy wires locations and other above ground power transmission structures or utility features.	M	Level D Modified (D_1 or D_2) PPE *

Test Pitting Services, St. Julien's Creek Annex (SJCA) - Site 2 AGVIQ, LLC, Working Under CH2M HILL Prime Contract # N62470-02-D-3052, Contract Task Order 54 ACTIVITY HAZARD ANALYSIS – Test Pitting Services				
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**RAC**	**Personal Protective Clothing and Equipment**
Subsurface Excavation/Test Pitting (cont.)	Buried Objects	• Verify that **Miss Utility (Virginia) has been contacted** to secure a utility owner verification request number at **(800) 552-7001** for utility clearance verification. Keep copies of any written documentation (faxes, email printouts) regarding utility location verification provided by utilities owners in the office project file and in a working field file on-site. **Documentation and coordination with Miss Utility will be completed by CH2M HILL for this work. Prior to starting verify that following additional conditions have been met:** 1) Miss Utility clearance request number has been secured. **2)** Photo document owner/client provided field utility mark-outs as related to proposed limits of ground disturbing activities prior to the start of work. 3) Verify a "third" party utility clearance has been performed and results of the third party utility location have been documented. 4) Determine if a NAVFAC "Excavator Permit" is required prior to performing any ground disturbing activities. If required verify it is authorized. 5) Hand dig around identified utilities (within 5') or as otherwise required by SJCA/NAVFAC issued excavation permit. 6) Verify a review base (SJCA) engineering records or drawings against utility owner or third party utility mark-outs has been performed to verify any potential differences. 7) Protect and preserve the markings of approximate locations of facilities until the markings are no longer required for safe and proper excavations. If the markings of utility locations are destroyed or removed before excavation commences or is completed, utilities must be relocated/marked. • Where unknown or unanticipated buried objects are encountered (i.e. drums, tanks, cylinders, munitions of explosive concern, soil with unusual staining or odor) AGVIQ shall 1) secure equipment to the extent possible, without causing bodily injury, 2) evacuate the work area and 3) immediately notify the site manager, SSHO or PM of the encountered condition. Work may only resume with appropriate documentation/notification that exposure hazards (physical or chemical) do not exist. Notify AGVIQ PM and ensure that CH2M HILL personnel notify applicable supervisors and NAVFAC POCs are notified of the condition(s) and do not resume work until authorized to do so.	L	Level D Modified (D_1 or D_2) PPE *
	Noise	• Wear hearing protection in loud work environments.	L	Level D Modified (D_1 or D_2) PPE *
	Visible Lighting	• Perform tasks in daylight hours whenever possible. If dawn, dusk or dark work is to be performed portable lighting must be provided to sufficient illuminate work area(s).	L	Level D Modified (D_1 or D_2) PPE *

Test Pitting Services, St. Julien's Creek Annex (SJCA) - Site 2 AGVIQ, LLC, Working Under CH2M HILL Prime Contract # N62470-02-D-3052, Contract Task Order 54 ACTIVITY HAZARD ANALYSIS – Test Pitting Services				
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**RAC**	**Personal Protective Clothing and Equipment**
Subsurface Excavation/Test Pitting (cont.)	MEC/MPPEH	• **CH2M HILL will provide UXO support during all intrusive activities in accordance with the provisions of the Explosives Safety Determination Request and Naval Ordnance Safety and Security Activity Response. Precisely follow operational and Emergency Notification procedures in the event live or potentially live MEC/MPPEH is encountered.** • UXO support must be provided during the execution of this task. • In the event that a UXO/MEC/MPPEH item is encountered during site operations, , the following procedures shall be executed: 1. **Immediately Stop Work (RECOGNIZE)***: Do not disturb or move a suspect MEC/MPPEH hazard. Only trained UXO Technicians are authorized to investigate potential MEC/MPPEH hazards. Make sure that cell phones/two way radios or other electro-magnetic sources are not engaged in the area of the suspect item.* 2. **Secure area/location where the UXO/MPPEH/MEC item is discovered (RETREAT)** *Stop and secure any operating equipment to the extent possible. Mark the general area/location of the UXO/MPPEH/MEC hazard with tape, colored cloth, or colored ribbon. Avoid using markers that penetrate the ground surface.* 3. **Immediately make notification to NAVFAC (REPORT):** *Once area has been evacuated, appropriate notifications shall be made immediately to the on-site UXO technician, site supervisor, project manager and NAVFAC. Provide as much information as possible, including location, approximate size, shape, color, and any other distinguishing features.* 4. **Operations can not resume until such safeguards and approvals are in place to safely continue the assigned work, in accordance with NAVFAC approvals to so.**	M	Level D Modified (D_1 or D_2) PPE *
	Adverse Weather	• Check internet, local TV weather or radio channels for daily forecasts and plan daily work activities accordingly. Have a portable radio available on-site to monitoring local weather or marine forecasts. If on-site internet or radio monitoring are not available, check with the ABL/ATK security office if severe weather systems appear to be developing to the east. ABL/ATK may be able to provide an update local forecast. If not check with home office support personnel who may be able to verify pending regional severe weather conditions. • Frequently observe the eastern skyline for developing rain squalls and thunder storms systems that may developing. • Bring clothing suitable for anticipated daily weather conditions. • Shut down operations during heavy rain/lightning events or high wind conditions. For storms producing lightning, seek safe haven in a grounded structure or rubber vehicle. Implement 30 – 30 rule. Do not seek refuge under trees during electrical or high wind storm events.	M	Level D Modified (D_1 or D_2) PPE *

Test Pitting Services, St. Julien's Creek Annex (SJCA) - Site 2
AGVIQ, LLC, Working Under CH2M HILL Prime Contract # N62470-02-D-3052, Contract Task Order 54
ACTIVITY HAZARD ANALYSIS – Test Pitting Services

Task Breakdown	Potential Hazards	Critical Safety Practices	RAC	Personal Protective Clothing and Equipment
Subsurface Excavation/Test Pitting (cont.)	Other	• Always using a seat belt while driving on military/government facilities. Always observe posted speed limits, traffic signs and signals. Never using a cell phone or two way radio while driving on military/government facilities. Violating these rules may result in loss of military/government facility driving privileges. • Buddy System maintained for all phases of work. • Base Emergency Dispatch numbers programmed into cellular phones. Have hospital route maps readily available. Verify base Emergency dispatch numbers are correct with Base POCs. • Report all unsafe conditions and acts, injury/illness or property damage to supervisors immediately.	L	NA

EQUIPMENT REQUIRED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
• Track Excavator • Misc. hand tools • First Aid/BBP Kits • Fire Extinguishers (fuel storage/equipment) • Communication devices	• Inspection of all emergency equipment (i.e.: first aid kits, fire extinguishers) • Visual Inspections of designated work areas to identify and address hazardous conditions. • Heavy Equipment Inspections/maintenance	• Review CH2M HILL APP by new site personnel. • 1st Aid/CPR (2 per site when medical attention a medical facility or physician is more than 5 minutes away to two or more employees. • Supervisors - BBLPS, 10 hour OSHA Construction Safety Training or equivalent • Heavy equipment operators qualified by previous training or experience. • Competent Person Requirement & Name: Excavation • UXO Avoidance Awareness Training for Non UXO personnel

DATE PREPPARED: 12/8/10
PREPARED BY (Name/Title): Jason Chebetar, Project Manager
REVIEWED BY (Name/Title): Glen Jackson, Health & Safety Officer, CHST, ASP

NOTES (Field Notes, Review Comments, etc.):

Overall Risk Assessment Code (RAC) (Use highest code)	

Risk Assessment Code (RAC) Matrix

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

- E = Extremely High Risk
- H = High Risk
- M = Moderate Risk
- L = Low Risk

PRINT	SIGNATURE		
Supervisor Name:	_____	_____	**Date/Time:**_____
Safety Officer Name:	_____	_____	**Date/Time:**_____
Site Personnel:	_____	_____	**Date/Time:**_____
	_____	_____	**Date/Time:**_____
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Contract Task Order 054 St. Juliens Creek Annex- Site 2 ACTIVITY HAZARD ANALYSIS – Mobilization/Site Preparation			
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**
Mobilization/Site Preparation	Slips, Trips, Falls	• Be aware of poor footing, potential slipping/tripping hazards in the work area, such as wet/steep slopes, stumps/roots, unprotected holes, ditches, rip rap, utilities, ground protrusions. Observe and avoid areas of unprotected holes, ramps and ground penetrations or protrusions (stumps, roots, holes curbs, utility structures etc). Use sturdy hard toe work boots with sufficient ankle support. • Institute and maintain good housekeeping practices.	Standard Level D PPE * * Work clothes, reflective vests/ high visibility clothing, hard hat, safety glasses and sturdy hard toed work boots, hand and hearing protection, as dictated by task.
	Heavy Equipment	• Workers to remain beyond the swing radius of heavy equipment. • Communicate with equipment operators with clear hand signals.	Standard Level D PPE
	Manual Lifting	• CH2M HILL or subcontract personnel must notify supervisors or safety representatives of preexisting medical conditions that may be aggravated or re-injured by lifting activities. • When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports may be considered. If heavy equipment isn't available to have someone assist with the lift— especially for heavy (> 50lbs.) or awkward loads. Use heavy equipment to transfer heavy or awkward loads wherever possible. • Plan storage and staging to minimize lifting or carrying distances. Make sure the path of travel is clear prior to the lift. • Avoid carrying heavy objects above shoulder level.	Standard Level D PPE
	Noise	• Personnel exposed to loud working environments shall wear hearing protection.	Standard Level D PPE
	High Ambient Temperature	• Provide fluids to prevent worker dehydration. • Monitor for heat stress in accordance with HSP (maintain use of buddy system). • Institute a proper work-break regiment to avoid heat stress symptoms and overexertion.	Standard Level D PPE (light colored clothing)
Mobilization/Site Preparation (continued)	Struck/pinched	• Wear reflective warning vests or high visibility clothing. • Isolate equipment swing areas from workers, fixed objects or other equipment. • Make/maintain eye contact with operators before approaching equipment. Do not approach equipment from rear or from blind spot of operator. • Understand and review hand signals. Designate one person to provide hand signals to equipment operators. • Ensure equipment has operable back-up alarms. • Avoid positioning between fixed objects and operating equipment. • No one shall walk under or in front of suspended loads. Only tagged, load rated and inspected rigging shall be used to lift loads. Become familiar with vertical, basket and choker load ratings of rigging.	Standard Level D PPE

Contract Task Order 054 St. Juliens Creek Annex- Site 2 ACTIVITY HAZARD ANALYSIS – Mobilization/Site Preparation			
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**
	Biological	• Observe ground surfaces especially in wet or grassy areas, tree trunks, and rock piles for evidence and presence of snakes (poisonous). • Observe ground surfaces or surrounding vegetation or structures for presence fire ants, spiders, bee/wasp hives etc. • Observe areas for presence of stinging insects. **Notify supervisors of known allergies to stinging insects and location of antidotes.** • Use insect repellant. Tape pant legs to boots. Frequently check body and clothing for ticks, chiggers, spiders. • Avoid exposure to blood borne pathogens	Standard Level D PPE
	Electric Hazards	• If/when electrical extension cords are required to complete work, extension cords must be: - Equipped with third-wire grounding. - Covered, elevated, or protected from damage when passing through work areas. - Protected from pinching if routed through doorways. - Not fastened with staples, hung from nails, or suspended with wire. - Extension cords and electrical power tools, must have ground fault circuit interrupters (GFCIs) installed. - Rated to handle the voltage/amperage of equipment.	Standard Level D PPE
	Fire Prevention	• Use only metal safety cans for storage and transfer of fuel. • Use funnels and nozzles during fueling operations. • Allow warm engine parts (generator motor) to cool before refueling. • Appropriately sized, easily accessible ABC fire extinguisher in work area.	Standard Level D PPE
	Pressure Washing/Equipment Decon	• Only qualified personnel will operate high pressure water cleaning equipment. • Operator will be aware of surroundings at all times. • Operator will never point pressure wand in direction of other personnel. • Pressure wands shall not be modified in field (i.e. shortened, bent, or trigger tied open). • Non-operating support personnel must never walk in front of operator during operation. • High pressure equipment shall be equipped with pressure dump safety valves. • Operator to wear pressure resistant foot wear and face splash shield. • Operator shall inspect high pressure hoses, fittings and safety equipment daily.	Modified Level D PPE with pressure resistant footwear and face splash shield

Contract Task Order 054 St. Juliens Creek Annex- Site 2 ACTIVITY HAZARD ANALYSIS – Mobilization/Site Preparation			
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**
	Other	• Always using a seat belt while driving on military/government facilities. Always observe posted speed limits, traffic signs and signals. Never using a cell phone or two way radio while driving on military/government facilities. Violating these rules may result in loss of military/government facility driving privileges. • Shut down operations in heavy rain and lightning. • Buddy System maintained for all phases of work. • Base Emergency Dispatch numbers programmed into CH2M HILL personnel cellular phones. Have hospital route maps readily available. • Report all unsafe conditions and acts, injury/illness or property damage to supervisors immediately. • Site work should always be performed with adequate lighting. • Site equipment, materials, and waste should be maintained according to good housekeeping practices.	NA

EQUIPMENT REQUIRED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
• Fire extinguisher (with fuel and electrical sources) • Eye wash (small portable type) • Miscellaneous power and manual hand tools. • Miscellaneous rigging.	• Visual Inspections of designated work areas identify and address hazardous conditions. • Equipment inspections and maintenance. • Inspections of hand tools (power) and extension chords if used.	• Review AHA with all task personnel • Review Site Specific Health and Safety Plan for new site personnel. • Review operations/safety manuals for all equipment utilized. • Behavior Based Loss Prevention Training (supervisors). • Power tool and equipment operators qualified by previous training or experience.

	PRINT	SIGNATURE	
Supervisor Name:	_____	_____	**Date/Time:**_____
Safety Officer Name:	_____	_____	**Date/Time:**_____
Site Personnel:	_____	_____	**Date/Time:**_____
	_____	_____	**Date/Time:**_____
	_____	_____	**Date/Time:**_____
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Contract Task Order -054 St. Juliens Creek Annex- Site 2 ACTIVITY HAZARD ANALYSIS – Test Pitting			
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**
Test Pitting and Soil Descriptions	Slips, Trips, Falls	• Be aware of poor footing, potential slipping/tripping hazards in the work area, such as wet/steep slopes, stumps/roots, unprotected holes, ditches, rip rap, utilities, ground protrusions. Observe and avoid areas of unprotected holes, ramps and ground penetrations or protrusions (stumps, roots, holes curbs, utility structures etc). Use sturdy hard toe work boots with sufficient ankle support. • Maintain a safe distance from the edge of test pits • No entry allowed in pits. • Institute and maintain good housekeeping practices.	Standard Level D PPE * * Work clothes, reflective vests/ high visibility clothing, hard hat, safety glasses and sturdy hard toed work boots, hand and hearing protection, as dictated by task.
	Manual Lifting	• CH2M HILL or subcontract personnel must notify supervisors or safety representatives of preexisting medical conditions that may be aggravated or re-injured by lifting activities. • When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports may be considered. If heavy equipment isn't available to have someone assist with the lift— especially for heavy (> 50lbs.) or awkward loads. Use heavy equipment to transfer heavy or awkward loads wherever possible. • Plan storage and staging to minimize lifting or carrying distances. Make sure the path of travel is clear prior to the lift. • Avoid carrying heavy objects above shoulder level.	Standard Level D PPE
	Noise	• Personnel exposed to loud working environments shall wear hearing protection.	Standard Level D PPE
	High Ambient Temperature	• Provide fluids to prevent worker dehydration. • Monitor for heat stress in accordance with HSP (maintain use of buddy system). • Institute a proper work-break regiment to avoid heat stress symptoms and overexertion.	Standard Level D PPE (light colored clothing)
	Struck/pinched	• Wear reflective warning vests or high visibility clothing. • Isolate equipment swing areas from workers, fixed objects or other equipment. • Make/maintain eye contact with operators before approaching equipment. Do not approach equipment from rear or from blind spot of operator. • Understand and review hand signals. Designate one person to provide hand signals to equipment operators. • Ensure equipment has operable back-up alarms. • Avoid positioning between fixed objects and operating equipment. • No one shall walk under or in front of suspended loads. Only tagged, load rated and inspected rigging shall be used to lift loads. Become familiar with vertical, basket and choker load ratings of rigging.	Standard Level D PPE

Contract Task Order -054 St. Juliens Creek Annex- Site 2 ACTIVITY HAZARD ANALYSIS – Test Pitting			
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**
Test Pitting and Soil description (continued)	Biological	• Observe ground surfaces especially in wet or grassy areas, tree trunks, and rock piles for evidence and presence of snakes (poisonous). • Observe ground surfaces or surrounding vegetation or structures for presence fire ants, spiders, bee/wasp hives etc. • Observe areas for presence of stinging insects. **Notify supervisors of known allergies to stinging insects and location of antidotes.** • Use insect repellant. Tape pant legs to boots. Frequently check body and clothing for ticks, chiggers, spiders. • Avoid exposure to blood borne pathogens	Standard Level D PPE
	Electric Hazards	• If/when electrical extension cords are required to complete work, extension cords must be: - Equipped with third-wire grounding. - Covered, elevated, or protected from damage when passing through work areas. - Protected from pinching if routed through doorways. - Not fastened with staples, hung from nails, or suspended with wire. - Extension cords and electrical power tools, must have ground fault circuit interrupters (GFCIs) installed. - Rated to handle the voltage/amperage of equipment.	Standard Level D PPE
	Fire Prevention	• Use only metal safety cans for storage and transfer of fuel. • Use funnels and nozzles during fueling operations. • Allow warm engine parts (generator motor) to cool before refueling. • Appropriately sized, easily accessible ABC fire extinguisher in work area.	Standard Level D PPE
	Pressure Washing/Equipment Decon	• Only qualified personnel will operate high pressure water cleaning equipment. • Operator will be aware of surroundings at all times. • Operator will never point pressure wand in direction of other personnel. • Pressure wands shall not be modified in field (i.e. shortened, bent, or trigger tied open). • Non-operating support personnel must never walk in front of operator during operation. • High pressure equipment shall be equipped with pressure dump safety valves. • Operator to wear pressure resistant foot wear and face splash shield. • Operator shall inspect high pressure hoses, fittings and safety equipment daily.	Modified Level D PPE with pressure resistant footwear and face splash shield
	Chemical Exposure	• All personnel performing this task shall be trained in accordance with 29CFR1910.120 and be deemed "fit for duty" by a licensed occupation physician. • Follow PPE and action level requirements identified in the site specific HSP. • Do not allow dermal contact or incidental ingestion of impacted soil or groundwater. Skin contact with contaminated water, soils, debris, or equipment shall be avoided at all times. Do not kneel or step in potentially contaminated media (soil or ground water). • Exercise good hygiene practices. Always wash hands before eating, drinking, smoking and leaving site. Only eat, drink, smoke or chew tobacco in designated areas. • Following sample collection, sample container lids should be tightened securely to prevent any leaks, and the containers should be rinsed with clean water to ensure that they are free of chemical constituents.	Modified Level D_1 or D_2 PPE (see table G5-1)

Contract Task Order -054 St. Juliens Creek Annex- Site 2
ACTIVITY HAZARD ANALYSIS – Test Pitting

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
	Other	• Always using a seat belt while driving on military/government facilities. Always observe posted speed limits, traffic signs and signals. Never using a cell phone or two way radio while driving on military/government facilities. Violating these rules may result in loss of military/government facility driving privileges. • Shut down operations in heavy rain and lightning. • Buddy System maintained for all phases of work. • Base Emergency Dispatch numbers programmed into CH2M HILL personnel cellular phones. Have hospital route maps readily available. • Report all unsafe conditions and acts, injury/illness or property damage to supervisors immediately. • Site work should always be performed with adequate lighting. • Site equipment, materials, and waste should be maintained according to good housekeeping practices.	NA

EQUIPMENT REQUIRED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
• Fire extinguisher (with fuel and electrical sources) • Eye wash (small portable type) • Miscellaneous power and manual hand tools. • Miscellaneous rigging.	• Visual Inspections of designated work areas identify and address hazardous conditions. • Equipment inspections and maintenance. • Inspections of hand tools (power) and extension cords if used.	• Review AHA with all task personnel • Review Site Specific Health and Safety Plan for new site personnel. • Review operations/safety manuals for all equipment utilized. • Behavior Based Loss Prevention Training (supervisors). • Power tool and equipment operators qualified by previous training or experience.

	PRINT	SIGNATURE	
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Safety Officer Name:	_____	_____	**Date/Time:**_____
Site Personnel:	_____	_____	**Date/Time:**_____
	_____	_____	**Date/Time:**_____
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Contract Task Order 054 St. Juliens Creek Annex- Site 2 ACTIVITY HAZARD ANALYSIS – Equipment Decontamination			
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**
Equipment Decontamination	Slips, Trips, Falls	• Be aware of poor footing, potential slipping/tripping hazards in the work area, such as wet/steep slopes, stumps/roots, unprotected holes, ditches, rip rap, utilities, ground protrusions. Observe and avoid areas of unprotected holes, ramps and ground penetrations or protrusions (stumps, roots, holes curbs, utility structures etc). Use sturdy hard toe work boots with sufficient ankle support. • Institute and maintain good housekeeping practices.	Standard Level D PPE * * Work clothes, reflective vests/ high visibility clothing, hard hat, safety glasses and sturdy hard toed work boots, hand and hearing protection, as dictated by task.
	Heavy Equipment/Haul Trucks	• Operator experienced with safe operation of excavation/loading equipment. • Workers to remain beyond the swing radius of heavy equipment. • Workers to remain out of the haul route when possible. • Communicate with equipment and haul truck operators with clear hand signals.	Standard Level D PPE
	Manual Lifting	• CH2M HILL or subcontract personnel must notify supervisors or safety representatives of preexisting medical conditions that may be aggravated or re-injured by lifting activities. • When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports may be considered. If heavy equipment isn't available to have someone assist with the lift— especially for heavy (> 50lbs.) or awkward loads. Use heavy equipment to transfer heavy or awkward loads wherever possible. • Plan storage and staging to minimize lifting or carrying distances. Make sure the path of travel is clear prior to the lift. • Avoid carrying heavy objects above shoulder level.	Standard Level D PPE
	Noise	• Personnel exposed to loud working environments shall wear hearing protection.	Standard Level D PPE
	High Ambient Temperature	• Provide fluids to prevent worker dehydration. • Monitor for heat stress in accordance with HSP (maintain use of buddy system). • Institute a proper work-break regiment to avoid heat stress symptoms and overexertion.	Standard Level D PPE (light colored clothing)
	Struck/pinched	• Wear reflective warning vests or high visibility clothing. • Isolate equipment swing areas from workers, fixed objects or other equipment. • Make/maintain eye contact with operators before approaching equipment. Do not approach equipment from rear or from blind spot of operator. • Understand and review hand signals. Designate one person to provide hand signals to equipment operators. • Ensure equipment has operable back-up alarms. • Avoid positioning between fixed objects and operating equipment. • No one shall walk under or in front of suspended loads. Only tagged, load rated and inspected rigging shall be used to lift loads. Become familiar with vertical, basket and choker load ratings of rigging.	Standard Level D PPE

Contract Task Order 054 St. Juliens Creek Annex- Site 2 ACTIVITY HAZARD ANALYSIS – Equipment Decontamination			
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**
Equipment Decontamination (continued)	Biological	• Observe ground surfaces especially in wet or grassy areas, tree trunks, and rock piles for evidence and presence of snakes (poisonous). • Observe ground surfaces or surrounding vegetation or structures for presence fire ants, spiders, bee/wasp hives etc. • Observe areas for presence of stinging insects. **Notify supervisors of known allergies to stinging insects and location of antidotes.** • Use insect repellant. Tape pant legs to boots. Frequently check body and clothing for ticks, chiggers, spiders. • Avoid exposure to blood borne pathogens	Standard Level D PPE
	Electric Hazards	• If/when electrical extension cords are required to complete work, extension cords must be: - Equipped with third-wire grounding. - Covered, elevated, or protected from damage when passing through work areas. - Protected from pinching if routed through doorways. - Not fastened with staples, hung from nails, or suspended with wire. - Extension cords and electrical power tools, must have ground fault circuit interrupters (GFCIs) installed. - Rated to handle the voltage/amperage of equipment.	Standard Level D PPE
	Fire Prevention	• Use only metal safety cans for storage and transfer of fuel. • Use funnels and nozzles during fueling operations. • Allow warm engine parts (generator motor) to cool before refueling. • Appropriately sized, easily accessible ABC fire extinguisher in work area.	Standard Level D PPE
	Pressure Washing/Equipment Decon	• Only qualified personnel will operate high pressure water cleaning equipment. • Operator will be aware of surroundings at all times. • Operator will never point pressure wand in direction of other personnel. • Pressure wands shall not be modified in field (i.e. shortened, bent, or trigger tied open). • Non-operating support personnel must never walk in front of operator during operation. • High pressure equipment shall be equipped with pressure dump safety valves. • Operator to wear pressure resistant foot wear and face splash shield. • Operator shall inspect high pressure hoses, fittings and safety equipment daily.	Modified Level D PPE with pressure resistant footwear and face splash shield
	Overhead/Suspended Loads	• No personnel are allowed to walk under elevated buckets on excavation equipment • If personnel have to work beneath elevated buckets for maintenance purpose, then safety blocks must be positioned on hydraulic arms to prevent lowering. • Hardhats to be worn at all times if potential for falling objects	Standard Level D PPE

Contract Task Order 054 St. Juliens Creek Annex- Site 2

ACTIVITY HAZARD ANALYSIS – Equipment Decontamination

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment
Equipment Decontamination (continued)	Chemical Exposure	• All personnel performing this task shall be trained in accordance with 29CFR1910.120 and be deemed "fit for duty" by a licensed occupation physician. • Follow PPE and action level requirements identified in the site specific HSP. • Do not allow dermal contact or incidental ingestion of impacted soil or groundwater. Skin contact with contaminated water, soils, debris, or equipment shall be avoided at all times. Do not kneel or step in potentially contaminated media (soil or ground water). • Exercise good hygiene practices. Always wash hands before eating, drinking, smoking and leaving site. Only eat, drink, smoke or chew tobacco in designated areas. • Following sample collection, sample container lids should be tightened securely to prevent any leaks, and the containers should be rinsed with clean water to ensure that they are free of chemical constituents.	Modified Level D_1 or D_2 PPE (see table G5-1)
	Other	• Always using a seat belt while driving on military/government facilities. Always observe posted speed limits, traffic signs and signals. Never using a cell phone or two way radio while driving on military/government facilities. Violating these rules may result in loss of military/government facility driving privileges. • Shut down operations in heavy rain and lightning. • Buddy System maintained for all phases of work. • Base Emergency Dispatch numbers programmed into CH2M HILL personnel cellular phones. Have hospital route maps readily available. • Report all unsafe conditions and acts, injury/illness or property damage to supervisors immediately. • Site work should always be performed with adequate lighting. • Site equipment, materials, and waste should be maintained according to good housekeeping practices.	NA

EQUIPMENT REQUIRED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
• Fire extinguisher (with fuel and electrical sources) • Eye wash (small portable type) • Miscellaneous power and manual hand tools. • Miscellaneous rigging.	• Visual Inspections of designated work areas identify and address hazardous conditions. • Equipment inspections and maintenance. • Inspections of hand tools (power) and extension cords if used.	• Review AHA with all task personnel • Review Site Specific Health and Safety Plan for new site personnel. • Review operations/safety manuals for all equipment utilized. • Behavior Based Loss Prevention Training (supervisors). • Power tool and equipment operators qualified by previous training or experience.

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Contract Task Order 054 St. Juliens Creek Annex- Site 2 ACTIVITY HAZARD ANALYSIS – IDW Handling and Management			
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**
IDW Handling and Management	Slips, Trips, Falls	• Be aware of poor footing, potential slipping/tripping hazards in the work area, such as wet/steep slopes, stumps/roots, unprotected holes, ditches, rip rap, utilities, ground protrusions. Observe and avoid areas of unprotected holes, ramps and ground penetrations or protrusions (stumps, roots, holes curbs, utility structures etc). Use sturdy hard toe work boots with sufficient ankle support. • Institute and maintain good housekeeping practices.	Standard Level D PPE * * Work clothes, reflective vests/ high visibility clothing, hard hat, safety glasses and sturdy hard toed work boots, hand and hearing protection, as dictated by task.
	Heavy Equipment/Haul Trucks	• Operator experienced with safe operation of excavation/loading equipment. • Workers to remain beyond the swing radius of heavy equipment. • Workers to remain out of the haul route when possible. • Communicate with equipment and haul truck operators with clear hand signals.	Standard Level D PPE
	Manual Lifting	• CH2M HILL or subcontract personnel must notify supervisors or safety representatives of preexisting medical conditions that may be aggravated or re-injured by lifting activities. • When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports may be considered. If heavy equipment isn't available to have someone assist with the lift— especially for heavy (> 50lbs.) or awkward loads. Use heavy equipment to transfer heavy or awkward loads wherever possible. • Plan storage and staging to minimize lifting or carrying distances. Make sure the path of travel is clear prior to the lift. • Avoid carrying heavy objects above shoulder level.	Standard Level D PPE
	Noise	• Personnel exposed to loud working environments shall wear hearing protection.	Standard Level D PPE
	High Ambient Temperature	• Provide fluids to prevent worker dehydration. • Monitor for heat stress in accordance with HSP (maintain use of buddy system). • Institute a proper work-break regiment to avoid heat stress symptoms and overexertion.	Standard Level D PPE (light colored clothing)
	Struck/pinched	• Wear reflective warning vests or high visibility clothing. • Isolate equipment swing areas from workers, fixed objects or other equipment. • Make/maintain eye contact with operators before approaching equipment. Do not approach equipment from rear or from blind spot of operator. • Understand and review hand signals. Designate one person to provide hand signals to equipment operators. • Ensure equipment has operable back-up alarms. • Avoid positioning between fixed objects and operating equipment. • No one shall walk under or in front of suspended loads. Only tagged, load rated and inspected rigging shall be used to lift loads. Become familiar with vertical, basket and choker load ratings of rigging.	Standard Level D PPE

Contract Task Order 054 St. Juliens Creek Annex- Site 2 ACTIVITY HAZARD ANALYSIS – IDW Handling and Management			
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**
IDW Handling and Management (continued)	Biological	• Observe ground surfaces especially in wet or grassy areas, tree trunks, and rock piles for evidence and presence of snakes (poisonous). • Observe ground surfaces or surrounding vegetation or structures for presence fire ants, spiders, bee/wasp hives etc. • Observe areas for presence of stinging insects. **Notify supervisors of known allergies to stinging insects and location of antidotes.** • Use insect repellant. Tape pant legs to boots. Frequently check body and clothing for ticks, chiggers, spiders. • Avoid exposure to blood borne pathogens	Standard Level D PPE
	Fire Prevention	• Use only metal safety cans for storage and transfer of fuel. • Use funnels and nozzles during fueling operations. • Allow warm engine parts (generator motor) to cool before refueling. • Appropriately sized, easily accessible ABC fire extinguisher in work area.	Standard Level D PPE
	Overhead/Suspended Loads	• No personnel are allowed to walk under elevated buckets on excavation equipment • If personnel have to work beneath elevated buckets for maintenance purpose, then safety blocks must be positioned on hydraulic arms to prevent lowering. • Hardhats to be worn at all times if potential for falling objects	Standard Level D PPE
	Chemical Exposure	• All personnel performing this task shall be trained in accordance with 29CFR1910.120 and be deemed “fit for duty” by a licensed occupation physician. • Follow PPE and action level requirements identified in the site specific HSP. • Do not allow dermal contact or incidental ingestion of impacted soil or groundwater. Skin contact with contaminated water, soils, debris, or equipment shall be avoided at all times. Do not kneel or step in potentially contaminated media (soil or ground water). • Exercise good hygiene practices. Always wash hands before eating, drinking, smoking and leaving site. Only eat, drink, smoke or chew tobacco in designated areas. • Following sample collection, sample container lids should be tightened securely to prevent any leaks, and the containers should be rinsed with clean water to ensure that they are free of chemical constituents.	Modified Level D_1 or D_2 PPE (see table G5-1)

Contract Task Order 054 St. Juliens Creek Annex- Site 2 ACTIVITY HAZARD ANALYSIS – IDW Handling and Management			
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**
IDW Handling and Management (continued)	Other	• Always using a seat belt while driving on military/government facilities. Always observe posted speed limits, traffic signs and signals. Never using a cell phone or two way radio while driving on military/government facilities. Violating these rules may result in loss of military/government facility driving privileges. • Shut down operations in heavy rain and lightning. • Buddy System maintained for all phases of work. • Base Emergency Dispatch numbers programmed into CH2M HILL personnel cellular phones. Have hospital route maps readily available. • Report all unsafe conditions and acts, injury/illness or property damage to supervisors immediately. • Site work should always be performed with adequate lighting. • Site equipment, materials, and waste should be maintained according to good housekeeping practices.	NA

EQUIPMENT REQUIRED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
• Fire extinguisher (with fuel and electrical sources) • Eye wash (small portable type) • Miscellaneous power and manual hand tools. • Miscellaneous rigging.	• Visual Inspections of designated work areas identify and address hazardous conditions. • Equipment inspections and maintenance. • Inspections of hand tools (power) and extension chords if used.	• Review AHA with all task personnel • Review Site Specific Health and Safety Plan for new site personnel. • Review operations/safety manuals for all equipment utilized. • Behavior Based Loss Prevention Training (supervisors). • Power tool and equipment operators qualified by previous training or experience.

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Safety Officer Name:	_____	_____	**Date/Time:**_____
Site Personnel:	_____	_____	**Date/Time:**_____
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	_____	_____	**Date/Time:**_____
	_____	_____	**Date/Time:**_____

Contract Task Order 054 St. Juliens Creek Annex- Site 2 ACTIVITY HAZARD ANALYSIS – Demobilization / Cleanup			
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**
Demobilization/ Cleanup	Slips, Trips, Falls	• Be aware of poor footing, potential slipping/tripping hazards in the work area, such as wet/steep slopes, stumps/roots, unprotected holes, ditches, rip rap, utilities, ground protrusions. Observe and avoid areas of unprotected holes, ramps and ground penetrations or protrusions (stumps, roots, holes curbs, utility structures etc). Use sturdy hard toe work boots with sufficient ankle support. • Institute and maintain good housekeeping practices.	Standard Level D PPE * * Work clothes, reflective vests/ high visibility clothing, hard hat, safety glasses and sturdy hard toed work boots, hand and hearing protection, as dictated by task.
	Heavy Equipment/Haul Trucks	• Operator experienced with safe operation of excavation/loading equipment. • Workers to remain beyond the swing radius of heavy equipment. • Workers to remain out of the haul route when possible. • Communicate with equipment and haul truck operators with clear hand signals.	Standard Level D PPE
	Manual Lifting	• CH2M HILL or subcontract personnel must notify supervisors or safety representatives of preexisting medical conditions that may be aggravated or re-injured by lifting activities. • When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports may be considered. If heavy equipment isn't available to have someone assist with the lift— especially for heavy (> 50lbs.) or awkward loads. Use heavy equipment to transfer heavy or awkward loads wherever possible. • Plan storage and staging to minimize lifting or carrying distances. Make sure the path of travel is clear prior to the lift. • Avoid carrying heavy objects above shoulder level.	Standard Level D PPE
	Noise	• Personnel exposed to loud working environments shall wear hearing protection.	Standard Level D PPE
	High Ambient Temperature	• Provide fluids to prevent worker dehydration. • Monitor for heat stress in accordance with HSP (maintain use of buddy system). • Institute a proper work-break regiment to avoid heat stress symptoms and overexertion.	Standard Level D PPE (light colored clothing)

Contract Task Order 054 St. Juliens Creek Annex- Site 2 ACTIVITY HAZARD ANALYSIS – Demobilization / Cleanup			
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**
Demobilization/ Cleanup (continued)	Struck/pinched	• Wear reflective warning vests or high visibility clothing. • Isolate equipment swing areas from workers, fixed objects or other equipment. • Make/maintain eye contact with operators before approaching equipment. Do not approach equipment from rear or from blind spot of operator. • Understand and review hand signals. Designate one person to provide hand signals to equipment operators. • Ensure equipment has operable back-up alarms. • Avoid positioning between fixed objects and operating equipment. • No one shall walk under or in front of suspended loads. Only tagged, load rated and inspected rigging shall be used to lift loads. Become familiar with vertical, basket and choker load ratings of rigging.	Standard Level D PPE
	Biological	• Observe ground surfaces especially in wet or grassy areas, tree trunks, and rock piles for evidence and presence of snakes (poisonous). • Observe ground surfaces or surrounding vegetation or structures for presence fire ants, spiders, bee/wasp hives etc. • Observe areas for presence of stinging insects. **Notify supervisors of known allergies to stinging insects and location of antidotes.** • Use insect repellant. Tape pant legs to boots. Frequently check body and clothing for ticks, chiggers, spiders. • Avoid exposure to blood borne pathogens	Standard Level D PPE
	Electric Hazards	• If/when electrical extension cords are required to complete work, extension cords must be: - Equipped with third-wire grounding. - Covered, elevated, or protected from damage when passing through work areas. - Protected from pinching if routed through doorways. - Not fastened with staples, hung from nails, or suspended with wire. - Extension cords and electrical power tools, must have ground fault circuit interrupters (GFCIs) installed. - Rated to handle the voltage/amperage of equipment.	Standard Level D PPE
	Fire Prevention	• Use only metal safety cans for storage and transfer of fuel. • Use funnels and nozzles during fueling operations. • Allow warm engine parts (generator motor) to cool before refueling. • Appropriately sized, easily accessible ABC fire extinguisher in work area.	Standard Level D PPE

Contract Task Order 054 St. Juliens Creek Annex- Site 2 ACTIVITY HAZARD ANALYSIS – Demobilization / Cleanup			
Task Breakdown	**Potential Hazards**	**Critical Safety Practices**	**Personal Protective Clothing and Equipment**
	Pressure Washing/Equipment Decon	• Only qualified personnel will operate high pressure water cleaning equipment. • Operator will be aware of surroundings at all times. • Operator will never point pressure wand in direction of other personnel. • Pressure wands shall not be modified in field (i.e. shortened, bent, or trigger tied open). • Non-operating support personnel must never walk in front of operator during operation. • High pressure equipment shall be equipped with pressure dump safety valves. • Operator to wear pressure resistant foot wear and face splash shield. • Operator shall inspect high pressure hoses, fittings and safety equipment daily.	Modified Level D PPE with pressure resistant footwear and face splash shield
	Overhead/Suspended Loads	• No personnel are allowed to walk under elevated buckets on excavation equipment • If personnel have to work beneath elevated buckets for maintenance purpose, then safety blocks must be positioned on hydraulic arms to prevent lowering. • Hardhats to be worn at all times if potential for falling objects	Standard Level D PPE
Demobilization/ Cleanup (continued)	Other	• Always using a seat belt while driving on military/government facilities. Always observe posted speed limits, traffic signs and signals. Never using a cell phone or two way radio while driving on military/government facilities. Violating these rules may result in loss of military/government facility driving privileges. • Shut down operations in heavy rain and lightning. • Buddy System maintained for all phases of work. • Base Emergency Dispatch numbers programmed into CH2M HILL personnel cellular phones. Have hospital route maps readily available. • Report all unsafe conditions and acts, injury/illness or property damage to supervisors immediately. • Site work should always be performed with adequate lighting. • Site equipment, materials, and waste should be maintained according to good housekeeping practices.	NA

EQUIPMENT REQUIRED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
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PRE-TASK SAFETY PLAN

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DAILY PRE-TASK SAFETY PLAN (PTSP)

Project: _____ Location: _____Date:_____
Site Safety Officer _____ Job Activity: _____

Task Personnel:
_____
_____
_____
_____

List Tasks:
_____
_____
_____
_____

Tools/Equipment/Materials required (ladders, scaffolds, fall protection, cranes/rigging, heavy equipment, power tools, cords, generators, compressed gases, regulated chemical products, etc.):
_____
_____
_____

Potential H&S Hazards, including chemical, physical, safety, biological and environmental (Check all that apply):

__ Chemical burns/contact	__ Trench, excavations, cave-ins	__Ergonomics
__ Pressurized lines/equipment	__ Overexertion	__ Chemical splash
__ Thermal burns	__ Pinch points	__ Poisonous plants/insects
__ Electrical	__ Cuts/abrasions	___Eye hazards/flying projectile
__ Weather conditions	__ Spills	__ Inhalation hazard
__Heights/fall> 6′	__ Overhead Electrical hazards	__ Heat/cold stress
__ Noise	__ Elevated loads	__ Water/drowning hazard
__ Explosion/fire	__ Slips, trip and falls	__ Heavy equipment
__Radiation	__ Manual lifting	__ Aerial lifts/platforms
__ Confined space entry	__Welding/cutting	__ Demolition

Other Potential Hazards (Describe):
_____
_____
_____

DAILY PRE-TASK SAFETY PLAN (PTSP)

Hazard Control Measures (Check all that apply):			
PPE __ Thermal/lined __ Eye __ Dermal/hand __ Hearing __ Respiratory __ Reflective vests __ Flotation device	**Protective Systems** __ Locate buried utilities __ Competent person __ Daily inspections __ Sloping __ Shoring __ Trench box __ Barricades	**Fire Protection** __ Fire extinguishers __ Fire watch __ Nonspark tools __ Grounding/bonding __ Intrinsically safe equipment __Combustible materials storage __Chemical Storage	**Electrical** __ Lockout/tagout __ Grounded __ Panels covered __ GFCI/extension cords __ Power tools/cord inspected __Insulated tools/gloves
Fall Protection __ Harness/lanyards __ Adequate anchorage __ Guardrail system __ Covered opening __ Fixed barricades __ Warning system	**Air Monitoring** __ PID/FID __ Detector tubes __ Radiation __ Personnel sampling __ LEL/O2 __ Other	**Proper Equipment** __ Aerial lift/ladders/scaffolds __ Forklift/ Heavy equipment __ Backup alarms __ Hand/power tools __ Crane w/current inspection __ Proper rigging __ Operator qualified	**Welding & Cutting** __ Cylinders secured/capped __ Cylinders separated/upright __ Flash-back arrestors __ No cylinders in CSE __ Flame retardant clothing __ Appropriate goggles
Confined Space Entry __ Isolation __ Air monitoring __ Trained personnel __ Permit completed __ Rescue provisions	**Medical/Emerg. Response** __ First-aid & BBP kit __ Eye wash __ FA-CPR training __ Route to hospital	**Heat/Cold Stress** __ Work/rest regime __ Rest area __ Liquids available __ Monitoring __ Training	**Vehicle/Traffic** __ Traffic Awareness __Traffic control __ Barricades __ Flags __ Signs
Permits __ Hot work __ Confined space __ Lockout/tagout __ Excavation __ Demolition __ Energized work __Local/Environmental	**Demolition** __ Pre-demolition survey __ Structure condition __ Isolate area/utilities __ Competent person __ Hazmat present	**Inspections** __ Ladders/aerial lifts __ Lanyards/harness __ Scaffolds __ Heavy equipment __Cranes and rigging __Other per Field Safety Plan	**Training** __ Hazwaste __ Construction __Equipment __ Competent person __ Task-specific (AHA) __ Hazcom
FieldNotes:_____ _____			

Supervisor signature:_____ Date:_____

SAFE WORK OBSERVATION FORM

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Safe Work Observation Form		
Project:	Observer:	Date:
Position/Title of worker observed:	Background Information/ comments:	
Task/Observation Observed:		

- 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)			
Repetitive motion			**Observed Worker's Corrective Actions/Comments:**
Other…			

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LOSS/NEAR-LOSS INVESTIGATION

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Root Cause Investigation

This attachment is provided to assist in accessing, completing, and reviewing an incident investigation. It is important to remember the following when conducting an investigation:

- Gather relevant facts, focusing on fact-finding, not fault-finding.
- Draw conclusions, pitting facts together into a probable scenario.
- Determine incident root cause(s), the basic causes why an unsafe act/condition existed.
- Develop and implement solutions, matching all identified root causes with solutions.

Documentation

The following should be included to document the incident.

Description

- Provide a description of the event and the sequence of events and actions that took place prior to the incident. Start with the incident event and work backwards in time through all of the preceding events that directly contributed to the incident. The information should identify why the event took place as well as who was involved, when and where the event took place, and what actions were taken.

Cause Analysis

Using the form and flowchart (provided below) the root cause of the incident will be determined. This form must be retained in the project and/or regional HS&E files.

Immediate Causes—List the substandard actions or conditions that directly affected the incident. The following are examples of immediate causes:

- ***Substandard Actions*:** Operating equipment without authority; failure to warn; failure to secure; operating at improper speed; making safety device inoperable; using defective equipment; failing to use PPE; improper loading; improper lifting; improper position for task; under influence of alcohol or drugs; horseplay.

- ***Substandard Conditions:*** Exposure to hazardous materials; exposure to extreme temperatures; improper lighting; improper ventilation; congestion; exposure to fire and explosive hazard; defective tools, equipment or materials; exposure to extreme noise; poor ventilation; poor visibility; poor housekeeping.

Basic Causes—List the personal and job factors that caused the incident. The following are examples of basic causes:

- ***Personal Factors:*** Capability; knowledge; skill; stress; motivation.

- ***Job Factors:*** Abuse or misuse; engineering; maintenance; purchasing; supervision; tools and equipment; wear and tear; work standards.

Corrective Action Plan

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 time frame for completion. Be sure the corrective actions address the causes. For example, training may prevent recurrence of an incident caused by a lack of knowledge, but it may not help an incident caused by improper motivation.

The following are examples of management programs that may be used to control future incidents. These programs should be considered when determining specific corrective actions:

- ***Management Programs***: Accident/incident analysis; emergency preparedness; engineering controls; general promotion; group meetings; health control; hiring and placement; leadership and administration; management training; organizational rules; personal protective equipment; planned inspections; program audits; program controls; purchasing controls; task analysis and procedures; task observation.

Incident & Near-Loss Investigation Report Form

Employer Information

Company Name:
_____

Project Name: _____ Task Order: _____

Project Location:
_____

Task Location:
_____

Job Assignment:
_____

Preparer's Name: _____ Preparer's Employee Number:
_____

Incident Specific Information

Date of Incident: _____ Time of Incident: _____ a.m./p.m.

Location of incident:

☐ Company premises
☐ Field
☐ In Transit
☐ Other:_____

Address where the incident occurred:
_____

Equipment Malfunction: Yes ☐ No ☐
Activity was a Routine Task: Yes ☐ No ☐

Describe any property damage:
_____

Specific activity the employee was engaged in when the incident occurred:
_____
_____

All equipment, materials, or chemicals the employee was using when the incident occurred:
_____
_____

Describe the specific incident and how it occurred:
_____
_____
_____
_____
_____
_____

Describe how this incident may have been prevented:
_____
_____
_____
_____

Contributing Factors (Describe in detail why incident occurred):
_____
_____
_____
_____

Date employer notified of incident: _____ To whom reported: _____

Witness Information (First Witness)

Name: _____
Employee Number_____
Address:_____
City: _____
Zip Code : _____
Phone: _____

Witness Information (Second Witness)

Name: _____
Employee Number_____
Address:_____
City: _____
Zip Code : _____
Phone: _____

Additional information or comments:_____

_____

_____

A ROOT CAUSE ANALYSIS FORM MUST BE COMPLETED FOR ALL INJURIES AND ILLNESSES OR ACTUAL LOSSES.

COMPLETION OF THE ROOT CAUSE ANALYSIS FORM FOR NEAR LOSSES IS OPTIONAL, AT THE DISCRETION OF THE HEALTH AND SAFETY MANAGER.

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Root Cause Analysis Form

Root Cause Analysis (RCA)

Root Cause Categories (RCC): In the first column, enter the appropriate RCC from the choices below that applies to the root cause (RC) and/or contributing factor (CF) of the incident. Describe the specific root cause and corrective actions in their respective columns.

1. **Lack of skill or knowledge**
2. **Lack of or inadequate operational procedures or work standards**
3. **Inadequate communication of expectations regarding procedures or work standards**
4. **Inadequate tools or equipment**
5. **Correct way takes more time and/or requires more effort**
6. **Shortcutting standard procedures is positively reinforced or tolerated**
7. **Person thinks there is no personal benefit to always doing the job according to standards**

RCC #	Root Cause(s)	Corrective Actions	RC[1]	CF[2]	Due Date	Completion Date	Date Verified

[1] RC = Root Cause; [2] CF = Contributing Factors (check which applies)

Investigation Team Members

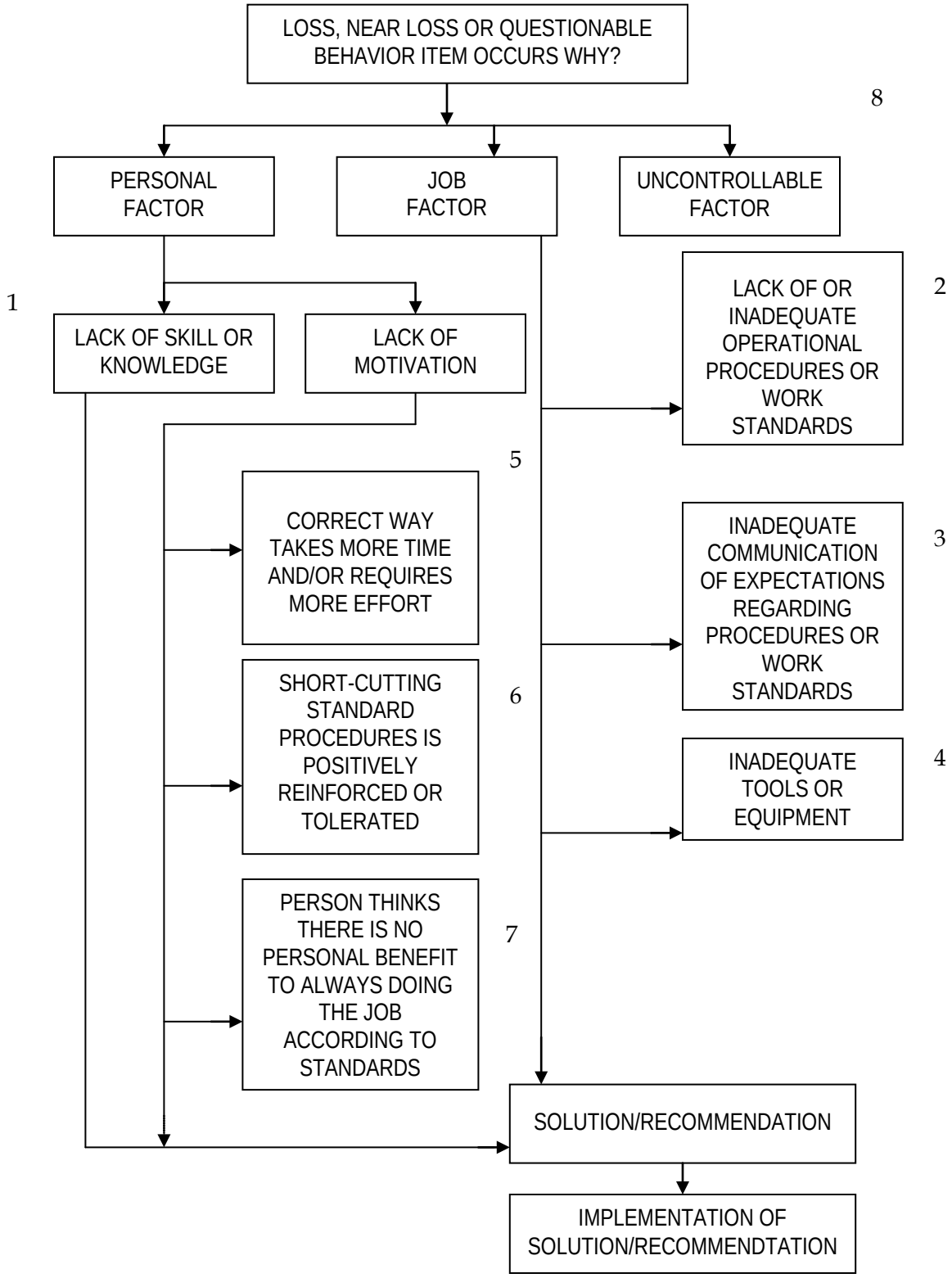
Name	Job Title	Date

Results of Solution Verification and Validation

Reviewed By

Name	Job Title	Date

Root Cause Analysis Flow Chart



Employee Training Records

1 employee/s match the criteria you selected.

Note: Only courses that you have rights to view are visible and counted. Any course noted with ***** matches your criteria. Results return both passed and failed courses unless you specify course results.

Only employees with HandS records are visable and counted.

Employee No.	Name	Company/ Sub Company	Location	Region	HS Level	Bus. Grp.	Sub Bus. Grp.	LLBU	Employee Status
AAA00054351	JANNA STASZAK	INC/INC	VBO	AMR	Comprehensive	EN	FED	AMRENFEDN	A

Course	Date Taken	Course Status	Date Expiring	Result	Status	Valid For (months)	Retraining
24-Hour Hazardous Waste - OJT	07-Jul-2000	Retrained	07-Jul-2001	Pass	Active	12	8-Hour Hazardous Waste Refresher Training
40-Hour Hazardous Waste	23-Jun-2000	Retrained	23-Jun-2001	Pass	Active	12	8-Hour Hazardous Waste Refresher Training
8-Hour Hazardous Waste Refresher Training	10-Jun-2010	Active	10-Jun-2011	Pass	Active	12	8-Hour Hazardous Waste Refresher Training
8-hour hazardous waste supervision course	26-Mar-2004	Active		Pass	Active		
Behavior Based Loss Prevention System (BBLPS)	08-Sep-2006	Active		Pass	Active		
Benzene	01-Oct-2007	Active		Pass	Active		
Bloodborne Pathogens	10-Jun-2010	Active	10-Jun-2011	Pass	Active	12	Bloodborne Pathogens
CPR 1 Year	12-Mar-2004	Equivalent	12-Mar-2005	Pass	Exited	12	CPR 1 Year
CPR 2 Year	20-Jul-2009	Active	20-Jul-2011	Pass	Exited	24	CPR 2 Year
Drug Free Workplace Training	**10-May-2007**	Expired	10-May-2008	Pass	Exited	12	Drug Free Workplace Training
Electrical Safety Awareness - Online module	08-Apr-2004	Active		Pass	Active		
Ergonomics Awareness	10-Feb-2004	Active		Pass	Active		
Excavation Safety Training	08-Apr-2004	Active		Pass	Active		
Fall Protection	08-Apr-2004	Active		Pass	Active		
Hazard Communication	10-Feb-2004	Active		Pass	Active		
Initial Safety Coordinator Course	25-Mar-2004	Active		Pass	Active		
Ladders	08-Apr-2004	Active		Pass	Active		
Lead	20-Apr-2006	Active		Pass	Active		
Manual Lifting	10-Feb-2004	Active		Pass	Active		
Medical Services and First Aid 3 yr	18-Oct-2004	Equivalent	18-Oct-2007	Pass	Exited	36	Medical Services and First Aid 3 yr
Medical Services First Aid 2yr	20-Jul-2009	Active	20-Jul-2011	Pass	Exited	24	Medical Services First Aid 2yr
New Employee Safety Orientation	10-Feb-2004	Active		Pass	Active		
OSHA 10-hr Construction Safety Awareness	08-Apr-2004	Active		Pass	Active		
Personal Protective Equipment	10-Jun-2010	Active		Pass	Active		
Remediation Waste Training	10-Jun-2010	Active	10-Jun-2011	Pass	Active	12	Remediation Waste Training
Respirators: Level C	10-Jun-2010	Active	10-Jun-2011	Pass	Active	12	Respirators: Level C
Safety Coordinator/Hazardous Waste	**26-Mar-2004**	Expired	26-Mar-2007	Pass	Exited	36	Safety Coordinator/Hazardous Waste Refresher
Safety Coordinator/Hazardous Waste Refresher	**22-Aug-2007**	Expired	22-Aug-2010	Pass	Exited	36	Safety Coordinator/Hazardous Waste Refresher
Site Worker Hazardous Waste Annual Medical	06-Apr-2010	Active	06-Apr-2011	Pass	Exited	12	Site Worker Hazardous Waste Annual Medical
Site Worker Hazardous Waste Baseline Medical	02-Mar-2004	Retrained	02-Mar-2005	Pass	Exited	12	Site Worker Hazardous Waste Annual Medical
Subcontractor Management	10-Jun-2010	Active		Pass	Active		
Fit Test	**03-May-2007**	03-May-2008	Pass	Exited	12	**Style:** Full Face Mask **Size:** Small **Model:** Survivair **Test Type:** Quantitative **Q Fit Fa**	

1 employee/s match the criteria you selected.

Note: Only courses that you have rights to view are visible and counted. Any course noted with ***** matches your criteria. Results return both passed and failed courses unless you specify course results.

Only employees with HandS records are visable and counted.

Employee No.	Name	Company/ Sub Company	Location	Region	HS Level	Bus. Grp.	Sub Bus. Grp.	LLBU	Employee Status
AAB00092686	MARK ORMAN	CCI/CCI	MKE	AMR	Basic	EN	FED	AMRENFEDD	A

Course	Date Taken	Course Status	Date Expiring	Result	Status	Valid For (months)	Retraining
40-Hour Hazardous Waste	08-Apr-1994	Retrained < 90 days	08-Apr-1995	Pass	Active	12	8-Hour Hazardous Waste Refresher Training
40-Hour Hazardous Waste - OJT	03-Jan-1997	Active		Pass	Active		
8-Hour Hazardous Waste Refresher Training	04-Mar-2010	Active < 90 days	**04-Mar-2011**	Pass	Active	12	8-Hour Hazardous Waste Refresher Training
8-hour hazardous waste supervision course	06-Nov-2007	Active		Pass	Active		
AED Training (AHA)	27-Jul-2010	Active	27-Jul-2012	Pass	Active	24	AED Training (AHA)
Asbestos Awareness	08-Nov-2007	Active		Pass	Active		
Awareness Training: Environmental Program	10-Dec-2007	Active		Pass	Active		
Behavior Based Loss Prevention System (BBLPS)	29-Oct-2007	Active		Pass	Active		
Benzene	10-Dec-2007	Active		Pass	Active		
Bloodborne Pathogens	04-Mar-2010	Active < 90 days	**04-Mar-2011**	Pass	Active	12	Bloodborne Pathogens
Cadmium	10-Dec-2007	Active		Pass	Active		
Chromium (VI) Exposure Training	10-Dec-2007	Active		Pass	Active		Chromium (VI) Exposure Training
Confined Space Entry	28-Nov-2001	Active		Pass	Active		
CPR 2 Year	27-Jul-2010	Active	27-Jul-2012	Pass	Active	24	CPR 2 Year
Dangerous Goods Shipping	02-Sep-2010	Active	02-Sep-2012	Pass	Active	24	Dangerous Goods Shipping
Drug Free Workplace Training	**27-Oct-2009**	Expired	27-Oct-2010	Pass	Active	12	Drug Free Workplace Training
Electrical Safety Awareness - Classroom	07-Nov-2007	Active		Pass	Active		
Electrical Safety Awareness - Online module	24-Oct-2007	Active		Pass	Active		
Ergonomics Awareness	03-Oct-2007	Active		Pass	Active		
Excavation Safety Training	08-Nov-2007	Active		Pass	Active		
Fall Protection	08-Nov-2007	Active		Pass	Active		
Fire Extinguishers	19-Feb-2010	Active < 90 days	**19-Feb-2011**	Pass	Active	12	Fire Extinguishers
Formaldehyde	14-Dec-2007	Active		Pass	Active		
Hand Safety	22-Dec-2008	Active		Pass	Active		
Hazard Communication	20-Nov-2008	Active		Pass	Active		
Initial Safety Coordinator Course	03-Oct-2007	Active		Pass	Active		
Ladders	08-Nov-2007	Active		Pass	Active		
Lead	08-Nov-2007	Active		Pass	Active		
Lockout/Tagout	12-Dec-2007	Active		Pass	Active		
Manual Lifting	12-Dec-2007	Active		Pass	Active		
Medical Services First Aid 2yr	27-Jul-2010	Active	27-Jul-2012	Pass	Active	24	Medical Services First Aid 2yr
Methylene Chloride	14-Dec-2007	Active		Pass	Active		
New Employee Safety Orientation	03-Oct-2007	Active		Pass	Active		
Noise	19-Feb-2010	Active < 90 days	**19-Feb-2011**	Pass	Active	12	Noise
OSHA 10-hr Construction Safety Awareness	07-Nov-2007	Active		Pass	Active		
Personal Protective Equipment	04-Mar-2010	Active		Pass	Active		
Process Safety Management	12-Dec-2007	Active		Pass	Active		
Remediation Waste Training	04-Mar-2010	Active < 90 days	**04-Mar-2011**	Pass	Active	12	Remediation Waste Training
Respirators: Level B	**04-Dec-2007**	Expired	04-Dec-2008	Pass	Exited	12	Respirators: Level B
Respirators: Level C	04-Mar-2010	Active < 90 days	**04-Mar-2011**	Pass	Active	12	Respirators: Level C
Safe Behavior Observation Training	01-Jul-2008	Active		Pass	Active		
Safety Coordinator Construction	08-Nov-2007	Retrained	08-Nov-2010	Pass	Active	36	Safety Coordinator Construction Refresher
Safety Coordinator Construction Refresher	24-Sep-2010	Active	24-Sep-2013	Pass	Active	36	Safety Coordinator Construction Refresher
Safety Coordinator/Hazardous Waste	06-Nov-2007	Retrained	06-Nov-2010	Pass	Active	36	Safety Coordinator/Hazardous Waste Refresher
Safety Coordinator/Hazardous Waste Refresher	24-Sep-2010	Active	24-Sep-2013	Pass	Active	36	Safety Coordinator/Hazardous Waste Refresher
Site Worker Hazardous Waste Annual Medical	13-Sep-2010	Active	13-Sep-2011	Pass	Active	12	Site Worker Hazardous Waste Annual Medical
Site Worker Hazardous Waste Baseline Medical	04-Oct-2007	Retrained	04-Oct-2008	Pass	Active	12	Site Worker Hazardous Waste Annual Medical
Subcontractor Management	04-Mar-2010	Active		Pass	Active		
Traffic Control	12-Dec-2007	Active		Pass	Active		
Vinyl Chloride	14-Dec-2007	Active		Pass	Active		
Waste Management	14-Mar-2008	Active		Pass	Active		
Fit Test	24-Mar-2010	24-Mar-2011	Pass	Active	12	**Style:** Full Face Mask **Size:** Large **Model:** MSA AD1000 **Test Type:** Qualitative **Q Fit Fa**	

1 employee/s match the criteria you selected.

Note: Only courses that you have rights to view are visible and counted. Any course noted with ***** matches your criteria. Results return both passed and failed courses unless you specify course results.

Only employees with HandS records are visable and counted.

Employee No.	Name	Company / Sub Company	Location	Region	HS Level	Bus. Grp.	Sub Bus. Grp.	LLBU	Employee S
AAA00062077	MARK OST	INC/INC	VBO	AMR	Comprehensive	EN	FED	AMRENFEDN	A

Course	Date Taken	Course Status	Date Expiring	Result	Status	Valid For (months)	Retraining
40-Hour Hazardous Waste	26-May-2005	Retrained	26-May-2006	Pass	Active	12	8-Hour Hazardous Waste Refresher Training
40-Hour Hazardous Waste - OJT	15-Apr-2010	Active		Pass	Active		
8-Hour Hazardous Waste Refresher Training	10-Jun-2010	Active	10-Jun-2011	Pass	Active	12	8-Hour Hazardous Waste Refresher Training
8-hour hazardous waste supervision course	16-Jun-2005	Active		Pass	Active		
Arsenic	02-Jun-2008	Active		Pass	Active		
Awareness Training: Environmental Program	15-Jun-2005	Active		Pass	Active		
Behavior Based Loss Prevention System (BBLPS)	27-Sep-2005	Active		Pass	Active		
Benzene	02-Jun-2008	Active		Pass	Active		
Blood Lead and ZPP	27-Sep-2010	Active		Pass	Active		
Bloodborne Pathogens	10-Jun-2010	Active	10-Jun-2011	Pass	Active	12	Bloodborne Pathogens
CPR 2 Year	19-Sep-2009	Active	19-Sep-2011	Pass	Active	24	CPR 2 Year
Dangerous Goods Shipping	14-Oct-2010	Active	14-Oct-2012	Pass	Active	24	Dangerous Goods Shipping
Drug Free Workplace Training	02-Mar-2010	Active < 90 days	**02-Mar-2011**	Pass	Active	12	Drug Free Workplace Training
Ergonomics Awareness	17-Sep-2010	Active		Pass	Active		
Fall Protection	20-Jan-2010	Active		Pass	Active		
Fire Extinguishers	31-Aug-2010	Active	31-Aug-2011	Pass	Active	12	Fire Extinguishers
Hazard Communication	17-Sep-2010	Active		Pass	Active		
HSSE Employee Commitment Statement	17-Sep-2010	Active		Pass	Active		
Initial Safety Coordinator Course	07-Jun-2005	Active		Pass	Active		
Lead	24-Aug-2010	Active		Pass	Active		
Manual Lifting	17-Sep-2010	Active		Pass	Active		
Medical Services First Aid 2yr	19-Sep-2009	Active	19-Sep-2011	Pass	Active	24	Medical Services First Aid 2yr
Methylene Chloride	02-Jun-2008	Active		Pass	Active		
New Employee Safety Orientation	17-Sep-2010	Active		Pass	Active		
OSHA 30-hr Construction Course	17-Sep-2010	Active		Pass	Active		
Personal Protective Equipment	10-Jun-2010	Active		Pass	Active		
Remediation Waste Training	10-Jun-2010	Active	10-Jun-2011	Pass	Active	12	Remediation Waste Training
Respirators: Level C	10-Jun-2010	Active	10-Jun-2011	Pass	Active	12	Respirators: Level C
Safe Behavior Observation Training	01-Dec-2008	Active		Pass	Active		
Safety Coordinator/Hazardous Waste	16-Jun-2005	Retrained	16-Jun-2008	Pass	Active	36	Safety Coordinator/Hazardous Waste Refresher
Safety Coordinator/Hazardous Waste Refresher	05-Nov-2008	Active	05-Nov-2011	Pass	Active	36	Safety Coordinator/Hazardous Waste Refresher
Site Worker Hazardous Waste Annual Medical	28-Jun-2010	Active	28-Jun-2011	Pass	Active	12	Site Worker Hazardous Waste Annual Medical
Site Worker Hazardous Waste Baseline Medical	19-May-2005	Retrained	19-May-2006	Pass	Active	12	Site Worker Hazardous Waste Annual Medical
Subcontractor Management	10-Jun-2010	Active		Pass	Active		
Waste Management	08-Jun-2005	Active		Pass	Active		
Fit Test	10-Jun-2010	10-Jun-2011	Pass	Active	12	**Style:** Full Face Mask **Size:** Medium **Model:** MSA AD1000 **Test Type:** Quantitative **Q**	

1 employee/s match the criteria you selected.

Note: Only courses that you have rights to view are visible and counted. Any course noted with ***** matches your criteria. Results return both passed and failed courses unless you specify course results.

Only employees with HandS records are visable and counted.

Employee No.	Name	Company/ Sub Company	Location	Region	HS Level	Bus. Grp.	Sub Bus. Grp.	LLBU	Employee
AAB00041525	TED DINGLE	INC/INC	VBO	AMR	Comprehensive	EN	FED	AMRENFEDN	A

Course	Date Taken	Course Status	Date Expiring	Result	Status	Valid For (months)	Retraining
40-Hour Hazardous Waste	26-Aug-2005	Retrained	26-Aug-2006	Pass	Active	12	8-Hour Hazardous Waste Refresher Training
8-Hour Hazardous Waste Refresher Training	10-Jun-2010	Active	10-Jun-2011	Pass	Active	12	8-Hour Hazardous Waste Refresher Training
8-hour hazardous waste supervision course	09-Oct-2008	Active		Pass	Active		
AED Training (AHA)	14-Jun-2010	Active	14-Jun-2012	Pass	Active	24	AED Training (AHA)
AED Training 1 year (ARC)	30-Jun-2007	Equivalent	30-Jun-2008	Pass	Exited	12	AED Training 1 year (ARC)
Arsenic	30-Sep-2005	Active		Pass	Active		
Awareness Training: Environmental Program	07-Sep-2005	Active		Pass	Active		
Behavior Based Loss Prevention System (BBLPS)	15-Jan-2008	Active		Pass	Active		
Benzene	25-Jun-2010	Active		Pass	Active		
Bloodborne Pathogens	10-Jun-2010	Active	10-Jun-2011	Pass	Active	12	Bloodborne Pathogens
Construction Quality Management (CQM) for Contract	15-Mar-2006	Active	15-Mar-2011	Pass	Active	60	Construction Quality Management (CQM) for Contract
CPR 1 Year	30-Jun-2007	Equivalent	30-Jun-2008	Pass	Exited	12	CPR 1 Year
CPR 2 Year	14-Jun-2010	Active	14-Jun-2012	Pass	Active	24	CPR 2 Year
Dangerous Goods Shipping	20-Aug-2010	Active	20-Aug-2012	Pass	Active	24	Dangerous Goods Shipping
Drug Free Workplace Training	23-Jun-2010	Active	23-Jun-2011	Pass	Active	12	Drug Free Workplace Training
Ergonomics Awareness	08-Sep-2005	Active		Pass	Active		
Excavation Safety Training	25-Jun-2010	Active		Pass	Active		
Fall Protection	05-Feb-2008	Active		Pass	Active		
Fire Extinguishers	23-Jun-2010	Active	23-Jun-2011	Pass	Active	12	Fire Extinguishers
Hazard Communication	07-Sep-2005	Active		Pass	Active		
Initial Safety Coordinator Course	05-Feb-2008	Active		Pass	Active		
Ladders	05-Feb-2008	Active		Pass	Active		
Manual Lifting	15-Sep-2005	Active		Pass	Active		
Medical Services and First Aid 3 yr	30-Jun-2007	Equivalent	30-Jun-2010	Pass	Exited	36	Medical Services and First Aid 3 yr
Medical Services First Aid 2yr	14-Jun-2010	Active	14-Jun-2012	Pass	Active	24	Medical Services First Aid 2yr
New Employee Safety Orientation	07-Sep-2005	Active		Pass	Active		
OSHA 10-hr Construction Safety Awareness	02-Oct-2006	Active		Pass	Active		
Personal Protective Equipment	10-Jun-2010	Active		Pass	Active		
Railroad Contractor Orientation Training	17-Sep-2010	Active	17-Sep-2011	Pass	Active	12	Railroad Contractor Orientation Training
Railroad Education for Contractors (On-Track)	14-Sep-2010	Active	14-Sep-2011	Pass	Active	12	Railroad Education for Contractors (On-Track)
Remediation Waste Training	10-Jun-2010	Active	10-Jun-2011	Pass	Active	12	Remediation Waste Training
Respirators: Level C	10-Jun-2010	Active	10-Jun-2011	Pass	Active	12	Respirators: Level C
Safe Behavior Observation Training	23-Jun-2010	Active		Pass	Active		
Safety Coordinator Construction	05-Feb-2008	Active < 90 days	**05-Feb-2011**	Pass	Active	36	Safety Coordinator Construction Refresher
Safety Coordinator/Hazardous Waste	09-Oct-2008	Active	09-Oct-2011	Pass	Active	36	Safety Coordinator/Hazardous Waste Refresher
Site Worker Hazardous Waste Annual Medical	13-May-2010	Active	13-May-2011	Pass	Active	12	Site Worker Hazardous Waste Annual Medical
Site Worker Hazardous Waste Baseline Medical	18-Aug-2005	Retrained	18-Aug-2006	Pass	Active	12	Site Worker Hazardous Waste Annual Medical
Subcontractor Management	10-Jun-2010	Active		Pass	Active		
Vinyl Chloride	23-Jun-2010	Active		Pass	Active		
Waste Management	25-Jun-2010	Active		Pass	Active		
Fit Test	10-Jun-2010	10-Jun-2011	Pass	Active	12	**Style:** Full Face Mask **Size:** Large **Model:** MSA AD1000 **Test Type:** Quantitative	

AGVIQ
AGVIQ ENVIRONMENTAL SERVICES

THOMAS E. CHERRIX — PROJECT MANAGER

EDUCATION/SPECIALIZED TRAINING

- Craven County Community College, NC Science 9 SH 1999-2000
- Chabot Community College, Hayward, CA Business Mgt 1989
- University of Berkley Extension Program (Project Management) 1991
- University of Hawaii at Hilo, Science 63 SH 1981-1983
- 29CFR 1926 Subpart P Excavation Competent Person 2009
- 29CFR1910.120 OSHA 8 hr Refresher 2009
- OSHA 10hr Construction Safety 2009
- US Army Corps of Engineers Construction Quality Management for Contractors 2008
- AGVIQ-CH2MHILL JV UXO Safety Awareness and Avoidance Training 2008
- AGVIQ, LLC Hazardous Waste Operations and Emergency Response Refresher Training 2008
- Qualified Person, ABCO Environmental Services 2003
- Construction Quality Management for Contractors, ACOE 1999
- Hazards & Protection IT Corporation 1999
- OSHA 8-Hour Supervisor Training 1997
- Environmental Sampling Training, OHM Corp 1996
- Hazardous Waste Operations, Environmental Compliance Services 1994
- 40 Hour Health & Safety Training USPCI, Sacramento, CA 1991
- 40 Hour OSHA 29 CFR1910.120 IT Corporation, Keller, TX 1986
- Tank Car Safety, Association of American Railroads 1986
- University of Hawaii 40 hours First Responder Emergency Medical Care 1982
- Hawaii County Fire Department Recruit Training, Hilo HI. (240hrs) 1981
- Advanced Life Saving & Water Air/Boat Rescue, Hilo, HI. American National Red Cross (40 hr) 1981
- United States Air Force Fire Fighter Technical School, Chanute AFB, IL (236 hrs) 1980
- Loudoun County Fire & Rescue Association, VA. Emergency Response (147 hrs) 1979

CERTIFICATIONS

- ESC Responsible Land Disturber, Commonwealth of Virginia 2005
- STI: Steel Tank Institute AST Inspector 5-2010 Ex 5-2015
- CPR/AED - Adult & Child plus CPR - Infant American Red Cross 2009

PROFESSIONAL SUMMARY

Mr. Cherrix has been AGVIQ's Operations Coordinator / Project Manager in our Northern Virginia satellite office since October 2007. Mr. Cherrix has more than twenty-six years of progressive management experience in fast-paced environments including construction/remediation site management, emergency response, and hazardous waste management. Cherrix's responsibilities include implementation, managing, coordinating, and administrating remediation projects. Mr. Cherrix also enforces all site specific health & safety policies for Government and State agencies, as well as private sector clients. Cherrix is charged with development and implementation of budgets, schedules/forecasting, and management oversight of all financial components of projects. He provides interaction with federal, state, and local regulators and assists with review of all technical work plans, site plans, and remedial design plans. Mr. Cherrix estimates contract task orders and private sector RFP requirements (which include reviewing plans & specifications to develop estimates), conducts site walks with clients, and determines the technical approach for potential jobs.

He assists project procurement by obtaining firm quotes for material suppliers, equipment, and subcontractors based on specification and/or contract requirements.

PROJECT EXPERIENCE

- **Various Navy Facilities, Small Business Remediation Contract JVIIIa**
  Mr. Cherrix has temporary assignments as needed for various projects as a Project Manager, Site Manager, Site Safety Officer, and QC Manager based on current resource requirements.

- **Naval Station Facility, Sigsbee Annex, Key West, Florida**
  Mr. Cherrix supervised the removal and subsequent transportation and disposal of 361 tons of non-hazardous Lead contaminated soils within the boundaries of two former water towers. Following excavation and load out of contaminated soils the area was backfilled with clean imported fill, restored to original conditions.

- **MCAS Cherry Point, Havelock, North Carolina**
  Mr. Cherrix was Project Site Manager and was responsible for estimating, implementation, and oversight of all financial components including all operational aspects on the LANTDIV RAC III Remedial O&M contract.
  Cherrix was also Project Superintendent and responsible for site and personnel management on LANTDIV RAC I and RAC III remedial construction & O&M contracts. Project history included site assignment with more than 127 Delivery Orders ranging in dollar value of $2,000 to $1.3 million which encompassed plating facility closure, UST removals, site excavations, installation of SVE/AS systems, free product recovery systems, demo/install plating facility scrubber units, pond closures, installation of monitoring wells, various sampling events, and emergency Delivery Orders. Mr. Cherrix also provided mentoring under Navy Program for an 8A/Hub-zone contractor.

- **Former U.S. Air Force Base McClellan, Sacramento, California**
  Mr. Cherrix was Site Project and Personnel Manager for the $15 million remediation services contract which involved UST closures, facility decontamination and demolition, monitoring well installations, and field sampling events.

- **Former U.S. Air Force Base George, Victorville, California**
  As Project and Personnel Manager for the UST/Pipeline closure project, Mr. Cherrix oversaw all Safety and Site operations to include pigging, tank cleaning and closures, demo of pipe lines associated with the airfield fueling system.

- **City of San Francisco, California and Other Local and Government Agencies**
  Mr. Cherrix acted as on site Project and Personnel Manager for a facility decontamination closure and also installed soil vapor recovery Systems for several transportation facilities.

- **Various Remediation Projects**
  Mr. Cherrix was Senior Operation Supervisor for remediation projects with up to 40 personnel. He specialized in facility demolition and restoration, chemical packaging, transportation & disposal, asbestos abatement, and turn-key remedial projects related to Hazardous and Non-Hazardous soils. Cherrix responded to approximately 1,800 Emergencies for: Chemical Factory Fires; Train Derailments; Lab Packing of Drug Labs; Oil Spills (land & Sea); EOD (chemicals); Pipeline Ruptures Earth Quake responses.
  As Operations Manager for Site Utility Construction (water, sanitary, curb/gutter / roads) for both commercial and residential housing developments, Mr. Cherrix's duties include daily operations of construction services, scheduling of personnel, subcontractors and materials delivery, estimating, project cost tracking, and procurement.

Mr. Cherrix also has more than five years of experience as Senior Project Estimator directly responsible for reviewing plans & specifications, develops estimates. Cherrix coordinates with assigned project manager to review bid strategy and assists in project buy-out. He conducts bid review meetings with the Director of Project Development and/or Project Manager to finalize bid, markup, and strategies. Cherrix obtains review and input information from other support groups as needed.

TAYLOR MADE DIAGNOSTICS
Occupational Health Services
801 Poindexter Street
Chesapeake, VA 23334
Phone: 757-494-1698

MEDICAL SURVEILANCE REPORT

Patient's Name: THOMAS E. CHERRIX SS #: [redacted]
Company: AGVIQ Date of Exam: 9-16-10

The examinee has been examined for health risks that may result from exposure to:

☒ Benzene ☒ Lead/ZNPP ☐ ☐
☒ Heavy Metals ☐ ☐ ☐

HAZMAT (29CFR1910.120):

☑ The examinee has been found to have no detectable medical condition which would place him/her at increased risk of material health impairment from work in hazardous waste/material operations or emergency response at this time.

☑ The examinee had the above biological monitoring levels performed pursuant to OSHA requirements.

☑ No restrictions and examinee physically qualified to perform job activities identified by employer.

Physician Signature: Albert Molina, PA Date: 9/16/10

Physician Name (print): Albert M Molina, PA
Physician Title (print): Physician Assistant

RESPIRATOR CLEARANCE STATEMENT (29CFR1910.134):

☑ No restrictions on respirator use.

☐ Specific restrictions on respirator use.

☐ Not qualified for respirator use.

Restrictions/Explanations: _____

Physician Signature: Albert Molina, PA Date: 9/16/10

Physician Name (print): Albert M Molina, PA
Physician Title (print): Physician Assistant

USPCI
A Subsidiary of
Union Pacific Corporation

INSTRUMENTATION - 2/92

This is to certify that

THOMAS CHERRIX

has successfully completed 40 hours of
HEALTH AND SAFETY TRAINING

Covering the following topics:

Introduction to Regulations
Medical Monitoring
Principles of Safety
Basic Chemistry
Properties of Hazardous Materials
Health Hazards
Hazard Communication
Personal Protective Equipment
Respiratory Protection
Drum Handling and Sampling
Monitoring Instruments
Confined Spaces
Spill Response
Site Control
Health and Safety Plans
UST'S
Drill Rig Safety
CPR
First Aid

And also successfully completed the following as indicated:
☒ A medical exam which satisfies the requirements of 29 CFR 1929.120(f)
☒ Three days of supervised field training

JUNE 3-7, 1991
Dates

Instructor
STEVE CLEGG

Certificate

AGVIQ, LLC

Tom Cherrix

This certifies that the above-named individual has satisfactorily completed an eight (8) hour Hazardous Waste Operations and Emergency Response refresher training course meeting the requirements of 29 CFR 1910.120(e)(8)/29 CFR 1926.65(e)(8).

02/19/10

Date of Training

David Leadenham
General Manager
AGVIQ, LLC

certification #:2010-12 HWR8
certification expires: 02/19/11

Safety Coordinator - Hazardous Waste

Certificate

AGVIQ, LLC

Tom Cherrix

This certifies that the above-named individual has satisfactorily completed a Hazardous Waste Operations and Emergency Response Management and Supervisor training course meeting the requirements of 29CFR1910.120(e)(4)/29CFR1926.65(e)(4).

Course Presented by:

Glen Jackson
Health & Safety Officer
AGVIQ, LLC.

David Leadenham
General Manager
AGVIQ, LLC

02/03/09
Date of Training

certification #:2009-003 SC-HW

AGVIQ
AGVIQ ENVIRONMENTAL SERVICES
CH2M HILL
JOINT VENTURE

OSHA 002270464

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

Tom Cherrix

has successfully completed a 10-hour Occupational Safety and Health Training Course in

Construction Safety & Health

George C Nelson 02/02/09
(Trainer) (Date)

OSHA recommends Outreach Training courses as an orientation to occupational safety and health for workers. Participation is voluntary. Workers must receive additional training on specific hazards of their job. This course completion card does not expire.

For further information go to "Training" at www.osha.gov

AGVIQ
AGVIQ ENVIRONMENTAL SERVICES LLC

June 30, 2009

Mr. Thomas Cherrix
AGVIQ, LLC.
4610 Westgrove Court
Virginia Beach, VA 23455

RE: Excavation Competent Person Acknowledgement

Dear Mr. Cherrix;

With this documentation, AGVIQ, LLC., hereby acknowledges your demonstrated skills as a qualified site superintendent and project manager, overall training, competency in heavy equipment operation, and previous twenty (20) plus years of on the job experience in the construction and Hazardous Waste Operations and Emergency Response (HAZWOPER) industries, where you have routinely performed excavation operations and requisite earthmoving activities.

This acknowledgement authorizes you to act in the capacity of the Competent Person for excavation operations engaged by AGVIQ, LLC. subject to the requirements of 29CFR1926, Subpart P – Excavations and authorizes you to perform in the following:

- Take prompt corrective measures to eliminate existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees;
- Perform daily or more frequent (i.e. rain or other hazard increasing occurrence) inspections of excavations, adjacent areas, and protective systems (i.e. shields/shoring, sloping/benching) for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions;
- Monitoring and inspection of the control or prevention of water accumulation (in excavations) and use of water removal equipment and inspect excavations subject to runoff from heavy rains;
- Grant employee access to excavations which have been determined to have proper protective systems in place and subsequently remove employee's from excavations that: exhibit evidence of a situation that could result in a possible cave-in, there are indications of a failure of installed protective systems, hazardous atmospheres are or may be present, or other hazardous conditions exist, until the necessary precautions have been taken to ensure their safety.
- Execute excavation operations in a manner which provides proper worker protection (via shields/shoring, sloping/benching) to employees against collapse, cave-in or engulfment during daily excavation operations subject to the above requirements.

Where it is determined that you do not have the proper means or methods to execute the above procedures, you must contact me such measures and resources can be can be put in-place.

AGVIQ, LLC appreciates your continued commitment to excellence and safety in the execution of this role.

Sincerely,

David Leadenham
General Manager

Cc: G. Jackson

AMERICAN SAFETY & HEALTH INSTITUTE

CPR, AED, and Basic First Aid
for the Community and Workplace

Tom Cherrix

has successfully completed and competently performed the required knowledge and skill objectives for:

- ☑ Adult CPR, AED, and First Aid
- ☐ Child CPR AED, and First Aid
- ☐ Infant CPR and First Aid

Check each that apply.

ASHI-approved Certification Card

Don Smith

Authorized Instructor (Print Name)

Cardholder's Signature

06/14/2010	06/2012
Date Completed	Renewal Date
907.222.7612	BEACON OHSS
Training Center Phone No.	Training Center I.D.

Successful completion indicates card holder has met required knowledge and skill objectives of the curriculum to the satisfaction of an ASHI-authorized Instructor. Certification does not guarantee future performance, nor imply state certification or licensure. Program content is based upon American Heart Association® Inc. Guidelines for CPR and ECC (*Circulation* ©2005) and other evidence-based treatment recommendations.

U.S. ARMY CORPS OF ENGINEERS

PROFESSIONAL DEVELOPMENT SUPPORT CENTER
HUNTSVILLE, ALABAMA

CERTIFICATE

This is to certify that

Tom Cherrix
AGVIQ, LLC

has completed the Corps of Engineers Training Course

CONSTRUCTION QUALITY MANAGEMENT FOR CONTRACTORS

THIS CERTIFICATE, CENAO-08-0430 EXPIRES 06 June 2013

Given at Virginia Beach, VA (Location) By Norfolk (Instructional District) 06 June 2008 (Date)

James R. Baldwin, P.E.
Facilitator

THIS CERTIFICATE EXPIRES FIVE YEARS FROM DATE OF ISSUE

Chief, USACE Professional Development Support Center

Certificate

AGVIQ, LLC

Tom Cherrix

This certifies that the above-named individual has satisfactorily completed a Dangerous Goods in Transportation General Awareness and Safety and Security Training Program meeting the requirements of 49CFR172.700 and 172.800.

03/08/08

Date of Training

David Leadenham
General Manager
AGVIQ, LLC

certification #: 2008-05 DOTHM
certification expires: 03/08/11

AGVIQ-CH2MHILL Joint Venture
UXO Safety Awareness and Avoidance Training

Thomas Cherrix

This certifies that the above-named individual has attended and satisfactorily completed the July 2003, Version 1.0, Air Force Unexploded Ordnance Safety Training Program.

AIR FORCE SAFETY CENTER

Kevin Lombardo
Course Presenter
CH2MHILL, INC.

AIR FORCE CIVIL ENGINEER SUPPORT AGENCY

David Leadenham
General Manager
AGVIQ, LLC.

AF CENTER FOR ENVIRONMENTAL EXCELLENCE

3/07/08
Course Presentation Date

2008-05 UXO
Certificate #

Appendix B
ESS Determination

DEPARTMENT OF THE NAVY
NAVAL ORDNANCE SAFETY AND SECURITY ACTIVITY
FARRAGUT HALL
3817 STRAUSS AVENUE, SUITE 108
INDIAN HEAD, MD 20640-5151

8020
Ser N537/1148
4 Aug 10

From: Commanding Officer, Naval Ordnance Safety and Security Activity
To: Commanding Officer, Naval Facilities Engineering Command, Mid-Atlantic (OPHE3)

Subj: EXPLOSIVES SAFETY SUBMISSION DETERMINATION REQUEST FOR WASTE DELINEATION OF EAST SIDE OF INSTALLATION RESTORATION SITE 2, ST. JULIENS CREEK ANNEX, CHESAPEAKE VIRGINIA

Ref: (a) E-mail NAVFAC MIDLANT (OPHE3) Mr. W. Bell/NOSSA (N539) Mr. K. Garcia of 22 Jul 10 (w/encl)
(b) NOSSAINST 8020.15B
(c) NAVSEA OP 5, Volume 1, Seventh Revision, Change 8

1. As requested by reference (a), the Naval Ordnance Safety and Security Activity (NOSSA) reviewed the subject Explosives Safety Submission (ESS) Determination Request in accordance with references (b) and (c). Based on the information provided, NOSSA has determined that an ESS is not required to conduct waste delineation activities at the eastern side of Installation Restoration Site 2, Waste Disposal Area B (formally known as Dump B or Landfill B), St. Juliens Creek Annex, Chesapeake, Virginia.

2. As outlined in your request, we understand that the likelihood of encountering Munitions and Explosives of Concern (MEC) and/or Material Potentially Presenting an Explosive Hazard (MPPEH) during the proposed project has been determined to be low and that the following conditions apply:

a. During studies and investigations conducted at Site 2 from 1981 to 2007, one expended 40mm cartridge casing and two expended 5-inch Mark V cartridges were encountered on the western portion of the site. No MEC or MPPEH were encountered on the eastern side of the tidal wetland area during more than 40 test pit excavations, surface/subsurface soil samples and monitory well locations. The tidal wetland (including standing water) divides the eastern and western sections of the site.

b. During waste delineation activities which will only be carried out on the eastern side of Site 2, on-site construction support will be provided as a conservative measure. Waste delineation includes test pitting to determine the edge of the waste area. When waste is encountered, excavation at that test pit will stop and a subsequent test pit east of the location will be initiated. Excavation will not extend below the water table nor extend into the tidal wetland.

c. The site is outside of all existing explosives safety quantity distance arcs.

d. As a precautionary measure, all onsite personnel will receive munitions awareness training prior to the start of delineation operations. This training will be provided by a qualified Unexploded Ordnance (UXO) technician.

3. If any MEC or MPPEH items are encountered, the following steps must be taken:

a. For expended or unexpended small arms ammunition, note their description and location, notify the responsible Explosives Safety Officer (ESO) and the project manager, and handle them in accordance with reference (c) and applicable environmental regulations.

b. For items other than expended or unexpended small arms ammunition, stop all operations, notify the responsible ESO, project manager, and request an emergency response from the cognizant Explosive Ordnance Disposal detachment. Operations cannot resume until NOSSA has been contacted and has provided guidance regarding the need for an ESS for this project.

Subj: EXPLOSIVES SAFETY SUBMISSION DETERMINATION REQUEST FOR WASTE DELINEATION OF EAST SIDE OF INSTALLATION RESTORATION SITE 2, ST. JULIENS CREEK ANNEX, CHESAPEAKE VIRGINIA

4. The NOSSA point of contact for this ESS determination is Ms. Kathy Garcia, who can be contacted at DSN 354-5636 or commercial at 301-744-5636.

PAMELA G. CLEMENTS
By direction

Copy to:
CNO (N411C; N411C2; N453; N453C)
NAVFAC HQ (ENV3)
NAVFAC MIDLANT (OPHE3)
NAVSHIPYD NORFOLK (C800)
COMNAVREG MIDLANT (N3)
NOSSA ESSOLANT (N5L;N5L8)

REQUEST FOR AN EXPLOSIVES SAFETY SUBMISSION DETERMINATION

Instructions: Project managers shall complete all blocks in this request and enclose it in a letter or memo, fax it, or attach it to a digitally signed e-mail, and send to either:

NOSSA (N53) 4234 Steve's Way, Ste 121 Indian Head, MD 20640-5058 Fax: 301-744-6749 (DSN 354) E-mail: inhdnossa-ess@navy.mil	COMMARSYSCOM (PM AMMO) 2200 Lester Street Quantico, VA 22134-5010 Fax: 703-432-3160 (DSN 378) E-mail: explosivessafety@usmc.mil

Site name/number, Activity, City, State and ZIP code:	Installation Restoration (IR) Site 2 - Waste Disposal Area B, St. Juliens Creek Annex (SJCA), Chesapeake, VA 23323	Date submitted:	20 July 2010
Project manager: Contact information	Mr. Walter Bell NAVFAC MIDLANT (P) 757.445.6638 (F) 757.444.3000 walt.j.bell@navy.mil	EOD/UXO contractor: Contact information	EOD Mobile Unit 2 Norfolk, VA

Site history: Briefly describe past MEC or MPPEH use at the site

Site 2 – Waste Disposal Area B (formerly known as Dump B and Landfill B) is a former waste disposal area covering approximately 5.7 acres at the corner of St. Juliens Road and Cradock Street in the southern portion of SJCA (Figure 1). The site is divided by a tidal wetland that runs approximately north to south. Mixed municipal wastes, abrasive blast media (ABM), waste ordnance, organics (including solvents), and inorganics were reportedly disposed of at Site 2. Operations began in 1921 and continued until sometime after 1947. Historic reports indicate that prior to the 1930s ordnance may have been disposed of in Dump B. Initially, refuse was burned openly on site and was used to fill in the adjacent swampy area (Site 2 inlet). The total volume of waste accumulated prior to burning was estimated to be 35,000 cubic yards (yd^3). In 1942, an incinerator was installed to replace the open burning practices. The total volume of waste burnt in the incinerator was estimated to be 15,000 yd^3.

Remedial Investigation activities were conducted at the site from 1997 to 2007 and included a geophysical survey; waste delineation through test pitting and direct push technology coring; monitoring well installation; water level monitoring; collection and analysis of surface and subsurface soil, groundwater, sediment, and soil samples; and membrane interface probe (MIP) (Figure 2). From 1997 through 2003, intrusive activities were conducted under the oversight of a UXO Technician. During the 2001 waste delineation test pitting , concrete (some containing rebar) glass, ABM, scrap metal, gravel, and asphalt were identified in waste delineation test pits. Munitions debris (one 40 mm cartridge casing and two 5-inch Mark V cartridge casings, all expended) were encountered in the subsurface after excavation of two test pit locations on the western side of the site (Figure 3, west of the tidal wetland). No munitions debris were encountered on the eastern side of the site (Figure 3, east of the tidal wetland).

Beginning in 2004, with NOSSA approval of an ESS Determination request, intrusive activities were conducted under the oversight of UXO Technician(s) practicing anomaly avoidance. 48 DPT locations, 9 piezometer locations (tripod and hammer), and 12 augered well borings were advanced on both sides of the tidal wetland during this investigation. No MEC or munitions debris were encountered.

MEC or MPPEH known or suspected to be present: Quantity, type/nomenclature, and condition	None on the east side of the site: ● Munitions debris has only been encountered on the west side of the tidal wetland. No other type of MEC (DMM, MC, or UXO) were encountered east or west of the tidal wetland. ● No MEC or munitions debris were encountered during intrusive site activities east of the tidal wetland. This indicates that historic ordnance disposal may have been limited to the west side of the tidal wetland. ● Munitions debris were only encountered west of the tidal wetland. Although by current definitions munitions debris may have been categorized as MPPEH until documented as MDAS, and documentation does not exist, verbal accounts of the project team indicate the on-site UXO Technician inspected the munitions debris and determined that it did not pose an explosive hazard.
Work task/project being proposed: Briefly describe proposed work; identify encumbering ESQD arcs	Waste delineation activities are planned to refine the waste boundary on the eastern side of the site. The current waste boundary in that area is believed to be conservative and includes areas of gravel and concrete that may be related to the former building demolition or roadway rather than waste disposal. Waste delineation will consist of test pitting to identify the edge of the waste. To limit the exposure to waste and/or potential waste ordnance, test pits will be initiated at the Planned Additional Waste Delineation Preliminary Test Pit Locations outside of the estimated waste boundary (Figure). Depending on the visual observation, the next test pit locations will proceed westward toward the known disposal area. When waste is encountered, excavation will stop at that location and a subsequent test pit east of the location will be excavated to refine the waste boundary. Excavation will not extend below the water table. Excavation will not extend into the tidal wetland or occur west of the tidal inlet. On-site construction support as a conservative measure, is proposed during the waste delineation activity in order to meet the objective of the waste delineation. Anomaly avoidance is not ideal based of the anticipated presence of metallic waste and concrete with rebar in the vicinity (Figure 3), as it will result in an over-estimation of the limits of waste. The investigation observations indicate that munitions debris discarded at the site is limited to the west side of the tidal inlet which will not be investigated during these waste delineation activities. Based on the site history, the planned location of test pitting east of the tidal inlet, and approach of minimal exposure to waste, there is a low likelihood of encountering munitions. In order to adequately define the waste boundary, test pits free of waste (excluding road construction and building foundation materials) need to be documented. No ESQD arcs encumber the work area.
Likelihood of encountering MEC or MPPEH: Low, medium or high	Low: Studies and Investigations were conducted at Site 2 in multiple phases from 1981 to 2007. Although 3 munitions debris items were encountered in the western portion of the site, no MEC or MPPEH were encountered in any of the locations previously investigated on the eastern side of the inlet (more than 40 test pit excavations, surface/subsurface soil samples, and monitoring well locations). Because the western and eastern portions of the site are divided by a tidal wetland (including surface water), the probability of MEC or MPPEH migration from the western side of the site to the eastern is unlikely. The likelihood of encountering MEC or MPPEH is considered to be low based on the following: • MEC or MPPEH have not been encountered east of the wetland/surface water body • Excavation activities are intended to define the limit of waste rather than characterize waste, and will therefore stop at the first sign of any waste (e.g., municipal waste, construction debris)

Legend

St. Juliens Creek Annex

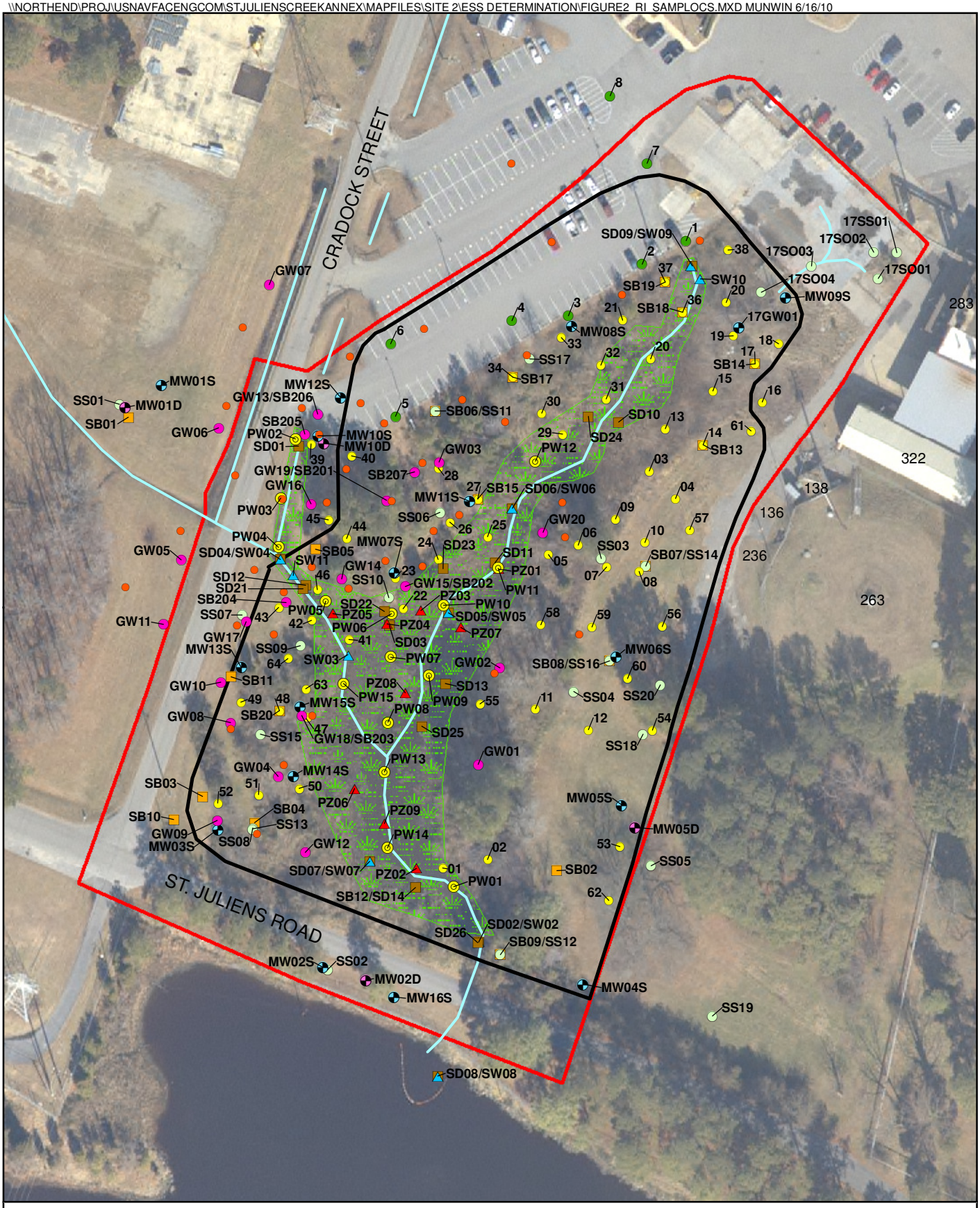
Site 2

N
W E
S

0 450 900
Feet

Figure 1
Site 2 Location Map
Site 2 ESS Determination
St. Juliens Creek Annex
Chesapeake, Virginia

CH2MHILL



Legend

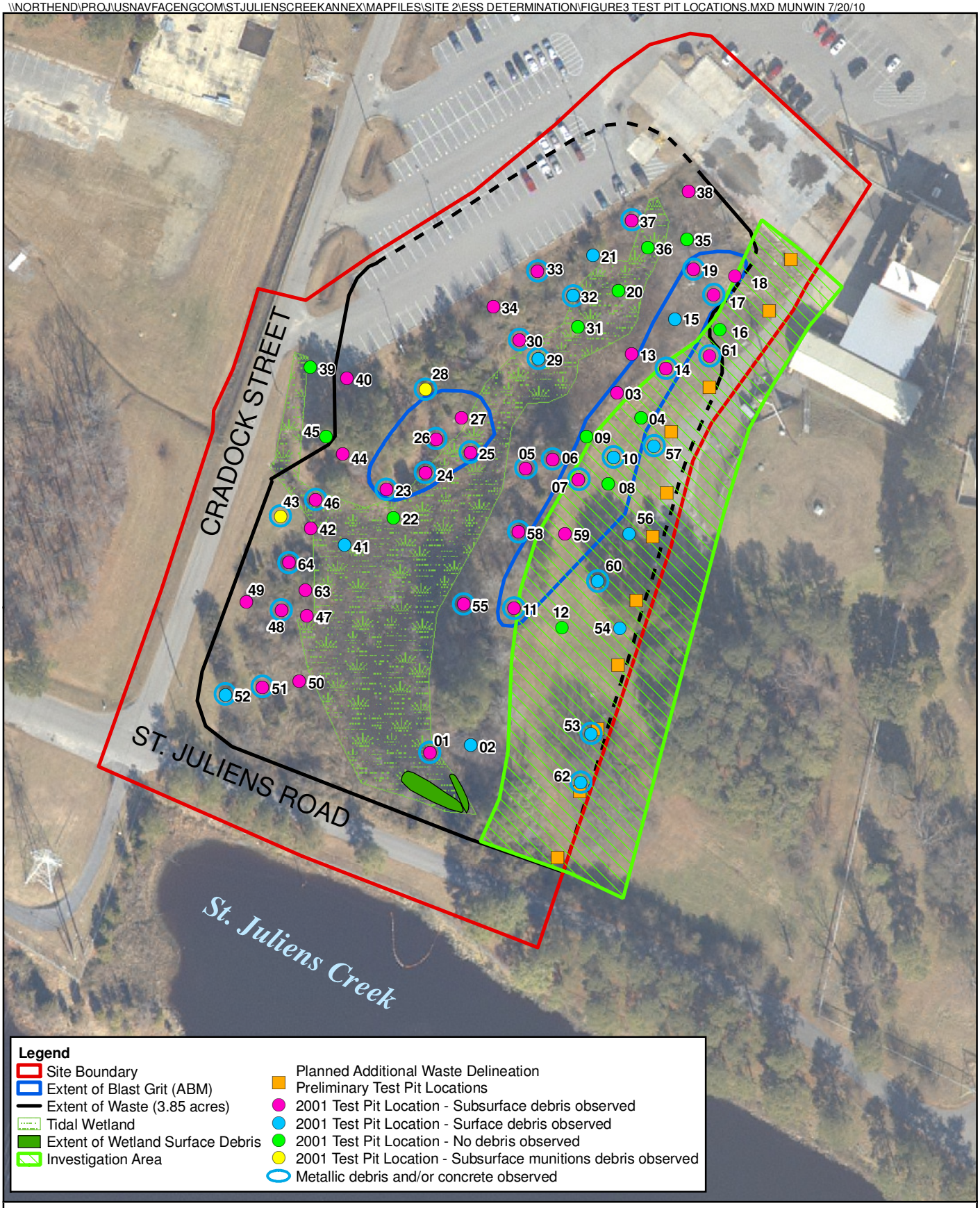
- Site Boundary
- Tidal Wetland
- Drainage
- RI Inlet Sediment Sample Locations
- Shallow Monitoring Well Locations
- Deep Monitoring Well Locations
- RI Surface Soil Sample Locations
- RI Subsurface Soil Sample Locations
- Test Pit Locations
- Surface Water Sample Locations
- DPT Soil Boring Locations (Waste Delineation)
- DPT Locations (Groundwater and/or Soil)
- Piezometer Locations
- Pore Water Sample Locations
- MIP Locations
- Extent of Waste (estimated)

N W E S

0 50 100 Feet

Figure 2
Site 2 RI Sample/Investigation Locations
Site 2 ESS Determination
St. Juliens Creek Annex
Chesapeake, Virginia

CH2MHILL



Note: Proposed preliminary test pit locations are a starting point for waste delineation. Test pits will continue east or west of the preliminary locations based on visual observations.

N
W E
S

0 55 110
Feet

Figure 3
Test Pit Locations
Site 2 ESS Determination
St. Juliens Creek Annex
Chesapeake, Virginia

CH2MHILL