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Final

Technical Memorandum
Work Plan for Limits of Waste Delineation at Sites 2, 3, 5, and 6

St. Juliens Creek Annex
Chesapeake, Virginia

CTO - 0028
September 2001

Prepared for

Department of the Navy
Atlantic Division
Naval Facilities Engineering Command

Under the

LANTDIV CLEAN II Program
Contract N62470-95-D-6007

Prepared by

CH2MHILL

SIGNATURE PAGE

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Contract Task Order 028
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Prepared by

CH2M HILL

September 2001

Approved by: William J. Friedmann Jr. for Donna Caldwell, P.G.
Activity Manager
Date: 9/25/2001

Approved by: William J. Friedmann Jr.
William J. Friedmann, Jr., P.G.
Project Manager
Date: 9/25/2001

Approved by: _____
John Tomik, P.G.
Senior Technical Reviewer
Date: 9/25/2001

St. Juliens Creek Annex: Final Work Plan for Limits of Waste Delineation at Sites 2, 3, 5, and 6

PREPARED FOR: Ms. Dawn Hayes/LANTDIV
Mr. Jeffrey Harlow/NWS Yorktown
Mr. Todd Richardson/USEPA
Mr. Devlin Harris/VADEQ

PREPARED BY: Tony Tomlin/CH2M HILL
Bill Friedmann/CH2M HILL

COPIES: Donna Caldwell/CH2M HILL

DATE: September 5, 2001

INTRODUCTION

This technical memorandum describes the approach to be taken to conduct a waste delineation at Sites 2, 3, 5 and 6, at St. Juliens Creek Annex Center, Chesapeake, Virginia (Figure 1). Preparation of updated Risk Assessments and Feasibility Studies (FS) for these sites is in progress. As part of the FS process, the horizontal limits of waste/contamination at each site is to be delineated. The objectives of the waste delineation are to:

- Delineate the horizontal extent of the waste/contamination via excavation of areas within each site. Secondarily, vertical extent of the waste will be delineated up to the groundwater level.
- Fill data gaps by conducting additional sampling at select locations.

Upon completion of the waste delineation and sampling, the information gathered will be incorporated into the remedial investigation report and feasibility study as appropriate.

This technical memorandum is divided below into three sections. The Site Background Section provides a summary of site history. The Field Activities Section provides the means and methods to be used in completing the work. The Personnel and Schedule Section provides detail on CH2M HILL personnel participating in the work and the timeframe in which the work will be completed.

SITE BACKGROUND

Brief site histories are provided in this section. A history of the St. Juliens Creek Annex and discussions on the sites' ecology or hydrogeology are not provided for brevity of the technical memorandum. Those items can be found in the original work plans for the sites, draft remedial investigation report, or the initial assessment study for the Annex.

Site 2

Site 2 (Landfill B) is an inactive unlined landfill located at the corner of St. Juliens Drive and Craddock St. in the southwestern section of St. Juliens Creek Annex. Landfill operations began in 1921. Initially, refuse was burned onsite and used to fill in an adjacent swampy

area. In 1942, an incinerator was installed and took the place of the open burning. The landfill was closed sometime after 1947. See Figure 2 for a plan view of the site.

Site 3

Site 3 (Landfill C) is unlined and covers 10 acres along the northern edge of the Annex and is accessible by way of a patrol road. The area was originally a mudflat where refuse was dumped and allowed to burn; the ash was then used to fill in the area. Operations began in 1940 and continued until 1970. The landfill was graded level and covered with grass. See Figure 3 for a plan view of the site.

Site 5 and 6

Site 5 and 6 includes both the Burning Grounds (Site 5) and Small Items Pit (Site 6), which encompass approximately two acres in total. The Burning Grounds are located in the north central portion of St. Juliens Creek Annex, approximately 600 feet west of Site 3; the caged pit is located approximately 400 feet west of Site 3. The majority of the site is comprised of a gravel parking lot. See Figure 4 for a plan view of the sites.

The Burning Grounds are believed to have operated from the 1930s to the 1970s. In 1977, the surface of the area was burned with oil and straw, diced and burned again, in an effort to decontaminate the soil. Wastes disposed at the Burning Grounds included ordnance materials such as black powder, smokeless powder, explosive D, Composition A-3, tetryl, TNT, and fuses. Non-ordnance materials reportedly included carbon tetrachloride, trichloroethylene (TCE), paint sludges, pesticides, and various types of refuse.

The Small Items Pit was used as a pit to burn small arms (including igniters and fuses). No surface evidence of the existence of the pit currently remains.

FIELD ACTIVITIES

The field activities can be divided into the following distinct phases:

- Utility Clearance
- Delineation: trenching within sites to determine extent of waste
- Soil Sampling
- Hand Augering
- Surveying

CH2M HILL will have three subcontractors participating on-site during for the trenching activities: a private utility clearance firm, an ordinance/explosives (OE) management firm, and a general excavation contracting firm. The roles of these subcontractors are described in the subsections below.

Prior to beginning any phase of the work, CH2M HILL and its subcontractors will have field meetings to discuss the work items, worker responsibilities, and familiarize workers with CH2M HILL's health and safety plan (HASP). The HASP is provided as Attachment A to this memorandum. In addition to conforming to the HASP, CH2M HILL will audit each

field activity with the use of appropriate checklists attached to this memorandum as Attachment B.

Utility Clearance

Before beginning any excavations, the sites will be marked for utilities. CH2M HILL will subcontract a private utility clearance firm to work in conjunction with Annex personnel to mark utilities. Utilities will be marked in paint using industry standard symbology. This activity will take approximately a day. The delineation efforts will not be initiated until the utility clearance activity has been completed.

Delineation

The purpose of the delineation activity is to establish the extent of any waste or visible contamination at Sites 2, 3, 5, and 6. CH2M HILL will accompany the excavation subcontractor and the UXO subcontractor during work and will coordinate UXO management efforts with each one. Under the direction of CH2M HILL, the excavation subcontractor will excavate trenches using a backhoe or trackhoe type vehicle. CH2M HILL will visually inspect excavations for traces of solid waste, burned material, or construction debris and make measurements of the waste depth and horizontal extent. Sites 3, 5, and 6 have been reported as areas where ordinance were detonated or where the burning of chemicals had taken place. At these sites, discolored soils will be considered as potentially contaminated soils. The proposed layouts of trenches at each site are presented in Figures 2, 3, and 4.

During the trenching operations, the OE subcontractor will be on site to help the excavation subcontractor avoid unearthing unexploded ordinance (UXO), ordinance related materials, and to handle any OE that may be unearthed. The UXO subcontractor will provide CH2M HILL with pathways in order to avoid geophysical anomalies found during the utility clearance portion of the work. The OE subcontractor will visually inspect trenches for possible OE and will manage any such items per their Ordnance and Explosives Work Plan provided as Attachment C to this memorandum. If the OE subcontractor determines we have uncovered a UXO, then the Little Creek Explosives Ordnance Detachment (EOD) will be contacted for an emergency response. The EOD will come to the site to make another determination on whether the item is a UXO and will determine if the UXO must be removed and how. In addition to contacting the EOD, CH2M HILL will contact Norfolk Naval Shipyard Security and the Annex's primary contact, Mr. Leroy Eaves.

In the event that containers such as drums, paint cans, or canisters are uncovered, CH2M HILL decide on two courses of action. If the item has been breached, then the trench would be left open for and the material, including any potentially contaminated soils, will be placed in 55-gallon drums to be removed by an IDW contractor. If the item has not been breached, then CH2M HILL will mark the item for surveying and document the location of the item and will allow the trench to be backfilled.

Trenching operations for all the sites will be done in lifts to visually classify the soil and debris. The first lift will consist of the top 1-foot of soil. This "topsoil" will be placed in a separate pile from other excavated material. The second and subsequent lifts will be excavated in 2-feet intervals and placed in a general stockpile. Trenching will continue until the vertical extent of waste material is encountered or until the groundwater table is

reached. The horizontal length of trenches will be extended as necessary to find the outer limits of waste. Once all data has been collected from the trench, the excavation subcontractor will fill the trench with the general stockpile material. The general material will be compacted by tamping it with the hoe bucket. Once the general stockpile has been exhausted, the "topsoil" will be placed over the trench area. Each trench will be restored to approximately the original grade and will be seeded and mulched by the end of the field activities. CH2M HILL will stake each trench to provide survey points for trench locations.

CH2M HILL will gather a variety of data from each trench, however CH2M HILL will not venture into trenches to obtain the data. CH2M HILL will gather the following data from each trench:

- Visual Soil and Waste Classification: Soils will be classified according to the Unified Soil Classification System (USCS) by the visual-manual methods described by the American Society for Testing and Materials (ASTM) D-2488. Soil classification includes soil type, indications of contamination and waste description, and a description of waste (if encountered).
- Measurement of Horizontal and Vertical Extents: CH2M HILL will use a measuring tape to delineate the depth and length of waste and soil layers.
- Photographs: CH2M HILL will photograph the sidewalls of each trench to provide documentation of the trench and allow for further study of the trenches in the office.
- Soil Sampling: See Field Sampling subsection for discussion of this work activity.

All data collected will be documented in a field logbook.

Hand Augering Activity

Proceeding the delineation phase of the field activities, additional delineation of the vertical extent of waste may be conducted at Site 2. Based on trenching at Site 2, CH2M HILL may determine that blast grit at Site 2 extends into the wetlands at the center of the site. In effort to ascertain the depth and extent of the blast grit, CH2M HILL will produce soil borings near the edge of the wetlands at Site 2. CH2M HILL will use a hand augering device to complete the soil borings. The total number and placement of borings will depend on the extent of blast grit found during the delineation phase of the work. It is anticipated that no more than 10 borings will be needed and the event should take one day.

Each soil boring will be classified per the methods outlined under the delineation task. Measurements on the thickness of the blast grit layer will also be collected. All data collected will be documented in a field logbook.

Field Sampling

In conjunction with the delineation activities, a number of soil samples will be collected. A summary of the analyses to be completed is provided in Table 1 below. Sampling depths for subsurface soils will be at 2 feet below ground surface.

Site 2: Based on historical information related to activities at Site 2, three to four grab samples are to be collected and analyzed for dioxins. The final number of dioxin samples to be collected at Site 2 will be determined in the field based on visual inspection of the soils.

Five soil samples will be collected beneath the blast grit and analyzed for TAL metals. Five sediment samples will be collected within the boundaries of the wetland and analyzed for dioxins. The proposed locations to take samples are shown on Figure 2.

An upgradient sediment and surface water sample will be collected at Site 2 to compliment the existing remedial investigation data. The sample will be collected from a culvert outlet upstream of Site 2. The sediment and surface water samples will be analyses for constituents as outlined in Table 1. The proposed locations to take samples are shown on Figure 2.

Sites 3 and 5/6: At Sites 3 and 5/6, soils will be sampled for dioxins only. The proposed locations to take samples at Sites 3 and 5/6 are presented on Figures 3 and 4, respectively, but final sample locations will be determined in the field based on soil staining during visual inspection of the soils.

Table 1: Summary of Sampling

Sample Location/Media	Sample Number	Sample Analyses
Site 2		
Subsurface Soil	5	TAL Metals
	3-4	Dioxins
Sediment – Upgradient (culvert sample)	1	TAL Metals, TCL Pesticides/PCBs, TCL VOCs, TCL SVOCs, Nitramines, Dioxins
Sediment – On Site	5	Dioxins
Surface Water (culvert sample)	1	TAL Metals (total and dissolved), TCL Pesticides/PCBs, TCL VOCs, TCL SVOCs, Nitramines
Site 3		
Subsurface Soil	2-3	Dioxins
Sites 5		
Subsurface Soil	2	Dioxins
Site 6		
Subsurface Soil	1	Dioxins

Sampling will be conducted in accordance with the standard operating procedures discussed in the Master *Project Plan, Naval, Station Norfolk, St. Juliens Creek Annex (Draft Final)* produced by CDM and CH2M HILL, 2000.

Surveying

Proceeding the delineation, augering, and sampling portions of the work, CH2M HILL will survey all staked/flagged locations for incorporation into the global information system (GIS) database. All locations will be surveyed using a hand-held or backpack type global positioning system (GPS) unit. Items to be surveyed include trenches, sampling locations, hand auger locations, utility locations not in the existing GIS database.

PROJECT PERSONNEL AND SCHEDULE

The CH2M HILL Project Manager will be Mr. William Friedmann. Mr. Friedmann will provide office support, subcontractor coordination for the field personnel, and act as the alternate field team member. Mr. Paul Landin will be the site safety coordinator and field team leader for the field activities. He will be the main CH2M HILL employee on site during the field activities. The anticipated time durations needed to implement the work plan and complete the field activities are presented in Table 2 below.

Table 2: Work Plan and Field Activity Schedule

Activity	Duration (Work Days)
Comment Period for Draft Work Plan	3
Prepare Final Work Plan	1
Utility Clearance/Field Preparation	1
Trenching and Sampling	16
Hand Augering	1
Surveying	1

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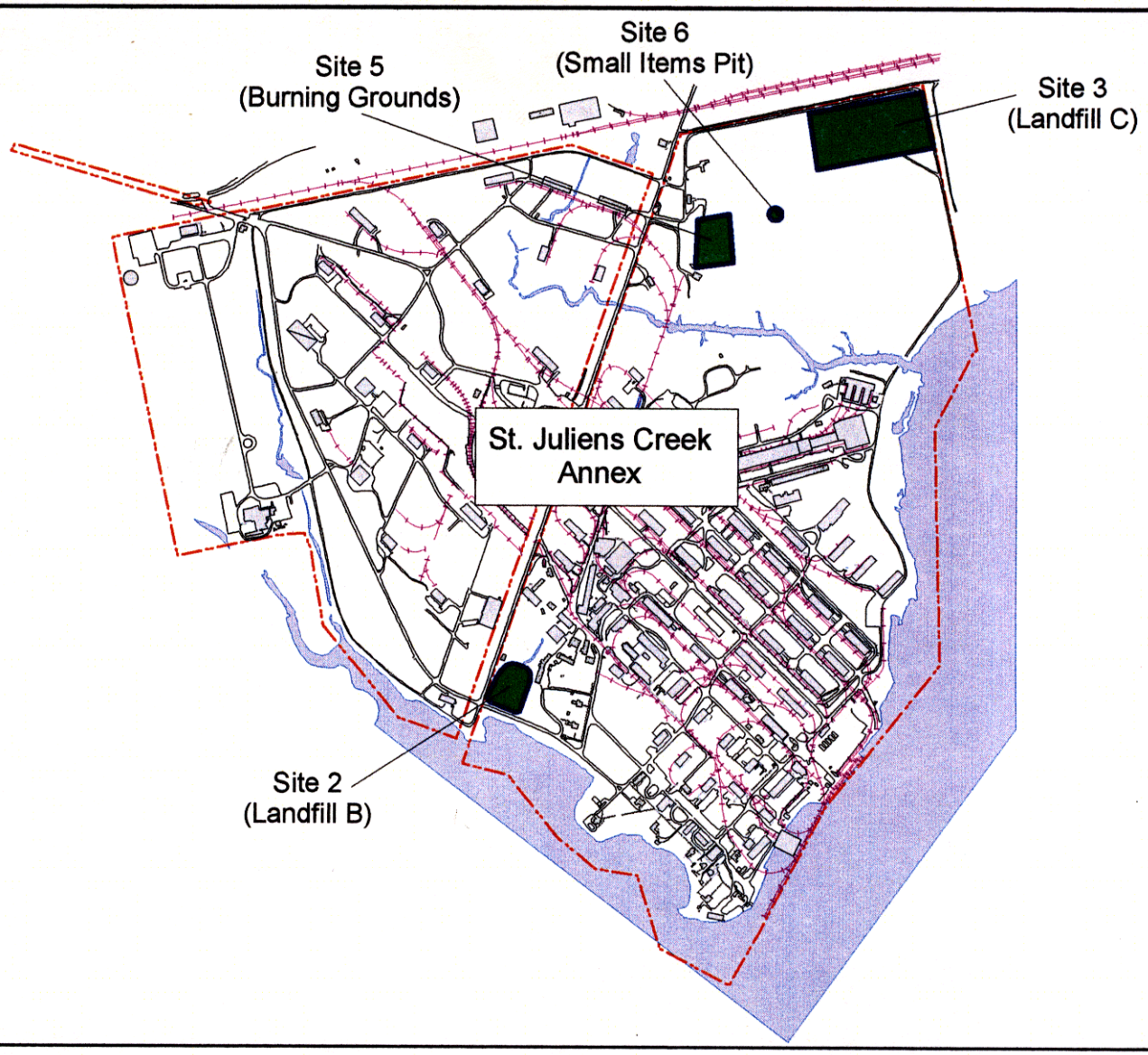

LEGEND

- Site
- Activity Boundary

N

400 0 400 800 Feet

Figure 1
Sites 2, 3, and 5/6
Site Vicinity Map
St. Juliens Creek Annex Center
Chesapeake, Virginia

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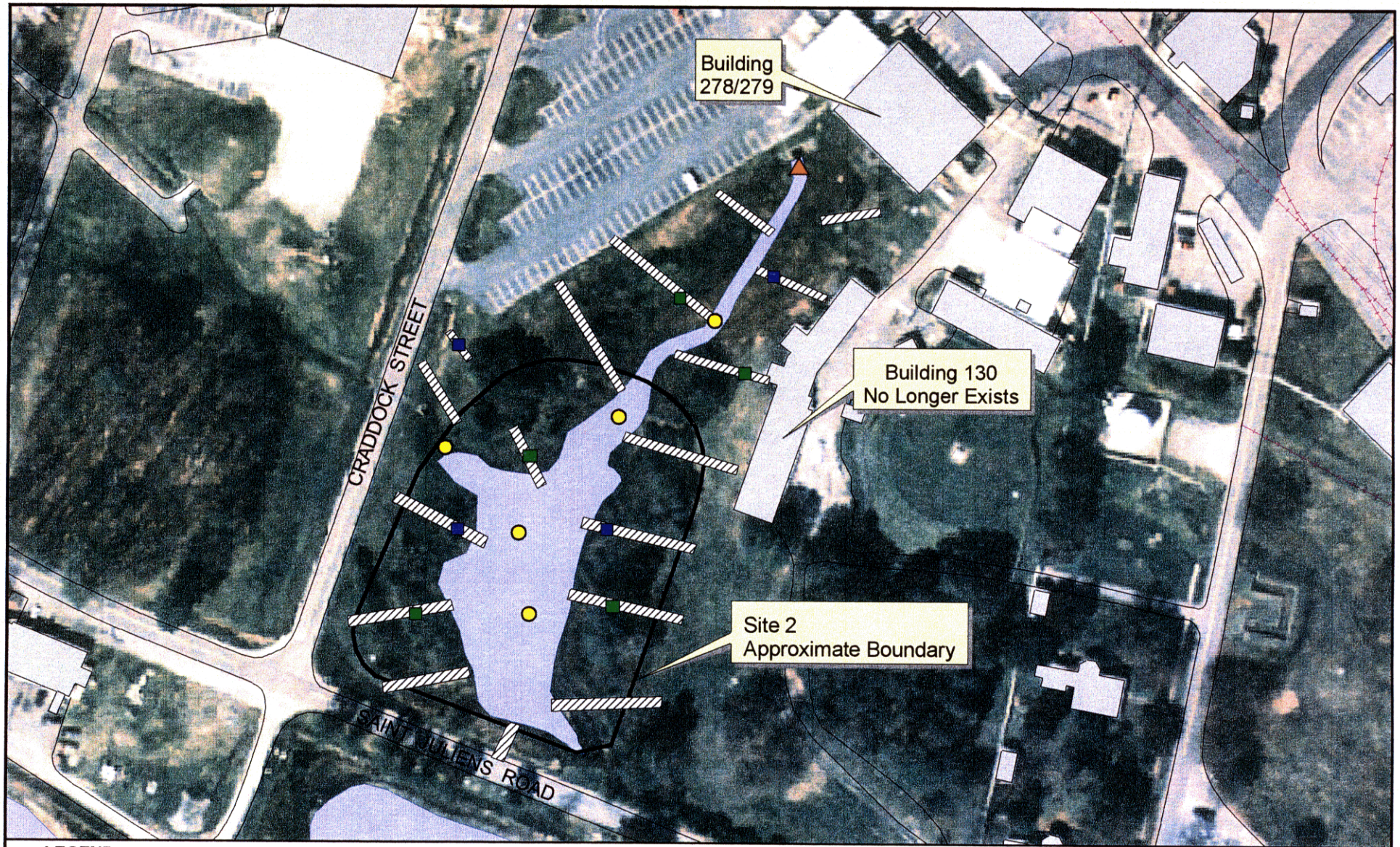

LEGEND

- Proposed Test Pit / Trench Location
- Proposed Soil Sample Location (TAL Metals)
- Proposed Surface Water / Sediment Sample Location
- Proposed Sediment (only) Sample Location
- Proposed Soil Sample Location (Dioxins)

N

0 80 160 Feet

Figure 2
Site 2
Waste Delineation
St. Juliens Creek Annex Center
Chesapeake Virginia

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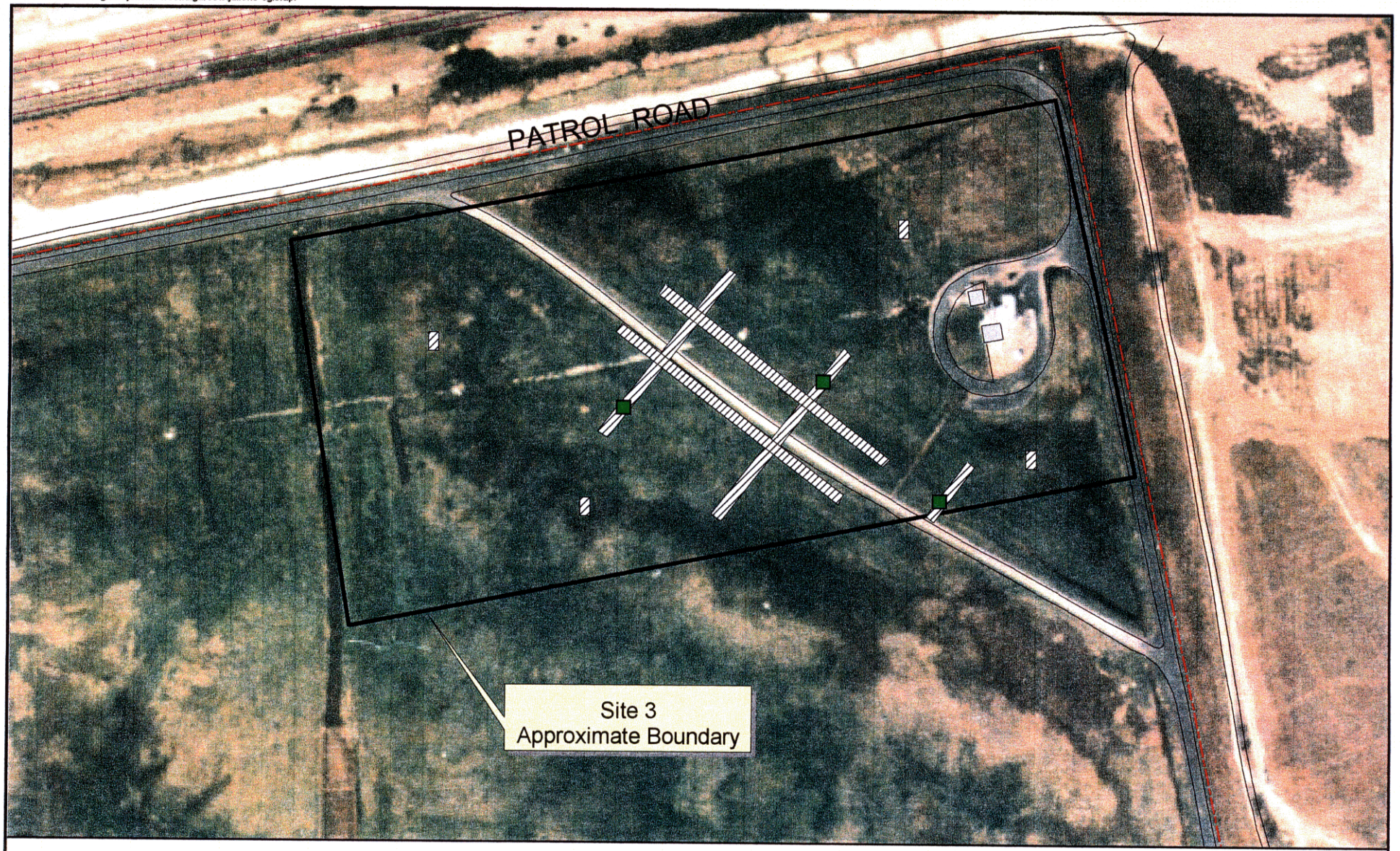

LEGEND

- Proposed Test Pit / Trench Location
- Proposed Soil Sample Location

N

0 90 180 Feet

Figure 3
Site 3
Waste Delineation
St. Juliens Creek Annex
Chesapeake Virginia

CH2MHILL

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LEGEND

- Proposed Test Pit / Trench Location
- Proposed Soil Sample Location
- 1997 Sampling Event

N

0 100 200 Feet

Figure 4
Site 5 and 6
Waste Delineation
St. Juliens Creek Annex
Chesapeake Virginia

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Attachment A

CH2M HILL Health and Safety Plan

CH2M HILL HEALTH AND SAFETY PLAN

This Health and Safety Plan (HSP) will be kept on the site during field activities and will be reviewed as necessary. The plan will be amended or revised as project activities or conditions change or when supplemental information becomes available. The plan adopts, by reference, the Standards of Practice (SOPs) in the CH2M HILL *Corporate Health and Safety Program, Program and Training Manual*, as appropriate. In addition, this plan adopts procedures in the project Work Plan. The Site Safety Coordinator (SSC) is to be familiar with these SOPs and the contents of this plan. CH2M HILL's personnel and subcontractors must sign Attachment 1.

Project Information and Description

PROJECT NO: 138804.PP.DR

CLIENT: Navy CLEAN

PROJECT/SITE NAME: St. Juliens Creek Annex, Sites 2, 3, 5, and 6

SITE ADDRESS: St. Juliens Creek Annex, Chesapeake, Virginia

CH2M HILL PROJECT MANAGER: Friedmann, Bill

CH2M HILL OFFICE: Virginia Beach

DATE HEALTH AND SAFETY PLAN PREPARED: 6/5/2001

DATE(S) OF SITE WORK: June 18-July 7

SITE ACCESS: Sites are accessible by paved roadways.

SITE SIZE: Site size varies from less than an acre to 10 acres

SITE TOPOGRAPHY: Sites 3, 5, and 6 are relatively flat and open areas. Poor to fair stands of grass exist at each of those sites. Site 2 is in a swampy area and is covered with brush, trees, and grass. A pond is located in the center of Site 2.

PREVAILING WEATHER: The climate is temperate and humid. The average summer temperatures range in the mid- to low-80s. Average winter lows range in the mid- to low-30s. Three to four inches of precipitation can be expected each month.

SITE DESCRIPTION AND HISTORY: St. Juliens Creek Annex, Norfolk Naval Shipyard, is located within the City of Chesapeake, Virginia. The mission of the annex has included the storage and manufacturing of ammunition. The health and safety plan focuses on four sites at the annex.

Site 2: Site 2 (Landfill B) is an inactive unlined landfill located at the corner of St. Juliens Drive and Craddock St. in the southwestern section of the annex. The landfill operations began in 1921. Initially, refuse was burned onsite and used to fill in an adjacent swampy area. In 1942, an incinerator was installed and took the place of the open burning. The landfill was closed sometime after 1947.

Site 3: Site 3 (Landfill C) covers 10 acres along the northern edge of the annex. The area was originally a mudflat where refuse was dumped and allowed to burn; the ash was then used to fill in the area. The landfill is unlined. Operation began in 1940 and continued until 1970. At some time after 1970 the landfill was graded level and covered with grass, but it has not been formally closed. Refuse disposed of a Site 3 included solvents, acids, bases, and mixed municipal waste. Two pits reportedly used for disposal of oils and oily sludges, as well as for periodic burning were also located at Site 3.

Site 5: Site 5 (the Burning Grounds) is located off of Craddock St. in the northern part of the annex. The exact start and closure dates of Site 5 are unknown, although it is believed to have been operated from the 1930s to the 1970s. In 1977, the surface of the area was burned with straw, diced, and burned again, in an effort to decontaminate the soil. Wastes disposed of at Site 5 included ordnance materials such as black powder, smokeless powder, explosive D, Composition A-3, tetryl, TNT, and fuses. These materials were burned at the site, then removed.

Site 6: Site 6 (Caged pit near Burning Grounds) consisted of a small concrete pit with a removable metal cage over the top. The pit was used for burning small items such as igniters and fuses. The pit was demolished prior to the Initial Assessment Study completed in 1989. The start and closure dates of Site 6 are unknown.

DESCRIPTION OF SPECIFIC TASKS TO BE PERFORMED: Task to be completed by CH2M HILL employees during this field investigation include: oversight of test pit/trench excavation and restoration, coordination with a UXO team, surface water and sediment sampling, soil sampling, and soil boring with a hand auger. During the oversight of test pit excavation, CH2M HILL will direct a subcontractor to excavate in and near the sites in order to ascertain the limits of wastes at the site. Measurements and observations will be taken outside of excavations; there will be no need to enter the excavations. It is anticipated that test pits will be only 3 feet in depth. In the event that a UXO is unearthed during the trenching operations, a UXO team will be on-site to handle the situation. CH2M HILL will stop work until the UXO team has completed their assessment of the situation and resolved it. Sampling will be performed using trowels and balers per CH2M HILL's SOPs for sampling. CH2M HILL will complete limited soil borings with a hand auger along the edge of a wetland.

Site Map

This page is reserved for a Site Map.

Note locations of Support, Decontamination, and Exclusion Zones; site telephone; first aid station; evacuation routes; and assembly areas.

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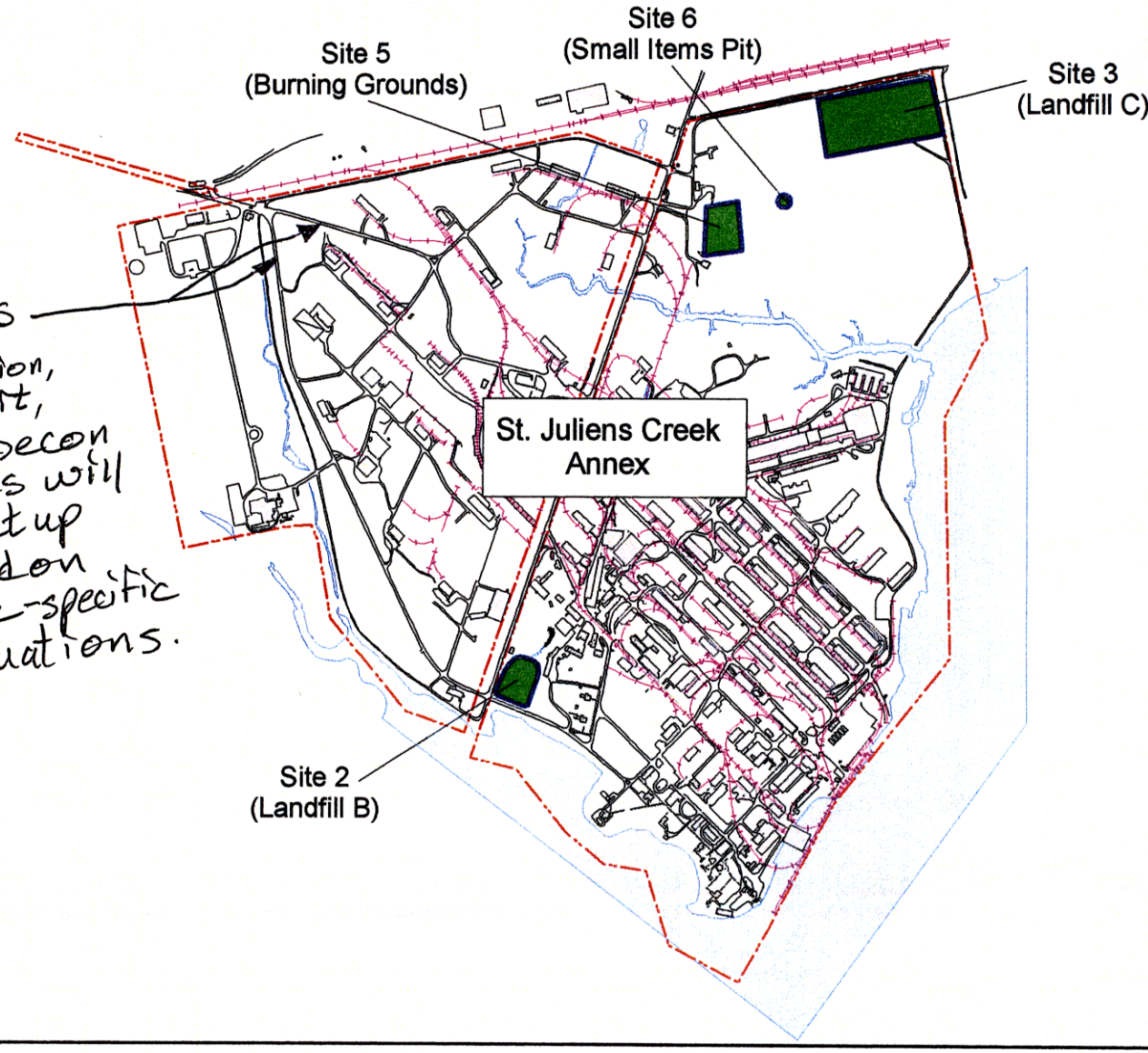

Evacuation Routes

Note: Exclusion, support, and decon zones will be set up based on site-specific situations.

LEGEND

- Site
- Activity Boundary

N

400 0 400 800 Feet

Figure 1
Sites 2, 3, and 5/6
Site Vicinity Map
St. Juliens Creek Annex Center
Chesapeake, Virginia

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YAHOO! Maps

Yahoo! - Yellow Pages - He
Powered by Mapquest.com (tr

Welcome, Guest User

Create My Locations - Sign I

Yahoo! Maps - Driving Directions

Starting from: 1660 Victory Blvd., Portsmouth, VA 23702-3123
Arriving at: 3650 High Street, Portsmouth, VA 23707-3236
Distance: 4.3 miles **Approximate Travel Time:** 10 mins

- Email Directions
- Get Reverse Directions
- Text Only Driving Direction

Full Route

Destination

Directions	Miles
1. Start out going Southwest on **TYRON PL** towards **VICTORY BLVD/VA-239 W** by turning left.	0.0
2. Turn RIGHT onto **VICTORY BLVD/VA-239 W**.	0.2
3. Turn RIGHT onto **US-17/GEORGE WASHINGTON HWY**.	1.2
4. **US-17/GEORGE WASHINGTON HWY** becomes unnamed road.	0.0
5. Turn LEFT onto **US-17 N**.	2.3

6. Turn LEFT onto **HIGH ST**.	0.0
7. **HIGH ST** becomes **US-17**.	0.5

When using any driving directions or map, it's a good idea to do a reality check and make sure the roa still exists, watch out for construction, and follow all traffic safety precautions. This is only to be used as an aid in planning.

Driving Directions New Location

1 Enter a starting address or select from My Locations

My Locations: -------- Sign In

Address (Address, Intersection or Airport Code): 1660 Victory Blvd.

City, State or Zip: Portsmouth, VA 23702-3123

Country: United States

2 Enter a destination address or select from My Locations

My Locations: -------- Sign In

Address (Address, Intersection or Airport Code): 3650 High Street

City, State or Zip: Portsmouth, VA 23707-3236

Country: United States

Get Directions

Table of Contents

1 Tasks to be Performed Under this Plan

1.1 Description of Tasks

(Reference Field Project Start-up Form)

Refer to project documents (i.e., Work Plan) for detailed task information. A health and safety risk analysis (Section 1.2) has been performed for each task and is incorporated in this plan through task-specific hazard controls and requirements for monitoring and protection. Tasks other than those listed below require an approved amendment or revision to this plan before tasks begin. Refer to Section 8.2 for procedures related to "clean" tasks that do not involve hazardous waste operations and emergency response (Hazwoper).

1.1.1 Hazwoper-Regulated Tasks

- Test pit excavation
- Surface water sampling
- Sediment sampling
- Surface soil sampling
- Hand auguring
- Surveying

1.1.2 Non-Hazwoper-Regulated Tasks

Under specific circumstances, the training and medical monitoring requirements of federal or state Hazwoper regulations are not applicable. It must be demonstrated that the tasks can be performed without the possibility of exposure in order to use non-Hazwoper-trained personnel. **Prior approval from the Health and Safety Manager (HSM) is required before these tasks are conducted on regulated hazardous waste sites.**

TASKS	CONTROLS
• General heavy equipment work (excavation, grading, etc.)	• Brief on hazards, limits of access, and emergency procedures
•	• Post contaminant areas as appropriate (refer to Section 8.2 for details)
•	• Sample and monitor as appropriate (refer to Section 5.0)
•	
•	
•	

1.2 Task Hazard Analysis

(Refer to Section 2 for hazard controls)

POTENTIAL HAZARDS	TASKS				
	Test pit/ excavation	Surface water and sediment sampling from the shore or water	Hand augering	Surveying	Remediation & construction oversight
Flying debris/objects	X	X	X		X
Noise > 85dBA	X				X
Electrical	X				X
Suspended loads	X				X
Buried utilities, drums, tanks	X		X		X
Slip, trip, fall	X	X	X	X	X
Back injury	X	X	X		X
Confined space entry	X			X	X
Trenches / excavations	X				X
Visible lightning	X	X	X	X	X
Vehicle traffic					X
Elevated work areas/falls	X	X			X
Fires	X	X			X
Entanglement			X		
Drilling					
Heavy equipment	X				X
Working near water		X			
Working from boat					
IDW Drum Sampling					

2 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 6. 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.

Project-specific frequency for completing self-assessments: An assessment will be completed at the start of the project.

2.1 Project-Specific Hazards

2.1.1 Arsenic

- Do not enter regulated work areas unless training, medical monitoring, and PPE requirements established by the competent person have been met.
- Do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in regulated areas.
- Avoid skin and eye contact with liquid and particulate arsenic or arsenic trichloride.
- Arsenic is considered a "Confirmed Human Carcinogen."
- Arsenic particulates (inorganic metal dust) are odorless. Vapor and gaseous odor varies depending upon specific organic arsenic compound.
- Respiratory protection and other exposure controls selection shall be based on the most recent exposure monitoring results obtained from the competent person.

2.1.2 Lead

The following requirements pertain to lead abatement activities:

- Work activities involving cutting, grinding, burning, welding, and other abrasive operations performed on any painted and/or coated surfaces should be treated as having an increased potential for lead exposure.
- Surfaces suspected of containing lead shall be treated as lead unless documentation and/or testing results indicate otherwise.
- Do not enter regulated work areas unless training, medical monitoring, and PPE requirements established by the competent person have been met.
- Do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in regulated areas.
- Do not launder work clothes with ordinary clothes.
- Respiratory protection and other exposure controls selection shall be based on the most recent exposure monitoring results obtained from the competent person.

The following requirements pertain to lead contaminated soils:

- Work shall progress in a sequence from less contaminated to more contaminated areas.
- Water should be added to soils prior to and during excavation, air rotary drilling, and other activities that create or have the potential to create airborne lead contaminated dust. For air rotary drilling operations, water can be added to the boring to reduce dust generation from the cyclone. Depending upon soil type, watering of soil may be required several days prior to commencing ground intrusive activities.
- Personnel working in the vicinity of lead contaminated soil shall wear disposable coveralls or equal and exercise enhanced personal hygiene (i.e., frequent hand washing prior to eating, drinking, and smoking; separation of work and street clothing/footwear; etc.).

2.1.3 Methylene Chloride

- Do not enter regulated work areas unless training, medical monitoring, and PPE requirements established by the competent person have been met.
- Do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in regulated areas.
- A Short Term Exposure Limit (STEL: 15 minutes) and a Ceiling Limit (Not to Exceed) exists for this material.
- Methylene Chloride has a faint, sweet odor which is not noticeable at dangerous concentrations.
- Shipped as liquefied compressed gas.
- Will cause frostbite on contact.
- Respiratory protection and other exposure controls selection shall be based on the most recent exposure monitoring results obtained from the competent person.

2.1.4 Excavation

(Reference CH2M HILL SOP HS-32, *Excavations*)

- Do not enter the excavations unless completely necessary, and only after the competent person has completed the daily inspection and has authorized entry.
- Follow all excavation entry requirements established by the competent person.
- Do not enter excavations where protective systems are damaged or unstable.
- Do not enter excavations where objects or structures above the work location may become unstable and fall into the excavation.
- Do not enter excavations with the potential for a hazardous atmosphere until the air has been tested and found to be at safe levels.
- Do not enter excavations with accumulated water unless precautions have been taken to prevent excavation cave-in.
- H&S Self-Assessment Checklist – Excavations, found in Attachment 6 of this plan, should be used to evaluate excavations prior to entry if excavations exceed 5' in depth and require entry.

2.1.5 Earthmoving Equipment

(Reference CH2M HILL SOP HS-27, *Earthmoving Equipment*)

- Only authorized personnel are permitted to operate earthmoving equipment.
- Maintain safe distance from operating equipment and stay alert of equipment movement. Avoid positioning between fixed objects and operating equipment and equipment pinch points, remain outside of the equipment swing and turning radius. Pay attention to backup alarms, but not rely on them for protection. Never turn your back on operating equipment.
- Approach operating equipment only after receiving the operator's attention. The operator shall acknowledge your presence and stop movement of the equipment. Caution shall be used when standing next to idle equipment; when equipment is placed in gear it can lurch forward or backward. Never approach operating equipment from the side or rear where the operator's vision is compromised.
- When required to work in proximity to operating equipment, wear high-visibility vests to increase visibility to equipment operators. For work performed after daylight hours, vests shall be made of reflective material or include a reflective stripe or panel.
- Do not ride on earthmoving equipment unless it is specifically designed to accommodate passengers. Only ride in seats that are provided for transportation and that are equipped with seat belts.
- Stay as clear as possible of all hoisting operations. Loads shall not be hoisted overhead of personnel.
- Earthmoving equipment shall not be used to lift or lower personnel.
- If equipment becomes electrically energized, personnel shall be instructed not to touch any part of the equipment or attempt to touch any person who may be in contact with the electrical current. The utility company or appropriate party shall be contacted to have line de-energized prior to approaching the equipment.

2.2 General Hazards

2.2.1 General Practices and Housekeeping

(Reference CH2M HILL SOP HS-20, *General Practices*)

- Site work should be performed during daylight hours whenever possible. Work conducted during hours of darkness require 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.

2.2.2 Hazard Communication

(Reference CH2M HILL SOP HS-05, *Hazard Communication)*

The SSC is to perform the following:

- Complete an inventory of chemicals brought on site by CH2M HILL using Attachment 2.
- Confirm that an inventory of chemicals brought on site 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 on site, 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 required chemical-specific HAZCOM training using Attachment 3.
- Store all materials properly, giving consideration to compatibility, quantity limits, secondary containment, fire prevention, and environmental conditions.

2.2.3 Shipping and Transportation of Chemical Products

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

Chemicals brought to the site might be defined as hazardous materials by the U.S. Department of Transportation (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 (e.g., 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.

2.2.4 Lifting

(Reference CH2M HILL SOP HS-29, *Lifting*)

- Proper lifting techniques must be used when lifting any object.
  - Plan storage and staging to minimize lifting or carrying distances.
  - Split heavy loads into smaller loads.
  - Use mechanical lifting aids whenever possible.
  - Have someone assist with the lift -- especially for heavy or awkward loads.
  - Make sure the path of travel is clear prior to the lift.

2.2.5 Fire Prevention

(Reference CH2M HILL SOP HS-22, *Fire Prevention*)

- Fire extinguishers shall be provided so that the travel distance from any work area to the nearest extinguisher is less than 100 feet. When 5 gallons or more of a flammable or combustible liquid is being used, an extinguisher must be within 50 feet. Extinguishers must:
  - be maintained in a fully charged and operable condition,
  - be visually inspected each month, and
  - undergo a maintenance check each year.
- The area in front of extinguishers must be kept clear.
- Post "Exit" signs over exiting doors, and post "Fire Extinguisher" signs over extinguisher locations.
- Combustible materials stored outside should be at least 10 feet from any building.
- 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.

2.2.6 Electrical

(Reference CH2M HILL SOP HS-23, *Electrical*)

- Only qualified personnel are permitted to work on unprotected energized electrical systems.
- Only authorized personnel are permitted to enter high-voltage areas.
- Do not tamper with electrical wiring and equipment unless qualified to do so. All electrical wiring and equipment must be considered energized until lockout/tagout procedures are implemented.
- Inspect electrical equipment, power tools, and extension cords for damage prior to use. Do not use defective electrical equipment, remove from service.
- All temporary wiring, including extension cords and electrical power tools, must have ground fault circuit interrupters (GFCIs) installed.
- 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.
- Electrical power tools and equipment must be effectively grounded or double-insulated UL approved.
- Operate and maintain electric power tools and equipment according to manufacturers' instructions.
- Maintain safe clearance distances between overhead power lines and any electrical conducting material unless the power lines have been de-energized and grounded, or where insulating barriers have been installed to prevent physical contact. Maintain at least 10 feet from overhead power lines for voltages of 50 kV or less, and 10 feet plus ½ inch for every 1 kV over 50 kV.
- Temporary lights shall not be suspended by their electric cord unless designed for suspension. Lights shall be protected from accidental contact or breakage.
- Protect all electrical equipment, tools, switches, and outlets from environmental elements.

2.2.7 Stairways and Ladders

(Reference CH2M HILL SOP HS-25, *Stairways and Ladders*)

- Stairway or ladder is generally required when a break in elevation of 19 inches or greater exists.
- Personnel should avoid using both hands to carry objects while on stairways; if unavoidable, use extra precautions.
- Personnel must not use pan and skeleton metal stairs until permanent or temporary treads and landings are provided the full width and depth of each step and landing.
- Ladders must be inspected by a competent person for visible defects prior to each day's use. Defective ladders must be tagged and removed from service.
- Ladders must be used only for the purpose for which they were designed and shall not be loaded beyond their rated capacity.
- Only one person at a time shall climb on or work from an individual ladder.
- User must face the ladder when climbing; keep belt buckle between side rails
- Ladders shall not be moved, shifted, or extended while in use.

- User must use both hands to climb; use rope to raise and lower equipment and materials
- Straight and extension ladders must be tied off to prevent displacement
- Ladders that may be displaced by work activities or traffic must be secured or barricaded
- Portable ladders must extend at least 3 feet above landing surface
- Straight and extension ladders must be positioned at such an angle that the ladder base to the wall is one-fourth of the working length of the ladder
- Stepladders are to be used in the fully opened and locked position
- Users are not to stand on the top two steps of a stepladder; nor are users to sit on top or straddle a stepladder
- Fixed ladders $\geq$ 24 feet in height must be provided with fall protection devices.
- Fall protection should be considered when working from extension, straight, or fixed ladders greater than six feet from lower levels and both hands are needed to perform the work, or when reaching or working outside of the plane of ladder side rails.

2.2.8 Heat Stress

(Reference CH2M HILL SOP HS-09, *Heat and Cold Stress*)

- Drink 16 ounces of water before beginning work. Disposable cups and water maintained at 50°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.
- Acclimate yourself by slowly increasing workloads (e.g., do not begin with extremely demanding activities).
- Use cooling devices, such as cooling vests, to aid natural body ventilation. These devices add weight, so their use should be balanced against efficiency.
- Use mobile showers or hose-down facilities to reduce body temperature and cool protective clothing.
- Conduct field activities in the early morning or evening and rotate shifts of workers, if possible.
- Avoid direct sun whenever possible, which can decrease physical efficiency and increase the probability of heat stress. Take regular breaks in a cool, shaded area. Use a wide-brim hat or an umbrella when working under direct sun for extended periods.
- Provide adequate 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/DSC to avoid progression of heat-related illness.

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 should 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 (HR) should be measured by the radial pulse for 30 seconds, as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 100 beats/minute, or 20 beats/minute above resting pulse. If the HR 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.

2.2.9 Cold Stress

(Reference CH2M HILL SOP HS-09, *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, hypothermia should consult the SSC/DSC to avoid progression of cold-related illness.
- Observe one another for initial signs of cold-related disorders.
- Obtain and review weather forecast – be aware of predicted weather systems along with sudden drops in temperature, increase in winds, and precipitation.

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

2.2.10 Compressed Gas Cylinders

- Valve caps must be in place when cylinders are transported, moved, or stored.
- Cylinder valves must be closed when cylinders are not being used and when cylinders are being moved.
- Cylinders must be secured in an upright position at all times.
- Cylinders must be shielded from welding and cutting operations and positioned to avoid being struck or knocked over; contacting electrical circuits; or exposed to extreme heat sources.
- Cylinders must be secured on a cradle, basket, or pallet when hoisted; they may not be hoisted by choker slings.

2.2.11 Procedures for Locating Buried Utilities

Utility location services will be provided by St. Juliens Creek personnel and a private firm prior to field personnel mobilization to the site.

- Call "Miss Utilities" @ 1(800) 552-7001 for field survey.
- Where available, obtain utility diagrams for the facility.
- Review locations of sanitary and storm sewers, electrical conduits, water supply lines, natural gas lines, and fuel tanks and lines.
- Review proposed locations of intrusive work with facility personnel knowledgeable of locations of utilities. Check locations against information from utility mark-out service.
- Where necessary (e.g., uncertainty about utility locations), excavation or drilling of the upper depth interval should be performed manually
- Monitor for signs of utilities during advancement of intrusive work (e.g., sudden change n advancement of auger or split spoon).
- When the client or other onsite party is responsible for determining the presence and locations of buried utilities, the SSC should confirm that arrangement.

2.2.12 Confined Space Entry

(Reference CH2M HILL SOP HS-17, *Confined Space Entry*)

No confined space entry will be permitted. Confined space entry requires additional health and safety procedures, training, and a permit. If conditions change such that confined-space entry is necessary, contact the HSM to develop the required entry permit.

When planned activities will not include confined-space entry, permit-required confined spaces accessible to CH2M HILL personnel are to be identified before the task begins. The SSC is to confirm that permit spaces are properly posted or that employees are informed of their locations and hazards.

2.3 Biological Hazards and Controls

2.3.1 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.

2.3.2 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.

2.3.3 Ticks

Ticks typically are in wooded areas, bushes, tall grass, and brush. Ticks are black, black and red, or brown and can be up to one-quarter inch in size. Wear tightly woven light-colored clothing with long sleeves and pant legs tucked into boots; spray **only outside** of clothing with permethrin or permanone and spray skin with only DEET; and check yourself frequently for ticks.

If bitten by a tick, grasp it at the point of attachment and carefully remove it. After removing the tick, wash your hands and disinfect and press the bite areas. Save the removed tick. Report the bite to human resources. Look for symptoms of Lyme disease or Rocky Mountain spotted fever (RMSF). Lyme: a rash might appear that looks like a bullseye with a small welt in the center. RMSF: a rash of red spots under the skin 3 to 10 days after the tick bite. In both cases, chills, fever, headache, fatigue, stiff neck, and bone pain may develop. If symptoms appear, seek medical attention.

2.3.4 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.

2.3.5 Bloodborne Pathogens

(Reference CH2M HILL SOP HS-36, *Bloodborne Pathogens*)

Exposure to bloodborne 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 (PPE) are required as specified in CH2M HILL SOP HS-36, *Bloodborne Pathogens*. Hepatitis B vaccination must be offered before the person participates in a task where exposure is a possibility.

2.4 Radiological Hazards and Controls

Refer to CH2M HILL's *Corporate Health and Safety Program, Program and Training Manual,* and *Corporate Health and Safety Program, Radiation Protection Program Manual*, for standards of practice in contaminated areas.

Hazards	Controls
None Known	None Required

2.5 Contaminants of Concern

(Refer to Project Files for more detailed contaminant information)

Contaminant	Location and Maximum[a] Concentration (ppm)	Exposure Limit[b]	IDLH[c]	Symptoms and Effects of Exposure	PIP[d] (eV)
Arsenic	GW: 0.004 SB: 12 SS: 111	0.01 mg/m^3	5 Ca	Ulceration of nasal septum, respiratory irritation, dermatitis, gastrointestinal disturbances, peripheral neuropathy, hyperpigmentation	NA
Chloroform	GW: 0.0004 SB: SS:	2 ppm	500 Ca	Dizziness, mental dullness, nausea, confusion, disorientation, headache, fatigue, eye and skin irritation, anesthesia, enlarged liver	11.42
Chromium (as Cr(II) & Cr(III))	GW: SB: SS: 74.6	0.5 mg/m^3	25	Irritated eyes, sensitization dermatitis, histologic fibrosis of lungs	NA
DDT	GW: SB: SS: 1.2	0.5 mg/m^3	500 Ca	Paresthesia of tongue, lips, hand, and face; tremors; dizziness; confusion; headache; fatigue; convulsion; eye and skin irritation; vomiting	UK
Dibutylphthalate (DBP)	GW: SB: SS: 4.7	5 mg/m^3	4,000	Eye, upper respiratory system, and stomach irritant	UK
Bis-(2-ethylhexyl)phthalate (DEHP, DOP)	GW: 0.002 SB: SS: 0.2	5 mg/m^3	5,000 Ca	Eye and mucous membrane irritant	UK
Lead	GW: 0.036 SB: 888 SS: 7210	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	GW: SB: SS: 1.0	0.05 mg/m^3	10	Skin and eye irritation, cough, chest pain, difficult breathing, bronchitis, pneumontitis, tremors, insomnia, irritability, indecision, headache, fatigue, weakness, GI disturbance	
Methylene Chloride	GW: SB: 12 SS:	25 ppm	2300	Eye irritation, jaundice, hepatitis, myocardial damage, spleen damage.	11.32
PCBs (Limits as Aroclor 1254)	GW: SB: SS: 0.001	0.5 mg/m^3	5 Ca	Eye and skin irritation, acne-form dermatitis, liver damage, reproductive effects	UK

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.

2.5 Contaminants of Concern

(Refer to Project Files for more detailed contaminant information)

Contaminant	Location and Maximum[a] Concentration (ppm)	Exposure Limit[b]	IDLH[c]	Symptoms and Effects of Exposure	PIP[d] (eV)

2.6 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).

3 Project Organization and Personnel

3.1 CH2M HILL Employee Medical Surveillance and Training

(Reference CH2M HILL SOPs HS-01, *Medical Surveillance,* and HS-02, *Health and Safety Training)*

The employees listed below are enrolled in the CH2M HILL Comprehensive Health and Safety Program and meet state and federal hazardous waste operations requirements for 40-hour initial training, 3-day on-the-job experience, and 8-hour annual refresher training. Employees designated "SSC" have completed a 12-hour site safety coordinator course, and have documented requisite field experience. An SSC with a level designation (D, C, B) equal to or greater than the level of protection being used must be present during all tasks performed in exclusion or decontamination zones. Employees designated "FA-CPR" are currently certified by the American Red Cross, or equivalent, in first aid and CPR. At least one FA-CPR designated employee must be present during all tasks performed in exclusion or decontamination zones. The employees listed below are currently active in a medical surveillance program that meets state and federal regulatory requirements for hazardous waste operations. Certain tasks (e.g., confined-space entry) and contaminants (e.g., lead) may require additional training and medical monitoring.

Pregnant employees are to be informed of and are to follow the procedures in CH2M HILL's SOP HS-04, *Reproduction Protection*, including obtaining a physician's statement of the employee's ability to perform hazardous activities before being assigned fieldwork.

Employee Name	Office	Responsibility	SSC/FA-CPR
Bill Friedmann	VBO	Field Team Leader	Level D SSC; FA-CPR

3.2 Field Team Chain of Command and Communication Procedures

3.2.1 Client

Contact Name: Ms. Dawn Hayes
Phone: (757) 322-4792
Facility Contact Name: Mr. Jeff Harlow
Phone: (757)887-4775 ext. 29

3.2.2 CH2M HILL

Project Manager: Bill Friedmann
Health and Safety Manager: John Longo
Field Team Leader: Tony Tomlin
Site Safety Coordinator: Bill Friedmann
The SSC is responsible for contacting the Field Team Leader and Project Manager. In general, the Project Manager will contact the client. The Health and Safety Manager should be contacted as appropriate.

3.2.3 CH2M HILL Subcontractors

(Reference CH2M HILL SOP HS-55, *Subcontractor, Contractor, and Owner*)

Subcontractor: To be determined
Subcontractor Contact Name: To be determined
Telephone: To be determined

The subcontractors listed above are covered by this HSP and must be provided a copy of this plan. However, this plan does not address hazards associated with the tasks and equipment that the subcontractor has expertise in (e.g., drilling, excavation work, electrical). Subcontractors are responsible for the health and safety procedures specific to their work, and are required to submit these procedures to CH2M HILL for review before the start of field work. Subcontractors must comply with the established health and safety plan(s). The CH2M HILL SSC 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). CH2M HILL's oversight does not relieve subcontractors of their responsibility for effective implementation and compliance with the established plan(s).

CH2M HILL should continuously endeavor to observe subcontractors' safety performance. This endeavor should be reasonable, and include observing for hazards or unsafe practices that are both readily observable and occur in common work areas. CH2M HILL is not responsible for exhaustive observation for hazards and unsafe practices. In addition to this level of observation, the SSC is responsible for confirming CH2M HILL subcontractor performance against both the subcontractor's safety plan and applicable self-assessment checklists. Self-assessment checklists contained in Attachment 6 are to be used by the SSC to review subcontractor performance.

Health and safety related communications with CH2M HILL subcontractors should be conducted as follows:

- Brief subcontractors on the provisions of this plan, and require them to sign the Employee Signoff Form included in Attachment 1.
- Request subcontractor(s) to brief the project team on the hazards and precautions related to their work.
- When apparent non-compliance/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 non-compliance/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 CH2M HILL employees and subcontractors, notify subcontractor safety representative, and stop affected work until adequate corrective measures are implemented. Notify the Project Manager and HSM as appropriate.
- Document all oral health and safety related communications in project field logbook, daily reports, or other records.

3.2.4 Contractors

(Reference CH2M HILL SOP HS-55, *Subcontractor, Contractor, and Owner*)

Contractor: NA
Contractor Contact Name: NA
Telephone: NA

This plan does not cover contractors that are contracted directly to the client or the owner. CH2M HILL is not responsible for the health and safety or means and methods of the contractor's work, and we must never assume such responsibility through our actions (e.g., advising on H&S issues). In addition to this plan, CH2M HILL staff should review contractor safety plans so that we remain aware of appropriate precautions that apply to us. Except in unusual situations when conducted by the HSM, CH2M HILL must never comment on or approve contractor safety procedures. Self-assessment checklists contained in Attachment 6 are to be used by the SSC to review the contractor's performance ONLY as it pertains to evaluating our exposure and safety.

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

- Request the contractor to brief CH2M HILL employees and subcontractors on the precautions related to the contractor's work.
- When an apparent contractor non-compliance/unsafe condition or practice poses a risk to CH2M HILL employees or subcontractors:
  - Notify the contractor safety representative
  - Request that the contractor determine and implement corrective actions

  - If needed, stop affected CH2M HILL work until contractor corrects the condition or practice. Notify the client, Project Manager, and HSM as appropriate.
- If apparent contractor non-compliance/unsafe conditions or practices are observed, inform the contractor safety representative. Our obligation is limited strictly to informing the contractor of our observation – the contractor is solely responsible for determining and implementing necessary controls and corrective actions.
- If an apparent imminent danger is observed, immediately warn the contractor employee(s) in danger and notify the contractor safety representative. Our obligation is limited strictly to immediately warning the affected individual(s) and informing the contractor of our observation – the contractor is solely responsible for determining and implementing necessary controls and corrective actions.
- Document all oral health and safety related communications in project field logbook, daily reports, or other records.

4 Personal Protective Equipment (PPE)
(Reference CH2M HILL SOP HS-07, *Personal Protective Equipment*, HS-08, *Respiratory Protection*)

PPE Specifications [a]

Task	Level	Body	Head	Respirator [b]
General site entry Surveying Observation of material loading for offsite disposal Oversight of remediation and construction	D	Work clothes; steel-toe, leather work boots; work glove.	Hardhat [c] Safety glasses Ear protection [d]	None required
Surface water sampling Aquifer testing Sediment sampling Surface soil sampling Hand augering Geoprobe boring	Modified D	Work clothes or cotton coveralls **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] Safety glasses Ear protection [d]	None required
Groundwater sampling Soil boring Investigation-derived waste (drum) sampling and disposal	Modified D	**Coveralls:** Uncoated 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] Safety glasses Ear protection [d]	None required.
Test pit excavation 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].
Tasks requiring upgrade	B	**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	Positive-pressure demand self-contained breathing apparatus (SCBA); MSA Ultralite, or equivalent.

Reasons for Upgrading or Downgrading Level of Protection

Upgrade[f]	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 (Section 5) exceeded.	• New information indicating that situation is less hazardous than originally thought. • Change in site conditions that decreases the hazard. • Change in work task that will reduce contact with hazardous materials.

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

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

[c] Hardhat and splash-shield areas are to be determined by the SSC.

[d] Ear protection should be worn when conversations cannot be held at distances of 3 feet or less without shouting.

[e] Cartridge change-out schedule is at least every 8 hours (or one work day), except if relative humidity is > 85%, or if organic vapor measurements are > midpoint of Level C range (refer to Section 5)--then at least every 4 hours. If encountered conditions are different than those anticipated in this HSP, contact the HSM.

[f] Performing a task that requires an upgrade to a higher level of protection (e.g., Level D to Level C) is permitted only when the PPE requirements have been approved by the HSM, and an SSC qualified at that level is present.

5 Air Monitoring/Sampling

(Reference CH2M HILL SOP HS-06, *Air Monitoring)*

5.1 Air Monitoring Specifications

Instrument	Tasks	Action Levels[a]		Frequency [b]	Calibration
FID: OVA model 128 or equivalent	NA	ppm ppm ppm	Level D Level C Level B	Initially and periodically during task	Daily
PID: OVM with 10.6eV lamp or equivalent	NA	ppm ppm ppm	Level D Level C Level B	Initially and periodically during task	Daily
CGI: MSA model 260 or 261 or equivalent	NA	0-10% : 10-25% LEL: >25% LEL:	No explosion hazard Potential explosion hazard Explosion hazard; evacuate or vent	Continuous during advancement of boring or trench	Daily
O_2Meter: MSA model 260 or 261 or equivalent	NA	>25%[c] O_2: 20.9%[c] O_2: <19.5%[c] O_2:	Explosion hazard; evacuate or vent Normal O_2 O_2 deficient; vent or use SCBA	Continuous during advancement of boring or trench	Daily
Dust Monitor: Miniram model PDM-3 or equivalent	Excavation	mg/m^3 80 (8-hr TWA) mg/m^3	Level D Level C	Initially and periodically during tasks	Zero Daily
Detector Tube: Drager benzene specific 0.5/c (0.5 to 10 ppm range) with pre-tube, or equivalent	NA	<0.5 ppm 0.5-1 ppm >1 ppm	Level D Level C Level B	Initially and periodically when PID/FIB >1 ppm	Not applicable
Colormetric Tube: Drager vinyl chloride specific (0.5 to 30 ppm range) with pre-tube, or equivalent	NA	<0.5 ppm 0.5 ppm	Level D Level B	Initially and periodically when PID/FID >1 ppm	Not applicable
Radiation Meter [d]: Ludlum Model 2 with GM probe model 44-9, or equivalent	NA	Background: >3x Background: >2 mR/Hr:	Continue work Consult RHM Establish REZ	Initially, periodically, and at end of task	Daily
Nose-Level Monitor [e]:	Hearing protection will be used during trench excavations.	<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. Monitoring results should be recorded. Documentation should include instrument and calibration information, time, measurement results, personnel monitored, and place/location where measurement is taken (e.g., "Breathing Zone/MW-3", "at surface/SB-2", etc.).

[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 (refer to Section 2).

[d] Refer to SOP HS-10 for instructions and documentation on radiation monitoring and screening.

[e] Noise monitoring and audiometric testing also required.

5.2 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
PID: TVA 1000	100 ppm isobutylene	CF = 1.0	100 ppm	1.5 lpm reg T-tubing
FID: OVA	100 ppm methane	3.0 ± 1.5	100 ppm	1.5 lpm reg T-tubing
FID: TVA 1000	100 ppm methane	NA	100 ppm	2.5 lpm reg T-tubing
Dust Monitor: Miniram-PDM3	Dust-free air	Not applicable	0.00 mg/m^3 in "Measure" mode	Dust-free area OR Z-bag with HEPA filter
CGI: MSA 260, 261, 360, or 361	0.75% pentane	N/A	50% LEL ± 5% LEL	1.5 lpm reg direct tubing

5.3 Air Sampling

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

Method Description

CH2M HILL will measure air quality periodically throughout each day of the field activity. If it is deemed that the dust level is exceeding the 8-hr TWA, then dust suppression measures will be taken. If it is deemed that dust levels are still problematic, then personnel will done Level C PPE.

Personnel and Areas

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

HSM: John Longo
Other: Project Manager, Bill Friedmann

6 Decontamination

(Reference CH2M HILL SOP HS-13, *Decontamination*)

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.

6.1 Decontamination Specifications

Personnel	Sample Equipment	Heavy Equipment
• Outer-glove removal • Hand wash/rinse • Shower ASAP • Dispose of PPE in municipal trash, or contain for disposal	• Wash/rinse equipment • Solvent-rinse equipment	• Wash

6.2 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.

Figure 6-1 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.

7 Spill-Containment Procedures

Situations in which a spill may occur are not applicable to the field activities.

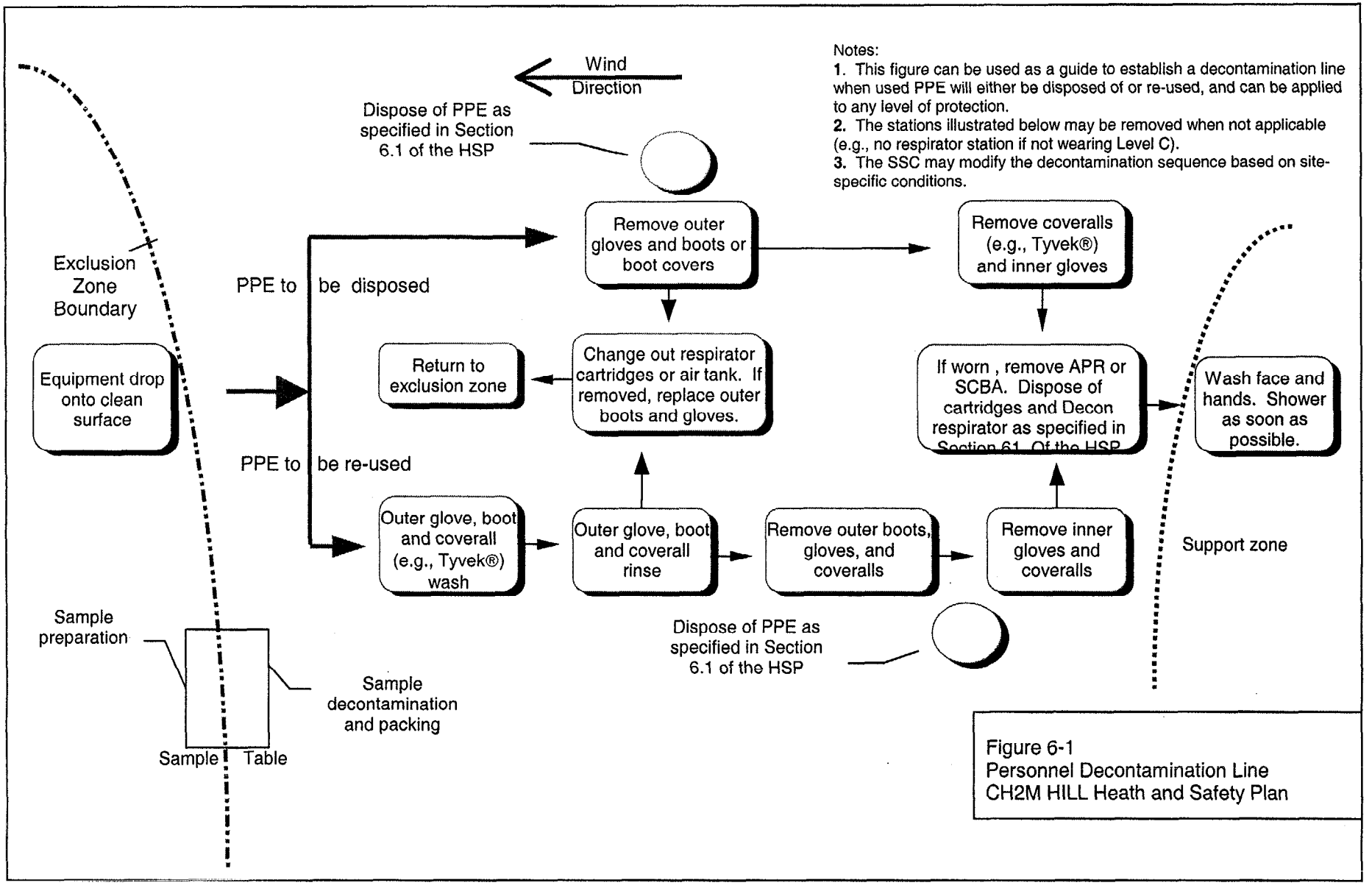

Figure 6-1
Personnel Decontamination Line
CH2M HILL Heath and Safety Plan

8 Site-Control Plan

8.1 Site-Control Procedures

(Reference CH2M HILL SOP HS-11, *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 on site safety: general discussion of Health and Safety Plan, site-specific hazards, locations of work zones, PPE requirements, equipment, special procedures, emergencies.
- The SSC records attendance at safety briefings in a logbook and documents the topics discussed.
- Post the OSHA job-site poster in a central and conspicuous location in accordance with CH2M HILL SOP HS-71, *OSHA Postings.*
- Establish support, decontamination, and exclusion zones. Delineate with flags or cones as appropriate. Support zone should be upwind of the site. Use access control at entry and exit from each work zone.
- Establish onsite communication consisting of the following:
  - Line-of-sight and hand signals
  - Air horn
  - Two-way radio or cellular telephone if available
- Establish offsite communication.
- Establish and maintain the "buddy system."
- Initial air monitoring is conducted by the SSC in appropriate level of protection.
- The SCC is to conduct periodic inspections of work practices to determine the effectiveness of this plan – refer to Sections 2 and 3. Deficiencies are to be noted, reported to the HSM, and corrected.

8.2 Hazwoper Compliance Plan

(Reference CH2M HILL SOP HS-19, *Site-Specific Written Safety Plans)*

Certain parts of the site work are covered by state or federal Hazwoper standards and therefore require training and medical monitoring. Anticipated Hazwoper tasks (Section 1.1.1) might occur consecutively or concurrently with respect to non-Hazwoper tasks. This section outlines procedures to be followed when approved activities specified in Section 1.1.2 do not require 24- or 40-hour training. Non-Hazwoper-trained personnel also must be trained in accordance with all other state and federal OSHA requirements.

- In many cases, air sampling, in addition to real-time monitoring, must confirm that there is no exposure to gases or vapors before non-Hazwoper-trained personnel are allowed on the site, or while non-Hazwoper-trained staff are working in proximity to Hazwoper activities. Other data (e.g., soil) also must document that there is no potential for exposure. The HSM must approve the interpretation of these data. Refer to subsections 2.5 and 5.3 for contaminant data and air sampling requirements, respectively.
- When non-Hazwoper-trained personnel are at risk of exposure, the SSC must post the exclusion zone and inform non-Hazwoper-trained personnel of the:
  - nature of the existing contamination and its locations
  - limitations of their access
  - emergency action plan for the site
- Periodic air monitoring with direct-reading instruments conducted during regulated tasks also should be used to ensure that non-Hazwoper-trained personnel (e.g., in an adjacent area) are not exposed to airborne contaminants.
- When exposure is possible, non-Hazwoper-trained personnel must be removed from the site until it can be demonstrated that there is no longer a potential for exposure to health and safety hazards.
- Remediation treatment system start-ups: Once a treatment system begins to pump and treat contaminated media, the site is, for the purposes of applying the Hazwoper standard, considered a treatment, storage, and disposal facility (TSDF). Therefore, once the system begins operation, only Hazwoper-trained personnel (minimum of 24 hour of training) will be permitted to enter the site. All non-Hazwoper-trained personnel must not enter the TSDF area of the site.

9 Emergency Response Plan

(Reference CH2M HILL, SOP HS-12, *Emergency Response*)

9.1 Pre-Emergency Planning

The SSC performs the applicable pre-emergency planning tasks before starting field activities and coordinates emergency response with CH2M HILL onsite parties, the facility, and local emergency-service providers as appropriate.

- Review the facility emergency and contingency plans where applicable.
- Determine what onsite communication equipment is available (e.g., two-way radio, air horn).
- Determine what offsite communication equipment is needed (e.g., nearest telephone, cell phone).
- Confirm and post emergency telephone numbers, evacuation routes, assembly areas, and route to hospital; communicate the information to onsite personnel.
- Field Trailers: Post "Exit" signs above exit doors, and post "Fire Extinguisher" signs above locations of extinguishers. Keep areas near exits and extinguishers clear.
- Review changed site conditions, onsite operations, and personnel availability in relation to emergency response procedures.
- Where appropriate and acceptable to the client, inform emergency room and ambulance and emergency response teams of anticipated types of site emergencies.
- Designate one vehicle as the emergency vehicle; place hospital directions and map inside; keep keys in ignition during field activities.
- Inventory and check site emergency equipment, supplies, and potable water.
- Communicate emergency procedures for personnel injury, exposures, fires, explosions, and releases.
- Rehearse the emergency response plan before site activities begin, including driving route to hospital.
- Brief new workers on the emergency response plan.

The SSC will evaluate emergency response actions and initiate appropriate follow-up actions.

9.2 Emergency Equipment and Supplies

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

Emergency Equipment and Supplies	Location
20 LB (or two 10-lb) fire extinguisher (A, B, and C classes)	Support Zone/Heavy Equipment
First aid kit	Support Zone/Field Vehicle
Eye Wash	Support & Decon Zone/Field Vehicle
Potable water	Support & Decon Zone/Field Vehicle
Bloodborne-pathogen kit	Support Zone/Field Vehicle
Additional equipment (specify):	

9.3 Incident Response

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

- Shut down CH2M HILL operations and evacuate the immediate work area.
- Notify appropriate response personnel.
- 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.

9.4 Emergency Medical Treatment

The procedures listed below may also be applied to non-emergency incidents. Injuries and illnesses (including overexposure to contaminants) must be reported to 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. During non-emergencies, follow these procedures as appropriate.

- Notify appropriate emergency response authorities listed in Section 9.8 (e.g., 911).
- The SCC 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 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.
- Report incident as outlined in Section 9.7.

9.5 Evacuation

- Evacuation routes and assembly areas (and alternative routes and assembly areas) are specified on the site map.
- Evacuation route(s) and assembly area(s) 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 assist local responders and advise them of the nature and location of the incident.
- The SSC will account for all personnel in the onsite assembly area.
- A designated person will account for personnel at alternate assembly area(s).
- The SSC will write up the incident as soon as possible after it occurs and submit a report to the Corporate Director of Health and Safety.

9.6 Evacuation Signals

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

9.7 Incident Notification and Reporting

- 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.

10 Approval

This site-specific Health and Safety 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.

10.1 Original Plan

Written By: Anthony Tomlin **Date: 6/6/01**

Approved By: Steve Beck **Date: 6/6/01**

10.2 Revisions

Revisions Made By: **Date:**

Revisions to Plan:

Revisions Approved By: **Date:**

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11 Attachments

Attachment 1: **Employee Signoff Form – Field Safety Instructions**
Attachment 2: **Project-Specific Chemical Product Hazard Communication Form**
Attachment 3: **Chemical-Specific Training Form**
Attachment 4: **Emergency Contacts**
Attachment 5: **Project H&S Forms/Permits**
Attachment 6: **Project Activity Self-Assessment Checklists**
Attachment 7: **Applicable Material Safety Data Sheets**

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 HSP, have read and understood it, and agree to abide by its provisions.

Project Name: St. Juliens Creek Annex Sites 2, 3, 5, and 6 **Project Number:** 138804.PP.DR

EMPLOYEE NAME (Please print)	EMPLOYEE SIGNATURE	COMPANY	DATE

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: St. Juliens Creek Annex **Project Number:** 138804.PP.DR

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

Hazardous Chemical Products Inventory

Chemical	Quantity	Location	MSDS Available	Container labels	
				Identity	Hazard
Methane	1 liter, compressed	Support Zone			
Isobutylene	1 liter, compressed	Support Zone			
Pentane	1 liter, compressed	Support Zone			
Hydrochloric acid	< 500 ml	Support Zone / sample bottles			
Nitric acid	< 500 ml	Support Zone / sample bottles			
Sulfuric Acid	< 500 ml	Support Zone / sample bottles			
Sodium hydroxide	< 500 ml	Support Zone / sample bottles			
Methanol	< 1 Gallon	Support/Decon Zones			
Hexane	< 1 Gallon	Support/Decon Zones			
pH buffers	< 500 ml	Support Zone			
MSA Sanitizer	< 1 liter	Support/Decon Zones			
Alconox/Liquinox	< 1liter	Support/Decon Zones			

Refer to SOP HS-05 *Hazard Communication* for more detailed information.

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.

Emergency Contacts

24-hour CH2M HILL Emergency Beeper – 888/444-1226

Medical Emergency – 911
Facility Medical Response #: NA
Local Ambulance #: 911

CH2M HILL Medical Consultant
Dr. Peter Greaney
GMG WorkCare, Orange, CA
800/455-6155
(After hours calls will be returned within 20 minutes)

Fire/Spill Emergency – 911
Facility Fire Response #: NA
Local Fire Dept #: 911

Local Occupational Physician
Maryview Hospital, Portsmouth, Virginia

Security & Police – 911
Facility Security #: NA
Local Police #: 911

Corporate Director Health and Safety
Name: Mollie Netherland/SEA
Phone: 206/453-5005
24-hour emergency beeper: 888-444-1226

Utilities Emergency
Water: Miss Utility (all)
Gas: 800-552-7001
Electric:

Health and Safety Manager (HSM)
Name: John Longo
Phone: 973-316-0159

Designated Safety Coordinator (DSC)
Name: Bill Friedmann
Phone: 757-460-3734

Regional Human Resources Department
Name: Norm Fisher
Phone: 703-471-1441

Project Manager
Name: Bill Friedmann
Phone: 757-460-3734

Corporate Human Resources Department
Name: John Monark/COR
Phone: 303/771-0900

Federal Express Dangerous Goods Shipping
Phone: 800/238-5355

CH2M HILL Emergency Number for Shipping Dangerous Goods
Phone: 800/255-3924

Worker's Compensation and Auto Claims
Sterling Administration Services
Phone: 800/420-8926 After hours: 800/497-4566

Report fatalities AND report vehicular accidents involving pedestrians, motorcycles, or more than two cars.

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

Facility Alarms: NA

Evacuation Assembly Area(s): NA

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

Hospital Name/Address: Maryview Medical Center
Portsmouth, VA 23701

Hospital Phone #: 757-398-2200

Directions to Hospital

Include written directions here, and attach or post a highlighted map if needed.

Leave the Annex via Magazine Road
Take Left on Victory Boulevard (west)
Victory Blvd to Airline Boulevard (ALT Rt. 460)
Take Right on Airline Boulevard
Airline Boulevard to High Street (Rt. 17)
Take Left on High Street
Approximately 7 miles from Victory Blvd to hospital.

CH2M HILL HEALTH AND SAFETY PLAN

Attachment 5

Project H&S Forms and Permits

CH2M HILL HEALTH AND SAFETY PLAN

Attachment 6

Project Activity Self-Assessment Checklists

CH2MHILL

H&S 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 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).

SSC/DSC 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 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.

Completed checklists shall be sent to the health and safety manager for review.

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 H&S requirements
Subcontractors Name: _____

- Check "Yes" if an assessment item is complete/correct.
- Check "No" if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the 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.

Numbers in parentheses indicate where a description of this assessment item can be found in Standard of Practice HS-32.

SECTION 1	Yes	No	N/A	N/O
PERSONNEL SAFE WORK PRACTICES (3.1)				
1. Competent person has completed daily inspection and has authorized entry	☐	☐	☐	☐
2. Personnel aware of entry requirements established by competent person	☐	☐	☐	☐
3. Protective systems are free from damage and in stable condition	☐	☐	☐	☐
4. Surface objects/structures secured from falling into excavation	☐	☐	☐	☐
5. Potential hazardous atmospheres have been tested and found to be at safe levels	☐	☐	☐	☐
6. Precautions have been taken to prevent cave-in from water accumulation in the excavation	☐	☐	☐	☐
7. Personnel wearing appropriate PPE, per HSP/FSI	☐	☐	☐	☐

SECTION 2	Yes	No	N/A	N/O
GENERAL (3.2.1)				
8. Daily safety briefing/meeting conducted with personnel	☐	☐	☐	☐
9. Excavation and protective systems adequately inspected by competent person	☐	☐	☐	☐
10. Defective protective systems or other unsafe conditions corrected before entry	☐	☐	☐	☐
11. Guardrails provided on walkways over excavation 6' or deeper	☐	☐	☐	☐
12. Barriers provided at excavations 6' or deeper when not readily visible	☐	☐	☐	☐
13. Barriers or covers provided for wells, pits, shafts, or similar excavation 6' or deeper	☐	☐	☐	☐
14. Excavating equipment operated safely (use earthmoving equipment checklist in HS-27)	☐	☐	☐	☐
PRIOR TO EXCAVATING (3.2.2)				
15. Location of underground utilities and installations identified	☐	☐	☐	☐
EXCAVATING ACTIVITIES (3.2.3)				
16. Rocks, trees, and other unstable surface objects removed or supported	☐	☐	☐	☐
17. Exposed underground utility lines supported	☐	☐	☐	☐
18. Undermined surface structures supported or determined to be in safe condition	☐	☐	☐	☐
19. Warning system used to remind equipment operators of excavation edge	☐	☐	☐	☐
EXCAVATION ENTRY (3.2.4)				
20. Trenches > 4' deep provided with safe means of egress within 25'	☐	☐	☐	☐
21. Structure ramps designed and approved by competent person	☐	☐	☐	☐
22. Potential hazardous atmospheres tested prior to entry	☐	☐	☐	☐
23. Rescue equipment provided where potential for hazardous atmospheres exists	☐	☐	☐	☐
24. Ventilation used to control hazardous atmospheres and air tested frequently	☐	☐	☐	☐
25. Appropriate respiratory protection used when ventilation does not control hazards	☐	☐	☐	☐
26. Precautions taken to prevent cave-in from water accumulation in the excavation	☐	☐	☐	☐
27. Precautions taken to prevent surface water from entering excavation	☐	☐	☐	☐
28. Protection provided from falling/rolling material from excavation face	☐	☐	☐	☐
29. Spoil piles, equipment, materials restrained or kept at least 2' from excavation edge	☐	☐	☐	☐
EXCAVATION PROTECTIVE SYSTEMS (3.2.5)				
30. Protective systems used for excavations 5' or deeper	☐	☐	☐	☐
31. Protective systems for excavation deeper than 20' designed by registered PE	☐	☐	☐	☐
32. If soil unclassified, maximum allowable slope is 34 degrees	☐	☐	☐	☐
33. Protective systems free from damage	☐	☐	☐	☐
34. Protective system used according to manufacturer recommendations and not subjected to loads exceeding design limits	☐	☐	☐	☐
35. Protective system components securely connected to prevent movement or failure	☐	☐	☐	☐
36. Cave-in protection provided while entering/exiting shielding systems	☐	☐	☐	☐
37. Personnel removed from shielding systems when installed, removed, or vertical movement	☐	☐	☐	☐
PROTECTIVE SYSTEM REMOVAL (3.2.6)				
38. Protective system removal starts and progresses from excavation bottom	☐	☐	☐	☐
39. Protective systems removed slowly and cautiously	☐	☐	☐	☐
40. Temporary structure supports used if failure of remaining components observed	☐	☐	☐	☐
41. Backfilling taking place immediately after protective system removal	☐	☐	☐	☐
EXCAVATING AT HAZARDOUS WASTE SITES (3.2.7)				
42. Waste disposed of according to HSP	☐	☐	☐	☐
43. Appropriate decontamination procedures being followed, per HSP	☐	☐	☐	☐

SECTION 3

Complete this section for all items checked "No" in Sections 1 or 2. Deficient items must be corrected in a timely manner.

Item #	Corrective Action Planned/Taken	Date Corrected

CH2MHILL

H&S 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 hazards associated with earthmoving equipment operations (complete Sections 1 and 3), and/or 2) CH2M HILL oversight of a earthmoving equipment subcontractor is required (complete entire checklist).

SSC/DSC may consult with earthmoving equipment subcontractors 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.

Completed checklists shall be sent to the health and safety manager for review.

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
☐ Evaluate a CH2M HILL subcontractor's compliance with earthmoving equipment H&S requirements
Subcontractors Name: _____

- Check "Yes" if an assessment item is complete/correct.
- Check "No" if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the 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 HS-27.

SECTION 1	Yes	No	N/A	N/O
PERSONNEL SAFE WORK PRACTICES (3.1)				
1. Only authorized personnel operating earthmoving equipment	☐	☐	☐	☐
2. Personnel maintaining safe distance from operating equipment	☐	☐	☐	☐
3. Personnel and equipment operator in close communication when personnel must be in proximity of operating equipment	☐	☐	☐	☐
4. Personnel approach operating equipment safely	☐	☐	☐	☐
5. Personnel wearing high-visibility and/or reflective vests when close to operating equipment	☐	☐	☐	☐
6. Personnel riding only in seats of equipment cab and using seat belts	☐	☐	☐	☐
7. Personnel not positioned under hoisted loads	☐	☐	☐	☐
8. Personnel not hoisted by equipment	☐	☐	☐	☐
9. Personnel instructed not to approach equipment that has become electrically energized	☐	☐	☐	☐
10. Personnel wearing appropriate PPE, per HSP/FSI	☐	☐	☐	☐

SECTION 2	Yes	No	N/A	N/O
GENERAL (3.2.1)				
11. Daily safety briefing/meeting conducted with crew	☐	☐	☐	☐
12. Daily inspection of equipment and equipment accessories conducted before use	☐	☐	☐	☐
13. At least one fire extinguisher available at the equipment operating area	☐	☐	☐	☐
EARTHMOVING EQUIPMENT COMPONENTS (3.2.2)				
14. Backup alarm or spotter used when backing equipment	☐	☐	☐	☐
15. Operational horn provided on bi-directional equipment	☐	☐	☐	☐
16. Seat belts are provided and used	☐	☐	☐	☐
17. Rollover protective structures (ROPS) provided	☐	☐	☐	☐
18. Braking system capable of stopping full payload	☐	☐	☐	☐
19. Headlights and taillights operable when additional light required	☐	☐	☐	☐
20. Brake lights in operable condition	☐	☐	☐	☐
21. Cab glass provides no visible distortion to the operator	☐	☐	☐	☐
22. Hauling equipment (dump trucks) provided with cab shield or canopy	☐	☐	☐	☐
23. Dump truck beds provided with positive means of support during maintenance or inspection	☐	☐	☐	☐
24. Dump truck operating levers provided with latch to prevent accidental dumping	☐	☐	☐	☐
EARTHMOVING EQUIPMENT PLACEMENT (3.2.3)				
25. Location of underground utilities identified	☐	☐	☐	☐
26. Safe clearance distance maintained while working under overhead powerlines	☐	☐	☐	☐
27. Safe distance is maintained while traveling under powerlines	☐	☐	☐	☐
28. Unattended equipment visibly marked at night	☐	☐	☐	☐
29. Parking brake set when equipment parked and equipment chocked when parked on incline	☐	☐	☐	☐
EARTHMOVING EQUIPMENT OPERATION (3.2.4)				
30. Equipment operated on safe roadways and grades	☐	☐	☐	☐
31. Equipment operated at safe speed	☐	☐	☐	☐
32. Equipment not operated during inclement weather, lightning storms	☐	☐	☐	☐
33. Using equipment to lift loads, other than earth, done according to equipment manufacturer specifications	☐	☐	☐	☐
34. Lifting and hauling capacities are not exceeded	☐	☐	☐	☐
35. Equipment components lowered when not in use	☐	☐	☐	☐
36. All machine guards are in place	☐	☐	☐	☐
37. Air monitoring conducted per HSP/FSI for hazardous atmospheres	☐	☐	☐	☐
EARTHMOVING EQUIPMENT MAINTENANCE (3.2.5)				
38. Defective components repaired immediately	☐	☐	☐	☐
39. Suspended equipment or equipment parts are supported prior to work under or between	☐	☐	☐	☐
40. Lockout/tagout procedures used prior to maintenance	☐	☐	☐	☐
41. Tires on split rims removed using safety tire rack or cage	☐	☐	☐	☐
42. Good housekeeping maintained on and around equipment	☐	☐	☐	☐
EXCAVATING AT HAZARDOUS WASTE SITES (3.2.6)				
43. Waste disposed of according to HSP	☐	☐	☐	☐
44. Appropriate decontamination procedures being followed, per HSP	☐	☐	☐	☐

SECTION 3

Complete this section for all items checked "No" in Sections 1 or 2. Deficient items must be corrected in a timely manner.

Item #	Corrective Action Planned/Taken	Date Corrected

CH2M HILL HEALTH AND SAFETY PLAN

Attachment 7

Applicable Material Safety Data Sheets

Attachment B

CH2M HILL Checklists

St. Juliens Creek Annex – Field Performance Audit Checklist from Master Quality Assurance Project Plan

Project Responsibilities

Project No.: _____ Date: _____

Project Location: _____ Signature: _____

Team Members: _____

Yes __ No __ 1) Was a SAP Prepared?
Comments _____
_____
_____

Yes __ No __ 2) Was a briefing held for project participants?
Comments _____
_____
_____

Yes __ No __ 3) Were additional instructions given to project participants?
Comments _____
_____
_____

Yes __ No __ 4) Is the current approved SAP being used?
Comments _____
_____
_____

Sample Collection

Yes __ No __ 1) Is there a written list of sampling locations and descriptions?
Comments _____
_____
_____

Yes __ No __ 2) Are samples collected as stated in the FSP?

Comments _____

_____

_____

Yes __ No __ 3) Are samples collected in the type of containers specified in the FSP?
Comments _____

_____

_____

Yes __ No __ 4) Are samples preserved as specified in the FSP?
Comments _____

_____

_____

Yes __ No __ 5) Are the number, frequency, and type of samples collected as specified in the FSP?
Comments _____

_____

_____

Yes __ No __ 6) Are quality assurance checks performed as specified in the FSP?
Comments _____

_____

_____

Yes __ No __ 7) Are photographs taken and documented as specified in the FSP?
Comments _____

_____

_____

Document Control

Yes __ No __ 1) Have any accountable documents been lost?
Comments _____

_____

_____

Yes __ No __ 2) Have any accountable documents been voided?
Comments _____

_____

_____

Yes __ No __ 3) Have any accountable documents been disposed of?
Comments _____

_____

_____

Yes __ No __ 4) Are the samples identified with sample tags?

Comments _____

_____

_____

Yes __ No __ 5) Are blank and duplicate samples properly identified?
Comments _____

_____

_____

Yes __ No __ 6) Are samples listed on a chain-of-custody record?
Comments _____

_____

_____

Yes __ No __ 7) Is chain-of-custody documented and maintained?
Comments _____

_____

St. Juliens Creek Annex - Site-Specific Field Sampling Plan Checklist

This checklist supplements the Master Field Sampling Plan with site-specific information. Once completed for a specific project, it provides necessary field sampling information for each investigation. It is to be taken into the field with the Master FSP.

Site: St. Juliens Creek Annex – Sites 2, 3, and 5/6

1. Tasks to be performed:

X Geophysical surveys	____ In-situ groundwater sampling
____ Soil gas surveys	____ Aquifer testing
X Sediment Sampling	____ Hydrogeologic measurements
____ Surface soil sampling	____ Biota sampling
____ Soil boring installation	X Trenching
X Subsurface soil sampling	X Land surveying
____ Monitoring well installation and development	____ Investigation derived waste sampling
____ Monitoring well abandonment	X Decontamination
____ Groundwater sampling	X Other Surface water sampling

2. Field measurements to be taken:

____ temperature	____ surveying
____ pH	____ magnetometry
____ dissolved oxygen	X global positioning system
____ turbidity	____ soil gas parameters (list):
____ specific conductance	____ combustible gases
____ organic vapor monitoring	____ water-level measurements
____ geophysical parameters (list):	____ pumping rate
____ electromagnetic induction	____ other____
____ ground-penetrating radar	

3. Sampling program (nomenclature, etc.):

X As per Section 3.1 of Master FSP ____ Other

4. Map of boring, well installation and sampling locations (attach to checklist): See work plan.

5. Table of field samples to be collected: See work plan.

6. Applicable SOPs (Volume 2 of Master Project Plans) or references to specific pages in Master FSP:

- Soil Sampling
- Surface Water Sampling

- Logging of Soil Borings
- Sediment Sampling
- VOC Sampling – Water
- Preserving Non-VOC Aqueous Samples
- Trenching for Landfill Delineation
- Chain-of-Custody
- Packaging and Shipping Procedures
- Field Rinse Blank Preparation
- Decontamination of Personnel and Equipment
- Decontamination of Drilling Rigs and Equipment
- Disposal of Fluids and Solids

6. Site-specific procedures or updates to protocols established in the Master FSP:

   Described in the work plan.

St. Juliens Creek Annex - Site-Specific Health and Safety Plan

This checklist must be used in conjunction with the Site-specific HASP. This checklist is intended for use by CH2M HILL employees only. All CH2M HILL employees performing tasks under this checklist must read and sign both this checklist and the Site-specific HASP and agree to abide by their provisions (see EMPLOYEE SIGNOFF attached to the Site-specific HASP).

Site: St. Juliens Creek Annex – Sites 2, 3, and 5/6

Location(s): Sampling Location Maps attached (see work plan)

This document shall be maintained on site with the Site-specific HASP. It will include as attachments from the work plan a site map and the site characterization and objectives for this site.

The procedures described in the Master Health and Safety Plan will be followed unless otherwise specified in this Site-Specific Health and Safety Plan.

1. HAZWOPER-Regulated Tasks

X Test pit and excavation
_____ Soil boring installation
_____ Hollow stem boring
X Geophysical surveys
X Hand augering
X Subsurface soil sampling
_____ Surface soil sampling
_____ Soil gas surveys
X Sediment sampling
_____ Monitoring well/drive point installation
_____ Monitoring well abandonment
_____ Groundwater sampling
_____ Aquifer testing
_____ Hydrologic measurements
X Surface water sampling
_____ Biota sampling
_____ Investigation-derived waste (drum) sampling and disposal
_____ Observation of loading of material for offsite disposal
_____ Oversight of remediation and construction
_____ Other_____

2. Hazards of Concern: (Check as many as are applicable. Refer to Section 3 of Master H&S Plan for control measures):

X Heat stress
_____ Cold stress
X Buried utilities, drums, tanks
_____ Inadequate illumination
_____ Drilling
X Heavy equipment
X Working near water
_____ Flying debris
_____ Gas cylinders
X Noise
X Slip, trip, or fall hazards
X Back injury
_____ Confined space entry
X Trenches, excavations
_____ Protruding objects
X Vehicle traffic
_____ Ladders, scaffolds
_____ Fire
_____ Working on water
X Snakes or insects
X Poison ivy, oak, sumac
X Ticks

_____Radiological X_____Other Unexploded Ordinance

3. Contaminants of Concern (List if known. Refer to Site-specific HASP)

Volatile organic compounds, metals

4. Personnel (List CH2M HILL field team members and telephone numbers):

Field team leader(FTL)	Paul Landin	757-460-3734 ext. 12
Site safety coordinator(SSC)	Paul Landin	757-460-3734 ext. 12
Alternate FTL and SSC	William Friedmann	757-460-3734 ext. 19
Field team members	NA	

5. Contractors/Subcontractors

__X__Procedures as per Master and Site-specific HASP

_____Other _____

Name: To be added _____ _____

Contact: To be added _____ _____

Telephone: To be added _____ _____

6. Level of personal protective equipment (PPE) required: D
Refer to Master HASP, Site-specific HASP, CH2M HILL SOPs, and Respiratory Protection, Section 2 of the Site Safety Notebook.

7. Air monitoring instruments to be used (refer to Master HSP for action levels):

_____OVM 10.6	_____FID
_____CGI	X_____Dust monitor
_____O_2	____PID

8. Decontamination procedures:

_____As per Section 7 of Master HASP

_____Other

9. List any other deviations or variations from the Master HASP: None

10. Emergency Response (Check that all names and numbers are correct in site-specific HASP and attach corrected page to this checklist)

11. Map to hospital (See site-specific HASP)

12. Emergency Contacts (Check that all names and numbers are correct in site-specific HASP)

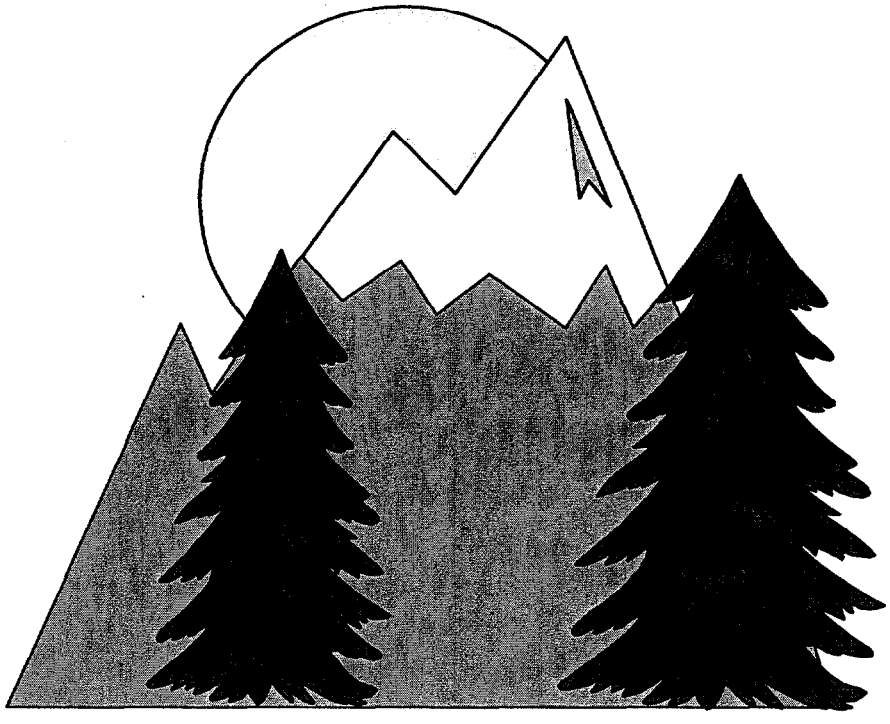
13. Approval. This prepared site-specific HASP must be approved by John Longo/NJO or authorized representative. (Check that approval has been given)

14. Employee Signoff. All CH2M HILL employees working at the site must sign the Employee Signoff for the Site-specific HASP.

Attachment C

OE Subcontractor Work Plan

Environmental Restoration ... An Ethical Commitment



Work Plan & SSHP

St. Juliens Creek Annex, Chesapeake, VA

Ordnance & Explosives (OE) Avoidance/Construction Support Services

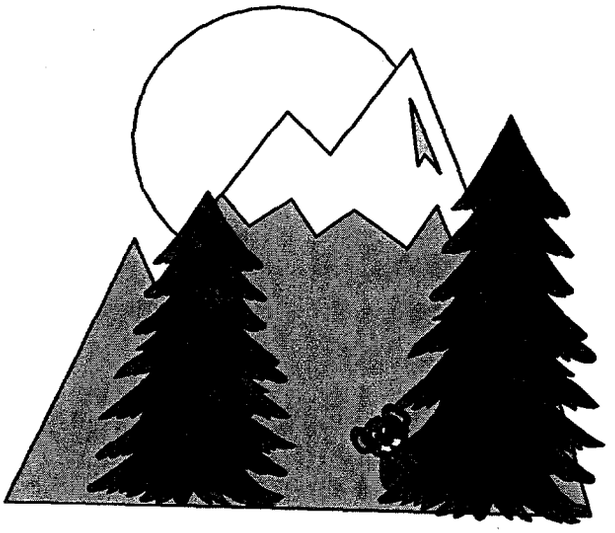
June 2001

Prepared for

CH2M HILL

Prepared By

USA Environmental, Inc.



USA Environmental, Inc.

USA Environmental, Inc.
5802 Benjamin Center Drive, Suite 101, Tampa, FL 33634
Telephone: (813) 884-5722 FAX: (813) 884-1876

Table Of Contents

OE AVOIDANCE PLAN

1.0 PURPOSE

This plan outlines the procedures USA Environmental, Inc. (USA) will use to perform Ordnance and Explosives (OE) Avoidance/Construction Support Services at St. Juliens Creek Annex (SJCA), Sites 2, 3, & 5/6, Chesapeake, Virginia. This plan is based on information provided by the prime contractor, CH2M HILL.

1.1 GENERAL

USA will perform operations at SJCA in a systematic manner using proven operating techniques and methods. USA operations will be executed in three distinct phases: Phase 1: Mobilization, Phase 2:- Operations, and Phase 3: Demobilization. This plan describes the activities USA will accomplish during each phase and the methodology USA will use to accomplish these activities.

1.2 SCOPE OF WORK

USA will provide will provide a two-person OE team to provide on-site OE avoidance support during all trenching and soil sampling activities and identification of surface and near surface unexploded ordnance (UXO) that may interfere with activities.

2.0 PHASE 1: MOBILIZATION

USA will begin mobilization following notification in writing of approval of this work plan and receipt of notification to proceed from CH2M HILL. The goal of this phase of mobilization is to ensure that the proper attention is dedicated to coordinating with the prime contractor and moving to the operational phase as soon as practical. Actions performed during this phase include:

- Identify/procure, package, ship, and inventory project equipment;
- Coordinate with the prime contractor's project manager for communications and other support;
- Finalize operating schedules;
- Conduct site-specific training if required.

2.1 PERSONNEL

USA will deploy a UXO Technician III and one UXO Technician II. All USA UXO personnel working at this site have completed Naval Explosive Ordnance Disposal (USNAVSCLEOD) training which details procedures for evaluation and disposal of OE. All USA employees at this job site will have completed a training program, prior to beginning work on site, which complies with OSHA Regulations 29 CFR 1910.120e(9). All USA employees who work on hazardous sites receive training, which includes an equivalent of 40 hours of training off-site and actual field experience under the direct supervision of a trained, experienced Supervisor. Management and Supervisors receive an additional 8 hours training on program supervision. Each employee receives 8 hours of OSHA refresher training annually.

2.2 PROJECT EQUIPMENT

USA has thoroughly assessed the equipment requirements for this project. During mobilization, USA will:

- Package and ship corporate equipment items to SJCA;
- Perform maintenance and quality checks of the equipment to ensure that it is operationally ready;
- Coordinate with CH2M HILL for communications and other support equipment;
- Prepare and issue purchase orders for support equipment items that are not on-hand.

2.3 SITE SPECIFIC TRAINING

As part of the mobilization process, USA will perform site specific training for all personnel assigned to this project. The purpose of this training is to ensure that all personnel fully understand the procedures and methods USA will use to perform operations at SJCA, their individual duties and responsibilities, and any and all safety and environmental practices/procedures associated with operations. All personnel will be trained as they arrive. Training topics/issues and training responsibilities are as follows:

- The UXO Technicians and support personnel will receive operational briefings and training on their duties and responsibilities. All personnel, to include CH2M HILL crews and subcontractors, will receive ordnance recognition and UXO safety precautions. This training will be performed by the UXO Technician III;
- All personnel will receive training on the individual equipment they will operate while on-site;
- All site personnel will receive detailed training on CH2M HILL's Site Safety and Health Plan (SSHP) and Environmental Protection Plan (EPP);
- Prior to mobilization, all USA personnel will receive HAZWOPER 40 hours (or eight hour refresher) training as required.

3.0 PHASE 2: OPERATIONS

Upon completion of Phase 1 activities, USA will begin Phase 2. The following sub-paragraphs describe the general work practices that USA will follow during all operations, and the specific procedures and methods USA will use during this project.

3.1 GENERAL SITE PRACTICES

All operational activities at SJCA will be performed under the supervision and direction of qualified UXO personnel. Non-UXO qualified personnel will be prohibited from entering the UXO operations area or performing operations unless they are accompanied and/or supervised by a UXO Technician. Throughout operations, USA will strictly adhere to the following general practices.

3.1.1 Work Hours

Operations will be conducted during daylight hours only. USA will work to CH2M HILL's schedule.

3.1.2 Site Access

USA, in conjunction with CH2M HILL, will control access into operating areas and will limit access to only those personnel necessary to accomplish the specific operations or who have a specific purpose and authorization to be on the site. No hazardous UXO operations will be conducted when unauthorized persons are in the vicinity.

3.1.3 Handling of UXO

UXO items will be handled by qualified UXO personnel only. Non-UXO site personnel will be emphatically instructed and closely supervised to ensure they do not handle any UXO. OE scrap will not be handled or touched unless it has first been checked by a UXO Technician.

--THIS POLICY WILL BE STRICTLY FOLLOWED--

3.1.4 Safety Training/Briefing

USA will routinely conduct two distinct safety meetings and briefings: daily tailgate safety briefings, and weekly safety meetings. In addition, the UXO Technician III may hold a safety stand-down at any time he notes any degradation of safety or a safety issue that warrants a review.

3.1.4.1 Daily Tailgate Briefing

Tailgate safety briefings will be conducted by the UXO Technician III. A written record of this training and the signatures of personnel attending the training will be maintained. The training will focus on the specific hazards anticipated at each work site during that day's operations and the safety measures that will be used to eliminate or mitigate those hazards. It will also refer to other operations within the area whose proximity may have safety ramifications. As work progresses and the team's location changes within a site, or from site-to-site, any corresponding changes in ingress/egress routes and emergency evacuation routes will also be reviewed during this tailgate briefing.

3.1.4.2 Weekly Safety Meeting

The UXO Technician III will hold a weekly safety briefing for all personnel. This training will focus on safety issues observed during the past week, any newly identified safety issues, and any needed/required safety or operational refresher training. Although scheduled weekly, these training briefings will be held anytime there is a significant change in site hazards or upon modification of site safety procedures.

3.1.4.3 Visitor Safety Briefing

Site visitors must receive a safety briefing prior to entering the operating area and must be escorted at all times by the UXO Technician III or the CH2M HILL Representative. All visitors entering must sign in at the CH2M HILL field office.

3.1.5 Environmental Awareness

The promotion of environmental awareness will be ongoing as part of safety and operational briefs.

3.1.6 Safety and Environmental Violations

Safety violations or unsafe acts will be immediately reported to the UXO Technician III. Failure to comply with safety rules/regulations or failure to report violations may result in immediate termination of employment. Reckless interference with sensitive species or blatant disregard for environmental issues will likewise not be tolerated and may lead to termination of employment.

3.1.7 Work Clothing and Field Sanitation

Work clothing will be appropriate for the conditions encountered. In most cases this will be Level D PPE. During intrusive operations the PPE will be in accordance with CH2M HILL's Safety and Health Plan.

- Footwear will be sturdy work boots with toe protection;
- Hand protection will consist of leather or canvas work gloves. Rubber inner or outer gloves may be required where increased protection is needed;

- Safety glasses with side shields, hearing protection, and hard hats will be available and worn when engaged in activities where their use is required;
- Clothing will be full length pants, long or short sleeve shirt (depending on the weather) and a reflective safety vest. In no case will tennis/running shoes or abbreviated attire such as tank tops or shorts be permitted.

The team will be outfitted with field decontamination equipment which will consist of portable eye-wash kits, containers of wash water, paper towels and soap. Prior to commencing operations each day, these facilities will be in place and ready for use in the vicinity of the team's work area as needed. Good housekeeping and decontamination measures will be practiced.

3.1.8 Compliance With Plans and Procedures

USA will conduct operations at SJCA in a systematic manner using proven operating methods and techniques. All activities will be conducted under the direction, supervision and observation of the UXO Technician III. All personnel will strictly adhere to approved plans and established procedures. When operational parameters change and there is a corresponding requirement to change procedures or routines, careful evaluation of such changes will be conducted by on-site supervisory personnel in close liaison with the CH2M HILL representative. Any new course of action or desired change in procedures will be submitted with justification for approval as required. Approved changes will be implemented in a manner that will ensure uniformity in procedures and end-product quality on the part of the UXO team.

3.1.9 Field Sanitation and Wash Point

Existing field sanitation stations will be utilized by the work team.

4.0 OE AVOIDANCE AND REMOVAL OF UXO

Throughout this operation, the UXO Technician III will closely monitor performance to ensure these procedures are being performed with due diligence and attention to detail. USA will perform UXO visual detection and avoidance operations as described below.

4.1 PREPARATION OF WORK AREAS

USA will be provided with copies of previous geophysical surveys by CH2M HILL. Prior to trenching or sampling crews going on site, the OE team will conduct a reconnaissance of the approach route to trench sites. The reconnaissance will include locating a clear path for the crews, vehicles and equipment. Based on the geophysical survey reports, an area clear of subsurface anomalies closest to the sample or trench location will be selected as a starting point for approaching the site(s). The approach paths , at a minimum, will be twice the width of the widest vehicle. The boundaries of the approach path will be clearly marked to prevent personnel from straying into un-cleared areas. If UXO is encountered, the UXO team will mark and report the item, and divert the approach path around the UXO. Personnel will be instructed to remain within the marked boundary limits. A magnetometer will be used to search for near surface anomalies within the approach path. If an magnetic anomaly is encountered, it will be assumed to be a possible UXO, it will be marked, the approach path diverted, and reported. UXO or OE encountered will be handled in accordance with Paragraph 4.4 below.

4.2 TRENCHING SITES

Prior to trenching equipment being moved to the proposed location, the OE team will locate a subsurface anomaly free site. During trenching operations the UXO Technicians will position themselves near (outside the reach of the swing) the earth moving machinery (EMM) (backhoe)

where they can observe the trench. If UXO or OE is spotted the UXO Technician will signal the EMM operator to stop digging, move the bucket and place it on the ground outside the trench, and remove his hands from the controls. The UXO Technician will then investigate the UXO. UXO encountered will be handled in accordance with paragraph 4.4 below. If UXO that cannot be moved is encountered the trenching operations will be relocated.

4.3 SOIL SAMPLING SITES

Prior to soil sampling the UXO Technician will clear the proposed location in accordance with paragraph 4.1 above. At the sample site the UXO Technician will check for subsurface anomalies and locate an anomaly free location. If, during sampling, UXO is encountered it will be handled in accordance with paragraph 4.4 below. If UXO is encountered that is not safe to move, it will be marked and a new location chosen.

4.4 LIVE AND SUSPECT OE

UXO or OE items encountered a will be inspected by the UXO Technicians. Items that are safe to move may be relocated to a bermed or sandbagged area a safe distance from ongoing operations. No items will be moved unless positively identified and determined safe to move. The item(s) will be marked and reported to CH2M HILL. OE encountered that is *not* safe to move will be marked in place and operations will be moved to another location. UXO will be marked by installing four (4) wooden stakes and encircling the stakes with flagging tape (see Table 1). Prior to installing stakes the location will be checked with a magnetometer to avoid driving the stake into a subsurface anomaly. All live and suspect live items will be inspected and identified by two UXO Technicians. If the item cannot be positively identified and determined to be inert and safe to move, it will be marked and reported.

Note:
If during identification of UXO or OE it becomes necessary to move or handle the item, non-UXO qualified personnel will withdraw to a safe distance.

4.5 OE RELATED MATERIAL

Adjacent to each operating area, the UXO Technicians will establish a OE scrap collection point. During operations OE items that are free of explosive contamination (i.e., fragments, parachutes, etc.) will be placed into these collection points and marked (see table 1). Upon completion of operations the materials in these temporary collection points will be transferred to a central collection point for disposal by CH2M HILL. As the material is being loaded, the UXO Technicians will perform a second inspection of the material to ensure it is free of explosives and other hazardous materials.

4.6 HEAVY EQUIPMENT OPERATION

Heavy equipment safety will be in accordance with the CH2M HILL SSHP.

4.7 EXCAVATIONS

Excavation safety will be in accordance with the CH2M HILL SSHP.

4.8 EQUIPMENT

The equipment requirements for this activity include:

- EMM, (trenching);
- Schonstedt GA-52CX Magnetometer;
- Marking material listed in table 1;

- Miscellaneous common hand tools (e.g. hammer, shovel, etc.).

Table 1: Color Codes, UXO Avoidance

Color	*Used to Mark*
Red/Orange Tape	*Danger, identified suspect UXO, special precaution required*
White Pin Flag	*Boundary or temporary marker*
Green Paint	*Marking OE-related scrap*

5.0 DISPOSAL OPERATIONS

All UXO and OE-related material containing explosives or hazardous material will be disposed of by other than USA. All hazardous material encountered will be reported to CH2M HILL for disposition.

6.0 RECORDS

The UXO Technician III will prepare and maintain a daily journal which includes a detailed accounting of all UXO and OE encountered and non-hazardous OE related scrap recovered. The inventory will include information pertaining to the following:

- The number, type, and description of UXO items recovered and disposition;
- The number, type, and description of non-hazardous items recovered and stockpiled, and an estimated weight, in pounds, of the scrap remaining for CH2M HILL disposal.

7.0 PHASE 3: DEMOBILIZATION

During this phase, USA will remove its operational capability from the area. All USA owned equipment will be shipped to corporate headquarters and all leased equipment will be returned.

8.0 SUMMARY

USA has developed a comprehensive plan to locate, identify, and avoid OE and OE-related material in the operational areas located at SJCA. Our approach is systematic and the methodology proposed is technically sound and operationally safe.

APPENDIX A

Table of Contents

A-0 SITE SAFETY AND HEALTH PLAN

The purpose of this Site Safety and Health Plan (SSHP)is to establish general guidelines and procedures to ensure protection of USA Environmental, Inc. (USA) personnel and the public while performing operations at the St. Juliens Creek Annex, Chesapeake, VA. This SSHP addresses safety for ordnance and explosives/unexploded ordnance (OE/UXO) avoidance operations and is to be incorporated into the Work Plan. The objective of this SSHP is to provide supervisors and workers the necessary tools to maintain a safe and healthy work place and to protect the environment. USA places safety and accident prevention above operations, and places the burden of responsibility on all employees. A copy of this SSHP is available for review by all employees, and visitors upon request. All supervisors and workers will be required to review the SSHP and sign the log prior to performing any work at the site. Personnel that violate policies contained in this SSHP may be dismissed from the work site and considered for termination.

A-1 SITE DESCRIPTION

A-1.1 ST. JULIENS CREEK ANNEX, CHESAPEAKE, VA.

Refer to the CH2M Hill Work Plan (WP) for a complete description or the site.

A-1.2 SPECIFIC WORK SITES

USA Environmental, Inc. will provide UXO Avoidance and Construction Support services at locations within the project site as directed by contract requirements and CH2M Hill personnel. Soil sampling will take place at locations designated by CH2M Hill personnel. Construction Support for trenching will take place at Landfills 2,3,5, and 6.

A-2 OBJECTIVE

The objective is for USA Environmental, Inc. to provide UXO Avoidance and Construction Support services for OE/UXO found within the project site during soil sampling operations and the characterization of approximately 2,000 linear feet of trenches/pits. Depths will coincide with the groundwater table.

A-3 ORGANIZATION STRUCTURE AND RESPONSIBILITIES

A-3.1 GENERAL

Ensuring the safe and healthful conduct of site operations is the responsibility of everyone assigned to the site, therefore, all USA personnel involved in site activities will be responsible for the following:

- Complying with the SSHP and all other required safety and health guidelines;
- Taking all necessary precautions to prevent injury to themselves and to their fellow employees;
- Continually being alert to any potentially harmful situation and immediately informing the UXO Technician III or UXO Safety Officer (UXOSO) of any such identified conditions;
- Performing only those tasks that they believe they can do safely and have been trained to do;
- Notifying the UXO Technician III or UXOSO of any special medical conditions (i.e., allergies, contact lenses, diabetes) which could affect their ability to safely perform site operations;

- Notifying the UXO Technician III or UXOSO of any prescription and/or over-the-counter medication which they are taking that might cause drowsiness, anxiety or other unfavorable side affects;
- Preventing spillage and splashing of materials to the greatest extent possible;
- Practicing good housekeeping by keeping the work area neat, clean and orderly;
- Immediately reporting all injuries, no matter how minor to the Technician III or UXOSO;
- Maintaining site equipment in good working order, and reporting defective equipment to the Technician III or UXOSO;
- Properly inspecting and using the PPE required by the SSHP, UXO Technician III or UXOSO.

A-3.2 ORGANIZATION

The Safety and Health (S&H) requirements listed in this plan may change as work progresses at the site, however, no changes will be made without approval of the USA Safety and Health Manager. The safety organizational structure and responsibilities for USA personnel operating at the project site are described in the following paragraphs. USA's Organizational Structure is depicted in Figure A-1 below:

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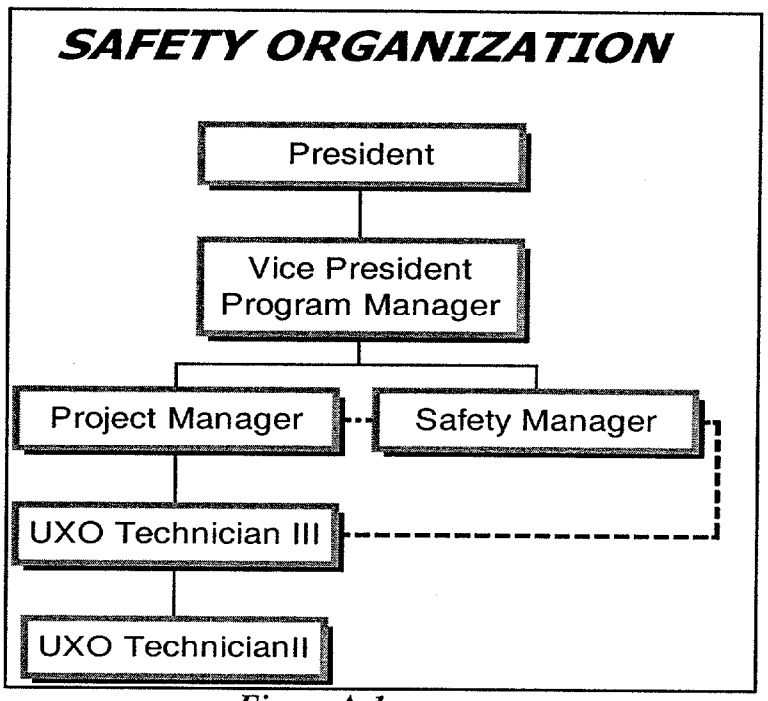

Figure A-1

A-3.3 PRESIDENT

Mr. Jonathan Chionchio is the President of USA Environmental, Inc. He has made safety a priority issue at USA. He has designated each and every USA employee as a Safety Officer and charged each employee with the responsibility for stopping unsafe acts before an accident occurs. USA takes safety seriously and Mr. Chionchio's personal involvement in safety is a reflection of USA's commitment to worker safety.

A-3.3.1 Vice President/Program Manager

Mr. John Adams is the Vice President/Program Manager for USA Environmental, Inc. He is responsible for the effective and efficient operation of all USA OE contracts.

A-3.3.2 Safety And Health Manager

Mr. Robert Crownover is the Safety and Health Manager for USA Environmental, Inc. He is the primary point of contact for safety and health issues at the corporate level. The SHM will have the following responsibilities:

- Reports directly to the Vice President/Program Manager of USA Environmental, Inc. for all safety and health matters;
- Assists in preparation and conducts a final review of the SSHP;
- Provides UXO safety and health consultation to site personnel;
- Coordinates with the Certified Industrial Hygienist (CIH) to ensure site compliance with the SSHP and the USA Corporate Safety and Health Plan (CSHP);

- Maintains an alternate line of communication with the President of USA Environmental, Inc.

A-3.3.3 Project Manager

Mr. George Spencer is the Project Manager for USA Environmental, Inc. During the execution of this contract he will monitor performance and act as the primary point of contact for operational issues at the corporate level.

A-3.3.4 UXO Technician III

The UXO Technician III is responsible for the direct supervision and safety of the personnel under their control and reports to the USA Corporate Project Manager. The Technician III is responsible for ensuring that all work accomplished and all personnel comply with the WP, SSHP, and all applicable federal, state, and local regulations. The UXO Technician III may conduct additional safety meetings and training as needed and reports all safety violations and accidents/injuries to the appropriate personnel. The Technician III will have the following responsibilities:

- Reports directly to the USA Corporate Project Manager;
- Managing the funding, manpower and equipment necessary to safely conduct site operations;
- Reviewing and becoming familiar with the site Work Plan (WP) and SSHP;
- Furnishes copies of the WP and SSHP to site personnel for their review;
- Reviewing the scope of work (SOW) and ensuring that the required safety and health elements are addressed in the SSHP and/or WP;
- Coordinating the assignment of personnel and ensuring that the personnel and equipment provided meet the requirements of the WP and SSHP;
- Ensuring implementation of project quality and safety and health procedures;
- Early detection and identification of potential problem areas, including safety and health matters, and instituting corrective measures;
- Directly interfacing with the CH2M HILL Site Manager and advising him/her of safety and health matters related to conduct of site operations.
- Acts as the alternate On-Scene-Incident-Commander (OSIC) in the event of an emergency, notifying and coordinating with off-site emergency and medical response agencies.

A-3.3.5 Project UXO Safety Officer (UXOSO)

The UXOSO responsibilities for this project will be performed by the UXO Technician III. The UXO Technician III will assume all duties of the UXOSO position and oversee all safety and health aspects of this contract. The UXOSO will have the following responsibilities:

- Has ***STOP WORK*** authority for safety and health reasons;
- Complete Personnel Data Sheets on all site personnel;
- Implement and enforce the SSHP, and report safety violations to the appropriate personnel;
- Establishing work zones and controlling access to these zones;
- Confirm all contractor and subcontractor personnel's suitability for work, based upon OSHA and site specific medical and training requirements;

- Conduct daily General Safety Briefings;
- Implement and document the Site Specific Hazard Information Training Program (as specified by 29 CFR 1910.120);
- Ensure proper condition, maintenance, storage, and use of PPE;
- Consulting with the appropriate personnel prior to downgrading or altering monitoring or PPE requirements;
- Assisting in the continued development of the SSHP and other safety and health procedures;
- On-site enforcement of the Alcohol/Drug Abuse Policy;
- Investigate accidents/incidents and "near misses";
- Conduct visitor orientation;
- Enforce the "buddy" system;
- Conduct and document daily safety inspections, and weekly safety audits;
- Maintain and calibrate safety monitoring equipment, and document calibration data in the monitoring or safety log;
- Restrict site personnel from site activities if they exhibit symptoms of alcohol or drug use or illness, and continually monitor site personnel for signs of environmental exposure or physical stress;
- Maintain the site safety and monitoring logs;
- Act as the On-Scene-Incident-Commander (OSIC) in the event of an emergency, notify and coordinate off-site emergency and medical response agencies;
- Post the descriptions and maps associated with hospital and emergency evacuation routes;
- Conduct on-site safety orientation and operational review. The orientation and review will be accomplished during the first working day at the project site.

A-3.3.6 UXO Technician II

The UXO Technician II is required to comply with the provisions of this SSHP, the WP and all applicable Federal, State and local laws and regulations. The Technician II will report to the UXO Technician III.

A-3.4 Responsibilities Of All Site Personnel

Ensuring the safe and healthful conduct of site operations is the responsibility of everyone assigned to the site, therefore, all USA and subcontractor personnel involved in site activities will be responsible for the following:

- Complying with the SSHP and all other required safety and health guidelines;
- Taking all necessary precautions to prevent injury to themselves and to their fellow employees;
- Continual alertness to any potentially harmful situation and the need to immediately inform the Technician III of any such conditions;
- Performing only those tasks that they believe they can do safely and have been trained to do;
- Notifying the Technician III of any special medical conditions (i.e., allergies, contact lenses, diabetes) which could affect their ability to safely perform site operations;

- Notifying the Technician III of any prescription and/or over-the-counter medication which they are taking that might cause drowsiness, anxiety or other unfavorable side affects;
- Preventing spillage and splashing of materials to the greatest extent possible;
- Practicing good housekeeping by keeping the work area neat, clean and orderly;
- Immediately reporting all injuries, no matter how minor to the Technician III;
- Maintaining site equipment in good working order, and reporting defective equipment to the Technician III;
- Reporting to work clean shaven, if required to use respiratory protection;
- Properly inspecting and using the PPE required by the SSHP, Technician III.

A-4 SITE CONTROL

The Technician III coordinates access control and security on site. Due to the hazardous nature of OE/UXO only authorized personnel will be allowed in the exclusion zone (EZ). The EZ is the work site, encompassing an area large enough to prevent personnel injuries from fragmentation resulting from either unintentional or intentional detonations of UXO. During all operations the EZ will be a radius of 200 feet from the operating team for all essential personnel. The limits of the EZ will be marked with visual, suitable marking material. During UXO operations, only UXO trained or authorized essential personnel are allowed in the EZ (unless escorted by the Technician III). Authorized personnel are those that have completed the required training and meet medical requirements.

Visitors will report to the Technician III. During all operations on individual sites, the site UXO Technician III will cease operations if non-essential personnel are observed within the operating area. During duty hours USA personnel will provide security at the individual sites. Equipment will be returned to a designated area and secured at the end of the workday.

Representatives from regulatory agencies will be permitted to enter the site at any time during business hours or any other reasonable times provided they have completed the required training and meet medical requirements. Further site controls to ensure safety are as follows:

- Eating, drinking, and smoking are prohibited except in designated areas;
- OE/UXO operations will cease if non-UXO trained personnel are present;
- The Technician III will escort all authorized visitors to the site;
- All personnel entering the site, including visitors, will be in the proper PPE;
- The Technician III will maintain the site entry control log to ensure accurate accountability for personnel;
- The Technician III will brief this SSHP to all personnel entering the site to inform them of the potential site hazards. All personnel will acknowledge this briefing by signing the SSHP briefing log;
- In case of an emergency, personnel will exit the site and move to the designated safe area. The safe area will be located upwind of the site outside of the fragmentation area. The Technician III will determine the severity of the emergency. If the emergency warrants evacuation, the Technician III will notify the CH2M HILL Site Manager.

A-5 HAZARD/RISK ANALYSIS

USA has analyzed the scope of work tasking to determine the work risk hazards associated with each task. The tasks consist of direct tasks and the implied tasks, or sub tasks, to accomplish the

work. Task hazard analyzes sheets are in section A2 of this plan. USA has identified the following hazards/risks for the project site:

A-5.1 PERFORM OE/UXO AVOIDANCE AND CONSTRUCTION SUPPORT

- Exposure to hazards associated with surface and subsurface OE/UXO. These items if moved or handled improperly could detonate, either killing or seriously injuring personnel;
- Heavy Equipment operation hazards inherent in the use of EMM;
- Lifting hazards, such as back strain , associated with handling OE scrap;
- Biological hazards: exposure to irritating or toxic plant life; exposure to wildlife, rodents, insects, ticks, and snakes which present the possibility of bites and associated diseases;
- Potential trip hazard associated with ground cover, irregular terrain, and vegetation;
- Heat/Cold Stress.

A-6 HAZARD CONTROL, ACCIDENT PREVENTION

A-6.1 GENERAL

USA personnel will follow the below listed procedures to mitigate the hazards/risks outlined in paragraph A-5 of the SSHP:

- Any approach to a suspected OE/UXO will be conducted in accordance with procedures outlined in the U.S. Army Engineering and Support Center (CEHNC) Safety Concepts and Basic Considerations Unexploded Explosive Ordnance (UXO), 22 May 2000 (located at the end of this appendix);
- Any OE/UXO found within the confines of the work area will be positively identified by two UXO qualified technicians;
- OE/UXO items will only be moved or handled (when necessary) by qualified UXO/EOD technicians;
- All personnel will wear as a minimum Level D PPE, sleeves rolled down when in heavy vegetation, leather or canvas work gloves and sturdy work boots. This will minimize contact with potentially irritating and/or toxic plants. In addition to these measures, any person known to have allergic reactions to insect bites or exposure to toxic plants will be identified and will carry appropriate first aid materials at all times;
- While on the job, all personnel will move at a moderate pace and stay alert for possible trip hazards;
- Personnel will avoid, to the maximum extent possible, contact with any wildlife. Should a person become bitten he/she will receive immediate first aid;
- Personnel working in vegetated areas will be reminded to check themselves for ticks and insect bites after leaving the work area;
- While working on site all personnel will use the "buddy" system. Buddies will be assigned each day prior to beginning work. They will remain in sight of each other at all times to ensure safe working practices. During hazardous operations one buddy will act as a safety observer.

A-6.2 OE/UXO

These basic safety precautions are the minimum OE/UXO safety requirements required of all personnel on site. Other precautions and requirements are in the CEHNC Safety Concepts and

Basic Considerations Unexploded Explosive Ordnance (UXO) at the end of this appendix and other applicable OE/UXO manuals referenced in this SSHP.

A-6.2.1 Basic Considerations

The following should be taken into consideration when planning or conducting OE/UXO operations:

- SAFETY IS PARAMOUNT;
- Do not move or disturb unidentified items.
- All OE/UXO will be identified independently by two (2) UXO technicians;
- Do not collect souvenirs;
- Do not smoke except in designated areas;
- Do not carry fire or spark producing devices into the site;
- All OE/UXO operations will use the "Buddy" system;
- Prohibit unnecessary personnel from visiting the site.

A-6.2.2 Basic Safety Precautions:

The following safety precautions are applicable to all OE/UXO:

- Suspend all operations immediately upon approach of an electrical storm;
- Observe the hazards of electromagnetic radiation (EMR) precautions when working in the vicinity of electrically initiated or susceptible OE/UXO;
- Do not handle any OE/UXO unnecessarily;
- Avoid inhalation and skin contact with smoke, fumes, dust, and vapors of detonations and OE/UXO residue;
- Do not attempt to extinguish burning explosives or any fire which might involve explosive materials;
- Incorporate appropriate property and personnel protective measures for shock and fragmentation when conducting OE/UXO operations;
- Do not subject OE/UXO to rough handling;
- Avoid unnecessary movement of armed or damaged OE/UXO;
- Avoid the forward portions of munitions employing proximity fuzing;
- Assume unknown fuzes contain cocked strikers or anti-disturbance features.

A-6.2.3 General Safety Precautions

A-6.2.3.1 Projectiles

- Determine if the projectile has been fired and if so consider it armed;
- Check for the presence of unburned tracers;
- Avoid the rear and front of rocket assisted and base ejecting projectiles.

A-6.2.3.2 Grenades

- Do not attempt to re-install safety pins on a dud fired grenade;
- Do not attempt to withdraw impinged firing pins from the fuze of a dud fired grenade.

A-6.2.3.3 Rockets

- Approach and work on rockets from the side;
- Do not dismantle or strip dud fired rockets or rocket motors;
- Do not expose electrically fired munitions to radio transmissions within 25 feet.

A-7 CHEMICAL HAZARDS

No chemical munitions have been identified as present on this site. If, during site operations, USA personnel encounter a suspected toxic chemical munition or Recovered Chemical Warfare Material (RCWM) they will immediately withdraw upwind along cleared paths, outside of the fragmentation zone of the ordnance, to a safe location and contact CH2M HILL.

A-8 BIOLOGICAL HAZARDS

Biological hazards, which may be found on site include insects, such as ticks, mosquitoes, spiders, centipedes, snakes, and hazardous plants. Depending on the season and weather the hazards will vary. For instance, during certain seasons many animals and insects are not active and many plants are dormant. Employee awareness and the safe work practices outlined in the following paragraphs should reduce the risk associated with these hazards.

A-8.1 HAZARDOUS PLANTS

During the conduct of site activities contact with hazardous plants may be encountered. The ailments associated with these plants may range from mild hay fever to contact dermatitis, to carcinogenic affects. However, the plants which present the greatest degree of risk to site personnel (i.e., potential for contact vs. affect produced) are those which produce skin and tissue injury and skin reactions.

Contact with splinters, thorns and sharp leaf edges is of special concern to site personnel. This concern stems from the fact that punctures, cuts and even minor scrapes caused by accidental contact may result in non-infectious skin lesions, and the introduction of fungi or bacteria through the skin or eye. Personnel receiving any of the injuries listed above, even minor scrapes, should report immediately to the Technician III for initial and continued observation and care of the injury.

A-8.2 REPTILES AND ANIMALS

A-8.2.1 Snakes

When site activities are conducted in warm weather on sites that are located in vegetated or rocky environments, the potential for contact with snakes becomes a possibility. Normally, if a person is approaching a snake, the noise created by the person is usually sufficient to frighten the snake off. However, during the warm months, extreme caution must be exercised when conducting site operations around areas where snakes might be found (i.e., rocks, bushes, or in holes, crevices, and abandoned pipes). If poisonous snakes are identified on-site, USA will have available for use protective clothing, such as snake leggings, for site personnel. The rules to follow if someone is bitten by a snake are:

- Do not cut "Xs" over the bite area as this will intensify the effect of the venom;
- Do not apply suction to the wound since this has a minimal effective in removing venom;

- Do not apply a tourniquet since this will concentrate the venom and increase the amount of tissue damage in the immediate area;
- If possible, kill the snake without risk to other personnel, bag it and transport it with the victim or try to identify it so proper selection of anti-venom can be made;
- Do not allow the victim to run for help since running increases the heart rate and will increase the spread of the venom throughout the body;
- Keep the victim calm and immobile;
- Have the victim hold the affected extremity lower than the body while waiting for medical assistance;
- Transport the victim for medical attention immediately.

A-8.2.2 Other Animals

Normally wildlife avoid people and areas where activities are ongoing. Small animals may become aggressive when cornered, injured, or infected with rabies. When working remain alert for likely locations that animals inhabit. Avoid nests, dens, and holes in the ground that may be the animal's home. If bitten by an animal, seek medical attention immediately. Do not try to capture the animal, this may result in additional personnel becoming bitten.

A-8.3 TICK BITES

The Center for Disease Control (CDC) has noted that Lyme Disease and Rocky Mountain Spotted Fever (RMSF) which are caused by bites from infected ticks that live in and near vegetated areas, have been identified within the state of Virginia. Ticks are small, ranging from the size of a comma up to about one quarter inch. They are sometimes difficult to see. The tick season extends from spring through summer. When embedded in the skin, they may look like a freckle.

A-8.3.1 Treatment

If you believe you have been bitten by a tick contact the Technician III, who will authorize you to visit a physician for an examination and possible treatment.

A-8.3.2 Protective Measures

Standard field gear (work boots, socks, and work uniform) provide good protection against tick bites, particularly if the openings are taped. However, even when wearing field gear, the following precautions should be taken when working in areas that might be infested with ticks:

- When in the field, check yourself often for ticks, particularly on your lower legs and areas covered with hair;
- Spray outer clothing, particularly your pant legs and socks, ***BUT NOT YOUR SKIN***, with an insect repellant that contains permethrin;
- When walking in vegetated areas, avoid contact with bushes, tall grass, or brush as much as possible;
- If you find a tick, remove it by pulling on it gently with tweezers;
- If the tick resists, cover the tick with salad oil for about 15 minutes to asphyxiate it, then remove it with tweezers;

- Do not use matches, a lit cigarette, nail polish or any other type of chemical to "coax" the tick out;
- Be sure and remove all parts of the tick's body, and disinfect the area with alcohol or a similar antiseptic after removal.

A-8.4 BEES, HORNETS AND WASPS

Contact with stinging insects like bees, hornets and wasps may result in site personnel experiencing adverse health affects that range from being mild discomfort to life threatening. Therefore, stinging insects present a serious hazard to site personnel, and extreme caution must be exercised whenever site and weather conditions increase the risk of encountering stinging insects. Some of the factors related to stinging insects that increase the degree of risk associated with accidental contact are as follows:

- The nests for these insects are frequently found in remote wooded, grassy areas where many waste sites are located;
- The nests can be situated in trees, rocks, bushes or in the ground, and are usually difficult to see;
- Accidental contact with these insects is highly probable, especially during warm weather conditions when the insects are most active;
- If a site worker accidentally disturbs a nest, the worker may be inflicted with multiple stings, causing extreme pain and swelling which can leave the worker incapacitated and in need of medical attention;
- Some people are hypersensitive to the toxins injected by a sting, and when stung, experience a violent and immediate allergic reaction resulting in a life-threatening condition known as anaphylactic shock;
- Anaphylactic shock manifests itself very rapidly and is characterized by extreme swelling of the body, eyes, face, mouth and respiratory passages;
- The hypersensitivity needed to cause anaphylactic shock, can in some people, accumulate over time and exposure; therefore, even if someone has been stung previously, and has not experienced an allergic reaction, there is no guarantee that they will not have an allergic reaction upon receipt of another sting.

With these things in mind and with the high probability of contact with stinging insects, all site personnel will comply with the following safe work practices:

- If a worker knows that he is hypersensitive to bee, wasp or hornet stings, they must inform the Technician III of this condition prior to participation in site activities;
- All site personnel will be watchful for the presence of stinging insects and their nests, and will advise the Technician III if a stinging insect nest or presence of a swarm of bees is located or suspected in the area;
- Any nests located on-site will be flagged off and site personnel will be notified of its presence;
- If stung, site personnel will immediately report to the Technician III to obtain treatment and to allow the Technician III to observe them for signs of allergic reaction;
- Site personnel with a known hypersensitivity to stinging insects will keep required emergency medication on or near their person at all times.

A-8.5 BITING INSECTS

Many types of biting insects such as mosquitoes, flies and fleas may be encountered on-site. The use of insect repellents will be encouraged by the Technician III if deemed necessary. The biting insects of greatest concern are spiders, especially the black widow and the brown recluse. These spiders are of special concern due to the significant adverse health effects that can be caused by their bite.

A-8.5.1 Black Widow Spider

The black widow is a coal-black bulbous spider ¾ to ½ inches in length, with a bright red hour-glass on the under side of the abdomen. The black widow is usually found in dark moist locations, especially under rocks, rotting logs and may even be found in outdoor toilets where they inhabit the underside of the seat. Victims of a black widow bite may exhibit the following signs or symptoms:

- Sensation of pinprick or minor burning at the time of the bite;
- Appearance of small punctures (but sometimes none are visible);
- After 15 to 60 minutes, intense pain is felt at the site of the bite which spreads quickly, and is followed by profuse sweating, rigid abdominal muscles, muscle spasms, breathing difficulty, slurred speech, poor coordination, dilated pupils and generalized swelling of face and extremities.

A-8.5.2 Brown Recluse Spider

The brown recluse is brownish to tan in color, rather flat, 2 to 5/8 inches long with a dark brown "violin" shape on the underside. It may be found in trees, or in dark locations. Victims of a brown recluse bite may exhibit the following signs or symptoms:

- Blistering at the site of the bite, followed by a local burning at the site 30 to 60 minutes after the bite;
- Formation of a large, red, swollen, pustulating lesion with a bull's-eye appearance;
- Systemic affects may include a generalized rash, joint pain, chills, fever, nausea and vomiting; and pain may become severe after 8 hours, with the onset of tissue necrosis.

A-8.5.3 Tegenaria (Hobo/Aggressive House Spider)

The Tegenaria spider is brown without any distinguishing marks. It measures 10-15 mm in diameter including the legs. The Tegenaria is an indoor spider, referred to as a funnel spider, for the shape of its web. Victims of a Tegenaria Spider bite may exhibit the following signs or symptoms:

- Sensation of pinprick at the location of the bite.;
- Formation of a hard lesion surrounded by a pale halo (similar to a brown recluse bite);
- Ensuing blister will measure two to six inches and take months to heal;
- Bite may leave permanent scar.

A-8.5.4 Treatment For Spider Bites

There is no effective first aid treatment for any of these bites. Except for very young, very old or weak victims, these spider bites are not considered to be life threatening, however medical

treatment must be sought to reduce the extent of damage caused by the injected toxins. If any these spiders are suspected or known to be on-site, the Technician III will brief the site personnel as to the identification and avoidance of the spiders. As with stinging insects, site personnel should report to the Technician III if they locate these spiders on site or notice any type of bite while involved in site activities.

A-9 DRUG AND ALCOHOL

USA is committed to having a drug free work place. The unlawful manufacture, distribution, dispensation, purchase, or sale of illegal drugs or alcohol at work is prohibited. Violation of this rule will result in employee termination. In accordance with the Drug-Free Workplace Act of 1988, any employee convicted of a violation of criminal drug statutes while in the employ of USA must notify the USA Human Resources Manager or the subsidiary Human Resources Representative within 5 days of the conviction.

A-10 SUBSTANCE ABUSE

A-10.1 GENERAL CONDITIONS

All employees and subcontractors shall at all times comply with all aspects of USA's Substance Abuse Prevention Program. A copy of the Program is available upon request and is included in this section on the following pages. Employees, or agents, who fail to comply with the program will be prohibited from entering the site.

A-10.2 DRUG SCREENING TEST

All USA employees or agents of subcontractors, or independent contractors hired by subcontractor to perform any of the work under the subcontract who participate in this subcontract, will be required to participate in a Drug Screening Test prior to commencing work on the project, excluding orientation, and after any project related accident that they may be involved in. Employees will be considered probationary workers until Drug Screen Test results are received by the individual's employer and such results are certified to the Technician III by an officer of the employer. The Drug Screening Test will require the production of a urine sample. The urine sample will be tested as a minimum for the following substances:

- Cocaine Metabolite;
- Amphetamines;
- Opiates;
- Phencyclidine;
- Cannabinoids.

Any USA employee, person employed or hired by any subcontractor or contractor who receives a confirmed positive test result will be permanently prohibited from entering project property.

A-10.3 SUBSTANCE ABUSE PREVENTION PROGRAM

The use of illegal drugs, on or off duty is inconsistent with law biding behavior expected of all citizens. The use of illegal drugs, or abuse of alcohol or prescription drugs, on or off duty, may impair the ability of project employees to perform tasks that are critical to proper work performance. The result is an increase in accidents and failures which pose a serious threat to the safety of all employees, visitors and the general public. Impaired employees also tend to be less

productive, less reliable and prone to greater absenteeism resulting in the potential for increased cost and delays in the timely completion of our contracts.

Furthermore, employees have the right to work in a drug-free environment and to work with persons free from the effects of drugs and alcohol. Employees who abuse alcohol or drugs are a danger to themselves and to other employees. In addition, drug and alcohol abuse inflicts a terrible toll on the nation's resources and the health and well-being of workers and their families.

A-10.3.1 Program Objectives

The substance abuse prevention program has the following objectives and goals:

- To assist in maintaining a safe and healthful working environment for our employees, our customers, visitors, vendors, suppliers, trade/subcontractors and members of the general public;
- To minimize absenteeism and tardiness; to improve productivity; and to ensure quality workmanship;
- To comply with contractual obligations.

A-10.3.2 Program Application

This program will apply to all regular full-time, probationary, casual or contract employees and applicants of USA. This program will be applied to USA on-site personnel. Compliance with this program will be required by USA. Entry onto the Owner's property constitutes consent to the right of the USA, or its authorized representatives, to enforce any aspect of this Substance Abuse Prevention Program.

A-10.3.3 Company Premises for Property Defined

For the purpose of this program the term "Owner's property" includes property, offices, facilities, land, buildings, structures, fixtures, installations, automobiles, vessels, trucks and all other vehicles and equipment, whether owned, leased or used. This also includes all areas under control, or any other work locations or mode of transportation to and from those locations (parameters of job site) during working time and while in the course and scope of company employment, or pay status or while the person is on company business during regular work hours.

A-10.3.4 Unauthorized Drugs, Alcoholic Beverages and Other Items

All USA employees, applicants, suppliers, vendors and visitors that use, abuse, or have presence in the body or reporting to work under the influence, bringing onto company property, unlawful manufacture, distribution, dispensation, possession, transfer, storage, concealment, transportation, promotion or sale of the following illegal and unauthorized drugs, controlled substances, alcoholic beverages, drug-related paraphernalia or weapons by employees and others is strictly prohibited from the company premises, or while on company business and/or during working time.

A-10.3.5 Illegal Drugs

Illegal drugs include:

- Marijuana - pot, dope, hash or hashish;
- Cocaine - coke, rock, crack or base;
- LSD - acid;
- PCP - angel dust, crystal;
- MDMA - ecstasy;
- Heroin - smack, black tar;
- Opium - morphine, white stuff, tar, black stuff;
- Any other unauthorized drugs and abnormal or dangerous substances which may affect an employee's/person's mood, responses, motor functions or alter or affect a person's perception, performance, judgment, reactions, or senses while working.

The foregoing list is provided by way of example only and is not to be considered as all inclusive. This policy prohibits the presence of any confirmed detectable amount of these drugs in the employee/person while on the Owner's Property regardless of when or where the substance entered their body.

A-10.3.6 Prescription Drug Abuse

Employees and others may possess prescription drugs and "over the counter" medications provided:

- The prescription drugs are prescribed by an authorized medical practitioner for current use (within the past 12 months) of the person in possession and the medicine is in its original container and in the employee's/person's name;
- Employees must not consume prescribed drugs more often than as prescribed by the employee's physician, and they must not allow any other person to consume the prescribed drug;
- Any employee who has been informed that the medication could cause adverse side effects while working or where medication indicates such warning, must inform his or her supervisor prior to using such substances on the job;
- The use of drugs/medicine prescribed by a licensed physician for the individual employee is permitted provided that it will not affect work performance. However, the Technician III reserves the right to have a licensed physician determine if use of a prescription drug or medication by an employee may produce effects which increase the risk of injury to the employee or others while working. If such a finding is made, the Technician II may limit or suspend the work activity of the employee during the period that the physician advises that the employee's ability to perform his/her job safely may be adversely affected by the consumption of such medication. Any employee who has been suspended or limited may seek substitute medication from his/her physician and if determination is made that the substitute medication will not adversely affect the employees' performance, then the suspension of limitations will be lifted.

A-10.3.7 Prohibited Material

The following material are prohibited by this program:

- Drug related paraphernalia is unauthorized material or equipment or item used or designed for use in testing, packaging, storing, injecting, ingesting, inhaling, or otherwise introducing into the human body a controlled substance;
- Unauthorized Possession of firearms, weapons, or explosive (incendiary) materials including, but not limited to: brass knuckles, illegal knives and other dangerous instruments;
- No firearms are allowed on the Owner's Property (loaded or unloaded), except when authorized for security purposes.

A-10.3.8 Program Enforcement Activity

(Work place searches, certified urine, drug and/or breathalyzer testing). USA also reserves the right to require all USA project site employees and applicants to undergo medical or physical examinations or tests at any time as a condition of employment or continued employment, including NIDA certified urine drug tests and breathalyzer tests to determine the use of any illegal or unauthorized drugs or substances prohibited in this program or to determine the employee's satisfactory fitness for duty. These tests, through the employee's direct employer, will be utilized under the following circumstances:

- Pre-employment/pre-placement testing will be required of any qualified applicant or candidate as a condition of consideration for employment with USA and trade contractors/subcontractors.
- If an employee suffers an occupational on-the-job injury: (requiring treatment from a doctor) or following a serious or potentially serious accident or incident in which safety precautions were violated, equipment or property was damaged, unusually careless acts were performed, or where the cause was due to an employee's or other person's failure to wear prescribed personal protective equipment or follow prescribed safety rules while working on the Owner's Property.

A-10.3.9 Searches

Whenever the Technician III has a reasonable basis to suspect that an employee's work performance or on-the-job behavior may have been affected by alcohol or drugs, or that the employee has sold, purchased, used or possessed alcohol, drugs, or drug paraphernalia on Owner's Property, or at all times while entering, departing, or on property, properties, or work areas, the Technician III may search the employee, the employee's locker, desk or other property under the control of the employee, as well as the employee's personal effects or automobile on the Owner's Property. *AT NO TIME WILL EMPLOYEE OR OTHERS BE TOUCHED*; only outer clothing will be required to be removed during these searches and inspections. Wherever deemed appropriate, the Technician III may use trained dogs to detect illegal drugs on personnel or on the site.

A-10.3.10 Notice of Disciplinary Action for Program Violations

The Technician III will require employees and others to participate in such Urinalysis, Breathalyzer or search activity as may be necessary to assist in providing a safe, healthful and productive working environment and to comply with Federal Laws. *NO EMPLOYEE OR PERSONS SEARCH, URINALYSIS, BREATHALYZER OR INSPECTION WILL BE*

CONDUCTED WITHOUT THE EMPLOYEE'S CONSENT, and whenever practicable, the Technician III will request the employee's written consent. However, failure to comply with the provisions of this program or failure to provide consent when requested shall be grounds for removal from the job site.

A-10.3.11 Offense Discharge

An employee shall be subject to removal from the job site for the following:

- The employee refuses to submit to a search or inspection, urinalysis or breathalyzer when requested by the Technician III. Refusal to submit to a search, inspection or test will be considered sufficient cause for removal from the job site.
- While on the site, the employee was using, manufacturing, distributing, dispensing, selling, or possessing any illegal or unlawful drug.
- The employee has failed his/her Substance Abuse Test.

A-11 SAFE WORKING PRACTICES (SWP)

All personnel on-site will be required to follow the SWPs contained in this Section and the work plan, and will immediately report to the Technician III any conditions which do not comply with this section. The provisions outlined in this section are intended to be the minimum SWPs which site personnel will follow.

A-11.1 POWER AND HAND TOOL OPERATION

A-11.1.1 Power Tools

By their very nature, power tools have great capability for inflicting serious injury upon site personnel if they are not used and maintained properly. Power tools must be manufactured by companies with a listing by an accepted testing laboratory to be authorized for use. To control the hazards associated with power tool operation, the requirements outlined in EM 385-1-1, Section 13, the manufacturers instructions and recommendations, and the safe work practices listed below shall be observed when using power tools:

- Operation will be conducted by authorized personnel familiar with the equipment, its operation, and safety precautions;
- Power tools will be inspected prior to use and on a continued periodic basis, defective equipment will be removed from service until repaired;
- Power tools designed to accommodate guards will have such guards properly in place prior to use;
- Loose fitting clothing or long hair will not be permitted around moving parts;
- Hands, feet, etc., will be kept away from all moving parts;
- Maintenance and/or adjustments to equipment will not be conducted while it is in operation; the power will be disconnected prior to maintenance activities;
- An adequate operating area will be provided, allowing sufficient clearance and access for operation;
- Personnel will use all required PPE, such as gloves, glasses, and hearing protection.

A-11.1.2 Hand Tools

Use of improper or defective tools can contribute significantly to the occurrence of accidents on site. Therefore, the requirements of EM 385-1-1, Section 13 and the safe work practices listed below shall be observed when using hand tools:

- Hand tools will be inspected for defects prior to each use and on a continued basis;
- Defective hand tools will be removed from service and repaired or properly discarded;
- Tools will be selected and used in the manner for which they were designed;
- Be sure of footing and grip before using any tool;
- Do not use tools that have split handles, mushroom heads, worn jaws, or other defects;
- Gloves will be worn to increase gripping ability and/or if cut, laceration or puncture hazards exist during the use of hand tools;
- Safety glasses or a face shield will be used if use of tools presents an eye/face hazard;
- Do not use makeshift tools or other improper tools;
- When working overhead, tools will be secured to ensure they cannot fall on someone below;
- Use non-sparking tools in the presence of explosive vapors, gases, or residue.

A-11.2 Material Lifting

Many types of objects are handled in normal day-to-day operations. Care should be taken in lifting and handling heavy or bulky items because they are the cause of many joint and back injuries. The requirements of EM 385-1-1, Section 14 and the following fundamentals address the proper lifting of materials to avoid joint and back injuries:

- The size, shape and weight of the object to be lifted must be considered. Site personnel will not lift more than they can handle comfortably;
- A firm grip on the object is essential, therefore the hands and object shall be free of oil, grease and water, which might prevent a firm grip;
- The hands, and especially the fingers shall be kept away from any points that cause them to be pinched or crushed, especially when setting the object down;
- The item will be inspected for metal slivers, jagged edges, burrs, rough or slippery surfaces and pinch points, and gloves shall be used, if necessary, to protect the hands;
- Use powered lifting devices if possible;
- The feet will be placed far enough apart for good balance and stability;
- Personnel will ensure that solid footing is available prior to lifting the object;
- When lifting, get as close to the load as possible, bend the legs at the knees, and keep the back as straight as possible;
- To lift the object, the legs are straightened from their bending position;
- Never carry a load that you cannot see over or around;
- When placing an object down, the stance and position are identical to that for lifting: with the back kept straight and the legs bent at the knees, the object is lowered; and
- If needed, USA will provide back support devices to their personnel to aid in preventing back injuries during lifting activities.

When two or more people are required to handle an object, coordination is essential to ensure that the load is lifted uniformly and that the weight is equally divided between the individuals

carrying the load. When carrying the object, each person, if possible, shall face the direction in which the object is being carried.

A-11.3 FIRE HAZARDS

A-11.3.1 Causes of Fires and Explosions

Although fires and explosions may arise spontaneously, they are more commonly the result of carelessness during the conduct of site activities, such as moving drums, mixing/bulking of site chemicals and during refueling of heavy or hand held equipment. Personnel will review EM385-1-1, Section 9 for additional fire prevention and protective measures. Some potential causes of explosions and fires include:

- Mixing of incompatible chemicals, which cause reactions that spontaneously ignite due to the production of both flammable vapors and heat;
- Ignition of explosive or flammable chemical gases or vapors by external ignition sources;
- Ignition of materials due to oxygen enrichment;
- Agitation of shock or friction-sensitive compounds;
- Sudden release of materials under pressure.

A-11.3.2 Fire Prevention

Explosions and fires not only pose the obvious hazards of intense heat, open flames, smoke inhalation, and flying objects, but may also cause the release of toxic chemicals into the environment. Such releases can threaten both personnel on-site and members of the general public living or working nearby. Site personnel involved with potentially flammable material or operations will follow the requirements of EM 385-1-1, Section 09.B, and the guidelines listed below to prevent fires and explosions:

- Potentially explosive/flammable atmospheres involving gases or vapors will be monitored using a combustible gas indicator;
- Prior to initiation of site activities involving explosive/flammable materials, all potential ignition sources will be removed or extinguished;
- Non-sparking and explosion-proof equipment will be used whenever the potential for ignition of flammable/explosive gases/vapors/liquids exists;
- Dilution or induced ventilation may be used to decrease the airborne concentration of explosive/flammable atmospheres;
- Smoking is prohibited at OE/UXO work sites, or in the vicinity of, operations which may present a fire hazard, and the area will be conspicuously posted with signs stating "No Smoking or Open Flame Within 50 Feet";
- Flammable and/or combustible liquids must be handled only in approved, properly labeled metal safety cans equipped with flash arrestors and self-closing lids;
- Transfer of flammable liquids from one metal container to another will be done only when the containers are electrically interconnected (electrically bonded);
- Equipment fueling points will be in an approved location and a safe distance from ongoing operations;
- Equipment fueling points will have spill containment/absorbent material available;

- Equipment fueling points and storage areas will have the appropriate type and size fire extinguisher ready for use;
- The motors of all equipment being fueled will be shut off during the fueling operations;
- Metal drums used for storing flammable/combustible liquids will be equipped with self-closing safety faucets, vent bung fittings, grounding cables and drip pans, and will be stored in an area approved by the Technician III.

A-11.3.3 Fire Protection

The following safe work practices will be used to protect against fires:

- Vehicles and equipment will not be fueled while running;
- Flammable/combustible liquid storage areas will have at least one 3A:40:B:C: fire extinguisher located within 25-75 feet, marked with the appropriate fire symbol and no smoking signs;
- Temporary offices will be equipped with a fire extinguisher of not less than 2A:10B:C;
- At least one portable fire extinguisher having a rating of not less than 2A:20B:C will be located at each work site.

A-11.4 Excavations and Confined Spaces:

Excavation activities will be conducted in accordance with 29 CFR 1926, and the USA SHP. The guidelines below are intended to reflect minimum requirements to be followed on this site:

- Prior to initiation of any excavation or trenching activity, the location of underground installations will be determined if applicable;
- When the excavation/trench achieves a depth of greater than four feet, the Technician III will determine the type of soil being excavated and designate the slope which will be used;
- The excavation(s) will be inspected daily by a competent individual prior to commencement of work activities;
- Evidence of cave-ins, slides, sloughing, or surface cracks will be cause for work to cease until necessary precautions are taken to safeguard workers;
- Excavations 5 feet. or deeper, which cannot be slopped at a 1.5 to 1 ratio, will require a competent individual to design and install a protective system;
- Protective systems shall be selected from OSHA 29 CFR 1926 Subpart P and/or designed by a registered professional civil engineer;
- Spoils and other materials will be placed 2 feet. or more from the edge of the excavation;
- Materials used for sheeting, shoring, or bracing will be in good condition.
- Timbers will be sound, free of large or loose knots, and of appropriate dimensions for the excavation;
- Safe access will be provided into the excavation(s) by means of a gradually sloped personnel access/egress ramp, or ladders or stairs will be provided;
- Ladders used will extend 3 feet. above grade level and be secured from movement.
- Excavations 4 feet. or more in depth will have a means of egress at a frequency such that lateral travel to the egress point does not exceed 25 feet.;
- Walkways or bridges with standard guardrail will be provided where employees are required or permitted to cross over excavations;

- If the depth of an excavation is greater than 4 feet, it will be inspected by the Technician III to determine if it meets the criteria for a confined space;
- If an excavation is determined to be a Confined Space the requirements set forth in the Confined Space Program found in the USE SHP will apply;
- IAW the requirements of 29 CFR 1926.651(g), if an excavation is greater than 4 feet in depth, and the potential for having a hazardous atmosphere inside the excavation exists, then the atmosphere shall be tested for oxygen deficiency and toxicity prior to entry by site personnel.

According to 29 CFR 1910.146, a confined space is defined as having all of the following criteria:

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

If an excavation meets all three of the criteria listed above, it must be defined as a confined space, and the provisions and safety precautions of the USA SHP will apply. To avoid classifying an excavation as a confined space, it is imperative that one of the requirements listed above be removed or avoided. The easiest requirement to remove is the one related to limited means of entry and exit. Entry/exit points must be designed and maintained which allow for easy entry and exit from the excavation. This can be accomplished through the construction of gently sloping entry and exit ramps which are located such that lateral travel to an exit is no greater than 25 feet from the work area in the excavation. If this can not be accomplished, then the excavation must be classified as a confined space and the appropriate safety precautions implemented.

A-12 BLOODBORNE PATHOGEN PROGRAM AND TRAINING

Due to the nature of OE/UXO work there is the potential for exposure to blood pathogens as a result of an accident or injury. Typically, work sites are in remote areas and first aid and/or initial emergency first aid is provided on site by other employees. Personnel will receive training on bloodborne pathogens prior to beginning work at the site.

A-12.1 DEFINITIONS

- Bloodborne Pathogens: Pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV).
- Exposure Incident: A specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials that results from the performance of an employee's duties.
- Other Potentially Infectious Materials: The following human body fluids:
  - Semen, vaginal secretions, cerbro-spinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids.
  - Any unfixed tissue or organ (other than intact skin) from a human living or de

- Parenteral: Piercing mucous membranes or the skin barrier through such events as needle sticks, human bites, cuts, and abrasions.
- Work Practice Controls: Controls that reduce the likelihood of exposure by altering the manner in which a task is performed.
- Universal Precautions: An approach to infection control. According to the concept of Universal Precautions, all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other Bloodborne pathogens.

A-12.2 EXPOSURE CONTROL PLAN:

A-12.2.1 Exposure Determination

Due to the hazardous nature of OE/UXO work there is the potential for accidents and the exposure to blood pathogens. USA employees will be required to perform emergency first aid and/or CPR in the event of an accident or injury.

A-12.2.2 Work Practice Controls

PPE (CPR Pocket Mask and disposable surgical gloves) are available in all first aid kits on site. Hand washing facilities are available in the EZ and SZ. Personnel performing first aid and/or CPR will comply with the following:

- Personnel that provide any first aid will wear disposable latex gloves if there is any visible body fluids;
- The CPR Pocket mask will be used when performing CPR and disposed of after use;
- Personnel will change clothing immediately, or as soon as feasible, that becomes contaminated with body fluids as a result of performing first aid;
- Personnel will immediately wash their hands after performing first aid procedures;
- Contaminated clothing and equipment will be bagged in red BIO-Hazard bags, labeled as to date and contents, and deposed of as infectious waste.

A-12.2.3 Post-Exposure Evaluation and Follow-Up

Following an exposure incident, USA will make available, to the exposed employee, a confidential medical evaluation and follow-up containing the following elements:

- Documentation of the routes(s) of exposure, and the circumstances under which the exposure incident occurred;
- The source individual's and exposed employee's blood will be collected as soon as feasible and tested after consent is obtained;
- The results of the source individual's testing will be made available to the exposed employee, and the employee will be informed of applicable laws and regulations concerning disclosure of the identity and infectious status of the source individual.

A-12.2.4 Information and Training

Training will be provided as initial site training prior to beginning work at the site. The training will be documented on the USA *ON-SITE SAFETY MEETING RECORD* on file as part of initial training. This training will be provided and documented annually for all employees.

A-13 QUALIFICATION TRAINING

All USA UXO personnel working on site have completed Naval Explosive Ordnance Disposal (USNAVSCLEOD) training which details procedures for evaluation and disposal of OE/UXO. All employees at this job site will have completed a training program, prior to beginning work on site, which complies with OSHA Regulation 29 CFR 1910.120e (1), (4) and/or (9). All USA employees who work on hazardous sites receive training, which includes an equivalent of 40 hours of training off-site and 3 days of actual field experience under the direct supervision of a trained, experienced Supervisor. Management and Supervisors receive an additional 8 hours training on program supervision. Each employee receives 8 hours of OSHA refresher training annually. Copies of training and qualifications will be on file at the Corporate or other designated location.

A-14 SITE SPECIFIC TRAINING

The Technician III will give site-specific training to all UXO and non-UXO personnel prior to initial site entry. The training will include:

- Project scope to include: organization and responsibilities; site orientation, facilities, access, egress, evacuation routes, and other general information;
- Safety, to include: safe work practices; physical hazards, PPE; on/off-site emergencies; evacuation routes; emergency agencies/numbers; emergency equipment; medical emergencies; Drug and Alcohol; Bloodborne pathogens; and other pertinent safety information.

A-15 ADDITIONAL TRAINING/MEETINGS

A-15.1 DAILY SAFETY MEETING

Safety training will be provided each morning on-site at the daily safety meeting. The safety and health considerations for the day's activities will be reviewed. Additional training will be conducted when circumstances dictate. The daily meeting will address that day's activities; safety issues; specific hazards; and emergency procedures, to include:

- Notification procedures and phone numbers;
- Rally points, and safe areas;
- Hospital and evacuation routes;
- Emergency equipment.

A-15.2 TAILGATE SAFETY MEETING

The Tailgate Safety meeting is conducted by the Technician III. The safety and health considerations for the task being performed by the individual team members will be reviewed. Additional task specific training may be conducted as required. The tailgate safety meeting will address the specific task and activities being performed at the teams location and entries made on the Tailgate Safety Meeting form.

A-15.3 WEEKLY SAFETY MEETING

The weeks safety and health considerations for the site will be reviewed. Changes, recommendations, concerns or violations will be briefed by the Technician III. This meeting is documented and shall include subjects covered and personnel attending.

A-16 PERSONAL PROTECTIVE EQUIPMENT (PPE)

PPE required at the site will be at a level necessary to protect personnel and IAW EM 385-1-1, Section 5. Normal work clothing will be level D. During OE/UXO operations a hard hat is not required unless a possible head injury could result from the use of equipment or overhead hazards. Steel toe footwear will not be used while operating magnetometers or geophysical instruments.

A-16.1 LEVEL D PPE

The minimum level of protection required of all personnel at the site is level D. The following is level D protection:

- Short or long sleeve cotton coveralls or work clothing;
- Sturdy work boots;
- Safety glasses with side shields or goggles when an eye hazard exists;
- Hard hat (when required);
- Leather or canvas work gloves;
- Hearing protection, when working around equipment or powered hand tools producing a noise hazard.

The level of protection is based on what is known about the site. The levels of protection may change as site conditions change. The Technician III will monitor site conditions and provide information to the CH2M HILL Site Manager as necessary. The Technician III may increase the levels of protection when necessary but will not downgrade the level without approval from the USA SHM.

A-17 MEDICAL

All personnel on site have completed a pre-placement or annual physical examination that complies with the requirements of EM 385-1-1, Section 3 and29 CFR 1910.120 and have been certified as fit to work by an Occupational Physician certified in Occupational Medicine by the American Board of Preventive Medicine, or who by necessary training and experience is board eligible. All USA UXO personnel on-site are in the USA medical surveillance program. Documentation as to the medical qualifications of personnel are on file on site and available to the Contracting Officer. All personnel are screened for drugs in accordance with the USA

Drug/Alcohol Abuse Program.

A-18 EXPOSURE MONITORING/AIR SAMPLING

While OE/UXO investigation may result in emissions of inhalable particulates and other criteria pollutant, these activities are not expected to adversely affect air quality. Engineering controls, such as wetting, may be used to eliminate the suspension of dust and other particulates that may become airborne and migrate off-site.

A-19 COLD AND HEAT STRESS

During activities conducted on OE/UXO sites, extreme temperature conditions can create serious safety and health threats to site workers. The concern at the project site will initially be heat stress as cold stress conditions are not anticipated. The Technician III will identify and monitor personnel that have had previous problems with heat stress. This section addresses the potential

hazards associated with heat stress, and outlines the procedures for monitoring and controlling those hazards.

A-19.1 COLD STRESS

The affects experienced by site personnel when working in cold environments depend upon many environmental and personal factors such as ambient air temperature, wind speed, duration of exposure, type of protective clothing and equipment worn, type of work conducted, level of physical effort and health status of the worker. In cold environments, overexposure can cause significant stress on the body which can lead to very serious and permanent injury. Cold may affect just the exposed body surfaces and extremities or may affect down to the deeper body tissues and the body core. Presented below is information about the most common cold stress disorders and their signs, symptoms, affects and control techniques.

A-19.1.1 Hypothermia/Frostbite

Hypothermia results when the body loses heat faster than it can produce it. When this occurs, the blood vessels in the skin and extremities constrict, reducing the flow of warm blood to those

TABLE A-1: WIND CHILL

COOLING POWER OF WIND ON EXPOSED FLESH EXPRESSED AS EQUIVALENT TEMPERATURE												
ACTUAL TEMPERATURE READING (° F)												
ESTIMATED WIND SPEED (in mph)	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Chill Temperature (° F)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little additional effect)	LITTLE DANGER In<hr with dry skin. Maximum danger of false sense of security				INCREASING DANGER Danger from freezing of exposed flesh within one minute.				GREAT DANGER Flesh may freeze within 30 seconds			
	Trench foot and immersion may occur at any point on this chart											

areas, thereby reducing the rate of heat loss. This reduction in blood flow usually affects the peripheral extremities first. Ears, fingers and toes begin to experience chilling then pain and finally numbness due to loss of both blood flow and heat. Shivering begins as the body's core temperature begins to drop and the body uses the shivering to compensate and create metabolic heat. Shivering is often the first sign of hypothermia. The pain and numbness in the extremities is an indication that the heat loss is increasing, and when shivering becomes uncontrollable, the heat loss in the body core has become extreme. Further heat loss produces speech difficulty, forgetfulness, loss of manual dexterity, collapse and finally death.

Frostbite usually occurs on exposed skin and the extremities, such as face, hands and feet. There are several degrees of injury from frostbite ranging from mild to severe: frost nip or incident frostbite is characterized by sudden blanching or whitening of the skin; with superficial frostbite

the skin has a waxy or white appearance and is firm to the touch but the tissue beneath is resilient; the most serious is deep frostbite where the tissues are cold, pale, and solid.

A-19.2 TREATMENT OF COLD STRESS DISORDERS

The intent of all cold stress treatment is to bring the deep body core temperature back to its normal temperature of about 98.6°F. Work performed in cold environments should be discontinued for any worker who exhibits the signs or symptoms associated with hypothermia or frost bite. Workers exhibiting those symptoms are brought to a warm area and allowed to rest and warm up. If a worker's clothing becomes wet, reducing its insulating effect, it should be removed and replaced by dry clothing or allowed to dry before resuming work. A warm, non-alcohol, de-caffeinated drink (not coffee) or soup may be given. Re-warming should be gradual. For frostbite the victim should be sheltered from the wind and cold and given warm drinks. If the frostbite is superficial the frozen part should be covered with extra clothing or blankets or warmed against the body. **Do not use direct heat, and do not pour hot water over or rub the affected area.** Warming should be gentle and gradual. Failure to do this could lead to bleeding in the tissues and increase the possibility of infection. If the frostbite is deep, i.e. the affected area is frozen and hard to the touch, immediate medical attention should be obtained. The safe thawing of deep frostbite is beyond the expertise and facilities found on-site.

A-19.3 PREVENTION OF COLD STRESS DISORDERS

During work in cold environments the UXOSO uses the tailgate safety briefing to inform site personnel of the measures to be utilized in the prevention and control of cold stress. The UXOSO also uses meteorological data and Table A-1 to inform site personnel of the combined temperature/wind chill affect to be expected during the day's activities. At air temperatures below 45 degrees F the temperature will be monitored. At temperatures below 30 degrees F the dry bulb temperature and wind speed will be measured every four hours to determine the wind-chill. When the temperature/wind-chill is expected to be below freezing, personnel will take more frequent breaks. Prevention methods which site personnel utilize include:

- Buddy system: Personnel monitor their buddy for signs of cold stress;
- Wearing adequate, appropriately layered clothing, including a water repellant outer layer if precipitation is forecasted;
- Layered clothing includes an innermost layer, such as cotton to trap heat and absorb perspiration, an insulating layer of wool or synthetic fiberfill (such as polypropylene), a layer of work weight clothing, and an outer protective layer designed to be wind/water proof, such as nylon or Gortex™;
- Wearing a hat and gloves and socks that are synthetic or wool insulated to help retain body heat and prevent its loss;
- Removing outer layers of clothing during breaks in heated shelters to prevent excessive sweating;
- In windy, cold conditions, covering all exposed skin;
- Eating well-balanced meals and maintaining adequate intake of non-alcoholic, decaffeinated fluids;
- Seeking shelter in a warm protected area when signs and symptoms of cold stress become evident; and

- Protecting clothing from getting wet; this includes keeping clothing from getting wet with sweat, so remove outer layers if work activities cause excessive sweating.

TABLE A-2: TLV WORK/WARM-UP

Air Temperature— Sunny Sky		No Wind		5 MPH Wind		10 MPH Wind		15 MPH Wind		20 MPH
^{0}C approx.	^{0}F approx.	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period
-26^0 to -28^0	-15^0 to -19^0	Normal	1	Normal	1	75 min	2	55 min	3	40 min
-29^0 to -31^0	-20^0 to -24^0	Normal	1	75 min.	2	55 min.	3	40 min	4	30 min
-32^0 to -34^0	-25^0 to -29^0	75 min.	2	55 min.	3	40 min.	4	30 min	5	Non-eme work cease
-35^0 to -37^0	-30^0 to -34^0	55 min.	3	40 min.	4	30 min.	5	Non-emergency work cease		
-38^0 to -39^0	-35^0 to -39^0	40 min.	4	30 min.	5	Non-emergency work should cease				
-40^0 to -42^0	-40^0 to -44^0	30 min.	5	Non-emergency work should cease						
-43^0 & below	-45^0 & below	Non-emergency work should cease								

Notes for Table:

1. Schedule applies to any 4-hour work period with moderate to heavy work activity, with warm-up periods of ten (10) minutes in a warm location and with an extended break (e.g., lunch) at the end of the 4-hour work period in a warm location. For Light-to-Moderate Work (limited physical movement): apply the schedule one step lower. For example, at -35^{0}C (-30^{0}F) with no noticeable wind (Step 4), a worker at a job with little physical movement should have a maximum work period of 40 minutes with 4 breaks in a 4-hour period (Step5).
2. The following is suggested as a guide for estimating wind velocity if accurate information is not available:

5 mph: light flag moves; 10 mph: light flag fully extended; 15 mph: raises newspaper sheet; 20 mph: blowing and drifting snow.
3. If only the wind chill cooling rate is available, a rough rule of thumb for applying it rather than the temperature and wind velocity factors given above would be:
special warm-up breaks should be initiated at a wind chill cooling rate of about 1750 W/m^2;
all non-emergency work should have ceased at or before a wind chill of 2250 W/m^2. In general, the warm-up schedules provided above slightly under-compensates for the wind at the warmer temperatures, assuming acclimatization and clothing appropriate for winter work. On the other hand, the chart slightly over-compensates for the actual temperatures in the colder ranges because windy conditions rarely prevail at extremely low temperatures.
4. TLVs apply only for workers in dry clothing.
*Adapted from the " Threshold Limit Values and Biological Exposure Indices,
American Conference of Governmental Industrial Hygienist, Cincinnati, OH.
USA assists in the prevention of cold stress by providing sheltered, warm areas where site personnel can rest and regain body heat during breaks (see Table A-2: Warm-up Schedule). When conditions warrant USA will provide hot water for personnel to prepare their cocoa, soup, etc. If approved by USACE, a heated shelter may be provided inside the EZ, upwind from the work area, where site personnel can rest and warm-up.

- Warm fluids, such as soup or decaffeinated tea and cocoa, will be provided as needed;
- A minimum of one fifteen minute break in a heated shelter every two hours;
- A heated shelter may be provided inside the EZ, upwind from the work area, where site personnel can rest and warm-up after having processed through a limited PDS consisting of glove wash and removal, respirator wash and removal, and hand washing.

A-19.4 HEAT STRESS

Heat stress is one of the most common (and potentially serious) illnesses that can affect hazardous waste site workers. The most common cause of heat stress during site activities is the affect that PPE has on the bodies natural cooling mechanism. Individuals will vary in their susceptibility and degree of response to the stress induced by increased body heat. Factors which may predispose a worker to heat stress include: lack of physical fitness; lack of acclimatization to hot environments; degree of hydration; level of obesity; current health status (i.e.,. having an infection, chronic disease, diarrhea, etc.); alcohol or drug use; and the worker's age and sex. For the remainder of this Section, reference to "liquids" will indicate water or an electrolyte replacement solution - not tea, coffee or soft drinks.

A-19.4.1 Heat Stress Disorders

A-19.4.1.1 Heat Rash

Heat rash is caused by continuous exposure to heat and humid air and is aggravated by wet chafing clothes. This condition can decrease a worker's ability to tolerate hot environments.

- Symptoms: Mild red rash, especially in areas of the body which sweat heavily.
- Treatment: Decrease amount of time in protective gear and provide powder such as corn starch or baby powder containing corn starch to help absorb moisture and decrease chafing. Maintain good personal hygiene standards and change into dry clothes if needed.

A-19.4.1.2 Heat Cramps

Heat cramps are caused by a rate of perspiration that is not balanced by adequate fluid and electrolyte intake. The occurrence of heat related cramps are often an indication that excessive water and electrolyte loss has occurred, which can further develop into heat exhaustion or heat stroke.

- Symptoms: Acute, painful spasms of voluntary muscles such as the back, abdomen and extremities.
- Treatment: Remove victim to a cool area and loosen restrictive clothing. Stretch and massage affected muscles to increase blood flow to the area. Have patient drink one to two cups of liquids immediately, and every twenty minutes thereafter. Consult with physician if condition does not improve. If available, an electrolyte replacement solution should be taken along with water. Consumption of soft drinks will not be adequate and may aggravate the condition.

A-19.4.1.3 Heat Exhaustion

Heat exhaustion is a state of very definite weakness or exhaustion caused by excessive loss of fluids from the body. This condition leads to inadequate blood supply and cardiac insufficiency. Heat exhaustion is less dangerous than heat stroke, but nonetheless must be treated. If allowed to go untreated, heat exhaustion can quickly develop into heat stroke.

- Symptoms: Pale or flushed, clammy, moist skin, profuse perspiration, and extreme weakness. Body temperature is basically normal or slightly elevated, the pulse is weak and rapid, and breathing is shallow. The individual may have a headache, be dizzy or nauseated.
- Treatment: Remove the individual to a cool, air-conditioned place, loosen clothing, elevate feet and allow individual to rest. Consult physician, especially in severe cases. Have patient drink one to two cups of liquids immediately, and every twenty minutes thereafter. Total liquid consumption should be about one to two gallons per day. If the signs and symptoms of heat exhaustion do not subside, or become more severe, immediate medical attention will be required.

A-19.4.1.4 Heat Stroke

Heat stroke is an acute and dangerous reaction to heat stress caused by a failure of the heat regulating mechanisms of the body. The failure of the individual's temperature control mechanism causes the perspiration system to stop working correctly. When this occurs, the body core temperature rises very rapidly to a point where brain damage and death will result if the person is not cooled quickly.

- Symptoms: The victims skin is hot, and may or may not be red and dry, due to the fact that the individual may still be wet from having sweat while wearing protective clothing earlier; nausea; dizziness; confusion; extremely high body temperatures, rapid respiratory and pulse rate; delirium; convulsions; unconsciousness or coma.
- Treatment: Cool the victim immediately. If the body temperature is not brought down quickly, permanent brain damage or death may result. Cool the victim by either sponging or immersing the victim in very cool water to reduce the core temperature to a safe level. If

conscious, give the victim cool liquids to drink. Observe the victim and obtain immediate medical help. Do not give the victim caffeine or alcoholic beverages.

A-19.5 PREVENTATIVE MEASURES

In order to avoid heat related illnesses, proper preventative measures will be implemented whenever environmental conditions dictate the need. Heat stress monitoring will begin at +75 degrees Fahrenheit. The preventative measures listed in this paragraph represent the minimal steps to be taken and will include the following procedures:

- The Technician III will examine each site worker prior to the start of daily operations in order to determine the individuals susceptibility to heat stress. Workers exhibiting factors which make them susceptible to heat stress will be closely monitored by the Technician III.
- Site workers will be trained to recognize and treat heat related illnesses. This training will include the signs, symptoms and treatment of heat stress disorders.
- Workers will be encouraged to drink a minimum of sixteen ounces of liquids prior to start of work in the morning, after lunch and prior to leaving the site at the conclusion of the days activities. Acceptable liquids will include water and an electrolyte replacement solution, with the intake of each being equally divided. Liquids containing caffeine are to be avoided.
- When ambient conditions and site workload requirements dictate, as determined by the Technician III, workers will be required to drink a minimum of sixteen (16) to thirty-two (32) ounces of liquids during each rest cycle.
- A shelter or shaded area will be provided where workers may be protected from direct sunlight during rest periods.
- Monitoring of ambient or physiological heat stress indices will be conducted to allow prevention and/or early detection of heat induced stress.
- Site workers will be given time to acclimatize to working in hot environments. Acclimatization usually takes two to six days and allows the worker's body to become adjusted to working in hot environments.

A-19.6 ADDITIONAL PREVENTATIVE MEASURES

When possible and/or feasible, the following measures will also be implemented to aid in prevention or reduce the affects of heat induced stress:

- Designated rest areas should be out of the direct sun and the number and frequency of breaks increased.
- Depending on the severity of the heat exposure some form of artificial cooling may be required to ensure protection of the workers.
- Workers will be encouraged to achieve and maintain an optimum level of physical fitness. Increased physical fitness will allow workers to better tolerate and respond to hot environments and heavy work loads. In comparison to an unfit person, a fit person will have: less physiological strain; a lower heart rate and body temperature; and a more efficient sweating mechanism.

A-20 PERSONNEL HYGIENE AND DECONTAMINATION

Site sanitation will be established and maintained in accordance with 29 CFR 1910.120(n).

A-21 POTABLE WATER SUPPLY

An adequate supply of potable (drinkable) water, coolers, and ice will be provided on site at all times in accordance with 29 CFR 1910.120. Potable water will also be used for the washing of personnel.

A-22 NON-POTABLE WATER

Containers of water, clearly marked non-potable water, will be available to teams for washing of equipment in accordance with 29 CFR 1910.120. Non-potable water will not be used for the washing of skin surfaces on personnel.

A-23 TOILET FACILITIES

To maintain sanitation, established toilet facilities will be utilized on site if available. If established facilities are not available, portable toilet facilities will be made available on-site in accordance with 29 CFR 1910.120.

A-24 WASHING FACILITIES

Hand and face washing facilities are available at the site support vehicles, and will be utilized by all personnel during breaks or upon exiting the EZ prior to eating, drinking, tobacco use, or other hand to face activities. Washing facilities in the EZ will consist of potable water containers, buckets, soap, and drying towels. These facilities will be in accordance with 29 CFR 1910.120.

A-25 SITE HOUSEKEEPING

All work areas will be maintained in a clean/neat fashion, free of loose debris and scrap. Any materials/equipment not being used will be removed and stored or disposed of accordingly. All work areas will be supplied with a trash receptacle with lid, the contents of which will be emptied daily.

A-26 ILLUMINATION

Personnel will only work during the hours of daylight, and no field activities will be scheduled during the period of thirty minutes before dusk to thirty minutes after dawn.

A-27 COMMUNICATIONS

On and off site communications will be provided using radios and/or cellular telephones. Communication of evacuation routes and assembly points will occur daily during the tailgate safety briefing. All communications will be tested daily. When emergency services are requested from any agency, the caller will remain available to provide information and directions to responding personnel.

A-28 OFF-SITE COMMUNICATIONS

Off-site communication will be available at all times. Site operations will not be conducted unless off-site communications are available.

A-29 TELEPHONE NUMBERS

The telephone numbers for all emergency services, including the telephone numbers for the USA SHM, are listed in Table A-3. These phone numbers will be posted in the vehicles and all site personnel (teams) will be aware of the location of the closest telephone or will have direct communications to someone with telephone service available.

A-30 ON-SITE COMMUNICATIONS

Communication between personnel in the SZ and personnel in the EZ will be maintained at all times. Personnel in the EZ should remain in constant communication with the Technician III. Any failure of communication requires an evaluation of whether personnel should leave the EZ. A repeated long horn blast (15 sec or longer) on the support vehicle is the emergency signal to indicate that all personnel should leave the EZ and proceed to the rally point.

A-31 LOGS, REPORTS, AND RECORD KEEPING

A-31.1 SAFETY LOG

The Technician III will maintain a safety log of all safety related site activity. The Technician III is responsible for ensuring that safety and health activities and events for the day are part of the log. The log may include the minutes of the tailgate safety meeting, or the meeting may be documented on the Tailgate Safety Briefing form. As a minimum the safety log should reference the tailgate safety briefing, and mention: accidents, near misses, internal and external audits, the reason for and duration of safety related "stop work" orders, and any other issues pertaining to site or personnel safety or health.

A-31.2 INJURY/ILLNESS/ACCIDENT REPORTS

In the event that a reportable injury/illness/accident occurs at the job site, the USA accident report will be completed and forwarded within two working days to the USA home office. All job related injuries and illnesses will be recorded on an OSHA No. 200 Log. This log will be maintained on site by the Technician III. If a near miss occurs the Technician III will investigate the near miss and report the results of the investigation to the appropriate personnel or agencies.

A-31.3 TRAINING LOG

The Technician III is responsible for ensuring that all training conducted relative to job site activities is documented in the Training Log and/or on the appropriate training forms. This log will include the initial site specific training conducted prior to the start of site activities. The Technician III will maintain this log and any associated training forms on-site so they will be available for inspection.

A-31.4 EQUIPMENT MAINTENANCE LOG

Required scheduled maintenance and Calibration of equipment performed will be annotated in the Daily Journal.

A-31.5 VISITOR LOG

The Technician III will be responsible for maintaining the visitor log which will be used to record the entry and exit of all visitors, including Federal, state or local officials who visit the site. This log will reflect name, organization, date and time of visitor entry/exit. Visitors will be briefed on:

- The St. Juliens Creek SSHP;
- Restricted and safe areas;
- Site hazards and risks to include OE/UXO, biological, heat, and trip hazards;
- PPE required and use;
- Fire and OE/UXO safety requirements;

- Site evacuation and emergency procedures.

A-32 DAILY AND WEEKLY SITE INSPECTIONS

Daily Safety and Health inspections will be conducted by the Technician III and the results will be recorded in the Safety Log. The results of the inspection will be reported to the Technician III on a weekly basis, the Technician III will conduct a compliance audit of the site and complete the Weekly Inspection form. The daily Safety and Health inspections will include:

- Scope of operations;
- Personnel assignments;
- Safety precautions on OE/UXO expected to be encountered;
- Equipment to be used;
- Emergency procedures to include requests for support;
- Communication procedures.

A-33 REGULATIONS AND REFERENCES

The safety and health of on-site personnel and the local community will be ensured by following all applicable requirements and regulations listed in the following publications:

- OSHA Occupational Safety and Health Standards, 29 CFR 1910;
- OSHA Construction Standards, 29 CFR 1926;
- Applicable sections of EPA 40 CFR Parts 260 to 299;
- Applicable sections of DOT 49 CFR Parts 100 to 199;
- CEHNC Safety Concepts and Basic Considerations for Unexploded Explosive Ordnance (UXO), dated. 22 May, 2000;
- USA Safety and Health Program (SHP);
- 2000 Threshold Limit Values and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists;
- DOD 6055.9-STD, DOD ammunition and Explosives Safety Standards;
- DOD 4160.21-M, Defense Reutilization and Marketing Manual.

A-34 EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES

This section details the procedures that USA will implement in the case of an emergency.

A-34.1 GENERAL

The frequency and severity of emergency situations can be dramatically reduced through proper implementation of the SSHP. However, if an emergency does occur, quick, decisive action will be required since delays in minutes can create or escalate life-threatening situations. In an emergency situation, site personnel involved in emergency response and rescue must be prepared to respond immediately and all required equipment must be on hand, in proper working order and ready to use. To ensure rapid, effective response to a site emergency, the procedures and contingency plans outlined in this Section and EM 385-1-1, Section 28 J, will be implemented prior to and during the conduct of any site activities involving exposure to safety and health hazards.

A-35 PRE-EMERGENCY PLANNING

A-35.1 IDENTIFICATION OF LOCAL EMERGENCY SERVICES

Prior to the conduct of site operations, USA site representatives will meet with the appropriate local authorities. The purpose of this meeting is to inform local authorities of the nature of the site activities to be performed under this SSHP, and the potential hazards that the conduct of these activities pose to site personnel, the environment, and the general public. In the unlikely event that the evacuation of the general public is required due to either normal site operations or an emergency event, USA will be responsible for contacting the appropriate personnel who will execute and coordinate the evacuation. The phone numbers for pre-notified local emergency services are listed in Table A-3 or refer to the CH2M HILL Safety and Health Plan.

TABLE A-3

EMERGENCY CONTACT	TELEPHONE NUMBER
Fire/Ambulance/Police (Emergency)	911
Chesapeake General Hospital	1-757-312-6128 (ER)
Poison Control Center	1-800-552-6337
USA Safety and Health Office	(813)-884-5722 ext.140
CH2M HILL Site Manager	See CH2M HILL S&H Plan

A-35.2 IDENTIFICATION OF POTENTIAL EMERGENCIES

During the development of this SSHP, great attention has been given to identifying potential safety and health hazards associated with the conduct of site activities. Once identified, these hazards were assessed to determine the risk that these hazards could result in an emergency situation. Contingency plans for responding to the potential emergency situations have been developed and are included in this section. The potential emergencies which may result during the conduct of site activities are as follows:

- Injury or illness;
- Fire/explosion;
- Inclement weather.

A-35.3 OTHER HAZARD INFORMATION

In the event that additional site or task hazard information becomes available during the conduct of site activities, this information will be assessed by the appropriate authorities to determine if the contingency plans in this section will need to be updated.

A-36 EMERGENCY RESPONSE RESPONSIBILITIES

A-36.1 ON-SCENE INCIDENT COMMANDER (OSIC)

In the event of an emergency, the Technician III will assume the responsibility of being the On-scene Incident Commander (OSIC). The alternate person to assume this role, in the event that the Technician III is unavailable or incapacitated, will be the CH2M HILL Site Manager or other designated person. The OSIC will have the responsibility of directing all on-site and off-site

response personnel, and will, as soon as possible, advise the appropriate authorities of the emergency situation.

A-36.2 On-Site Emergency Response Services

USA personnel will provide First Aid treatment for minor injuries. At least two personnel on-site will be First Aid and CPR certified. The Technician III will determine if the injury requires further treatment. If necessary the Technician III will contact medical personnel to determine if additional treatment is required.

A-36.3 Off-Site Emergency Response Services

The off-site emergency response services which may be needed in the event of a emergency include fire and law enforcement personnel. Fire Protection and emergency medical services (EMS) can be obtained by dialing 911 while on site. All requests for emergency service will go through the CH2M HILL Site Manager. The CH2M HILL Site Manager will notify the required emergency services.

A-36.4 Medical Evacuation (MedEvac)

Medical evacuation will be determined by the emergency first responder. The emergency first responder will determine and coordinate medical evacuation if required.

A-37 EMERGENCY TRAINING

All site personnel will receive specialized training which will be given by the Technician III and conducted prior to initiating site activities involving safety and health hazards. The content of this training will include the items listed below, and will be documented using the site Training Log.

- USA's SSHP requirements;
- Emergency chain-of-command;
- Communication methods and signals;
- Emergency equipment and PPE;
- Removing injured personnel from the site;
- Emergency contacts, phone numbers.

A-38 EMERGENCY SITE CONTROL AND SECURITY

In an emergency, it is imperative that site control and security be maintained. To control site personnel, the OSIC will utilize the Site Entry/Exit Log to ensure all personnel are present or accounted for at the assembly point(s). Depending upon site size and configuration, weather and wind conditions and the nature of the emergency, the following will, as applicable, be used to maintain site security:

- Close, but do not lock, gates as evacuation occurs;
- Erect flagging or barrier tape to prevent accidental entry;
- Use a megaphone to alert personnel to stay clear of the site;
- Use vehicles to block access routes to the site, but ensure they can be moved rapidly if emergency vehicles must use the access route.

A-39 EVACUATION ROUTE

The map showing the location and evacuation route to the emergency treatment facility are located in the CH2M HILL Safety and Health Plan. The route will be briefed to all site personnel prior to start of site activities to familiarize them with the route.

A-40 GENERAL EMERGENCY PROCEDURES

Emergency response procedures include all steps to be taken for notifying, evaluating, reacting to, documenting and following-up on a given emergency situation. To ensure all necessary elements are covered, the procedural steps outlined in this paragraph will be implemented for each emergency, regardless of its nature.

A-40.1 NOTIFICATION

Once the OSIC has been informed of the emergency, the OSIC will alert site personnel to the presence of the emergency by radios. This will be done in order to:

- Notify personnel and to get their attention;
- Stop all work activity as required;
- Lower noise levels in order to speed and simplify communication;
- Begin emergency and/or evacuation procedures.

If on-site USA personnel or off-site emergency personnel are to enter the site in response to the emergency, the OSIC will to the extent possible, notify the response personnel about the nature of the emergency, to include:

- What happened and when it happened;
- Where on-site the emergency situation occurred;
- Who is involved and, if possible, the cause of the emergency;
- The extent of damage and what hazards may be involved;
- What actions should be taken.

A-40.2 ASSESSING THE EMERGENCY

Available information related to the emergency and the on-site response capabilities should be evaluated and the information listed below obtained to the extent possible:

- What happened:
  - Type of incident;
  - Casualties involved:
  - Victims (number, location and condition);
  - Treatment required; and
  - Missing personnel.
- Cause of incident;
- Extent of damage to structures, equipment and terrain.
- What could happen from this point; consider:
  - Potential for fire or explosion;
  - Location of all personnel in relation to hazardous areas; and
  - Potential for emergency affecting the general public or the environment.
- What can be done to remediate the situation; consider:

- Equipment and personnel needed for rescue and hazard mitigation;
- Number of uninjured personnel available for response;
- Resources available on-site;
- Resources available from off-site response groups and agencies;
- Time needed for off-site response resources to reach the site;
- Hazards involved in rescue and response.

A-40.3 RESCUE AND RESPONSE ACTIONS

Based on the information collected during the emergency assessment, the general actions listed below will be taken, with some actions being conducted concurrently. No one will attempt emergency response/rescue until the situation has been assessed and the appropriate response outlined by the OSIC.

- Enforce the Buddy System:
  - Allow no one to enter a hazardous area without a partner.
  - Personnel in the EZ should be in line-of-sight or in communication with the OSIC or his designee.
- Survey Casualties:
  - Locate all victims and assess their condition;
  - Determine resources needed for stabilization and transport;
  - Assess Existing and Potential Hazards and Determine;
  - Whether and how to respond;
  - The need for evacuation of site personnel and off-site population;
  - The resources needed for evacuation and response.
- Request Aid:
  - Contact the required off-site/on-site personnel or facilities, such as ambulance, fire department, police, etc.
- Allocate Resources:
  - Allocate on-site personnel and equipment to rescue and initiate incident response operations;
  - Control the site;
  - Assist in bringing the hazardous situation under complete or temporary control and use measures to prevent the spread of the emergency, i.e. control fire, secure site, etc.
- Extricate:
  - Remove or assist victims from the area.
- Stabilize:
  - Administer any medical procedures that are necessary before the victims can be moved.
  - Stabilize or permanently fix the hazardous condition.
  - Attend to what caused the emergency and anything damaged or endangered by the emergency (e.g., drums, tanks).

- Transport:
  - Using either on-site or off-site assets.
  - Casualty Logging;
  - Record who, time, destination and condition upon transport.
- Evacuate:
  - Move site personnel to the rally point, a safe distance upwind of the incident.
  - Monitor the incident for significant changes; the hazards may diminish, permitting personnel to re-enter the site, or hazards may increase and require public evacuation.
- Casualty Tracking:
  - Record disposition, condition and location.

A-40.4 POST EMERGENCY FOLLOW-UP

Before normal site activities can resume, the site and personnel must be prepared and equipped to handle another emergency. It is also imperative that all Federal, state and local regulatory agencies be notified of the emergency. Therefore, the following activities must be conducted prior to re-start of site activities:

- Notify all appropriate governmental agencies as required (i.e. OSHA must be notified if there have been any fatalities or three or more personnel hospitalized);
- Restock and clean all equipment and supplies utilized or damaged in the emergency;*
- Conduct an accident investigation to determine the cause of the emergency and what preventative measures could be taken to ensure the emergency does not occur again; *
- Complete the USA accident and/or insurance forms;
- Review and revise, as needed, the site operational procedures, and if necessary update the SSHP to reflect the new procedures.

*To be accomplished prior to re-starting site activities

A-40.5 DOCUMENTATION

Documentation related to the emergency will be recorded in an accurate, authentic and complete fashion. Documentation shall be recorded as soon as possible after the emergency to ensure it is recorded while the events are vivid in the minds of the personnel involved. The information recorded will include:

- A chronological record of events;
- A listing of the personnel involved, including personnel on-site, site personnel who responded, personnel in charge, and off-site groups or agencies that responded;
- A listing of the actions taken to minimize the effects of or mitigate the emergency;
- An assessment of the potential exposures received by site personnel and the surrounding public;
- A recording of the injuries or illnesses which occurred as a result of the emergency.

A-41 ON-SITE EMERGENCY EQUIPMENT

The emergency equipment listed below in Table A-4 will be on-site, stored in the location indicated, and available for use during the operation specified. The Support Vehicle EZ will be on the work site with each team. The team support vehicle will be designated as an emergency

vehicle. All emergency equipment will be maintained in proper working order and inspected by the Technician III at least weekly to ensure completeness and proper working order. The results of the inspection will be documented on the Safety Inspection Control Log. In the event that any of the disposable items are utilized, the Technician III will ensure they are replaced immediately. Site operations will not be conducted if the required emergency equipment is not available on-site.

A-42 CONTINGENCY PLANS

The following paragraphs contain emergency specific contingency plans. These plans outline the procedures for mitigating each of the potential emergency situations that were identified in the pre-emergency planning. These contingency plans specify the minimum emergency procedures and may be subject to alteration by the Technician III, based on actual or changing site conditions. Any changes to these contingency plans will be approved by the appropriate authorities.

A-43 INJURY OR ILLNESS

In the event of an emergency involving personal injury or illness, immediate response will be key in preventing further injury/illness and providing comfort to the affected party. When EZ personnel are injured or overcome by illness, the following procedure will be followed:

- Upon notification of the occurrence and nature of the injury/illness the OSIC will, if deemed necessary, summon emergency personnel;
- EZ personnel will transport the injured/ill victim to the rally point using the stretcher;
- The OSIC will assess the severity of the injury/illness, direct the EZ personnel to provide immediate life support if required;
- If immediate life support is not required, or once the victim is stabilized, and if required, transport victim to the appropriate medical facility for further attention.

TABLE A-4

Emergency Equipment	Number per Location	Location Stored	Operation Where Emergency Equipment is Required
First Aid/Burn Kit, (16 unit minimum)	1 ea.	Team Support Vehicle, EZ.	Each team has complete sets of first aid equipment.
Eye Wash	1 ea.	All First Aid Kits	
CPR Pocket Mask	1 ea	All First Aid Kits	
Disposable latex Gloves	5 ea.	All First Aid Kits	
Fire Extinguisher 2A:10 BC rated	1 ea.	All Vehicles.	All operations.

To ensure that adequate first aid supplies are available, the size (16 unit minimum) and number of first aid kits will be sufficient to accommodate the maximum number of people (including government personnel and visitors) on-site at any given time. The kits will be located at each EZ work site and the location of the kit will be made known to all EZ personnel. Additional kits may also be maintained in each vehicle and in the SZ. Kit locations will be provided with adequate water and other supplies necessary to cleanse and decontaminate burns, wounds or lesions.

A-44 FIRES AND EXPLOSIONS

A-44.1 FIRE EXTINGUISHERS

The occurrence of a fire on-site can present a serious threat to all site personnel, the environment and the general public. To ensure immediate, aggressive response is possible, dry-chemical-type fire extinguishers will be available at each individual work site. Dry chemical fire extinguishers (3A:40B:C)will also be provided at any other site location where flammable materials may present a fire risk, such as the petroleum, oil and lubricant (POL) storage area. Additionally, a fire extinguisher rated at least 2A:10B:C will be located with each piece of heavy equipment and in each site vehicle. Fire extinguishers will be inspected, and the results recorded, weekly by the Technician III.

A-44.2 SMALL FIRES

A small fire is defined as a fire that can be extinguished with a 2A:10B:C type fire extinguisher. In the event of a small fire, site personnel will take the following actions:

- All unnecessary personnel will be evacuated from the immediate area, to an upwind location;
- Extinguish the fire using portable fire extinguishers or by smothering from an upwind location;
- Request emergency response assistance (fire, ambulance, police) as needed;
- Do not attempt to extinguish a fire, even a small one, involving explosives;

- Notify the Technician III.

A-44.3 LARGE FIRES

In the event of a large fire or small fire which cannot be extinguished, the following actions will be taken:

- All unnecessary personnel will be evacuated from the site, to an upwind location;
- The Emergency Response Services (fire, police, ambulance, hospital, etc.) will be notified as required;
- If it can be conducted safely, the OSIC will direct personnel to move vital equipment/supplies from the fire path;
- The OSIC will order the appropriate level of protective clothing to be worn by personnel fighting the fire;
- To the extent possible, and with available resources, fight the fire from an upwind location;
- At no time, will attempts be made to extinguish a fire involving explosives;
- Notify the Technician III.

A-44.4 EXPLOSION

In the event of an explosion, all nonessential personnel will evacuate and help secure the site, the OSIC will request the required support equipment and personnel, and ensure proper authorities are notified. It is essential that the site be evacuated and no one is allowed to re-enter, except to possibly save a life, until at least 30 minutes, or longer if necessary, after the explosion. The OSIC will determine what actions, if any, are appropriate.

A-45 INCLEMENT WEATHER

In the event of inclement weather: high winds, electrical storms, extremely hot weather (>100?F) it may be necessary to cease operations and evacuate the site. The Technician III will be responsible for contacting the weather service on a daily basis. If necessary, the weather service will be contacted on a more frequent basis.

A-46 HAZARD ANALYSIS

The following Hazard Analysis worksheets were used to identify hazards associated with operations at the St. Juliens Creek project site and the safety methods that would be used to mitigate, eliminate, or control exposure to hazards.

CEHNC-OE-CX (200-1c)

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Basic Safety Concepts and Considerations for Ordnance and Explosives (OE) Operations, OE Center of Expertise (CX) Interim Guidance Document 00-03

1. PURPOSE: To specify how OE operations will be performed on project sites.

2. APPLICABILITY: This guidance is applicable to all U.S. Army Corps of Engineers Commands having responsibility for performing OE response activities.

3. REFERENCES: Refer to Appendix A of the enclosure.

4. REQUIREMENTS AND PROCEDURES: Refer to the enclosed document, Basic Safety Concepts and Considerations for Ordnance and Explosives Operations. This document should be used by USACE personnel at OE sites and should be incorporated into contract work statements for OE activities. This document supersedes Interim Guidance Document 00-02, Basic Safety Concepts and Considerations for Ordnance and Explosives (OE) Operations, dated 7 March 2000. We are issuing a revised document to make both minor and significant changes to the 7 March 2000 version. Significant changes include:

a. Paragraphs 1-7.f.(4) and 6-1.b: Clarification is provided for the use of earth-moving machinery to remove overburden from suspected OE.

b. Paragraph 1-8.b: Clarification is provided concerning the supervision of activities performed by non-UXO personnel.

c. Paragraph 2-1.c: Additional detail is provided for procedures to be followed when suspect chemical warfare materiel (CWM) is encountered at a conventional OE site.

d. Paragraph 6-1.a: The term "UXO personnel" is replaced by "UXO qualified personnel" in reference to hand excavation of suspect OE.

e. Paragraph 7-1: The sentence previously reading "Open burning of explosives, propellants, incendiary materials, and pyrotechnics is unauthorized" is deleted.

CEHNC-OE-CX (200-1c)
SUBJECT: Basic Safety Concepts and Considerations for Ordnance and Explosives (OE) Operations, OE Center of Expertise (CX) Interim Guidance Document 00-03

5. EFFECTIVE DATES: The requirements and procedures set forth in this interim guidance are effective immediately. They will remain in effect indefinitely, unless superseded by other policy or regulation.

6. POINTS OF CONTACT: If you need additional information, please contact Mr. Gregory Bayuga at 256-895-1596.

FOR THE COMMANDER:

Encl

C. DAVID DOUTHAT, P.E.
Director, Ordnance and
Explosives Team

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Chief of Staff, Department of the Army Safety Office, ATTN: DACS-SF (Mr. Jim Patton), 200 Army Pentagon, Room 3D253, Washington, DC 20310-0200
Chairman, Department of Defense Explosives Safety Board, ATTN: DDESB-KT, 2461 Eisenhower Avenue, Alexandria, VA 22331-0600
Director, U.S. Army Defense Ammunition Center, ATTN: SIOAC-ESL, Route 84 N. Bldg. 249, 3700 Army Depot Road, Savanna, IL

CEHNC-OE-CX (200-1c)
SUBJECT: Basic Safety Concepts and Considerations for Ordnance and Explosives (OE) Operations, OE Center of Expertise (CX) Interim Guidance Document 00-03

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BASIC SAFETY CONCEPTS AND CONSIDERATIONS FOR ORDNANCE AND EXPLOSIVES OPERATIONS

U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE

22 May 2000

TABLE OF CONTENTS

BASIC SAFETY CONCEPTS AND CONSIDERATIONS FOR ORDNANCE AND EXPLOSIVES (OE) OPERATIONS

CHAPTER 1
INTRODUCTION

1-1. Purpose. This pamphlet establishes the safe operating procedures for dealing with ordnance and explosives (OE) and unexploded ordnance (UXO) items on formerly used defense sites (FUDS), base realignment and closure (BRAC) and installation restoration (IR) projects. Because there are no absolute safe procedures for dealing with OE, merely procedures considered being least dangerous, it is essential that a planned and systematic approach be established.

1-2. Applicability. This pamphlet applies to all Headquarters, United States Army Corps of Engineers (HQUSACE) elements, United States Army Corps of Engineers (USACE) commands, and their contractors having the responsibility for performing OE response activities. For the purpose of this document, all references to OE include UXO.

1-3. References. Required and related publications are listed in appendix A.

1-4. Distribution. Approved for public release; distribution is unlimited.

1-5. Policy. It is the policy of the USACE to produce products and services that fully meet the customers' expectations of quality, timeliness and cost effectiveness. All OE response procedures must be formulated to ensure harmony with the USACE Strategic Vision and should be in concert with activities presented in other USACE guidance. There should be no compromise of health and safety requirements to meet production or quality goals. Safety is the leading edge of quality.

1-6. Responsibilities. It is the responsibility of all USACE and contractor personnel involved with OE response projects to safely execute them in accordance with (IAW) the approved Site Safety and Health Plan (SSHP), Work Plan (WP), and all applicable laws, regulations, and policies.

1-7. Terms and Definitions.

a. Ordnance and Explosives. Ammunition, ammunition components, chemical or biological warfare materiel, or explosives that have been abandoned, expelled from demolition pits or burning pads, lost, discarded, buried or fired. Such ammunition components and explosives are no longer under accountable record control of any DOD organization or activity.

b. Explosive Soil. Explosive soil refers to a mixture of explosives in soil, sand, clay or other solid media at concentrations such that the mixture itself is explosive.

c. Unexploded Ordnance (UXO). Military Munitions that have been primed, fuzed, armed, or otherwise prepared for action, and have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to the operations, installations, personnel, or material, and remain unexploded either by malfunction, design, or any other cause.

d. UXO Qualified Personnel. The term UXO Qualified Personnel applies only to personnel meeting the requirements for the positions of UXO Technician II, UXO Technician III, UXO Safety Officer, UXO Quality Control Specialist, and the Senior UXO Supervisor. For qualification requirements, refer to EP 1110-1-18, Ordnance and Explosives Response.

e. OE Procedures. These procedures include, but are not limited to, the following actions performed by a UXO qualified individual.

(1) Gaining access to (manual excavation) and identifying subsurface anomalies and assessing the condition of buried OE.

(2) Identifying and assessing the condition of surface OE.

(3) Recovery and final disposal of all OE.

f. OE Related procedures: These OE related procedures include, but are not limited to, the following and can be performed by a non-UXO qualified individual:

(1) Location and marking of subsurface anomalies.

(2) Location and marking of suspected surface OE.

(3) Transportation and storage of recovered OE.

(4) Utilizing earth-moving machinery (EMM) to excavate overburden from suspected OE.

1-8. General Safety Concerns and Procedures.

a. OE operations will not be conducted until a complete plan for the site is prepared and approved. These plans will be based upon limiting exposure to the minimum number of personnel, for the minimum time, to the least amount of OE consistent with safe and efficient operations.

b. Only UXO qualified personnel will perform OE procedures. Non-UXO personnel may be utilized to perform OE related procedures when supervised by a UXO Technician III. All personnel engaged in field operations will be thoroughly trained and capable of recognizing the specific hazards of the procedures being performed. To ensure that these procedures are performed to standards, all field personnel will be under the direct supervision of a UXO Technician III.

c. Personnel who will be handling OE items will not wear outer or inner garments having static electricity generating characteristics. Materials made of 100 percent polyester, nylon, silk and wool, are highly static producing. Refer to DA Pam 385-64 for more information regarding non-static producing clothing.

d. Prior to any action being performed on an ordnance item, all fuzing will be positively identified. This identification will consist of fuze type by function, condition (armed or unarmed), and the physical state/condition of the fuze, i.e., burned, broken, parts exposed/sheared, etc.

CHAPTER 2
OE SAFETY PRECAUTIONS

2-1. OE Safety Precautions.

a. Every effort will be made to identify a suspect OE item. Under no circumstances will any OE be moved in an attempt to make a positive identification. The OE item will be visually examined for markings and other external features such as shape, size, and external fittings. If an unknown OE item is encountered, the on-site USACE representative will be notified immediately. If there is no USACE personnel on-site, the District or Design Center's OE Safety representative will be notified as soon as possible. If external research is required, it will be initiated by the U.S. Army Engineering and Support Center, Huntsville. The following are additional considerations for the safe handling of OE items:

(1) Projectiles containing Base Detonating (BD) fuzes are to be considered armed if the round is fired.

(2) Arming wires and pop-out pins on unarmed fuzes should be secured prior to any movement.

(3) Do not depress plungers, turn vanes, rotate spindles, levers, setting rings or other external fittings on OE items. Such actions may arm or activate the OE.

(4) Do not attempt to remove any fuze(s) from the OE. Do not dismantle or strip components from any OE items.

(5) UXO Personnel are not authorized to inert any OE items found on-site.

(6) OE /UXO items will not be taken from the site as souvenirs/training aids.

(7) Civil War ordnance will be treated as any other OE.

b. Prior to entering areas/ranges contaminated with Improved Conventional Munitions (ICM) an approved DA -waiver must be obtained. The District and/or Design Center's OE Safety representative must be notified.

c. Any time -suspect chemical warfare materiel (CWM) is encountered during conventional OE site activities, all work will immediately cease. Project personnel will withdraw along cleared paths upwind from the discovery. A team consisting of a minimum of two personnel will secure the area to prevent unauthorized access. Personnel should position themselves as far upwind as possible while still maintaining security of the area.

(1) On Formerly Used Defense Sites (FUDS), the UXO team will notify the local Point of Contact (POC) designated in the Work Plan. The local POC will facilitate Explosives Ordnance Disposal (EOD) response and two personnel will secure the site until EOD's arrival. If the local POC designated in the Work Plan is not the local law enforcement agency, the local POC will inform the local law enforcement agency of the discovery. The EOD unit will notify the Technical Escort Unit (TEU) and secure the area until TEU's arrival. After notifying the local law enforcement agencies, the local POC will notify the USAESCH Safety Office to inform them of the actions taken.

(2) On active installations, the UXO team will normally notify the Range Control Officer, Facility Engineer, Post Headquarters, or POC designated in the Work Plan.

d. Avoid inhalation and skin contact with smoke, fumes, and vapors of explosives and other related hazardous materials.

e. Consider OE items, which may have been exposed to fire and detonation, as extremely hazardous. Chemical and physical changes may have occurred to the contents, which might render it more sensitive than its original state.

f. Do not rely on the color coding of OE for positive identification. Munitions having incomplete or improper color codes have been encountered.

g. Avoid approaching the forward area of an OE item until it can be determined whether or not the item contains a shaped charge. The explosive jet, which is formed during detonation, can be lethal at great distances. Assume that all shaped charge munitions contain a piezoelectric (PZ) fuzing system until identified. PZ fuzing is extremely sensitive. They can function at the slightest physical change and can remain hazardous for an indefinite period of time.

h. Approach an unfired rocket motor from the side at a 45-degree angle. Accidental ignition can cause a missile hazard and hot exhaust.

i. Do not expose unfired rocket motors to any Electromagnetic Radiation (EMR) sources.

j. Consider an emplaced landmine armed until proven otherwise. It may be intentionally booby-trapped to deceive.

(1) Many training mines contain spotting charges capable of inflicting serious injury.

(2) Exercise extreme care with wooden mines that have been buried for long periods of time. Certain soil conditions can cause the wood to deteriorate and any inadvertent movement or pressure may initiate the fuze.

k. Assume that practice OE contains a live charge until it can be determined otherwise. Expended pyrotechnic and practice devices can contain red or white phosphorus residue. Due to incomplete combustion, the phosphorous residue may re-ignite spontaneously if the crust is broken and exposed to air.

l. Do not approach a smoking white phosphorous (WP) munition. Burning WP may detonate the explosive burster charge at anytime.

m. Foreign ordnance was returned to the United States for exploitation and subsequent disposal. Every effort will be made to research the applicable documentation and publications prior to commencement of a project.

n. Anomaly Avoidance Operations. Anomaly Avoidance procedures are detailed in

- ETL 385-1-2, (Draft) Generic Scope of Work for Ordnance Avoidance Operations, August 1996, and

- Ordnance and Explosives (OE) Center of Expertise (CX) Interim Guidance Document 99-01, Unexploded Ordnance (UXO) Support for Other Activities, 5 February 1999.

  These documents can be located on the OE Home Page at:

  http://www.hnd.usace.army.mil/oew/policy/regpro.html.

CHAPTER 3
OE STORAGE

3-1. OE Storage. During OE projects, explosive storage falls into two categories, on-DOD installations and off-DOD installations.

a. On-DOD installations the provisions of DOD 6055.9 STD will be followed. Generally, the installation should have an explosive storage area that meets DOD standards. The permitting and compliance requirements are the responsibility of the installation. The compatibility of explosives found in Chapter 3, DOD 6055.9 STD will be followed. OE items awaiting final disposition will not be stored with other explosives. Storage of commercial explosives requires DOD hazard class storage compatibility group.

b. In the event the installation does not have an existing storage facility, the provisions of paragraph c, in this section, will apply.

c. Off-DOD installations, the contractor will be responsible for the construction of a temporary explosive storage area. This temporary storage area will meet all local, state, and 27 CFR, Bureau of Alcohol Tobacco and Firearms (BATF) requirements and as much of DOD 6055.9 STD as is practical to implement. The establishment of a temporary explosive storage area must meet the following requirements.

(1) The area will, if possible, meet the inhabited building and public traffic route distances specified in DOD 6055.9 STD. If the distances are less than required by the DOD guidance, a proposed barricading plan to protect the public from accidental detonation must be submitted and approved by the Huntsville Center's Engineering Directorate.

(2) Magazines must meet the requirements of the BATF regulations, and each magazine must have a Net Explosive Weight (NEW) established for the explosives to be stored.

(3) Each magazine must be grounded as specified in NFPA 780 and must meet the intermagazine distances as defined in the DOD guidance.

(4) A physical security survey will be conducted to determine if fencing or guards are required. This survey will be coordinated through local law enforcement agencies. Generally, a fence around the magazine is not needed IAW BATF regulations. However, it is the responsibility of the contractor for determining the degree of protection to prevent the theft of explosives and OE items.

(5) A fire plan for either on or off-installation explosive storage areas will be prepared and coordinated with the local fire department. All magazines will have placards IAW 27 CFR/ATF P 5400.7 or DOD 6055.9 STD.

CHAPTER 4
OE TRANSPORTATION

4-1. OE Transportation. In the event that OE items must be transported off-site, the provisions of 49 CFR, DA Pam 385-64 state and local laws will be followed. These additional considerations are provided for the safe transportation of OE items:

a. USACE contractors are prohibited from transporting OE off-site for destruction until the provisions of paragraph 1-9, TB 700-2 are followed.

b. Do not transport WP munitions unless they are immersed in water, mud or wet sand.

c. If loose pyrotechnic, tracer, flare or similar mixtures are to be transported, they will be placed in #10 mineral oil or equivalent to minimize the fire and explosion hazards.

d. Incendiary loaded munitions should be placed on a bed of sand and covered with sand to help control the burn if a fire should start.

e. If an unfired rocket motor must be transported, it will be positioned in the vehicle parallel to the rear axle. This will afford maximum protection for the personnel operating the vehicle.

f. If a base-ejection projectile must be transported to a disposal area, the base will be oriented in the vehicle so that it is parallel to the rear axle. This will afford maximum protection for the personnel operating the vehicle.

g. OE with exposed hazardous fillers such as High Explosive (HE), will be placed in appropriate containers with packing material to prevent migration of the hazardous fillers. Padding should be added to protect the exposed filler from heat, shock and friction.

CHAPTER 5
EXCLUSION ZONE OPERATIONS

5-1. Exclusion Zone Operations. On OE project sites, it is the responsibility of the contractor's UXO Safety Officer (UXOSO) to establish the exclusion zone for each UXO team. This exclusion zone should not be confused with the safe separation distance, which is maintained between teams.

a. The purpose of the exclusion zone is for the protection of non-essential project personnel and the public from blast overpressure and fragmentation hazards. There are two criteria for calculating exclusion zones;

(1) Intentional Detonations. When destroying ordnance, both the hazards from fragmentation and overpressure must be considered. The minimum separation distances in DOD 6055.9 STD will be used unless otherwise stated. The maximum fragmentation and overpressure distances may also be calculated IAW HNC-ED-CS-S-98-1, Methods for Predicting Primary Fragmentation Characteristics of Cased Munitions.

(2) Unintentional Detonations. If the identification of OE on an OE site is unknown, the minimum separation distance specified in DOD 6055.9 STD, Chapter 5, Paragraph C5.5.4, will be used to establish the exclusion zones. When the identification of OE items are known, the exclusion zones will be determined by the U.S. Army Engineering and Support Center, Huntsville, (USAESCH) Engineering Directorate using HNC-ED-CS-S-98-1.

b. When multiple teams are working on site, a safe separation distance will be established. The minimum distance maintained between teams will never be less than 200 feet or the K50 overpressure distance. The one that is greater will be used.

c. While OE operations are being conducted, only personnel essential for the operation will be allowed in the exclusion zone. When non-essential personnel enter the exclusion zone, all OE operations will cease. In addition to this work stoppage, the following actions will be accomplished:

(1) The individual(s) must receive a safety briefing and sign the visitor's log prior to entering the zone.

(2) The individual(s) will be escorted by a UXO qualified individual.

(3) All OE operations will cease within the radius of the exclusion zone for the areas to be visited.

d. All personnel working within the exclusion zone will comply with the following:

(1) There will be no smoking within the exclusion zone, except in areas designated by the UXOSO.

(2) There will be no open fires for heating or cooking (gas stoves, grills, etc.) within the exclusion zone, except where authorized by the UXOSO.

(3) During magnetometer operations, workers will have no metal parts in or on their shoes that would cause the magnetometer to present false indications.

CHAPTER 6
OE EXCAVATION OPERATIONS

6-1. OE Excavation Operations.

a. Hand excavation is the most reliable method for uncovering OE provided the item is near the surface. Hand excavation exposes personnel to the hazard of detonation for longer periods of time than any other method. Taking this into consideration, only UXO qualified personnel will be used to accomplish this task.

b. Earth-Moving Machinery (EMM) may be used to excavate overburden from suspected OE. EMM will not be used to excavate within 12 inches of a suspected OE. Once the EMM is within 12 inches of the OE, the excavation will be completed by hand excavation methods. Personnel who are not UXO qualified may operate EMM only when supervised by a UXO Technician III.

(1) If more than one EMM is to be used on site, the same minimum separation distances required for multiple work teams applies.

(2) EMM operations will be conducted within the guidelines of EM 385-1-1 and 29 CFR 1926 Subpart P.

c. Excavation operations, whether by hand or EMM, will employ a step down or offset access method. Under no circumstances will any excavation be made directly over the suspected OE.

CHAPTER 7
OE DISPOSAL OPERATIONS

7-1. OE Disposal Operations. All demolition operations will be conducted IAW TM 60A 1-1-31 and the USAESCH Procedures for Demolition of Multiple Rounds on OE Sites. No other publications are to be used for these operations.

a. As a general rule, all demolition operations will be accomplished by electrical means to assure maximum safety. There are exceptions to this requirement in situations where static electricity or Electromagnetic Radiation (EMR) hazards are present. Unintentional detonations can occur because of these induced currents (or lightning). The following precautions from TM 9-1375-213-12 are to be followed.

(1) Premature detonation of electric blasting caps by induced current from radio frequency (RF) signals is possible. Refer to TM 9-1375-213-12 that shows the minimum safe distance in respect to transmitter power and indicates distance beyond which it is safe to conduct electric blasting even under the most adverse conditions.

(2) Lightning is a hazard to both electric and non-electric blasting caps. A strike or a nearby miss is almost certain to initiate either type of cap or other sensitive explosive elements such as caps in delay detonators. Lightning strikes, even at distant locations, may cause extremely high local earth currents that may initiate electrical firing circuits. Effects of remote lightning strikes are multiplied by proximity to conducting elements, such as those found in buildings, fences, railroads, bridges, streams, and underground cables or conduits. The only safe procedure is to suspend all blasting activities during electrical storms and when one is impending.

(3) Electric power lines also pose a hazard for electric initiating systems. It is recommended that any demolition operation closer than 155 meters to electric power lines be done with a non-electric system such as NON-EL. This non-electric firing system provides the same amount of safety and control as electrical firing systems, but without the interference of EMR and static electricity hazards.

(4) Provisions of paragraph 1-9, TB 700-2 will be fully complied with prior to USACE contractors transporting OE off-site for destruction.

a. Only serviceable condition explosive material will be used for disposal operations.

b. The only acceptable disposal method is the one stated in the appropriate TM60 Series manual for specific ordnance types. Any commercial explosives being used will be equivalent to the military explosive required for the disposal operation.

NOTE

Oil well perforators/conventional shape charges are not acceptable substitutes for bulk explosives and will not be used for disposal operations except where applicable, refer to TM 60A-2-1-51. Otherwise these items are to be used only for the venting OE items prior to their turn-in as scrap.

c. If a situation dictates, protective measures to reduce shock, blast overpressure, and fragmentation will be taken. The USAESCH Engineering Directorate will assist in any design work and will review and approve all proposed protective works. As a minimum requirement all demolition shots will be tamped with clean earth or sand. IAW DOD 6055.9 STD the following separation distances will be observed unless otherwise directed by the Engineering Directorate.

(1) Minimum separation distance for non-fragmenting explosive materials will be no less than 1250 feet.

(2) Minimum separation distance for fragmenting explosive ordnance will be no less than 2500 feet. For bombs and projectiles with a diameter of 5 inches or greater, use a minimum distance of 4000 feet.

(3) Ordnance items with lifting lugs, strong backs, base plates, etc., will be oriented away from personnel, as fragments from these items tends to travel farther than normal.

d. Once demolition operations are completed, a thorough search of the demolition area will be conducted with a magnetometer to ensure a complete disposal was accomplished.

g. Inert ordnance will not be disposed of for scrap until the internal fillers/voids have been exposed and unconfined. Heat generated during the reclamation process can cause the inert fillers, moisture or air to expand and burst the sealed casings. In this situation, Oil Well Perforators can be used for venting these ordnance items which require demilitarization.

Appendix A

27 CFR 55	Alcohol, Tobacco Products and Firearms
29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
49 CFR 100-199	Hazardous Materials Transportation
DOD 6055.9 STD	DOD Ammunition and Explosives Safety Standards, August 1997
AR 190- 11	Physical Security
DA PAM 385-64	Ammunition and Explosives Safety Standards
TM 9-1375-213-12	Operators and Organizational Maintenance Manual; Demolition Materials
TM 60A 1-1-22	EOD Procedures /General EOD Safety Procedures, April 1991
TM 60A 1-1-31	EOD Procedures/General Information on EOD Disposal Procedures, May 1994
EM 385-1-1	USACE Safety and Health Requirements Manual, September 1996
USAESCH	Procedures for Demolition of Multiple Rounds (consolidated shots) on Ordnance and Explosive Sites, August 1998
ER 1110-1-8153	Ordnance and Explosives Response, 19 May 1999
EP 1110-1-18	Ordnance and Explosives Response, 24 April 2000
ATF P 5400.7	ATF Explosives Laws and Regulations, June 1990
HNC-ED-CS-S 98-1	Methods for Predicting Primary Fragmentation Characteristics of Cased Explosives, January 1998
HNC-ED-CS-S 98-2	Methods for Calculating Range to No More Than One Hazardous Fragment Per 600 Square Feet on OE Sites, January 1998
HNC-ED-CS-S 96-8	Guide Selection and Siting of Barricades for Selected OE, September 1997

TABLE A-5: HAZARD ANALYSIS

PROJECT NAME: St. Juliens Creek, Chesapeake, VA
CUSTOMER: CH2M HILL
ACTIVITY: OE/UXO Avoidance and Construction Support Services

PRINCIPLE STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
Locate, identify and mark UXO and anomalies.	Potential OE; unplanned detonation. Wildlife, insects. Toxic Plants. Slips, trips, falls. Heat/Cold Stress. Sunburn/Windburn. Unauthorized personnel.	UXO safety precautions IAW the WP and SSHP. UXO qualified personnel will accompany all non-UXO qualified personnel. Establish an EZ for site control. Check for subsurface anomalies prior to driving stakes or excavating samples Do Not handle UXOs. Mark UXO IAW the WP. Do not subject UXO to heat, shock or friction. Avoid toxic plants. Do not handle wildlife. Wear Level D PPE. Use insect repellent/barrier cream as necessary. Be alert, watch for slip/trip/fall hazards. Dress for the weather. Use Buddy system monitoring. Use Sunscreen as necessary. No Smoking except in designated areas.
EQUIPMENT TO BE USED	**INSPECTION REQUIREMENTS**	**TRAINING REQUIREMENTS**
Vehicle. First Aid kit. Fire extinguisher. Communications equipment. Hand tools. Flagging material.	Daily PMCS vehicle. Daily check of First Aid Kit contents. Check extinguisher. Calibration checks. Communications check.	Current state driver license. OSHA Qualifications. UXO personnel are EOD trained. Safe work practices and hazard protection IAW the SSHP. Daily tailgate safety briefings to include evacuation and notification procedures. UXO identification and safety precautions training for non-UXO trained personnel.

A-47 ATTACHMENT 1: CEHNC SAFETY CONCEPTS

The following pages contain the U.S. Army Engineering and Support Center, Huntsville, Basic Safety Concepts and Considerations for Ordnance and Explosives Operations, dated 22 May 2000.

APPENDIX B: FORMS

This appendix contains general preprinted forms that USA may use to record the operations associated with this work plan. This appendix contains the following forms:

UXO Operations:

- Daily Report of OE Operations
- Safety Meeting Attendance Log
- Safety Inspections Log
- Quality Control Log
- Site Visitors Log

DAILY OE OPERATIONS SUMMARY

DATE: ____/____/____ **PAGE ___ OF ___ PAGES**

SITE / LOCATION: _____

1. **WORK SUMMARY**

a. Work Accomplished:	Number Completed	Total
(1) Survey	_____	_____
(2) Preparation	_____	_____
(3) Mag & Flag	_____	_____
(4) Geophysical	_____	_____
(5) Intrusive	_____	_____
(6) Quality Control	_____	_____
(7) Quality Assurance	_____	_____

b. **Discrepancies:** _____

_____

_____

_____

c. Inspection Results:	Pass	Fail
(1) Quality Control	_____	_____
(2) Quality Assurance	_____	_____
(3) Safety	_____	_____

2. **INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE: _____**

_____

_____

_____

_____

Daily Operations Summary Con't. **PAGE ___ OF ___ PAGES**

3. UXO SUMMARY

a. UXO Located:

Type:	Quantity:	Total:	Remarks:

Daily Operations Summary Con't. **PAGE ___ of ___ PAGES**

b. Demolition Supplies Expended:

Type:	Quantity:	Total:	Remarks:

c. Scrap Generation / Deposition:

Type:	Quantity:	Total:	Weight:	Total:

Daily Operations Summary Con't. **PAGE ___ of ___ PAGES**

4. **Utilization**

   a. **Daily Man-hours:**

Labor Category:	Task:	M/H Used Today:	M/H Remaining:	% M/H Remaining:	Remarks:
Project Manager					
SUXO					
UXO Supervisor					
UXO Specialist					
UXO Assistant					
Laborer					
Site Safety					
Admin Personnel					
Visitor					
Sub-Contractor Personnel (List by Category)					

Daily Operations Summary Con't. **PAGE ___ of ___ PAGES**

b. **Daily Equipment:**

Description:	Task:	Hours Used:	Hours Remaining:	% Hours Remaining:	Remarks:
Schonstedt					
Geophysical					
Truck (Heavy)					
Truck (Light)					
Radio, Base					
Radio, Handheld					
Backhoe					
Front-end Loader					
Rental Car					
GPS					
Weed eater					
Chainsaw					
Chipper					

5. **Operational Remarks:**

_____
_____
_____
_____
_____
_____

6. **Signature / Date:**

_____ **Date:** ____/____/____
SUXO / Project Manager

USA Environmental, Inc.

SAFETY MEETING/TRAINING RECORD

DATE: _____/_____/_____ **TIME:** _____ AM PM

LOCATION/SITE: _____

1. Reason for Meeting/Training: (Check all that apply)	
	Daily Safety Meeting/Training
	Initial Site Safety Meeting/Training
	New Task Briefing
	Periodic Safety Meeting/Training
	New Site Procedures
	New Site Information
	Periodic Review of Site Information
	Other (Explain):

2. Personnel Attending Meeting/Training:

Name	Signature	Company

USA Environmental Inc.

Safety Meeting/Training Record Con't:

3. Topics Covered (Check all that apply)			
	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response Plan
	Site Characterization		Hazard Communication
	Biological Hazard(s)		On-Site Emergency
	Chemical Hazard(s)		On-Site Injuries/Illnesses
	Physical Hazard(s)		Evacuation Procedures
	Heat Stress		Rally Point(s)
	Cold Stress		Emergency Communication
	Site Control		Directions to Medical Facility
	Work and Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring Program
	Air monitoring		Specific Task Training
	Safe Work Practices		Confined Spaces
	Engineering Controls and Equipment		Heavy Equipment
	Spill Containment Procedures		Other: (Specify)

4. Remarks:

5. **Verification:**
I certify that the personnel listed above on this record received the Information and/or Training described as indicated. Personnel not attending this meeting/training will receive said information/training prior to commencing their assigned duties.

_____
Site Safety Officer

Date: ____/____/____

SAFETY INSPECTION REPORT

USA Environmental, Inc.

Site / Location: _____ Date: ____/____/____

Type of Inspection: ____ Daily ____ Weekly ____ Re-Inspection ____ Other

Type of Operation Inspected:

_____

_____

Equipment Inspected: (Specify if Safety or Operational in Nature)

_____

_____

_____

_____

_____

Comments:

_____

_____

_____

_____

Deficiencies Found or Noted:

_____

_____

_____

Corrective Action:

_____

_____

_____

Re-Inspection Required: ____ Yes ____ No If Yes, Date of Re-Inspection: ____/____/___

Signature:_____

_____

Site Safety Officer

SUXO / Project Manager

* Copy to Supervisor if Deficiencies or Corrective Action were found, noted or deemed necessary.

USA Environmental, Inc.

DAILY QUALITY CONTROL REPORT

Date: ____/____/____ Contract #: _____ **Task Order #:** _____

Site/Location : _____

Weather: _____ Temperature: _____ Rainfall: _____

1. Preparatory Inspection: _____

_____

_____

Results: _____

2. QC Audits Performed

a. Operations: _____

_____

_____

Results: _____

b. Safety: _____

_____

_____

Results: _____

c. Administrative: _____

_____

_____

Results: _____

d. Equipment: _____

_____

_____

_____

Results: _____

_____

Daily Quality Control Report Con't:

3. QC Performed (Grids)

Number of Grids QC'd: _____ Results: _____ # Pass _____ # Fail

Comments: _____

_____

_____

_____

4. Follow Up Inspections and Results

Section(s): _____

_____

_____

Results: _____

5. Instructions Received: _____

_____

_____

_____

_____

Remarks: _____

_____

_____

_____

QC Signature: _____ **Date:** ____/____/____

Printed Name: _____

SITE VISITOR'S LOG

CONTRACT NO._____
DELIVERY ORDER NO._____
LOCATION_____

DATE	NAME	COMPANY	SAFETY BRIEF: Y/N	US CITIZEN Y/N	TIME		REMARK
					IN	OUT	

SITE SPECIFIC SAFETY AND HEALTH PLAN (SSHP) ACKNOWLEDGEMENT

I have read, understand, and agree to abide by the provisions of this Site Specific Safety and Health Plan prepared by USA Environmental, Inc. Failure to comply with these provisions may lead to disciplinary action and/or my dismissal from the work site.

Printed Name	Signature	Employee Number	Date