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**Human Factors Applications, Inc.**  
ORDNANCE & EXPLOSIVE WASTE REMEDIATION  
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ORDNANCE REMOVAL ACTION

**DOLLY SODS  
WORK PLAN**

**CONTRACT NUMBER:** DACA87-94-D-0019  
**DELIVERY ORDER:** #0020  
**CLIENT NAME:** U.S. Army Corps of Engineers  
**PRIME CONTRACTOR:** Human Factors Applications, Inc.  
**PROJECT TITLE:** Ordnance Removal Action  
**PROJECT LOCATION:** Dolly Sods, West Virginia

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# **CHAPTER 1**

## **OVERVIEW**

### **1.1 INTRODUCTION**

**1.1.1** Human Factors Applications, Inc. (HFA) is under contract to the U. S. Army Engineering and Support Center (CEHNC), Huntsville, Alabama, to provide unexploded ordnance (UXO) services for the former West Virginia Maneuver Area, located in the Dolly Sods Wilderness. [See Scope of Work, Appendix A]. This Work Plan (WP) and Site-Specific Health and Safety Plan (SSHP) [see Appendix B] describe the overall scope of the project, the general methodology to be used, and the specific UXO site requirements. The work required under this Scope of Work (SOW) falls under the Defense Environmental Restoration Program - Formerly Used Defense Sites (DERP-FUDS). Ordnance and explosives (OE) exist on property formerly owned by the Department of the Army.

**1.1.2** Explosive ordnance is a safety hazard and constitutes an imminent and substantial endangerment to site personnel and the local populace. During this removal action, it is the Government's intent that Human Factors Applications, Inc. destroy, by on-site detonation, all Unexploded Ordnance (UXO) encountered. This action will be performed according to (IAW) the Comprehensive Environment Response, Compensation, and Liability Act (CERCLA), Section 104 and the National Contingency Plan (NCP), Section 300.400; therefore, permits for on-site disposal are not required. This ordnance removal action does not fall under the RCRA hazardous waste management requirements.

**1.1.3** OE is classified as hazardous waste, thus, the applicable provisions of 29 CFR 1910.120 apply.

**1.1.4** Due to the inherent risk in this type of operation, HFA will limit its workers to a 40-hour work week: either five 8-hour days or four 10-hour days. UXO personnel shall not perform UXO-related tasks more than 10 hours per day.

## **CHAPTER 2**

### **BACKGROUND**

**2.1** The 10,215 acres Dolly Sods Wilderness is located within the former West Virginia Maneuver Area. Beginning in August of 1943, the Army used these 10,215 acres for artillery and mortar training and a maneuver area. This portion of the former West Virginia Maneuver Area is now frequently used for hiking, fishing, camping, picnics, and hunting. It is estimated that between 45,000 and 76,000 people visit Dolly Sods Wilderness annually. The terrain is undeveloped, mountainous, rocky, and rugged. Portions are covered with dense brush and are heavily vegetated. Plant and animal life are comparable to northern Canada. Endangered species include the Cheat Mountain Salamander. There are also areas of archaeological significance.

**2.2** This removal action pertains to 20.89 miles of trails and 101 campsites commonly used in the Dolly Sods Wilderness as designated by the U.S. Forest Service. The total acreage to be cleared of surface and subsurface OE is approximately 113.9 acres. This is further divided into 111.9 acres for trails and 2.0 acres for campsites.

#### **2.3 OBJECTIVE**

**2.3.1** Human Factors Applications will safely locate, recover, and dispose of all surface and subsurface ordnance and explosives (OE) to a depth of one foot beneath all trails (to include a width of 20 feet on each side of the trails) and to a depth of four feet beneath designated camping areas at this site.

**2.3.2** HFA has prepared this Work Plan and Site Specific Safety & Health Plan to accomplish that objective. We will investigate, identify, and dispose of all OE and OE related scrap located during the project. HFA will perform surface and subsurface search of each area shown in the SOW and dispose of all UXO located. Upon completion of the project, HFA will submit a final report that details the events and documents, the areas cleared, and significant findings.

**2.4** The site map located at Appendix C generally describes the location of each site, and shows Dolly Sods general location.

## CHAPTER 3

### SITE CONDITION

**3.1** The 10,215 acres Dolly Sods Wilderness is located within the former West Virginia Maneuver Area. Beginning in August of 1943, the Army used these 10,215 acres for artillery and mortar training and a maneuver area. The former West Virginia Maneuver Area is now frequently used for hiking, fishing, camping, picnics, and hunting. It is estimated that between 45,000 and 76,000 people visit Dolly Sods Wilderness annually.

**3.2** The terrain is undeveloped, mountainous, rocky, and rugged. Portions are covered with dense brush and are heavily vegetated. Plant and animal life are comparable to northern Canada. Endangered species include the Cheat Mountain Salamander. There are also areas of archaeological significance. Iron bearing rock was discovered in almost every area and was common throughout the Dolly Sods Wilderness Area. Non UXO materials were generally concentrated in areas where past human activities had occurred and where present human activities currently take place. Ordnance was found in northern Dolly Sods, in the Breathed Mountain region, and in the Red Creek floodplain next to Breathed Mountain.

**3.3** Because the site is isolated and the use of motorized equipment is not authorized, emergency support services will not be immediately available. Adequate support is available from several local jurisdictions. The Davis Memorial Hospital, in Elkins will be the primary emergency response for accident victims. The U. S. Forest Service will provide fire fighting and law enforcement support within the Wilderness Area. The Grant County Emergency Communication Center will be relied upon to coordinate emergency support if in the event primary sources are unable to respond.

**3.4** Each site is described in the following paragraphs: Figure 3-1 depicts the general form of the areas listed in paragraph 3.4.1 through 3.4.9. Campsites vary in size and the width of hiking trails vary from a narrow path to the width of a vehicle road bed. The trails will be cleared to a depth of one foot to include 20 feet on either side of the trail as terrain and vegetation permit. Each campsite will be subsurface cleared to a depth of 4 feet. Working in these areas requires close coordination between the on-site Forest Service representative and HFA's SUXOS. No brush and tree cutting, trimming or clearance will be done on this site except as approved by Forest Service personnel. Areas where the brush is too thick to penetrate and efficiently sweep, will be left undone and appropriately marked on their respective grid sheets.

**3.4.1** Area 1. 4 campsite, 2.35 miles of trails: Total area acreage is 1,648. Maximum clearance acreage: 0.6 acre campsites; 12.8 acres trails.

**3.4.2** Area 2. 2 campsites, 1.05 miles of trails: Total area acreage is 735. Maximum clearance acreage: 0.03 acre campsites; 5.7 acres trails.

**3.4.3** Area 3. 1 campsite, 0.44 miles of trails: Total area acreage is 1.05. Maximum clearance acreage: 0.01 acre campsites; 2.4 acres trails.

**3.4.4** Area 4. 5 campsites, 1.63 miles of trails: Total area acreage is 767. Maximum clearance acreage 0.07 acres campsites; 8.9 acres trails.

**3.4.5** Area 5. 41 campsites, 7.88 miles of trails: Total area acreage is 1,565. Maximum clearance acreage: 0.60 acres campsites; 43 acres trails.

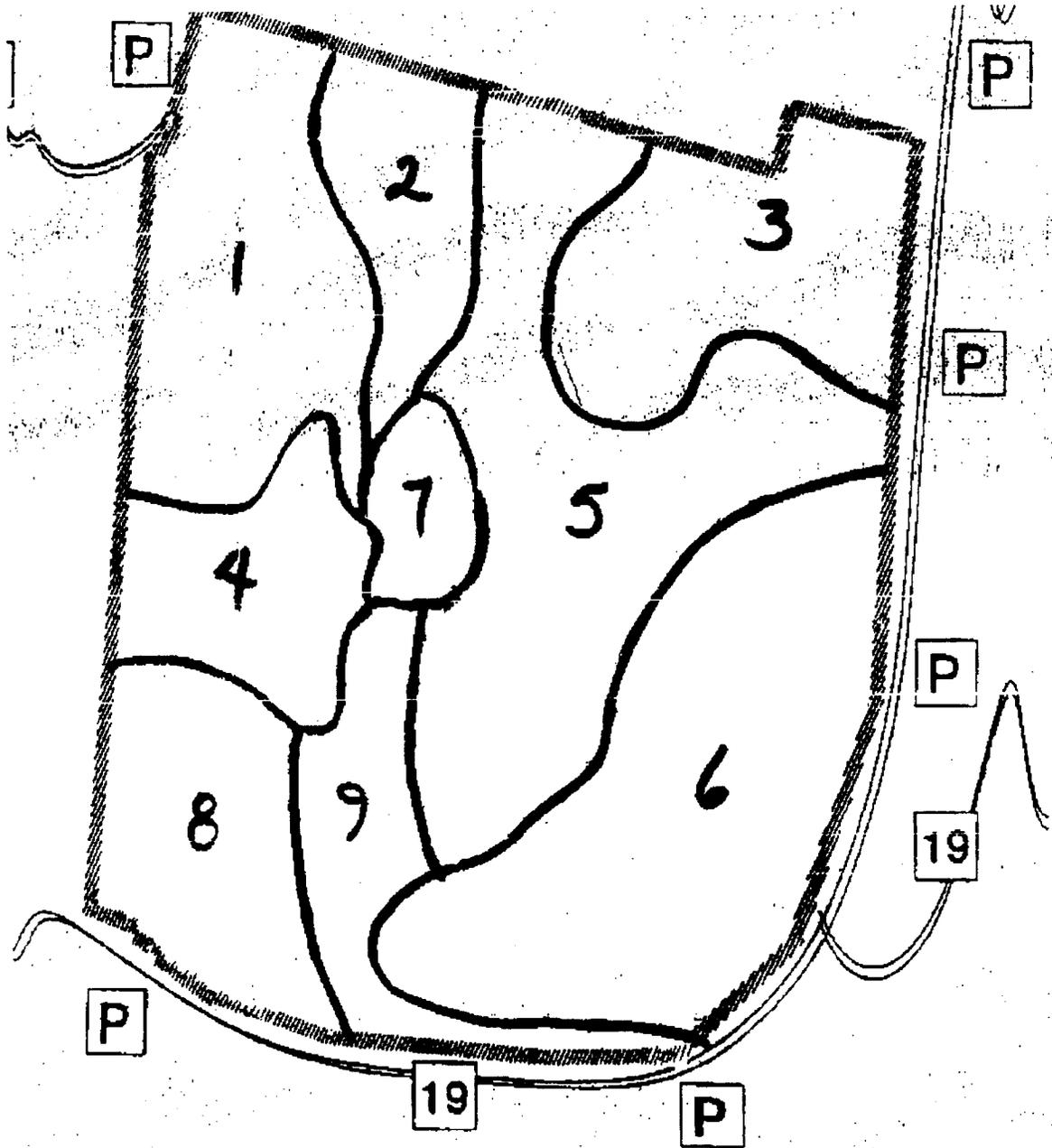
**3.4.6** Area 6. 21 campsites, 3.34 miles of trails: Total area acreage is 2,156. Maximum clearance acreage: 0.30 acres campsites; 18.2 acres trails.

**3.4.7** Area 7. 5 campsites, 0.69 miles of trails: Total area acreage is 282. Maximum clearance acreage: 0.07 acre campsites; 3.8 acres trails.

**3.4.8** Area 8. 15 campsites, 2.50 miles of trails: Total area acreage is 1,192. Maximum clearance acreage: 0.22 acres campsites; 13.6 acres trails.

**3.4.9** Area 9. 7 campsites, 1.01 miles of trails. Total area acreage is 819. Maximum clearance acreage: 0.1 acres campsites; 5.5 acres trails.

Figure 3-1



## CHAPTER 4

# UXO OPERATIONS PLAN

### 4.1 GENERAL SITE OPERATIONS

**4.1.1** All UXO operations will be performed in accordance with CEHNC's Basic Concepts & Safety Considerations for UXOs [see Appendix D].

**4.1.2** This work plan pertains to the clearance of 20.89 miles of trails and 101 campsites. A total of approximately 113.9 acres will be cleared. HFA will begin operations on the south end of Red Creek trail just inside the Wilderness Area according to agreements made between the CEHNC PM, Mr. Bill Sargent, and Forest Service representatives during the site visit. Priorities and the order of operations are subject to change. After the Red Creek trail is completed, the other areas will be completed in sequence beginning with Site 1. If the need arises to change priorities, the SUXOS will be notified in advance. Each designated site will receive an investigation and clearance as outlined in this work plan and Task 4 of the SOW. All subsurface anomalies will be excavated to a depth of **one foot** beneath and 20 feet to either side (measured from the centerline) of all trails. Additionally, all subsurface anomalies will be investigated to a depth of **four feet** beneath all inventoried camping areas. Deeper excavations will be undertaken only with the approval of the CEHNC on site Safety Specialist.

**4.1.3** The purpose of this project is to locate, excavate, and remove or destroy all UXO discovered in the project area. Each grid in the subsurface area will be swept with a Schonstedt Magnetometer and 100% of the contacts will be excavated or identified. All excavations of anomalies will be completed by hand. All UXO discovered, will be detonated in place or within the site where they were found, (IAW Instructions for Protection of the Cheat Mountain Salamander (CMS)).

**4.1.4** Potential exposure to CWM materials on this site is not anticipated. If HFA UXO personnel encounter any UXO that cannot be positively identified as a conventional UXO, HFA personnel will withdraw from the site and request assistance from the nearest Technical Escort Unit (TEU) through the onsite CEHNC Safety Specialist. HFA personnel will take emergency, non-invasive actions such as covering the item with plastic sheeting, and securing the area until Forest Service personnel and TEU can establish the appropriate exclusion and safety zones.

### 4.2 DETERMINING BOUNDARIES & ESTABLISHING SEARCH GRIDS/LANES

#### 4.2.1 SITE SPECIFIC OPERATIONS

**4.2.1.1** The general site boundaries have been determined by the information collected during the previous Sampling Action, the Archives Search Report, and the SOW.

**4.2.1.2** Individual grids will be established as outlined in Chapter 7 of this WP. The gridding team will be responsible for locating and establishing the corners of each grid. The UXO team assigned

to search and clear a grid will be responsible for establishing search lanes within each grid. All grids will be laid out with five feet search lanes, oriented to follow the trail's course. The lower left corner stake will be conspicuously painted and marked with that grid's identification number. Grids in danger areas which permit north to south orientation and larger grids, will have grids so established.

**4.2.1.3** The team's UXO Supervisor (UXOS) will be responsible for plotting and recording UXO and other significant contacts located within each grid. Significant contacts/points are identified and explained in para 7.3.4. All contacts will be plotted using the Southwest Corner Stake as the prime reference point. All plots will be recorded on the HFA UXO Grid Location Form [see *Appendix E*]. An XYZ coordinate system will be used to plot each contact. The Y coordinate will be measured from the southern boundary line of the grid in a northerly direction, and the X coordinate will be measured from western boundary in an easterly direction. The Z coordinate will be recorded at the depth that the contact was found.

**4.2.1.4** If a UXO is located and later detonated in place, the UXOS will show that the UXO was detonated at that point on the grid sheet.

**4.2.1.5** Because of the very long walking distances to and from the work area(s), a dedicated effort will be made to schedule clearance operations in a way that will reduce "backtracking" to an absolute minimum.

**4.2.1.6** To simplify the efficient scheduling of work efforts, a weekly planning meeting will be conducted with Forest Service representatives attending.

**4.2.1.7** A Forest Service representative will be on site at all times during clearance operations. This representative will, for the most part, be working with the SUXOS or SSO well ahead of clearance teams, marking the boundaries of campsites and culturally significant areas.

**4.2.1.8** Due care will be exercised while driving on Forest Service roads during the winter months. Forest Service roads are not plowed during the snow season.

#### **4.2.2 UXO SITE OPERATIONS**

**4.2.2.1** The order of site operations, the location, and boundaries of each site were determined by the CEHNC, Forest Service representatives, and information gained during the site visit. The order and priorities of operations may be modified by notice of the CEHNC PM, his representative, or by proper Forest Service officials.

**4.2.2.2** **The Dolly Sods Wilderness will not be closed during UXO/OE operations. Trails and/or portions of trails will be posted and blocked as appropriate, during clearance operations to limit public access. A Maximum Creditable Event (MCE) will be based upon an 4.2" mortar which is 944 feet. If an item larger than a 4.2" mortar is discovered, the MCE will be adjusted accordingly. Signs and barricades will be placed at trail heads, and trails will be closed during OE removal.**

#### **4.2.2.3 Areas.**

**4.2.2.3.1** Area 1 consists of four campsites and 2.35 miles of trails. Maximum clearance acreage: 13.4

**4.2.2.3.2** Area 2 consists of two campsites and 1.05 miles of trails. Maximum clearance acreage: 5.73

**4.2.2.3.3** Area 3 consists of one campsite and .44 miles of trails. Maximum clearance acreage: 2.41

**4.2.2.3.4** Area 4 consists of five campsites and 1.63 miles of trails. Maximum clearance acreage: 8.97

**4.2.2.3.5** Area 5 consists of 41 campsites and 7.88 miles of trails. Maximum clearance acreage: 43.6

**4.2.2.3.6** Area 6 consists of 21 campsites and 3.34 miles of trails. Maximum clearance acreage: 18.5

**4.2.2.3.7** Area 7 consists of five campsites and .69 miles of trails. Maximum clearance acreage: 3.87

**4.2.2.3.8** Area 8 consists of 15 campsites and 2.50 miles of trails. Maximum clearance acreage : 13.82

**4.2.2.3.9** Area 9 consists of seven campsites and 1.01 miles of trails. Total clearance acreage : 5.6.

#### **4.2.2.4 General Site Operations**

**4.2.2.4.1** HFA will establish temporary control based on the data provided by CEHNC. This control will be used by HFA personnel to lay out and establish the grid network. The number and locations of the control will be determined by the size and shape of the site.

**4.2.2.4.2** Grids will be established before specific site clearance operations. Grids will generally be 100ft X 200ft, but the size and shape may be altered by the SUXOS to best fit the area being investigated. For trails, a 40 ft X 200 ft grid will be used. The 200 foot leg of the grid will be laid out along the axis of the trail with the centerline such that 20 feet of the base leg lie on each side of the trail centerline. The grids will be identified by the trail name and consecutively numbered starting with the first grid starting at the mouth of the trail entering into the wilderness area. The grid stake anchoring the left corner of the base leg will be designated the base stake.

**4.2.2.4.3** No trees, brush or any other type of vegetation will be cut or *trimmed* within the Dolly

Sods Wilderness Area except as approved by Forest Service personnel.

**4.2.2.4.4** No spray paint of any kind will be allowed within the Dolly Sods Wilderness Area.

**4.2.2.4.5** Grid layout for the trails and campsites will be irregular and sized to fit each specific location. Subsurface removal locations will be marked with red flags or flagging tape at intervals that clearly indicate the area to be cleared. They will not be removed until the area has received a satisfactory QC and QA Check.

### **4.3 SEARCH ACTIVITIES**

#### **4.3.1 SURFACE SEARCHES**

**4.3.1.1** Surface searches are necessary if subsurface magnetometer searches are to be effective. Surface searches are normally conducted simultaneously with subsurface operations; however, if a site or grid is heavily contaminated with surface metallic debris, removal of the surface debris will be accomplished first.

#### **4.3.2 SUBSURFACE SEARCHES**

**4.3.2.1** All grids in the areas designated for subsurface removal will receive a 100% subsurface search using government furnished Schonstedt Magnetometers. All subsurface anomalies will be excavated, classified, and identified if possible. Their positions will be recorded as outlined in Chapter 7. Anomalies identified as UXO requiring in place destruction will be marked with red and yellow flags for destruction at the end of the day.

**4.3.2.2** Grid search lanes will be established in a north/south direction whenever possible. Sweep lanes will be marked with 1/4 inch line and will be no wider than five feet. Each lane will be swept as described above.

**4.3.2.3** The UXOS will record the X, Y and Z coordinates of all explosive ordnance located in each grid. Additionally, the locations of all CMS undocumented, archaeological, and cultural sites will be plotted.

**4.3.2.4** No trees, brush, or other vegetation will be cut or *trimmed* within the Dolly Sods Wilderness Area except as approved by Forest Service personnel. This is a strict rule laid down by the US Forest Service.

**4.3.2.5** All subsurface searches will be conducted according to Operational Instructions for protection of the Cheat Mountain Salamander (CMS ) in Chapter 8.

#### **4.3.3 RECORDING SITE DATA**

**4.3.3.1** Each UXOS will provide a detailed accounting to the QC/Site Safety Officer of all ordnance, ammunition, explosive items, components, and scrap encountered in each grid. This

Location Form (grid sheet) shown in Appendix E.

**4.3.3.2** Completed grid sheets will be turned over to the QC/SSO at the end of each work day. The QC/SSO will verify the completeness of each grid sheet before it is transferred to the site data base. Any corrections or clarifications will be made then. The grid markers will not be removed until all grids have received a QC check by the HFA QC Officer, QA certification by the CEHNC on site, and QA/Safety Specialist.

#### **4.3.4 INTRUSIVE OPERATIONS**

**4.3.4.1** Excavations will only be performed by qualified UXO personnel. If the UXO Supervisor cannot immediately identify the UXO, he will request assistance from the QC/SSO.

**4.3.4.2** All intrusive operations will be accomplished according to Operational Instructions for protection of the Cheat Mountain Salamander (CMS) in Chapter 8. All artifacts will be returned to their original locations.

**4.3.4.3** Subsurface contacts will be uncovered by hand. If a contact proves to be non-UXO, it will be removed and the hole rechecked with a magnetometer. If the contact is UXO, it will be classified and identified. If the contact is an artifact, it will be returned to the hole. All holes will be refilled (IAW instructions for Protection of the Cheat Mountain Salamander in Chapter 8).

**4.3.4.4** If the UXO is safe to move, it may be moved by hand and consolidated with other UXO in the same grid for destruction. At no time will UXO be moved to or from any other area or grid.

**4.3.4.5** All unsafe to move UXO located, will be marked with crossed red and yellow flags, and destroyed in place. To conserve explosives and setup time if the UXO is safe to move, they may be consolidated within a grid for destruction. Because of the anticipated schedule, detonations may be scheduled late in the work day. Never will UXO remain over night unless appropriate security is posted.

#### **4.3.5 RESTRICTED AREAS**

**4.3.5.1** Restricted Areas will be established at each work site. Since the work sites are large and the boundaries are irregular, a single Restricted Area is impractical. The boundaries of the Restricted Area will change frequently, if not daily. The on site Forest Service persons' assistance will be sought if unauthorized persons enter the site and do not voluntarily leave the area.

**4.3.5.2** The Restricted Area will encompass the area of activity of each search team. The Restricted Area will be based upon the **maximum credible event**. Access to the site will be through the support zone at the site office. Only HFA UXO personnel and CEHNC Safety Representatives will be authorized to be within a Restricted Area during UXO and demolition operations. When non-UXO personnel are on site, they will be escorted by a UXO person. UXO operations will cease before non-UXO personnel are allowed into a Restricted Area. All persons

entering or leaving the site will do so through the site office, which is located at the Bell Knob Tower.

**4.3.5.3** At least a 200 feet separation will be maintained between teams during UXO operations. This separation distance may be increased if a UXO is located and requires greater separation distance.

#### **4.3.6 PERSONAL PROTECTIVE EQUIPMENT**

**4.3.6.1** Personal Protective Equipment (PPE) will be maintained at a level deemed appropriate to protect UXO personnel, CEHNC personnel, and other workers. Normal work clothing will be worn and it will include long trousers, shirts, leather gloves, leather work boots (w/o stealthiest), and safety sunglasses. A sturdy pair of hiking boots is recommended. A hat is optional but strongly recommended for protection from the sun. Hard hats are required if a potential head injury could result from an overhead hazard.

#### **4.3.7 SCRAP REMOVAL**

**4.3.7.1** Scrap removal is essential to successfully complete the subsurface magnetometer survey of each grid. Non UXO scrap will not be removed from any areas/grids. Scrap means metallic debris that is not contaminated with explosives. The scrap could be made up of UXO related material as long as:

**4.3.7.1.1** The case is vented and a mechanical rupture could not occur if the item were placed in a melting furnace. The item has been internally inspected to determine that it does not contain explosives or explosive residue.

**4.3.7.2** All scrap will be carefully inspected by the Search Team UXOS to ensure that it does not contain any explosives or explosive residue.

**4.3.7.3** UXO Scrap will be staged in an area designated by the SUXOS. The Search Team UXOS will estimate and record the weight of scrap for each grid.

**4.3.7.4** A final inspection of the scrap will be made by the SUXOS and the QC officer. Afterwards, the SUXOS will sign a certificate stating : "The property listed hereon has been inspected by me and, to the best of my knowledge and belief, contains no items of a dangerous nature." All material will be accounted for in the daily and weekly reports.

**4.3.7.5** All UXO related scrap will be inspected and vented if necessary. Arrangements will be made with a local scrap dealer to remove the scrap at no cost to the government. A DD Form 1348 will be used to document and account for all scrap turned in.

#### **4.3.8 TRANSPORTATION OF DEMOLITION MATERIALS**

**4.3.8.1** All movement of demolition explosives will be performed by either the SUXOS or a

**4.3.8.1** All movement of demolition explosives will be performed by either the SUXOS or a UXOS.

**4.3.8.2** Because all material must be hand carried, explosives will be carried into the site each day and staged at a predetermined location. When explosives are required, they will be brought to the detonation point by the SUXOS and the SSO. All HE will be separated and stored in temporary containers until needed. All unused explosives will be removed from the site at the end of each work day and stored in approved magazines at Bell Knob Tower.

**4.3.8.3** All demolition explosives and UXO will be inventoried and accounted for before performing any demolition operation.

**4.3.8.4** Explosives will be transported only on the designated routes.

**4.3.8.5** Blasting caps and demolition materials are placed in suitable, separate metal containers, separated and sand bagged, to ensure containment in case of premature functioning of blasting caps. The containers will remain closed always, unless actually using the materials.

**4.3.8.6** It will be necessary to hand carry demolition materials for long distances along trails. Due care must be exercised to prevent slips, trips, and falls. All demolition materials will be carried in padded knapsacks, haversacks, or packs. NONEL will be separated from other demolition materials during human or animal transport.

**4.3.8.7** All demolition materials will be located a minimum of 50 feet from work parties and break areas, but within sight at all times.

#### **4.3.9 STORAGE OF EXPLOSIVE AND DEMOLITION MATERIALS**

**4.3.9.1** All explosives and demolition materials will be stored in two portable type magazines located on US Forest Service land in the vicinity of Bell Knob Tower. **Magazine requirements/standards will be in accordance with the RASP (Appendix J).** The SUXOS will be responsible for the safe handling of all explosives.

**4.3.9.2** The US Forest Service gate on the access road will be locked **always**.

**4.3.9.3** The SUXOS will record usage data of explosives and the quantities of UXO destroyed in place. The SUXOS will record the location and type of UXO detonated in place for inclusion in the final report.

#### **4.3.10 DEMOLITION OPERATIONS**

**4.3.10.1** Demolition safety and operations will be conducted in accordance with the standard practices and procedures outlined in TM 60A 1-1-31 and the appropriate specific 60 Series EOD Publications. UXO will only be detonated after positive identification. NONEL procedures will be employed as the method of choice for all detonations.

**4.3.10.2** Demolition operations, if required, will take place each day, and all UXO will be disposed of on that day. No UXO will be allowed to remain in the project area overnight. If an event—such as inclement weather —prevents the destruction of any UXO, arrangements will be made to provide security for the site. The SUXOS is responsible for determining whether minimum safe conditions to conduct demolitions operations are met. The SUXOS will notify the US Forest Service representative in charge of the time and location of the UXO(s) to be destroyed. HFA personnel will assist by providing perimeter security if necessary.

### **4.3.10.3** Preparation Sequence

**4.3.10.3.1** The process outlined below will be used to assemble a NONEL firing system:

**4.3.10.3.1.1** -Test and maintain control of the NONEL firing device.

**4.3.10.3.1.2** -Lay out the NONEL shock cord.

**4.3.10.3.1.3** -Protect the NONEL detonator.

**4.3.10.3.1.4** -Prime the charge/s.

**4.3.10.3.1.5** -Connect the firing device to the shock tube.

### **4.3.10.3.2** Testing and Maintaining Control of the NONEL firing device

**4.3.10.3.2.1** The NONEL firing device (mushroom starter) will be inspected daily to insure that it is operating properly. The mushroom starter is a simple mechanical device with only two moving parts, the striker and a spring. Checking the starter requires that it be inspected to insure it is clean and operating freely.

**4.3.10.3.2.2** The NONEL starter is designed to use a Federal No. 209 Shot Shell primer or equivalent.

**4.3.10.3.2.3** Feed the NONEL through the upper hole in the safety ring on the starter base from the outside.

**4.3.10.3.2.4** Pull six to eight inches of slack through passing it over the rim of the safety ring and through the lower hole into the port in the barrel. Then pull the loop formed as tight as possible as shown in Fig 4-1.

**4.3.10.3.2.5** When the shot is ready and the area is clear, remove the striker from the receiver, place a shot shell primer in the receiver, and gently replace the striker. The spring will hold the striker in the ready position.

**4.3.10.3.2.6** To fire the shot, set the starter on the ground or other hard surface, and firmly strike the starter with your fist or foot.

**4.3.10.3.2.7** The SUXOS is responsible for maintaining control of the NONEL firing device at all times. This responsibility cannot be delegated.

#### **4.3.10.3.3 Laying Out the NONEL Shock Tube**

**4.3.10.3.3.1** After locating a safe firing area, the NONEL shock tube will be completely laid out. Care will be taken to prevent kinks or sharp bends in the shock tube.

**4.3.10.3.3.2** Personnel will not walk on or step over the shock tube.

**4.3.10.3.4** Protect the NONEL detonator.

**4.3.10.3.4.1** The NONEL detonator will be protected at all times prior to priming of the charge(s). Sand bags or cushioning material will be used for this purpose.

**4.3.10.3.5** Priming the charges / Returning to the firing point

**4.3.10.3.5.1** HFA will use jet perforators to detonate UXO. HFA UXO Specialists are experienced and knowledgeable in the use of these charges and have used them successfully during previous projects.

**4.3.10.3.5.2** The NONEL detonator will be connected to a detonating cord trunk line or ring main system.

**4.3.10.3.5.3** All personnel involved in the setup of the charge/s will return to the firing point.

**4.3.10.3.6** Initiating the NONEL firing system

**4.3.10.3.6.1** Control of the firing position will be maintained from this point on. Controlling the firing post will ensure that no one tampers with the shock tube or fires the charge prematurely.

**4.3.10.3.6.2** At this point the ignition system is complete. The NONEL firing device will not be connected until all personnel are accounted for and perimeter security is verified. The SUXOS or designated UXOS for that day's demolition activities will give the order to fire the charge(s) only after verification of perimeter security and all personnel are accounted for. A "loud fire in the hole" followed by a long blast on the air horn will precede the firing of the charge(s).

#### **4.3.10.4 Detonating UXO in Place**

**4.3.10.4.1** Detonations will be scheduled, if required, each day at the designated demolition time but not later than 1600 hours. All detonations will be conducted according to 60A1-1-31.

**4.3.10.4.2** Detonations will take place only after all unnecessary personnel have left the area and road guards have been posted.

**4.3.10.4.3** The composition of the Demolition Team will be decided by the SUXOS. The team will only be composed of qualified UXO personnel under the direct supervision of a UXOS who is the designated blaster. Additional Demolition Teams may be used at the discretion of the

SUXOS if there are large quantities of UXO to detonate.

**4.3.10.4.4** The remaining HFA UXO personnel may act as perimeter security as directed by the SUXOS.

**4.3.10.4.5** Notification of detonations will be made in accordance with the Standard Operating Procedures for Notification of UXO Detonations [*see Appendix F*].

**4.3.10.4.6** During detonations, a designated project vehicle will remain as close to the safe area as possible, to provide emergency support for the demolition team.

**4.3.10.4.7** The Demolition Team, SUXOS, QC, SSO, and the CEHNC Safety Specialist will be permitted in the area where charges are being assembled and demolition operations are being conducted. However, all of the above authorized personnel should not be in the demolition operations area at the same time.

**4.3.10.4.8** All demolition materials will be accounted for by the UXOS and reported to the SUXOS. Only the amount required to complete the day's operations will be drawn from the bunkers and transported to the site.

**4.3.10.4.9** The area where demolition operations are being conducted will remain secured until the "all clear" is given by the SUXOS or SSO.

**4.3.10.4.10** After each detonation, the detonation points will be inspected by the UXOS and the SUXOS; or SSO to ensure that a misfire, low order, or a kick out has not occurred. The "all clear" is sounded by two long blasts of an air horn.

**4.3.10.4.11** All charges will be initiated with NONEL. Detonating cord trunk and branch lines will be used to link multiple shots.

#### **4.3.10.5 Misfire Procedures**

**4.3.10.5.1** According to 29 CFR 1910-109 (e), (4), vi, EM 385-1-1 §29, and 60A 1-1-31, if a misfire occurs, the following general procedures will be strictly followed:

**4.3.10.5.1.1** The SUXOS will be notified of the time of the suspected misfire, and

**4.3.10.5.1.2** The SUXOS will notify the HFA Project Manager (PM), if on site, and the CEHNC Safety Specialist. All other personnel will be notified of the event via radio, or by three short blasts of an air horn. All persons are instructed to hold their positions until the "all clear" is given. The circumstances surrounding the misfire will be included in the sites Daily Journal [*see Appendix G HFA Forms*].

**4.3.10.5.2** NONEL misfire Procedures (shock tube failed to function)

**4.3.10.5.2.1** Another attempt will be made to fire the shot. If a secondary firing system is available for use it may be employed.

**4.3.10.5.2.2** The NONEL firing device will be checked and reloaded with a new primer.

**4.3.10.5.2.3** The shock tube will be re-attached to the firing device. Another attempt will be made to fire the charge(s).

**4.3.10.5.2.4** Thirty minutes will lapse before the downrange inspection of a NONEL misfire. The entire system will be checked for breaks. If it is suspected that the NONEL system is at fault, no attempt will be made to remove or handle the NONEL detonator. A new charge will be assembled and placed next to the misfired charge and detonated.

#### **4.3.10.5.3 Detonating Cord Misfires**

**4.3.10.5.3.1** A new NONEL detonating system will be attached to the remaining detonating cord, with care taken to fasten it properly, and the original charge will be detonated.

**4.3.10.5.3.2** Branch lines will be treated in the same manner as noted above.

**4.3.10.5.3.3** If detonating cord leading to the charge detonates but fails to function, the following actions will be taken:

**4.3.10.5.3.3.1** Investigation will not occur until 30 minutes after the charges have stopped burning.

**4.3.10.5.3.3.2** The charge will be re-primed and another attempt will be made to detonate the charge.

**4.3.10.5.3.3.3** Scattered charges that do not contain blasting caps or detonators may be collected.

#### **4.4 NOTIFICATION**

**4.4.1** Notification will take place as outlined in the Standard Operating Procedures for Notification of UXO Operations [see Appendix F].

## **CHAPTER 5**

# **TECHNICAL & MANAGEMENT PLAN**

### **5.1 APPROACH, METHODS, AND OPERATIONAL PROCEDURES**

**5.1.1** All UXO removal actions and operations will be performed according to this WP, the SOW [*see Appendix A* ], the SSHP [*see Appendix B*], and CEHNC's Safety Concepts & Basic Considerations for UXOs [*see Appendix D* ].

**5.1.2** UXO detection, identification, and disposal will be according to Chapter 4 of this Work Plan.

**5.1.3** A systematic search of the 9 areas identified in the SOW will be performed by laying out a grid network and documenting the search, location, QC, and QA of each grid.

**5.1.4** The subsurface removal grids/areas will be investigated using ferrous magnetic locators. UXO Teams will then excavate and determine the identity of each subsurface anomaly. All UXO will be detonated in place. All other UXO scrap and UXO related material detected to be free of explosive residue will be vented if required and turned over to the DRMO at Letterkenny Army Depot, PA. or to a local commercial scrap dealer, at no charge to the government.

**5.1.5** All UXO located in each grid will be plotted and recorded by the UXOS. Each day's data will be inspected by the QC officer, processed in the site's data base, and then plotted on the sites digital map. Daily reports will be generated from the data base by the QC officer and provided to the SUXOS.

**5.1.6** A weekly meeting will be held, at which the following weeks' work schedule will be reviewed and discussed with the Forest Service Representative. Locations of work will be discussed in detail and visited if necessary. Planned or necessary trail or area closures will be planned and published.

### **5.2 MOBILIZATION, DEMOBILIZATION AND HOME LEAVE**

#### **5.2.1 MOBILIZATION**

**5.2.2** Because the work site at Dolly Sods is isolated, rental and leased equipment must come from distant sources. HFA anticipates an early mobilization of the SUXOS, SSO, QC, and one UXO Team. This team will:

**5.2.2.1** Set up the site.

**5.2.2.2** Receive and prepare equipment.

**5.2.2.3** Install magazines and lighting protection systems.

**5.2.2.4** Liaison with emergency support agencies.

#### **5.2.2.5 Test communications.**

### **5.2.3 HOME LEAVE**

**5.2.3.1** If the projects begins as anticipated, a home leave may be scheduled for the Thanksgiving Day week, which coincides with the opening of deer hunting season in the project area. All of the potential lodging facilities are pre-booked and a break at this time is also recommended by the EECA and the Forest Service Representative as a safety measure.

### **5.2.4 DEMOBILIZATION**

**5.2.4.1** Demobilization can take place upon completion of the project, if the weather becomes adverse and hampers site operations, or at the opening of deer hunting season. Re-mobilization will take place in the spring possibly the first week of April 1997. Adverse weather can be expected any time during the project.

## **5.3 DESCRIPTION OF ORDNANCE LOCATORS TO BE USED**

**5.3.1** HFA will use Schonstedt Flux Gate Magnetometers. These magnetometers have been furnished by the government.

**5.3.1.1** Schonstedt Magnetometers are ferrous metal locators and will only detect "iron" or magnetic materials. The depth of detection is limited by the size and orientation of the target and the soil characteristics of the work area. The instrument is not capable of classifying the anomaly; it will only indicate the presence or absence of a magnetic anomaly. The target must be excavated and investigated by a trained UXO Specialist.

**5.3.1.2** Schonstedt Magnetometers do not require calibration. They have a simple battery function test and a "GO/No Go" field operational check. This check is achieved by burying a target of a similar size and characteristics as the expected type of UXO. Magnetometer(s) will be tested before starting UXO operations in the morning and when operations are resumed after lunch. Random checks will be performed by the QC officer and/or the SUXOS during daily operations to ensure the equipment is operating and being operated properly. Failure to detect the test target is reason to reject the instrument and return it to the manufacturer for repairs.

**5.3.1.3** During subsurface magnetometer searches, the magnetometers will be set on the sensitivity setting that provides for positive detection of the test target.

## **5.4 COMPOSITION AND MANAGEMENT OF TEAMS**

### **5.4.1 PROJECT HEADQUARTERS ELEMENT**

**5.4.1.1** The Project Headquarters is composed of the PM, SUXOS, SSO, QC officer, and a clerk. This element is responsible for the command, control, and coordination of the resources of the project.

**5.4.1.1.1** The Project Headquarters will be located at the Bell Knob Tower. This location has a locked gate controlling access. Communications and GPS antennae may be temporarily installed on the tower. A work trailer, explosive storage, and secure equipment storage will be set up in this area. The area has no utilities so a generator will be necessary to provide power requirements.

#### **5.4.1.2 UXO Search Teams**

**5.4.1.2.1** Two UXO search teams will be used to perform UXO removal operations. Site layout and gridding will be conducted on a daily basis. Each UXO team will be responsible for laying out and marking their assigned work areas. Each team will be composed of one UXOS and four UXO Specialists. Each team will be under the direct supervision of the UXOS. All field operations will be under the complete supervision of the SUXOS.

**5.4.1.2.2** Search teams will be responsible for:

**5.4.1.2.2.1** -Establishing and laying out the search lanes.

**5.4.1.2.2.2** -Operating magnetometers and metal detectors.

**5.4.1.2.2.3** -Marking, plotting, and recording all UXO/UXO related materials located during  
-grid searches.

**5.4.1.2.2.4** -Identifying and classifying UXO and UXO components.

**5.4.1.2.2.5** -Conducting explosive disposal procedures of UXO.

**5.4.1.2.2.6** -Segregating and removing all OE scrap from each grid.

### **5.5 METHOD OF TRANSPORTING UXO TO THE SAFE HOLDING AREA**

**5.5.1** There will be no designated Safe Holding Areas. All UXO unsafe to move will be detonated in place. If a UXO is safe to move, it may be considered for consolidation within the grid for destruction to conserve explosives and setup time.

### **5.6 PROTECTIVE MEASURES TO BE EMPLOYED**

**5.6.1** Several methods of protecting people and structures may be employed during this Removal Action.

**5.6.1.1** An appropriate safety distance will be maintained during intrusive activities and disposal operations. Only UXO qualified persons will be authorized within this area while intrusive activities are underway.

**5.6.1.1.1** There may be inhabited buildings/structures located at the head of some trails. Generally this area is uninhabited, but trails where UXO operations are ongoing will be blocked and posted. Guards will be posted during demolition operations.

**5.6.1.1.2** In the case of planned detonations, item(s) that are near trail heads and to be detonated will be earth tamped as required. But in order to preclude unnecessary cratering effects, and to reduce the amount of additional labor, items detonated within the wilderness area and beyond the frag range of trail heads or structures will not be tamped. The area will be evacuated and secured to the maximum frag distance for any UXO that is to be detonated.

## **5.7 LAYOUT OF THE GRID SYSTEM**

**5.7.1** The boundary of the area was determined by the Archive Search Report (ASR) and CEHNC. GPS may be used to tie the grid network to the West Virginia State Plane, and plot UXO, mark campsites and other significant points. The location of grids will be digitally plotted on the area map provided by CEHNC.

**5.7.2** The nominal size of each grid will be 100' x 200'. Many areas will not allow this configuration however, and the grid will be modified to fit the area of concern.

**5.7.3** Where possible, grids and sweep lanes will be laid out in north-south direction, and sweep lanes will be five feet in width. Grids will be identified by an alphanumeric code (*i.e.*, Grid 1-A1 will be the first grid in Site 1 and all other grids will be numbered sequentially).

**5.7.4** UXO and other significant points will be plotted on an HFA UXO Grid Location Form [*see Appendix E*] by the UXOS, IAW para 7.3, using an XYZ coordinate system measuring from the southwest corner of each grid. All Y coordinates will be referenced from the south grid boundary measured to the north, and all X coordinates will be from the western grid boundary measured to the east. The Z coordinate will be the depth at which the UXO was found.

**5.7.5** Each UXOS will submit all of his completed grid forms to the QC officer at the end of each working day. The QC officer will review each grid form for completeness and accuracy. After review, the information on all forms will be entered into the site's database and digital maps.

## **5.8 GANTT CHART OF PROJECT**

**5.8.1** A Gantt chart depicting project schedules and milestones are provided at Figure 5-1.

## **5.9 ESTIMATED COST FOR THE SCHEDULED WORK**

**5.9.1** A spread sheet depicting the anticipated expenditures for the duration of this task is provided at Figure 5-2.

## **5.10 REQUIRED REPORTS**

**5.10.1** The following reports will be provided by the SUXOS to the HFA PM via the Monday following the end of the work week/month.

**5.10.1.1** Weekly Project Summary [*see Appendix G*]

**5.10.1.2** Weekly QC/Safety Report [*see Appendix G*]

**5.10.1.3** Weekly QC Report [*see Appendix G*]

**5.10.1.4** The HFA Waldorf, Maryland office will prepare and provide to the CEHNC PM the following reports:

**5.10.1.4.1** A Monthly Summary will be provided of operations and events for the project site.

**5.10.1.4.2** Progress/Meeting Reports will be submitted within 10 days of the event.

**5.10.1.4.3** A draft Final Removal Report will be provided within 30 days of project completion.

**5.10.1.4.4** A revised Final Removal Report within 30 days after receipt of CEHNC comments.

Dolly Sods, WV Gantt Chart

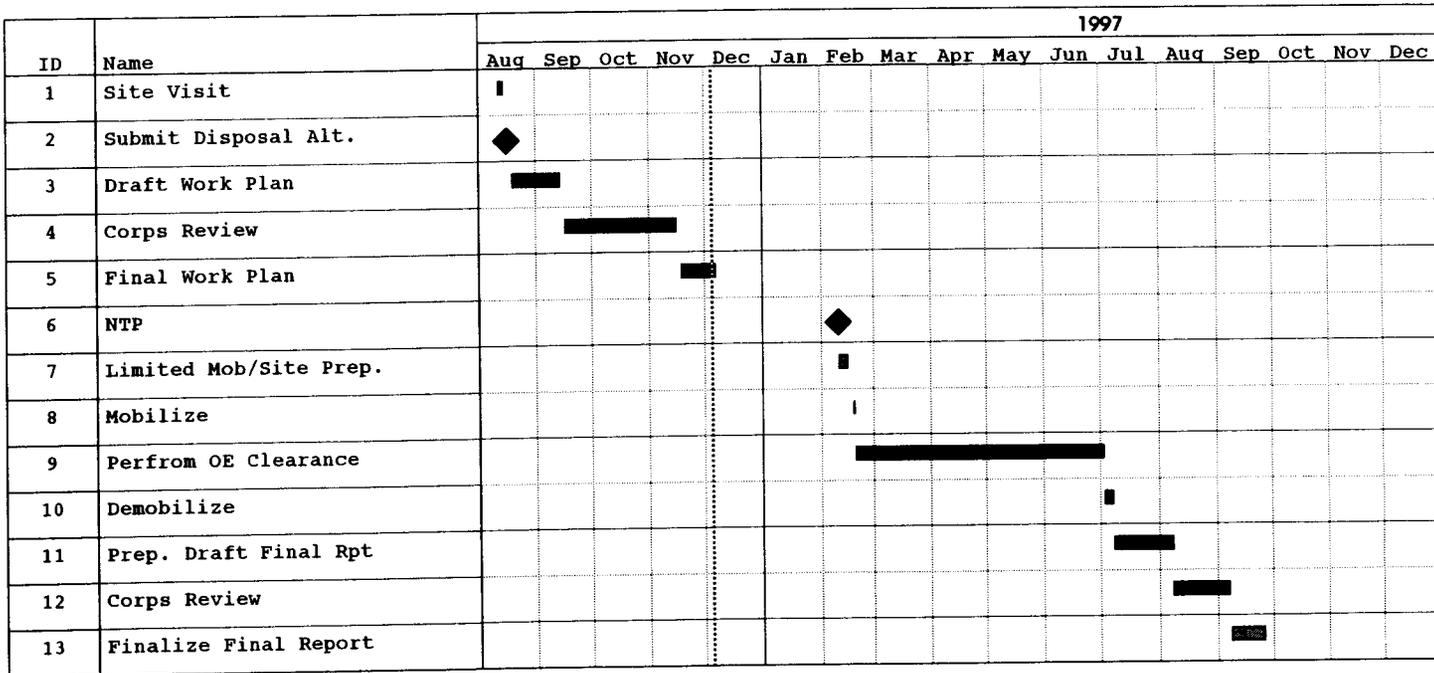


FIGURE 5-1  
GANTT CHART

PROJECTED REQUIREMENTS FOR THE FORMER WEST VIRGINIA MANEUVER AREA												
Item	Description	Unit Cost	Task One	Mob/Demob	Task 2 CR	Task 3 Bur	Task 4 Remo	Task 5 Scrap	Task 6 QC	Task 7 Fnl Rpt	Projected Hrs	Projected Cost
0028	CH	\$85.07	8								8	\$680.56
0031	Clerk/Typist	\$17.84	40	20			1100		40	40	1240	\$22,121.60
0032	Drafter I	\$32.01									0	\$0.00
0035	Laborer	\$19.08									0	\$0.00
0036	Heavy Eqpt Operator	\$30.99									0	\$0.00
0040	Project Manager	\$49.83	80	20	10		228			80	418	\$20,828.94
0041	QC Specialist	\$39.91		18					1140		1158	\$46,135.98
0042	Rodman	\$22.49									0	\$0.00
0045	Senior UXO Sup	\$43.98	80	40	10		1140	20		80	1370	\$60,252.60
0046	Site Safety Off	\$40.18		18			1140	40			1198	\$48,055.28
0047	Surveyor	\$50.00									0	\$0.00
0048	Truck Driver	\$24.36									0	\$0.00
0049	UXO Asst	\$27.02									0	\$0.00
0050	UXO Specialist	\$34.15		80	20		11400	100			11600	\$396,140.00
0051	UXO Supervisor	\$39.91		32	10		2280	40			2382	\$94,287.42
	<b>Projected Total Hours</b>		<b>208</b>	<b>224</b>	<b>50</b>	<b>0</b>	<b>17288</b>	<b>200</b>	<b>1180</b>	<b>200</b>	<b>19350</b>	
											<b>Labor Total</b>	<b>\$686,482.36</b>
0052	<b>Material</b>											<b>Projected Mat Cost</b>
	Vehicles				\$35,820.00							\$35,820.00
	Site Tri				\$4,500.00							\$4,500.00
	Fuel				\$5,800.00							\$5,800.00
	Telephones/Commo				\$15,000.00							\$15,000.00
	Admin Supplies				\$1,500.00							\$1,500.00
	Field Sups/ Team Eqpt				\$25,000.00							\$25,000.00
	Misc				\$5,000.00							\$5,000.00
	GPS				\$7,000.00							\$7,000.00
	Port A Potties				\$1,000.00							\$1,000.00
	Explosives				\$2,000.00							\$2,000.00
	Magazines				\$10,000.00							\$10,000.00
	Security				\$21,800.00							\$21,800.00
	Magnetometers				\$9,000.00							\$9,000.00
					\$143,420.00							\$143,420.00
	<b>Projected Mat Totals</b>											<b>\$155,327.80</b>
0054	<b>Travel</b>		<b>Site Visit</b>	<b>Mob/Demob</b>	<b>Task 2 CR</b>	<b>Task 3 Bur</b>	<b>Task 4 Remo</b>	<b>Task 5 Scrap</b>	<b>Task 6 QC</b>	<b>Task 7 Fnl Rpt</b>	<b>Home leave</b>	<b>Projected Trvl Cost</b>
	Travel		\$1,250.00	\$24,000.00			\$2,000.00				\$12,000.00	\$39,250.00
	Lodging		\$282.00	\$1,128.00	\$282.00		\$120,387.00				\$584.00	\$122,823.00
	Per Diem		\$208.00	\$824.00	\$156.00		\$66,586.00				\$912.00	\$67,886.00
	<b>Projected Trvl Cost</b>		<b>\$1,740.00</b>	<b>\$25,752.00</b>	<b>\$438.00</b>		<b>\$68,596.00</b>				<b>\$12,876.00</b>	<b>\$250,437.31</b>
											<b>Estimated</b>	
											<b>Project Total</b>	<b>\$1,095,247.47</b>

FIGURE 5-2  
ESTIMATED COST OF THE PROJECT

## CHAPTER 6

# WORK, DATA, & COST MANAGEMENT PLAN

### 6.1 MANAGEMENT

**6.1.1** This project will be managed by an HFA PM. The PM will be on site during the initial phases of the project and will be located at HFA's Waldorf, Maryland office when not on site. In either case, the PM will track the progress of projects using computerized project management software and spreadsheets. The PM will receive daily and weekly reports from the SUXOS detailing the use of project funds, man-hours, and equipment, and other pertinent data concerning site accomplishments. The PM will also make periodic site visits to personally view and inspect the site records and work progress. He will always be available by phone (301-705-5044) to assist the SUXOS or the customer as the need arises.

**6.1.2** The actual conduct of the work is outlined in this WP. HFA has a supervisory staff of experienced professionals to manage all phases of the project. Each PM is versed in the use of Lotus 123, a spreadsheet designed to manage numerical data. Lotus 123 provides actual cost vs. planned cost data comparisons, and graphic displays enabling the PM to accurately track costs and work completion goals, and allocate resources.

**6.1.3** HFA's estimate of the projected costs for this project is shown in Figure 5-2.

### 6.2 SCHEDULE OF PROJECT MILESTONES

Perform Site Visit .....	Completed August 15, 1996
Submit Disposal Alternatives Letter .....	August 16, 1996
Submit Draft Work Plan .....	September 13, 1996
Receive Comments from CEHNC .....	November 4, 1996
Submit Final Work Plan .....	December 5, 1996
Limited Mobilization/ Site Preparation .....	February 10, 1997
Receive NTP .....	February 10, 1997
Mobilization .....	February 18, 1997
Start OE Clearance .....	February 19, 1997
Complete OE Clearance .....	July 2, 1997
Submit Draft Final Report .....	August 8, 1997
Receive Comments .....	September 8, 1997
Submit Final Report .....	September 26, 1997

### 6.3 STAFFING/RESUMES [see Appendix H, HFA Resumes]

#### 6.3.1 PROJECT MANAGER (PM)

**6.3.1.1** Mr. Richard T. Thiel is responsible for the effective day-to-day management of the project staff, direct communication and liaison with the client, technical approach, and review of

deliverables; management of resources, schedules, budgets; and coordination between the general and technical support functions.

### **6.3.2 SENIOR UXO SUPERVISOR (SUXOS)**

**6.3.2.1** Mr. Floyd Kittle is responsible for the day-to-day on-site management of UXO services. His responsibilities include coordination and direction of all UXO site operations.

### **6.3.3 SITE SAFETY OFFICER (SSO)**

**6.3.3.1** The Site Safety Officer (SSO) has the responsibility for ensuring site safety and compliance with the safety provisions of the WP and SSHP. The SSO has the on-site responsibility and authority to modify and/or halt work, and to remove personnel from the site if working conditions that may affect onsite/offsite safety and health change. The site SSO is the main contact for any on-site emergency. Except in an emergency, the SSO may modify the approved SSHP only after consultation and concurrence of the HFA PM and the Contracting Officer.

### **6.3.4 QUALITY CONTROL OFFICER(QC)**

**6.3.4.1** The Quality Control Officer (QC) is responsible for quality control of all site activities administered by HFA and required by CEHNC. He will be responsible to the PM for project quality control, which includes administering the program and coordinating directly with the SUXOS. He is also responsible for maintaining the site inventory of all government and HFA company equipment.

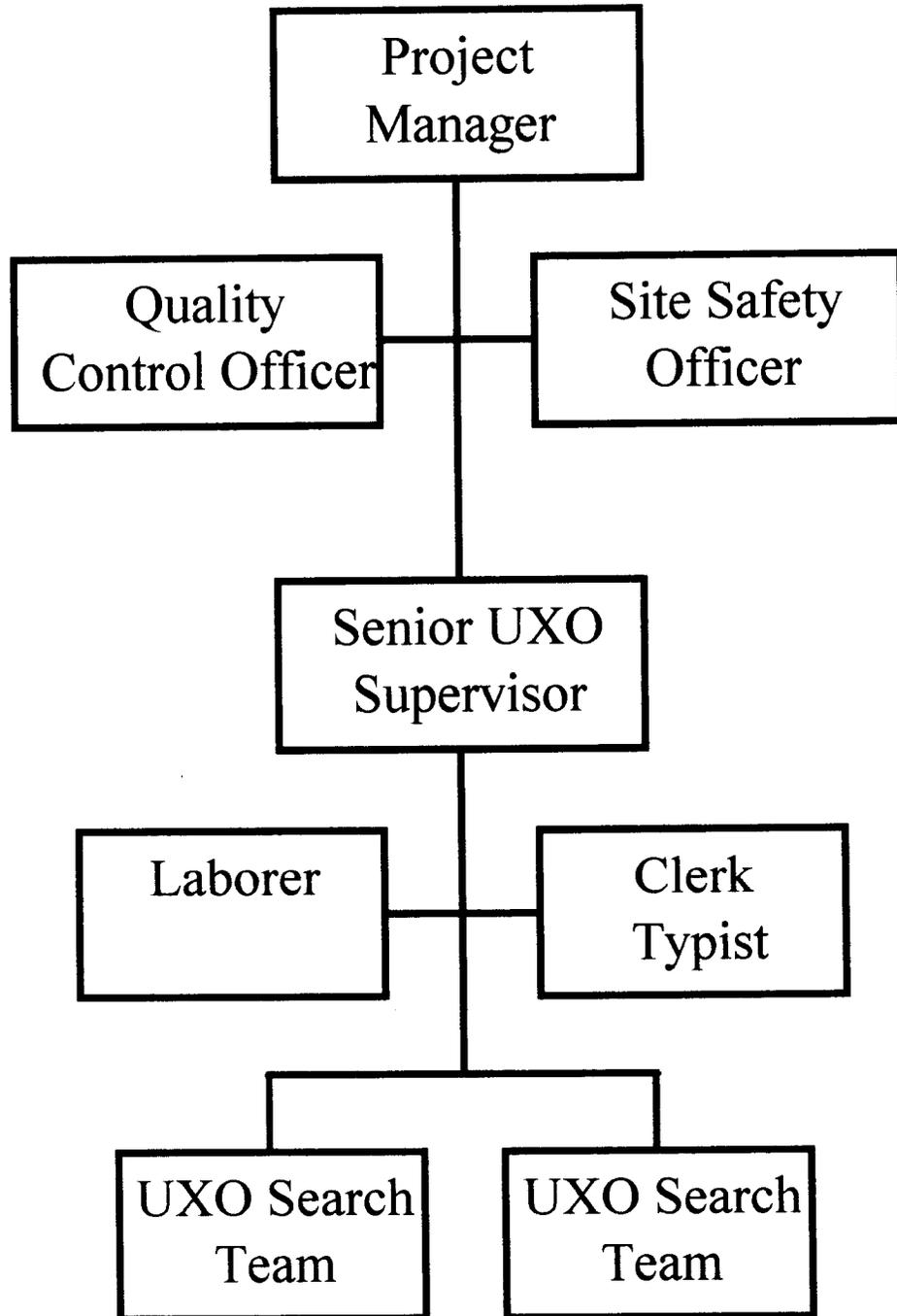
### **6.3.5 UXO SUPERVISOR**

**6.3.5.1** Each UXO Supervisor is responsible for his team's operations, ensuring personnel compliance with safety and PPE requirements, monitoring working conditions, notification of the SSO, QC or SUXOS of any unsafe condition; and identifying Ordnance, Ammunition, & Explosives or UXO that are located within his team's operating zone. He also has the authority to stop operations in his zone if any unsafe act or condition exists until corrective action is taken.

## **6.4 PERSONNEL REQUIREMENTS**

- 1 - Project Manager
- 1 - Senior UXO Supervisor
- 1 - Site Safety Officer
- 1 - Quality Control Officer
- 1 - Admin Clerk
- 1 - Laborer
- 2 - UXO Supervisors
- 8 - UXO Specialists

**FIGURE 6-1  
ORGANIZATION CHART**



## CHAPTER 7

# SURVEYING AND RECORDING

### 7.1 SURVEYING

**7.1.1** The following information is excerpted from the SOW and provided here should there be a requirement as part of the clearance activity to establish additional survey control in and around Dolly Sods Wilderness. HFA has been supplied a copy of the existing aerial photography, orthophotos, monument locations, and survey control markers previously established (under a separate delivery order) in the Dolly Sods Wilderness, Cabin Mountain, and Black Bird Knob areas. HFA will, following, the guidance provided by the following paragraphs, map all grid locations and UXO removed from the project locations. If multiple UXO are removed from an area, that area may be marked as a grid and the corner of the grid located on the map (not each individual UXO).

**7.1.2 Control Points.** Plastic or wooden hubs shall be used for all basic control points. Horizontal control (1: 1 0,000) referenced to the North American Datum of 1983 (NAD83), and Vertical control (1:5,000) referenced to the North American Vertical Datum of 1988 (NAV88) of "Third Order" or better shall be established for the network required for all monuments.

**7.1.2.1** All coordinates and all elevations are to be shown to the closest one hundredth of a foot (0.01). All the control points recovered and/or established at this site shall be plotted at the appropriate coordinate point on a reproducible (Mylar) planimetric or topographic map at a scale of 1 inch 200 feet.

**7.1.2.2** These points will be identified on the map by their name or number, final coordinates, and final adjusted elevations. A tabulated list, and a "Description Card" of all control points used, will be submitted IAW paragraph 3.3.3 of this SOW. The Description Card shall show a sketch of each monument; its location relative to reference marks, buildings, roads, railroads, towers, etc; a typed description telling how to locate the monument from a known point; the monuments name or number; and, the final adjusted coordinates and elevations. The Description Cards shall be 5 inches by 8 inches with one monument per description per card, or two monuments being described on an 8.5 inch by 11 inch sheet of bond paper.

### 7.1.3 MAPPING

**7.1.3.1** The location, identification, coordinates, and elevations of all the control points recovered and/or established at the site, and the corners of all of the areas that are cleared of UXO, shall be plotted on a reproducible (Mylar) planimetric or topographic map (at a scale no smaller than 1 inch = 200 feet) to show their location with respect to all the surface and planimetric features within the project area. In addition, all UXO that are located in the field shall be plotted and shown on the map in their respective locations.

**7.1.4 ITEMS AND DATA TO BE SUBMITTED TO CEHNC AS FOLLOWS:**

**7.1.4.1 Field Survey**

**7.1.4.1.1** The original copies of all field books, layout sheets, computation sheets, abstracts, and computer printouts. All of these items shall be suitably bound, clearly marked, and identified.

**7.1.4.1.2** A tabulated list of all control points showing the adjusted coordinates and elevations (to the closest one-hundredth of a foot) established and/or used for this survey.

**7.1.4.1.3** A "Report on Establishment of Survey Mark" (Description Card) on each permanent control monument used for the survey. In addition to the name or ID number of the monument, the cards shall show the adjusted coordinates, the adjusted elevations (to the closest 0.01 foot), a written description for locating the monument, and a sketch showing how to locate the monuments.

**7.1.4.2 Drawings**

**7.1.4.2.1** All maps shall be drawn at a scale no smaller than 1 inch = 200 feet on reproducible (Mylar) drawings. One original copy and one blue line print of each final drawing shall be delivered to CEHNC. Grid lines referenced to NAD83, and a true North Arrow and Magnetic North Arrow shall be shown on each map.

**7.1.5 SCHEDULE**

**7.1.5.1** All work and services under this paragraph shall be completed and submitted to CEHNC IAW with paragraph 4.1 of this SOW.

**7.1.6** During all field and intrusive activities the survey crew shall be accompanied by a UXO Specialist and magnetometer.

**7.2 TEAM RESPONSIBILITIES**

**7.2.1** The team will be equipped with the necessary materials for laying out search grids within their assigned work areas. Teams may be equipped with a GPS receiver if necessary for general mapping and plotting of camp site boundaries, trails, wetlands, etc.

**7.2.2** The team will be responsible for:

**7.2.2.1** -Locating and establishing grids IAW Para. 4.2.2.3.2, Ch. 4;

**7.2.2.2** -Marking and identifying each grid IAW Para. 7.3 below;

**7.2.2.3** -Coordinating and processing data;

**7.2.3** The UXO Team will also serve to support additional requirements, such as a licensed land surveyor if required.

### **7.3 MARKING SIGNIFICANT ANOMALIES/POINTS**

**7.3.1** Each grid will be investigated using a Schonstedt Magnetometer. All UXO in each grid will be plotted and recorded by the UXOS as outlined in paragraph 7.1 above. Each day's data will be processed and included in the site's database.

**7.3.2** UXO and other significant points will be plotted on an HFA UXO Grid Location Form [see *Appendix E*] by the UXOS using an XYZ coordinate system. All measurements will be from the southeast corner of each grid. All Y coordinates will be referenced from the south grid boundary measured to the north (or left hand grid stake measuring up) and all X coordinates will be from the western grid boundary measured to the east (or left hand grid stake moving to the right). The Z coordinate will be the depth at which the UXO was found.

**7.3.3** Each UXOS will submit all of his completed grid forms to the QC at the end of each working day. The QC will review each grid form for completeness and accuracy, after which the information in all sheets will be entered into the site's data base.

#### **7.3.4 SIGNIFICANT ANOMALIES/POINTS ARE:**

**7.3.4.1** -Any complete live UXO, such as a mortar round, artillery shell, or bomb, etc.;

**7.3.4.2** -All buried pits or trenches despite what they contain;

**7.3.4.3** -Excavations where historical artifacts are discovered, and

**7.3.4.4** -The points where in-place detonations occurred.

**7.3.5** Scrap will be recorded only as a total quantity by weight for each grid, small arms ammunition will also be recorded as total quantity per grid. Neither scrap nor small arms locations will be plotted.

#### **7.3.6 DAILY RECORDING REQUIREMENTS**

**7.3.6.1** Each UXOS will provide to the QC a detailed accounting of all ordnance, ammunition, and explosive item/component/scrap encountered. This accounting will include the quantity, type, depth, condition, and final disposition of all items located in each grid.

### **7.4 LOGS, RECORDS AND REPORTING [see *Appendix G, HFA Forms*]**

**7.4.1** The SUXOS will keep the official log. He shall record UXO positions and significant anomalies. This log will be an official part of the site operation's record. The log will be kept separate and in addition to the Daily Site Journal. This log shall be maintained as a spreadsheet or database, and will be provided as part of the information and data for the final report.

**7.4.2** The UXOS will maintain a 'rough log' providing the SUXOS with the details required for

the official record. The rough log will be maintained in the same fashion as the official log and may become part of the Daily Site Journal and HFA Grid Location Forms.

## **CHAPTER 8**

### **ENVIRONMENTAL PLAN**

#### **8.1 OVERVIEW**

##### **8.1.1 GENERAL DESCRIPTION OF THE AREA**

**8.1.1.1** This removal project consists of searching all Forest Service designated trails, 20 feet to each side of the trails, and all Forest Service inventoried campsites (cleared areas only). OE shall be cleared to a depth of 1 foot in trails and adjacent areas and to 4 feet in campsites. To minimize adverse impacts on the environment, HFA will follow the mitigation measures defined in field operating procedures provided by the Forest Service and the Dolly Sods Wilderness Ordnance Removal Project Environmental Assessment dated September 1995. These mitigation measures include the following:

- No motorized vehicles will be used in the Wilderness.
- Before activities begin within the Wilderness, Government-furnished specialists will train the HFA's personnel to recognize endangered species, historic and prehistoric sites, and protect habitat.
- Prior to beginning their work, the Forest Service will provide to HFA with maps showing the locations of known cultural resource sites, statements as to the significance of those sites, and recommendations for treatment.
- If artifacts or structural remains are detected in a work area, they will be carefully set aside, then returned to their previous locations.
- If artifacts or structural remains are detected in a designated work area not known to be a site, that location will be noted on a map along with a general description of what was found. This information will be furnished to the Forest Service.
- When areas not previously designated as work areas are selected for disturbance, the Forest Archaeologist will be notified and given the opportunity to survey for cultural resources in that area.

**8.1.1.2** Operational Instructions for protection of the Cheat Mountain Salamander (CMS) in unexploded ordnance removal activities at Dolly Sods Wilderness in 1996: The following operational instructions shall replace CMS protection measures as listed on page 4-9 of the approved environmental assessment, in the biological evaluation, and in the 22 August 1995 consultation letter from the U.S. Fish and Wildlife Service to Colonel Jemiola.

**8.1.1.3** When a metal object is detected by a magnetometer and the object is beneath a trail or

beneath the area within 20 feet of each side of the trail the anomaly will be hand excavated to a depth of one foot.

**8.1.1.3.1** The ordnance specialist will remove as much as possible by hand, any leaf litter and organic matter from an area large enough to dig a hole to the maximum depth allowed (1 ft.), to store the soil and to work at the site. Leaf litter and organic matter will be placed in a plastic bag or bucket for replacement over the site later. Any salamanders found during removal of leaf litter and organic matter shall be placed in a suitable container with damp moss. The container will be kept cool, and placed in the shade. It may be necessary to utilize a cooler. Only one salamander will be placed in each container.

**8.1.1.3.2** The ordnance specialist will then hand excavate down to the metal object to identify it, or to the maximum depth allowed.

**8.1.1.3.3** If the metal object is not a UXO, the metal object will be removed from the hole and the hole rechecked to insure that the metal object is not masking a UXO. After the hole is judged to be clean, QC'd, and QA'd satisfactorily, the non UXO material will be replaced (metal objects associated with ordnance may be removed); and the soil tamped with the foot, leaf litter, and organic matter replaced.

**8.1.1.3.4** Release any salamanders previously collected to the area.

**8.1.1.4** If the metal object is a UXO, but can be safely moved, such as an unfused UXO, the UXO will be excavated and considered for consolidation with other UXO in the grid for detonation, or be detonated in place. The excavation will be backfilled, tamped and the leaf litter and organic matter replaced. Release any salamanders previously collected.

**8.1.1.5** If the metal object is a UXO that must be detonated in place, mark the location, a qualified Forest Service representative will direct the search for and collect all salamanders from within 15 ft. of the UXO.

**8.1.1.6** If any salamanders are found, remove most of the leaf litter and organic matter from a 15-foot radius area around the UXO and store in plastic bags or buckets out of detonation range. Consult the Forest Service Representative to decide if this is required if no salamanders are found.

**8.1.1.7** All salamanders collected will be placed in suitable containers (a breathable plastic bag) with damp moss and kept cool in the shade. This may require the use of a cooler. Only one salamander will be placed in each container. Multiple salamanders may be placed in a container such as a cooler as long as each salamander is self contained within the cooler.

**8.1.1.8** If a UXO is detonated directly beneath the trail, backfill the crater with rocks from the detonation point plus additional rocks from within 100 feet to complete filling the crater.

**8.1.1.8.1** To reduce the effects of collecting rocks and material to refill the crater, remove small quantities from several different areas within the designated area. Cover rocks placed in the crater

with any clumps of soil from the detonation and tamp the soil.

**8.1.1.8.2** Replace leaf litter and organic matter uniformly across the site from where it was collected, and replace any salamanders collected.

**8.1.1.8.3** If a UXO is not detonated in the trail, the crater may not need to be refilled unless required by the Forest Service.

**8.1.2** If the metal object is detected beneath a designated camping area, the object will be excavated to a depth of four feet. Deeper excavations will be approved by the CEHNC Site Safety Specialist and the Forest Service Representative.

**8.1.2.1** The UXO Specialist will conduct searches and excavations in the same manner as described above. He will apply the same techniques to protect the CMS's and their habitat.

**8.1.2.2** To protect salamanders and their habitat, personnel will conduct a search for and collect all salamanders from within a 15-foot radius of a UXO that is to be detonated. The Forest Service Representative will be consulted for guidance in these areas.

**8.1.3** If the metal object is located on the surface of the ground in camp sites, or within the search areas along trails:

**8.1.3.1** If the metal object is not a UXO or UXO related, the object will be lifted and the area beneath it will be checked. If the area is clean, the item will be replaced where it was found.

**8.1.3.2** If the object is an unfused UXO, it may be considered for consolidation with other UXO in the grid for detonation or it will be detonated in place.

**8.1.3.3** If the metal object is a UXO that cannot be moved, it will be detonated in place. To protect salamanders and their habitat, personnel will conduct a search for and collect all salamanders from within a 40-foot radius of a UXO that is to be detonated. The Forest Service Representative will be consulted for guidance in these areas.

**8.1.4** There will be no need for a biologist to conduct a walkover of the area to identify potential CMS habitat before the project begins. Under these operational instructions, all sites where metal objects are found, excavated to be identified, and/or detonated, will be treated to protect the CMS and other salamander species and vertebrate animals.

**8.1.5** If there is a need to use sandbags as a protective measure when detonating any UXO, a borrow area will be jointly selected by the ordnance specialist and a qualified Forest Service person, as an area from which soil may be taken to fill sand bags. These borrow areas will be treated similar to a site where a metal object is found. Leaf litter and organic matter will be removed and stored, salamanders collected, borrow material removed, litter replaced, and salamanders replaced.

**8.1.6** It will not be necessary to conduct field surveys for CMS at night or within 48 hours of rainfall.

**8.1.7** Other animals such as turtles, toads, lizards, snakes, etc., found while searching for salamanders or while removing leaf litter shall be relocated to adjacent areas.

**8.1.8** Since trails and campsites are heavily affected by human use, it is unlikely that large amounts of leaf litter or salamanders will need to be removed from these areas before excavation of a metal object or detonating a UXO.

## **8.2 SITE CONDITION SURVEY**

**8.2.1** The HFA PM will perform a site condition survey prior to commencing UXO operations. During this survey, the project site areas, access routes, and adjacent areas will be visually examined to note utilities, site improvements, fences, trees, shrubs, and other features. The conditions of these items will be noted and included on a hand drawn sketch of the site during the survey of the site. Specific items of interest are as follows.

### **8.2.2 TREES**

**8.2.2.1** The physical condition of trees, to include existing damage, will be noted.

### **8.2.3 VEGETATED AREAS**

**8.2.3.1** The physical condition of shrubs and vegetated areas, to include existing damage, will be noted. As noted during the Site Visit, the actual project site is a Wilderness Area and as such is largely pristine. HFA's activities do not normally disrupt the vegetation or wildlife because excavations are small and the soil is normally replaced immediately after the contact is removed. In all cases, HFA personnel will seek the advice and council of the Forest Service Representative on matters of replanting or reseeding.

### **8.2.4 ON-SITE AND IMMEDIATE OFF-SITE DRAINAGE**

**8.2.4.1** Existing drainage patterns will be noted, especially areas undergoing active erosion/sedimentation. HFA personnel will try not to change existing drain patterns.

### **8.2.5 ACCESS ROADS AND HAUL ROUTES**

**8.2.5.1** The access roads and haul routes will be examined for signs of deterioration and wear, such as potholes, muddy stretches, obstructing debris, and clogged drainage ditches.

### **8.2.6 DRAIN CULVERTS**

**8.2.6.1** Drain culverts will be checked for crushed sections and blocked openings, and their

location will be noted.

### **8.2.7 FENCING**

**8.2.7.1** Damaged or missing sections of fencing will be noted.

### **8.2.8 PRE-EXISTING REFUSE/DEBRIS ACCUMULATIONS**

**8.2.8.1** The location of accumulated refuse or other debris within or next to the project site will be noted.

**8.2.8.2** A copy of the site condition survey will be provided to the Contracting Officer (CO) or the designated Contracting Officer's Representative (COR).

## **8.3 ENVIRONMENTAL PROTECTION**

**8.3.1** All land on-site areas and outside the specifically assigned UXO work areas, storage areas, and access routes will be preserved in their original condition during UXO operations. UXO work activities will be confined to the areas defined in the WP. Trucks and equipment will be confined to the designated haul and access routes and the project work area. During site UXO operations, every effort will be made to prevent damage to the roads, culverts, trees, shrubs, and grassed areas.

### **8.3.2 PROTECTION OF LANDSCAPING**

**8.3.2.1** All landscaping outside the specifically assigned UXO work area shall be preserved in its original condition with the following restrictions observed:

**8.3.2.1.1** No trees, shrubs, turf, or crops will be removed, cut, or disturbed.

**8.3.2.1.2** All public and private easements used for site access will be restored to the original condition.

**8.3.2.1.3** No ropes, cables, or guys will be fastened to any nearby trees for anchorage. Trees will not be painted or marked with spray paint. If it becomes necessary to mark an area, only flagging tape will be used.

**8.3.2.1.4** If it becomes necessary to build barrier cable for site security, waste segregation, or equipment staging areas, posts will be placed on anchorages.

**8.3.2.1.5** Appropriate measures will be taken during excavation of UXO to prevent root damage to trees that are to remain alive. If the situation arises where a UXO is located beneath or entangled in the roots of trees or bushes the Forest Service Representative will be advised and consulted for the disposition of the UXO.

**8.3.2.1.6** During excavation of suspected UXO sites, the boundaries will be marked to ensure that all UXO operations are restricted to the limits of the project area.

**8.3.2.1.7** Collection of the UXO scrap and nonhazardous UXO components will be consolidated in predetermined holding areas awaiting turn-in to DRMO or **a local scrap dealer at no cost to the Government.**

### **8.3.3 PROTECTION OF WATER RESOURCES**

**8.3.3.1** As a rule, all UXO services are limited to surface searches and hand excavation of suspected UXO. Little to no waste is generated by these services that could result in contaminated waste entering surface waters. The individual UXO excavations performed by HFA usually involve a total surface area of only two to four square feet. Each hole is immediately filled after excavation and tamped. Due to the minimal intrusive soil activities, run-on/run-off control measures as outlined in EM 385-1-1 are not required.

## **8.4 CONTAMINATION CONTROL MEASURES**

**8.4.1** This plan focuses on the minimization of contaminant generation resulting from UXO operations in the Dolly Sods Wilderness. There are two primary areas in which contaminant generation could occur. They are (1) airborne contaminants or potentially toxic vapors, and (2) liquid spills. Previous site investigations do not indicate the presence of, nor do we expect to encounter, Hazardous Toxic or Radiological Waste (HTRW). Therefore, this plan does not provide for the removal or remediation of HTRW. If HTRW is encountered, HFA's personnel will secure the site, withdraw to a safe area, and report the suspected HTRW to the CEHNC Safety Representative and the Forest Service Representative.

### **8.4.2 WASTE DISPOSAL**

**8.4.2.1** HFA will maintain appropriate project on-site housekeeping practices during the course of the UXO services project. All waste generated by HFA will be collected and properly disposed of.

### **8.4.3 DUST CONTROL**

**8.4.3.1** HFA's UXO services will not normally generate any significant amounts of dust that require dust control measures.

### **8.4.4 SPILL CONTROL**

**8.4.4.1** To reduce the possibility of spilling any potentially hazardous unknown liquid, HFA personnel will not open, move, or otherwise handle any drums or containers. To control possible spills of liquids such as gasoline or other petroleum used in the course of the work day, HFA will store such materials in suitable approved containers. When dispensing them, personnel will do so

on a leak proof surface such as a plastic or metal lined tray whenever possible. If spills do occur when refueling equipment, they will be immediately cleaned up and the materials contained. No motorized equipment will be used in the wilderness area. The use of fuel or other similar materials will be restricted to use at the Bell Knob Tower Headquarters site. If a spill resulting from a ruptured UXO or another type of container filled with chemical agents or HTRW should occur, HFA and all other personnel on-site shall evacuate in an upwind direction.

## **8.5 POST-UXO OPERATIONS CLEANUP**

**8.5.1** HFA will maintain a clean and unobstructed working environment at all times. No tools, equipment, materials (except as noted below), or rubbish will remain on-site following completion of UXO operations. Except for the boundary markers used to identify the limits of the UXO services performed by HFA, all rubbish and other materials brought onto the project site by HFA will be removed at the conclusion of the days activities.

### **8.5.2 SITE WALKOVER**

**8.5.2.1** The HFA PM or SUXOS will perform a site walkover inspection to ensure that all of the UXO excavations have been filled and tamped. The PM will also ensure that all of the rubbish and materials brought on-site by HFA have been collected and properly disposed of.

## **CHAPTER 9**

# **QUALITY CONTROL**

**9.1** To ensure that effective UXO services are performed, the quality control procedures outlined below will be in effect during this project.

### **9.2 EQUIPMENT**

**9.2.1** All equipment will be inspected by the SUXOS and/or the QC officer before placing it in service to ensure it meets the standards of the equipment ordered. Equipment received in unsatisfactory condition will be returned for replacement or repair.

#### **9.2.2 EMERGENCY EQUIPMENT**

**9.2.2.1** All emergency equipment or emergency items will be inspected daily, or as required by the manufacturer, to ensure that they are operating as designed and are in good repair.

#### **9.2.3 MAGNETOMETERS**

**9.2.3.1** Magnetometers will be field tested daily to ensure they are operating properly. This will be accomplished by planting a 75mm projectile or equivalent at four feet of depth. If a magnetometer does not meet the standard during the daily check, it will be returned to the manufacture for calibration, repair or replacement.

#### **9.2.4 HAND TOOLS**

**9.2.4.1** UXO tools and demolition kits will be inspected before use, or at least weekly, to ensure that they are complete and in good repair.

#### **9.2.5 SITE SPECIFIC ITEMS**

**9.2.5.1** Individual sites may require items that are not normally included in the site inventory. These items could include PPE or special tools. All site specific items will be inspected to ensure that they are in good repair.

#### **9.2.6 OPERATIONAL CHECKS**

**9.2.6.1** Magnetometer(s) will be tested before starting UXO operations in the morning and when operations are resumed after lunch. Random checks will be performed by the QC officer and/or the SUXOS during daily operations to ensure the equipment is operating and being operated properly.

### **9.3 RECORDS AND RECORD KEEPING**

**9.3.1** The QC officer will inspect all records to ensure they are kept and maintained in the manner prescribed by HFA Standard Operating Procedures. Records will include, but are not limited to, UXO/demolition explosives inventory, safety reports, and training and maintenance records.

**9.3.2** The QC officer will conduct a timely review of all UXO Grid Location Forms to ensure completeness and accuracy prior to the data being transferred to the map database.

### **9.4 QUALITY CONTROL SITE CHECKS**

**9.4.1** Quality control site checks will be performed of the areas and grids completed. The QC officer will perform a visual inspection of each grid site to ensure that all excavations and the area have been restored as nearly possible to its original condition.

**9.4.1.1** Magnetometer sweeps will be performed over 10% of each grid in areas where a sub surface removal was performed. If a UXO is located in any grid, it will cause the entire grid to be swept to insure it is free of UXO/anomalies.

**9.4.1.2** Points or areas where Non UXO metallic material was located and returned to their locations will be marked and identified to facilitate QC/QA checks. Excavations will not be refilled until the excavations have been checked by the CEHNC Site Safety Specialist.

**9.4.1.3** Grid markers will not be removed until the grids have received a satisfactory QA check by the CEHNC Site Safety Specialist and the Forest Service.

**9.4.2** In addition to 10% QC grid inspections, the QC will conduct random observations of UXO teams' search and clearance operations. These field observations will ensure proper operational techniques and methodologies are being used.

**9.4.3** The HFA QC will provide to the CEHNC Safety/QA Specialist by the close of business each day, a list of all grids QC'ed and are ready for QA inspection. If no grids were QC'ed that day, no report will be required.

### **9.5 DAILY QUALITY CONTROL REPORTS**

**9.5.1** Daily Quality Control Reports [see Appendix G, HFA Forms] will be completed and submitted to the PM. These reports will include descriptions of the areas quality control checked and the results of the check. The results of his records inspections will be submitted at the end of this project.

## **CHAPTER 10**

# **COMMUNICATIONS**

### **10.1 HANDHELD RADIOS**

**10.1.1** Handheld radios will be used to maintain communications between the command site and all field units. A base station radio will be located in the office trailer in the vicinity of Bell Knob tower with the antenna at the top of the fire tower itself. All personnel will be familiar with radio operation and communication procedures. Radio checks will be made before departure from the command site to establish positive communications. Periodic check-ins with the command site are required.

**10.1.2** Since HFA will be working in an unfamiliar site, it will be necessary to conduct a complete communications survey of the wilderness area using radios. "Dead spots," if any, located during the survey will be noted and plotted on a communications map. If it becomes necessary to work in a "dead spot," the SUXOS will station a "radio relay" person in such a position as to be able to communicate with both the work site and the base station.

### **10.2 TELEPHONES**

**10.2.1** Normal commercial telephone service is not available at the work site. Cellular telephone communications will be available from the command site to all emergency agencies. In addition, a land line telephone is available in the West Virginia Department of Natural Resources cabin located in Laneville. This telephone is to be used only in case of emergency.

## **CHAPTER 11**

### **PROPERTY MANAGEMENT PLAN**

**11.1** This section prescribes HFA's procedures for managing HFA property, HFA obtained government property, and government furnished property.

#### **11.2 GENERAL**

**11.2.1** HFA's goal is to ensure that our personnel have the correct, workable equipment to efficiently accomplish the job assignment. Purchasing/leasing of this equipment is to provide the best combination of price and value to the client. To maximize the use of resources, it is imperative that we know what equipment is on-hand, its location, and its working condition.

#### **11.3 RESPONSIBILITIES**

**11.3.1** It is HFA's responsibility to provide the necessary equipment to its workforce to accomplish the assigned task in a safe and cost-effective manner. HFA must and will maintain proper accountability of all government furnished and HFA obtained government property as specified in the contract.

##### **11.3.2 SUPERVISOR RESPONSIBILITY**

**11.3.2.1** It is the responsibility of the UXOS to ensure that property issued to or used by his team is properly used and cared for. Also, that proper custody and safe keeping are provided. This is an inherent responsibility and is not contingent upon whether there is a signed receipt.

##### **11.3.3 DIRECT RESPONSIBILITY**

**11.3.3.1** It is the obligation of each person to ensure that all property for which he or she is issued is properly used and maintained, and proper custody and safe keeping are provided.

##### **11.3.4 PERSONAL RESPONSIBILITY**

**11.3.4.1** It is the responsibility of all HFA personnel to exercise reasonable and prudent action to properly use, care for, and safeguard property in their physical possession, whether or not they are receipted for it.

## **11.4 PROPERTY CATEGORIES**

**11.4.1** For the purposes of this contract, HFA will divide property into the following accountability categories:

**11.4.1.1** Vehicles - trucks, 4WD vehicles, ATV's etc., leased from a local vendor or government furnished.

**11.4.1.2** Heavy Equipment - backhoes, bulldozers, etc., leased from a local vendor.

**11.4.1.3** HFA Property - equipment owned by HFA and leased to the client at a competitive rate, such as GPS equipment, computers, magnetometers, mobile phones, etc.

**11.4.1.4** Non-Expendable Government Property (both GFE and HFA obtained)

**11.4.1.5** Field Equipment - property and equipment that are not expended by its intended use, such as magnetometers, audio visual equipment, surveying equipment, etc., that is primarily used by field crews.

**11.4.1.6** Office Equipment - property and equipment that is not expended by its intended use, such as computers, office furniture, copiers, etc., that is primarily used in the site office.

**11.4.1.7** Consumable Government Property (both GFE and HFA obtained) - items that are consumed during their use and lose identity, such as office supplies, tyvek, gloves, marking paint, surveyors' stakes, rain gear, etc.

## **11.5 ACCOUNTABILITY**

**11.5.1** It is the responsibility of the person in charge of each HFA office/project site to designate a specific individual as property manager to maintain supply/equipment logs and files and to conduct periodic physical accounting/reconciliation of all property.

**11.5.2** It is imperative that control of all equipment is established upon receipt. Arriving items will be verified against shipping documents, and once completed, these items will be placed on a Government Tracking Log (GTL) [see Appendix G, HFA Forms].

**11.5.3** All blocks of the GTL will be completed. Two copies of the GTL and shipping documents will be maintained. A completed copy of these documents will be provided to the CEHNC Property Manager upon request and upon completion of the project.

**11.5.4** When inventorying the equipment, shipping documents will be used as proof of receipt.

**11.5.5** All expendable/non-expendable property will be maintained on the same GTL with the appropriate box checked to suggest its category.

## **11.6 MARKING OF EQUIPMENT**

**11.6.1** Initial nonexpendable equipment received from the CEHNC Property Manager will have an identifying number on the paperwork (i.e., Portable Radio with Charger CEHNC-SO-110). That number will also be affixed to the item of equipment. All other equipment not requiring a number will be marked "CEHNC."

**11.6.2** When a non-expendable item is purchased, such as a typewriter, the CEHNC Property Manager will be contacted and a number obtained for that piece of equipment.

## **11.7 PETTY CASH LOGS/SPREADSHEET**

**11.7.1** Petty Cash Logs/spreadsheet [see Appendix F, HFA Forms] are forwarded to the Holicong, PA office at the end of each time period, or biweekly. All original receipts are forwarded with this log/spreadsheet. A copy of the log/spreadsheet and receipts will be maintained on site. All property purchased will be entered on the GTL.

## **11.8 MASTER CARD LOG**

**11.8.1** A Master Card Log/spreadsheet [see Appendix F, HFA Forms] will be maintained for each individual possessing a company credit card. This log, like the Petty Cash Log/spreadsheet, will be maintained with a separate numbering system. Original receipts will be forwarded to Holicong, PA, on the same schedule as the Petty Cash Log /spreadsheet. Copies of the log and receipts will be maintained on site. All property purchased will be entered on the GTL.

## **11.9 MAINTENANCE**

**11.9.1** Regular and scheduled maintenance (if required) will be performed on all government property in accordance with the manufacturer's instructions. All equipment maintenance and calibration will be conducted in accordance with the manufacturer's specifications. Maintenance and calibration logs will be maintained for each item.

## **11.10 STORAGE**

**11.10.1** HFA will have storage facilities located in rented trailers near Bell Knob tower. All equipment other than consumable personal gear (rain suits, etc.) will be stored in these trailers during non working hours. It will be necessary to buy, rent or lease a generator to furnish power to the office trailer/s.

## 11.11 DISPOSITION

**11.11.1** In the event that government equipment must be disposed of, turned in for repair, or returned to the government, authorization will be required from the CEHNC Property Manager before action being taken. A complete record will be maintained and the circumstances documented in the remarks section of the GTL.

**11.11.2** A detailed, written report will be prepared by the PM or SUXOS for all lost, damaged, or destroyed non-expendable property and immediately forwarded through the project management and supply channels to the Contracting Office. This report will provide a detailed description of what happened, including applicable statements and reports (e.g. Police Reports). Adjustments to the GTL will not be made until the CEHNC Property Manager has completed an investigation and the CO has notified HFA to make the adjustment.

**11.11.3** At the close of the project, all government equipment and property will be turned in to the CEHNC Property Manager, shipped to a project site designated by him/her or custody maintained by HFA. Appropriate shipping and chain of custody documents will be prepared as directed by the CEHNC Property Manager, and the shipment will be documented in the "Remarks" section of the GTL. One copy of the annotated GTL is to be sent to the CEHNC Property Manager and one copy is to be retained with the site records for inclusion in the final report.

**11.12** As the project progresses, the SUXOS will replace expended consumables and make additional equipment purchases required to support the project up to the amount authorized by the basic contract. If a purchase over this amount is required, three quotes will be obtained and submitted to the Contracting Officer, along with justification for requesting the purchase, for his/her approval. Equipment may be transferred from other project sites as they are completed. The following equipment is to be used in the performance of this Task Order:

### 11.12.1 VEHICLES

Van Type Vehicles	2 ea.
F150 Type Pickup Trucks w/Bed Liner	2 ea.
All Terrain Vehicles (ATV)	1 ea.

### 11.12.2 HFA EQUIPMENT

Sokkia Spectrum GPS System w/Two Rovers Systems and 1 Base Station ( if required)	1 ea.
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### 11.12.3 NON-EXPENDABLE GOVERNMENT FIELD EQUIPMENT

	Generator Set, Gasoline, 8-12KW	1 ea.
	Schonstedt GA52 CX	12 ea.
	MT or HT 1000 Radios w/Chargers	6 ea.
	Cellular Telephones	3 ea.
	Wet-Bulb, Dry Glade	1 ea.
	NONEL Firing Devices	2 ea.
	Portable Stretcher	1 ea.
	Portable Oxygen Unit	1 ea.
	VHS Video Camera	1 ea.
	35mm Zoom Lens Camera	1 ea.
	300' Fiberglass Survey Tapes	3 ea.
	Hand held Compasses	4 ea.
	Redi-Rite Sheet Holders	4 ea.
	5 gal Water Jugs	3 ea.
	Tool Kits w/Hand Tools	2 ea.
	Long Handled Shovels	10 ea.
	Small Crowbars	
4 ea	Pick Mattocks	6 ea.
	Sledgehammer	1 ea.
	Small picks	6 ea.
	Blasting Cap Crimpers	3 ea.
	5 gal OSHA Gas Cans for Generator	2 ea.
	Rubbermaid Team Boxes	2 ea.
	Wind Wizard	1 ea.

## NON-EXPENDABLE OFFICE EQUIPMENT

	Desktop Computer, 486DX2 66MHz, 500 MB HD, Double Speed CD ROM, Fax Modem w/Lotus 123 and Word Perfect for Windows installed	2 ea.
	Monitor	1 ea.
	Copier	1 ea.
	Laser Printer	1 ea.
	Fax Machine	1 ea.
	Surge Suppressors	4 ea.
	3 Hole Punch	1 ea.
	2 Hole Punch	1 ea.
	Stapler	2 ea.
	Tape Dispenser	2 ea.

## 11.12.4 CONSUMABLE GOVERNMENT PROPERTY

	Handy Wipes	A/R
	36" Wood Survey Stakes	A/R

Red Plastic Survey Flags	500
Yellow Plastic Survey Flags	500
Red Flagging Tape	75 rolls
Vertical Wood Survey Stake Bags	2 ea.
Survey Flag Carry Bags	2 ea.
1/4" Poly Line	1,000 ft.
Electrical Cord Reels	6 ea.
Field Books	8 ea.
Duct Tape	A/R
Monofilament Tape	A/R
Electrical Tape	A/R
Caution Tape	12 rolls
"AA" or "C" or 9 volt Batteries	A/R
Fluorescent Orange Marking Paint	A/R
White Marking Paint	A/R
EMT First Aid Kit	1 ea.
Small First Aid Kits	4 ea.
Burn Kits	3 ea.
Eyewash Kits	3 ea.
1a 10bc Fire Extinguisher	3 ea.
20lb abc Fire Extinguisher	2 ea.
35mm Film	A/R
VHS HQ Videotape	2 ea.
20' x 100' 6 mil Plastic Sheeting	1 roll
5 gal Plastic Buckets	15 ea.
Sand Bags, for bunkers	500 ea.
Small plastic bags, for Schonstedts	A/R
Plastic Trash Bags	A/R
Leather Work Gloves	30 pairs
Rain suits	13 ea.
Disposable CPR Masks	A/R
Tick Repellant	6 ea.
Air horns w/Compressed Air	10 ea.
Nitrile Inner Gloves	3 boxes
Earplugs	1 box
Sweep Brooms	A/R
Jet Perforators	120
80 grain Detonating Cord	1,000 feet
NONEL Firing Systems	120
Detonating Cord Clips	50 ea.
Copy Paper	A/R
Fax Paper	A/R
Pens, Pencils, Markers, etc.	A/R
Envelopes	A/R
Scissors	2 pr.

Yellow Legal Pads	A/R
1/4" Grid Pads	A/R
3 Ring Binders	A/R
Hanging File Folders	A/R
Waste Baskets	2 ea.
Trash Barrels	2 ea.
Petty Cash Log	1 ea.
Staples	A/R
Scotch Tape	A/R
Misc. Clips, Tacks, etc.	A/R
Staple Remover	1 ea.
Paper Towels	A/R
Paper Cups	A/R
Electronics Cleaner	A/R

## **CHAPTER 12**

### **GENERAL SITE REQUIREMENTS**

#### **12.1 SAFETY TRAINING**

**12.1.1** The SUXOS, and SSO are responsible for setting up a rigorous training program covering safe and proper work practices. This will include occupational hazard training and familiarization with emergency procedures. Although no CWM materials are expected on this site, training will include recognition of CWM, signs and symptoms of exposure, emergency procedures, and HFA's role in supporting and assisting TEU should any be discovered. Records will be maintained for training schedules, topics, and safety logs. Training will be conducted in accordance with the provisions of paragraph 4.3.5.1 of the Site Specific Safety and Health Plan.

**12.1.2** All personnel will attend the initial site safety and indoctrination briefing before being assigned any tasks in the field. This briefing is site-specific training conducted on-site and will outline specific procedures to be followed. The course will be broken down into the following areas:

#### **12.1.3 PROJECT SCOPE**

**12.1.3.1** The project scope instructions will include staff instructions; chain of command; climate, terrain; history of range, project objectives and deadlines, on-site facilities, PPE, and personal, rental, CEHNC, and company equipment.

#### **12.1.4 MEDICAL**

**12.1.4.1** Medical instructions will include health and physical problems, posted procedures, and medical emergency routes.

#### **12.1.5 EMERGENCY PROCEDURES**

**12.1.5.1** Emergency instructions will include actions, procedures, and chain of command. A representative of the Davis Memorial Hospital has agreed to provide on-site emergency first aid and site specific hazards training to all site personnel. This training will be performed during the initial special briefings conducted when the site is opened.

#### **12.1.6 DEFINITION OF WORK SITE**

**12.1.6.1** Definition of work site instructions will include access/egress and operations.

### **12.1.7 ENDANGERED SPECIES, HABITAT, AND HISTORICAL SITE TRAINING**

**12.1.7.1** The West Virginia Department of Natural Resources and the Forest Service professionals will provide *initial training* of UXO personnel in the identification and handling endangered species, historical artifacts and other issues of concern.

### **12.1.8 PROJECT COMMUNICATION**

**12.1.8.1** Communication instructions will include radio familiarization and procedures.

### **12.1.9 ACCIDENT REPORTING**

**12.1.9.1** Accidents of any nature will be immediately reported to the UXOS who will report them directly to the SUXOS. Accidents involving personnel injuries will be reported to the PM or SUXOS immediately. Injuries requiring medical treatment or first aid will be reported [see Appendix I, Accident Report Form 3394] and investigated in accordance with AR 385-40 and U.S. Army Corps of Engineers supplements.

### **12.1.10 UXO PERSONNEL**

**12.1.10.1** UXO personnel will receive additional training, which will include UXO refresher training, magnetometer operation (all assigned units), range control, and medical evacuation procedures.

### **12.1.11 SAFETY MEETINGS**

**12.1.11.1** Safety meetings will be at least daily, and more frequently if conditions warrant, or as required by the UXOS. All safety meetings will be documented on the Site Safety Meeting Attendance Log [see Appendix F, HFA Forms].

### **12.1.12 NON-UXO PERSONNEL**

**12.1.12.1** Non-UXO personnel will also receive UXO recognition and safety training prior to beginning work on-site.

### **12.1.13 UXO SAFETY TRAINING AND OTHER SITE HAZARDS**

**12.1.13.1** UXO safety and hazards training will be continually reinforced throughout the project and will be a daily topic for each morning's Tailgate Safety Meetings.

## **12.2 OFFICE FACILITIES**

**12.2.1** Office facilities will be located at the Bell Knob Tower site. The HFA field office

headquarters will be housed in trailers.

### **12.3 VISITOR CONTROL**

**12.3.1** All visitors are required to report to the PM or SUXOS at the site on each and every visit. Visitors to sites must meet all of the provisions of the SSHP prior to entering or visiting any site. All subcontractor work and/or visitor tours will be closely coordinated with the SUXOS to ensure safety of all personnel, and all UXO work will cease while the visitor is in the area.

### **12.4 INCLEMENT WEATHER**

**12.4.1** The SUXOS and the SSO will monitor the weather and determine if it is safe to conduct operations in inclement weather. Lightning storms shall cancel all field operations until the storm passes. In all instances, personnel safety is foremost.

### **12.5 PERSONNEL SAFETY**

**12.5.1** At no time will personnel conduct UXO operations on the site unless accompanied by a least one other person. A two-man policy or "buddy system" shall be in effect during operations. The only exception will be when traversing in a vehicle along access roads.

### **12.6 PHYSICAL QUALIFICATIONS**

**12.6.1** All persons will be physically, medically, and emotionally qualified for performing the duties to which they are assigned. Some factors to be considered in making work assignments are strength, endurance, agility, coordination, visual and hearing acuity, and the ability to wear and properly maintain any required personal protective equipment. All site employees are enrolled in the HFA Medical Surveillance Program and will be screened and certified by a qualified Occupational Health Physician.

### **12.7 DRUG/ALCOHOL ABUSE PREVENTION**

**12.7.1** Substance abuse will not be tolerated. HFA has a comprehensive Drug and Alcohol Abuse Policy and Program. All employees are screened for drugs during initial and annual physical and all employees are required to read and acknowledge receipt of a copy of the HFA Drug and Alcohol Policy. Personnel exhibiting irregular or unusual actions will not be permitted on the work site. Personnel identified as substance abusers will be dismissed.

## **12.8 PERSONAL PROTECTIVE EQUIPMENT**

**12.8.1** All personnel will be dressed to protect themselves from job related hazards. Additional protective equipment will be provided as required by the task and the SSHP. All contaminated PPE will be handled and disposed of in accordance with the provisions of 29 CFR 1910.120.

## **12.9 PROJECT EQUIPMENT**

**12.9.1** Only licensed drivers will be allowed to drive vehicles owned or leased by HFA. Drivers will obey all traffic laws, whether driving on or off the site. Persons who receive traffic tickets or summons will be personally responsible for any fines incurred.

**12.9.2** Vehicle drivers are responsible for conducting safety inspections prior to operation of the vehicle. Items to be inspected include, but are not limited to, fuel level, tires, belts, trailer hitches, fluid levels, and gauge operation. All vehicles will be equipped with fire extinguisher and first aid kits. All discrepancies will be reported to the SUXOS.

**12.9.3** Any special or heavy equipment owned or leased by HFA will only be operated by personnel that have received training on that specific type of equipment. Training will be documented in the individual's personnel folder.

## **12.10 NON-PERSONNEL ACCIDENTS**

**12.10.1** Accidents involving damage to equipment or property will be immediately reported to the SUXOS, SSO or the QC. The SUXOS, SSO or QC will conduct an investigation of the accident to attempt to ascertain the facts and, if possible, determine responsibility for the accident. The SUXOS or SSO will institute preventative measures to avoid future occurrences. All accidents which occur on this project will be reported and investigated in accordance with paragraph 01.D of EM 385-1-1.

## **12.11 FIRE**

**12.11.1** In the event of a fire, the PM and/or SUXOS will be notified via the radio, and help will be summoned by calling 257-1212 which will provide nearest fire department support.

## **12.12 SAFETY INSPECTION SCHEDULE**

**12.12.1** Continuous monitoring of all safety aspects of this contract in accordance with these plans will be carried out by the SSO. Daily worker inspections are the responsibility of the UXOS. The SSO will provide a report of items inspected and results of the inspections.

**12.12.2** Corrective action will be taken any time the CEHNC Safety Specialist indicates work is not in accordance with safety requirements.

### **12.13 ACCIDENT INVESTIGATION/REPORTS**

**12.13.1** The following procedures will be used to investigate all accidents.

**12.13.1.1** A sequence will be established of events leading to the accident.

**12.13.1.2** The accident scene and all involved property will be observed. Sketches or photographs will be used, if necessary, to clearly present the sequence of events and possible contributing factors.

**12.13.1.3** The cause of the accident or contributing factors will be identified, if possible.

**12.13.1.4** Interviews will be conducted of people involved and witnesses. Each witness and those involved will be identified.

**12.13.1.5** The accident scene will be photographed as soon as possible.

**12.13.1.6** The collected information will be analyzed and a corrective action/plan will be developed to eliminate future accidents, if possible.

**12.13.1.7** Copies of the accident report will be provided to the CEHNC Safety Specialist and CEHNC.

**12.13.1.8** All accidents which occur incident to the project will be investigated, reported, and analyzed as prescribed in paragraph 01.D of EM 385-1-1.

**12.13.1.9** Accidents of any nature will be immediately reported to the PM and/or SUXOS and HFA's Health and Safety Manager.

### **12.14 FORMS**

**12.14.1** Appendix G contains examples of some of the forms HFA expects to use during the life of this project. These examples are not necessarily all inclusive, and forms may be added or deleted as required.

## **12.15 REFERENCES**

American National Standards Institute (ANSI Z39.18-1987)

USACE EM 385-1-1 Safety and Health Requirements Manual

U.S. Army Regulation AR 385-40 with USACE Supplement (1987) Accident Reporting and Records

FM 5-250 Explosives and Demolition - TM 60A-1-1-31

HFA Site Operations Safety Manuals

HFA Comprehensive Drug Free Work Place Program

U.S. Army Corps of Engineers, Huntsville Division, Safety Concepts and Basic Considerations of Unexploded Explosive Ordnance (UXO)

Contract DACA87-94-D-0019



**STATEMENT OF WORK  
ORDNANCE REMOVAL ACTION  
FORMER WEST VIRGINIA MANEUVER AREA  
DOLLY SODS WILDERNESS  
DAVIS, WV**

**2 APRIL 1996**

**1.0 BACKGROUND AND GENERAL STATEMENT OF WORK:** The work required under this Scope of Work (SOW) falls under the Defense Environmental Restoration Program (DERP) - Formerly Used Defense Sites (FUDS). Ordnance and Explosive (OE) contamination exists as a result of Department of Defense activities.

**1.1** OE is a safety hazard and constitutes an imminent and substantial endangerment to the public. During this removal action, it is the Government's intent that the contractor destroy all OE encountered. This action will be performed in accordance with (IAW) the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Section 104, and the National Contingency Plan (NCP), Section 300.400; therefore, permits for on-site disposal are not required.

**1.2** This ordnance removal action does not fall under the RCRA hazardous waste management requirements.

**1.2.1** OE is classified as hazardous waste, thus the applicable provisions of 29CFR 1910.120 apply.

**1.2.2** Due to the inherent risk in this type of operation, the contractor shall be limited to a 40-hour work week: either five 8-hour days or four 10-hour days. UXO personnel shall not perform UXO-related tasks more than 10 hours per day.

**1.2.3** All work performed under this contract shall be conducted in full compliance with with U.S. Army Corps of Engineers, Huntsville Center (CEHNC), U.S. Army Corps of Engineers (USACE), Department of the Army (DA) and Department of Defense (DoD) requirements and operational instructions for protection of the Cheat Mountain Salamander during ordnance removal activities at the Dolly Sods site.

**1.2.4** This Project does not require an on-site full-time Contract Manager.

**1.3 GENERAL DESCRIPTION:**

**1.3.1** The former West Virginia Maneuver Area, 10,215 acres, is located in the Dolly Sods Wilderness. Beginning in August of 1943, the Army used these 10,215 acres for artillery and mortar training as well as a maneuver area. The former West Virginia Maneuver Area is now frequently used for hiking, fishing, camping, picnics, and hunting. It is estimated that between

45,000 and 76,000 people visit Dolly Sods Wilderness annually.

**1.3.2** The terrain is undeveloped, mountainous, rocky, and rugged. Portions are covered with dense brush and are heavily vegetated. Plant and animal life are comparable to northern Canada. Endangered species include the Cheat Mountain Salamander. There are also areas of archaeological significance.

**1.3.3** This SOW pertains to 20.89 miles of trails and 101 campsites commonly used in the Dolly Sods Wilderness as designated by the U.S. Forest Service. The total acreage to be cleared of surface and subsurface OE is approximately 113.9 acres. This is further divided into 111.9 acres for trails and 2.0 acres for campsites.

**1.3.3.1** Area 1. 4 campsites, 2.35 miles of trails. Total area acreage is 1,648. Maximum clearance acreage: 0.6 acre campsites; 12.8 acres trails.

**1.3.3.2** Area 2. 2 campsites, 1.05 miles of trails. Total area acreage is 735. Maximum clearance acreage: 0.03 acre campsites; 5.7 acres trails.

**1.3.3.3** Area 3. 1 campsites, 0.44 miles of trails. Total area acreage is 1.05. Maximum clearance acreage: 0.01 acre campsites; 2.4 acres trails.

**1.3.3.4** Area 4. 5 campsites, 1.63 miles of trails. Total area acreage is 767. Maximum clearance acreage: 0.07 acres campsites; 8.9 acres trails.

**1.3.3.5** Area 5. 41 campsites, 7.88 miles of trails. Total area acreage is 1,565. Maximum clearance acreage: 0.60 acres campsites; 43 acres trails.

**1.3.3.6** Area 6. 21 campsites, 3.34 miles of trails. Total area acreage is 2,156. Maximum clearance acreage: 0.30 acres campsites; 18.2 acres trails.

**1.3.3.7** Area 7. 5 campsites, 0.69 miles of trails. Total area acreage is 282. Maximum clearance acreage: 0.07 acre campsites; 3.8 acres trails.

**1.3.3.8** Area 8. 15 campsites, 2.50 miles of trails. Total area acreage is 1,192. Maximum clearance acreage: 0.22 acres campsites; 13.6 acres trails.

**1.3.3.9** Area 9. 7 campsites, 1.01 miles of trails. Total area acreage is 819. Maximum clearance acreage: 0.10 acres campsites; 5.5 acres trails.

**1.3.4** Clearing these areas will be a relatively normal UXO clearance operation involving close coordination of the clearance team with the on-site Forest Service representative. No brush and tree clearance will be done on this site.

**1.3.5** An unexploded ordnance field investigation was conducted by a Corps of Engineers, Huntsville Division, contractor during July-October 1991. 18 random areas were sampled which composed 281 surface acres and 10 subsurface acres. The site was found to be contaminated with OE and OE-related scrap. The UXOs found included 4.2", 81mm, 60mm, mortars, and 57mm projectiles. It is also reported that 105 and 155mm projectiles have been found and the area was used to test fire rockets.

**1.4 DEFINITIONS:** Definitions of applicable terms are found in Section C, paragraph 2.4, of the basic contract.

**2.0 OBJECTIVE:** The Contractor shall safely locate, recover and dispose of all surface and subsurface ordnance and explosives (OE) to a depth of one foot beneath all trails (to include a width of 20 feet on each side of the trails) and to a depth of four feet beneath designated camping areas at this site.

**3.0 DESCRIPTION OF SERVICES:**

**3.1 General.** This removal project consists of searching all Forest Service designated trails, 20 feet to each side of the trails, and all Forest Service inventoried campsites (cleared areas only). OE shall be cleared to a depth of 1 foot in trails and adjacent areas and to 4 feet in campsites. To minimize adverse impacts on the environment, the Contractor shall follow all mitigation measures defined in field operating procedures provided by the Forest Service and the *Dolly Sods Wilderness Ordnance Removal Project Environmental Assessment* dated September 1995. These mitigation measures include the following:

- No motorized vehicles will be used in the Wilderness.
- Before activities begin within the Wilderness, Government-furnished specialists will train the Contractor's personnel to recognize historic and prehistoric sites.
- Prior to beginning their work, the Forest Service will provide to the Contractor maps showing the locations of known cultural resource sites, statements as to the significance of those sites, and recommendations for treatment.
- If artifacts or structural remains are detected in a work area, they will be carefully set aside, then returned to their previous locations.
- If artifacts or structural remains are detected in a designated work area not known to be a site, that location will be noted on a map along with a general description of what was found. This information will be furnished to the Forest Service.
- When areas not previously designated as work areas are selected for disturbance, the Forest Archaeologist will be notified and given the opportunity to survey for cultural resources in that area.

**3.2 Operational Instructions for protection of the Cheat Mountain Salamander (CMS) during unexploded ordnance removal activities at Dolly Sods Wilderness in 1996.** The following operational instructions shall replace CMS protection measures as listed on page 4-9 of the approved environmental assessment, in the biological evaluation and in the 22 August 1995 consultation letter from the U.S. Fish and Wildlife Service to Colonel Jemiola.

-When a metal object is detected by magnetometer:

A. If the metal object is beneath a trail or beneath the area within 20 feet of each side of the trail (hand excavation only to a depth of one foot).

1. The ordnance specialist will remove, as much as possible, by hand, any leaf litter and organic matter from a area large enough to dig a hole to the maximum depth allowed (1 ft.), to store the soil and to work at the site. Leaf litter and organic matter will be placed in a plastic bag or bucket for replacement over the site later. Any salamanders found during removal of leaf litter and organic matter shall be placed in a suitable container with damp moss and the container will be kept cool, and placed in the shade. It may be necessary to utilize a cooler. Only one salamander will be placed in each container.

2. The ordnance specialist will then hand excavate down to the metal object to identify it, or to the maximum depth allowed.

a. If the metal object is not a UXO:

Replace material from the hole without removing the object, (metal objects associated with ordnance may be removed);

Tamp with foot;

Replace leaf litter and organic matter;

Release any salamanders previously collected to the area.

b. If the metal object is a UXO, but can be safely moved, (such as many UXO without a fuse):

Dig out the UXO and transfer it to a storage area mutually agreed upon by the FSS and COE/contractor for later disposal/detonation;

Replace material from the hole;

Tamp with foot;

Replace leaf litter and organic matter;

Release any salamanders previously collected to the area.

c. If the metal object is a UXO that must be detonated in place:

Mark the location;

Call in a qualified Forest Service salamander person;

This qualified person will search for and collect all salamanders from within 15 ft. of the UXO. All salamanders will be placed in suitable containers with damp moss and kept cool in the shade. This may require the use of a cooler. Only one salamander will be placed in each container;

After salamanders have been removed, (if any are found), remove the majority of leaf litter and organic matter from a 15 foot radius area around the UXO and store in plastic bags or buckets out of detonation range. The FS will determine appropriateness of this

step if no salamanders are found;

Detonate UXO in place with appropriate use of sand bags;

If the item detonated was directly beneath the trail, fill crater with any rocks in the vicinity resulting from the detonation of the UXO plus any additional rocks from within 100 feet of the detonation needed to complete filling the crater, as deemed necessary. To minimize the effects of collecting rocks and material to fill the crater, remove small quantities from several different areas within the designated area. Cover rocks placed in the crater with any clumps of soil from the detonation, as appropriate. Tamp with foot;

Replace leaf litter and organic matter uniformly across the site from where it had been collected;

Replace all salamanders collected prior to detonation to as close to their site of original collection as possible.

If the item detonated is not located in the trail itself, the crater may not have to be refilled unless such refilling is mandated by the Forest Service.

B. If the metal object is beneath a designated camping area (hand excavation only to a depth of four feet):

1. The UXO specialist will remove, as much as possible, by hand, all leaf litter and organic matter from a area large enough to dig a hole to the maximum depth allowed (4 ft.), to store the soil and to work at the site. Leaf litter and organic matter will be placed in plastic bags or buckets for replacement over the site later. Any salamanders found during removal of leaf litter and organic matter shall be placed in an appropriate container with damp moss and the container will be kept cool in the shade. This may require use of a cooler. Only one salamander will be placed in each container.

2. a. The digging and removal of UXO/UXO scrap will be the same as prescribed in the trail and adjacent areas.

b. Because ordnance personnel have advised that a detonation at four feet in depth with sandbags will create a similar sized crater and area of impact as a detonation at one foot of depth, the qualified FS person will search for and collect all salamanders from within a 15 foot radius of the UXO.

C. If the metal object is on the surface of the ground (no substantial hand excavation needed) and on a trail, within 20 ft. of each side of a trail or within a designated camping area:

a. If the metal object is not a UXO:

Leave the object in place, except that metal objects associated with ordnance may be removed.

b. If the metal object is a UXO, but can be safely moved (such as many UXO without a fuse):

Remove the object and transfer it to a storage area mutually agreed upon by the FS and COE/contractor for later disposal/detonation.

c. If the metal object is a UXO that cannot be moved, the qualified FS person will search for and collect all salamanders from within a 40 ft. radius of the UXO. The majority of leaf

litter and organic matter from a 40 ft. radius area around the UXO will be removed and stored in plastic bags or buckets out of detonation range. All other procedures for UXO will apply.

There will be no need for a biologist to conduct a walkover of the area to identify potential CMS habitat before the project begins. Under these operational instructions, all sites where metal objects are found and excavated to be identified and/or detonated will be treated to protect the CMS and other salamander species and vertebrate animals.

If there is a need to use sandbags to facilitate detonation of any UXO in place, a borrow area will be jointly selected by the ordnance specialist and a qualified Forest Service person, as an area from which soil may be taken to fill sand bags. These borrow areas will be treated similar to a site where a metal object is found. Leaf litter and organic matter will be removed and stored, salamanders collected, borrow material removed, litter replaced and salamanders replaced.

It will not be necessary to conduct field surveys for CMS at night or within 48 hours of rainfall.

Other animals such as turtles, toads, lizards, snakes, etc., found while searching for salamanders or while removing leaf litter shall be relocated to adjacent areas.

Since trails and campsites are heavily impacted by human use, it is unlikely that large amounts of leaf litter or salamanders will need to be removed from these areas prior to excavation of a metal object or detonation.

### **3.1 (TASK 1) PERFORM SITE VISIT AND PREPARE WORK PLAN (WP):**

**3.1.1 PERFORM SITE VISIT:** This task shall be accomplished IAW Section C, paragraph 3.2, of the basic contract. Prior to preparation of the WP, a site visit, not to exceed 5 days including travel time, is authorized. The site visit team shall not exceed two persons, one of whom shall be a Senior UXO Supervisor. The contractor shall notify the CEHNC Project Manager of the proposed dates for the site visit. The site visit shall include coordination with the appropriate Dolly Sods Wilderness agencies. Additionally, the site visit team will coordinate with the local medical facility and airport. During the site visit, environmental concerns, cultural resources and endangered species in the ordnance removal areas shall be addressed.

**3.1.2 PREPARE WORK PLAN:** The WP shall outline the contractor's proposed methodology of accomplishing the objective. This shall include site-specific training, UXO-related procedures and practices, equipment, administrative area equipment, demolition materials and their security and accountability system, personal protective equipment, responsibilities and qualifications of personnel, organizational structure to include subcontractor(s) (if applicable), internal and external communications, project site office, project schedule, UXO safety and site-general safety to include snakes, ticks, and other flora and fauna, quality control procedures, on-site and off-site emergency medical arrangements to include transportation, and the completion of ENG Form 3394 in the event of an accident. All UXO-related procedures shall comply with CEHNC Safety Concepts and Basic Considerations for UXO.

**3.1.2.1 DISPOSAL ALTERNATIVES:** Based on the site visit, the contractor shall describe and recommend the safest and most cost-effective method of treatment and disposal of OE. The contractor shall provide three disposal alternatives IAW Section C, paragraph 3.3, of the basic contract. The method of treatment shall be selected and approved by CEHNC, after which the contractor shall proceed with preparation of the WP.

**3.1.2.2** The contractor shall submit a draft WP for review and a final WP for approval IAW paragraph 4.1, this SOW.

**3.1.2.3** The WP shall include the following subplans written IAW Data Item Description OT-005 of the Basic Contract:

**3.1.2.3.1** UXO Operational Plan.

**3.1.2.3.2** Site-specific Safety and Health Plan (SSHP). The contractor shall submit a SSHP IAW 29CFR 1910.120 that contains OE safety standards and procedures.

**3.1.2.3.3** Equipment Plan (EP). The contractor shall prepare and submit a detailed EP (as a WP subplan) describing the equipment to be employed to perform all necessary operations.

**3.1.2.3.4** Location Survey and Mapping Plan.

**3.1.2.3.5** Environmental Protection Plan.

**3.1.2.3.6** Quality Control Plan.

**3.1.2.3.7** Work, Data, and Cost Management Plan.

**3.1.3** In addition to the WP and subplans required above, a brief, concise, separate document, the *Remedial Action Safety Plan (RASP)*, shall be prepared for submission with the WP. The RASP shall contain the following information and may reference chapters of the WP, when applicable.

**3.1.3.1** Site location and description.

**3.1.3.2** Projected removal action starting date.

**3.1.3.3** Suspected items.

**3.1.3.4** An assessment of the potential for migration of contamination and a description of the steps taken to halt such migration.

**3.1.3.5** Precautions to be taken if toxic chemical agent items are discovered.

3.1.3.6 Name of UXO contractor.

3.1.3.7 An on-site detailed disposal plan.

3.1.3.8 A drawing of the site.

3.1.3.9 Location of the demolition area(s) as a potential explosive site and distances of potential exposed sites.

3.1.3.10 A summary of risk assessment and mitigating features at demolition areas.

3.1.3.11 When it is applicable, the off-site disposal plan will include the following specific information: how the off-site disposal will be accomplished; who will perform the actual off-site disposal; the off-site disposal location; transportation procedures; and the expected results of the disposal action.

3.1.3.12 Identify the basic contract and the delivery order.

3.1.4 Other subplans identified in the basic contract are not required for this delivery order.

3.1.5 The contractor shall notify the CEHNC Project Manager, Mr. Bill Sargent, at (205) 895-1562 at least five calendar days in advance of site visit.

## 3.2 (TASK 2) PERFORM COMMUNITY RELATIONS

3.2.1 The contractor shall assist in the conduct of a public meeting and media day to inform the public of the purpose of the project, the procedures to be followed, and the cooperation requested.

3.2.2 All press releases and media appearances shall be coordinated with, and approved by, the PAO, Huntington District (See Paragraph 5.0).

**3.3 (TASK 3) LOCATION SURVEYING AND MAPPING.** The following information is provided should there be a requirement as part of the clearance activity to establish additional survey control in and around Dolly Sods Wilderness. The contractor will be supplied a copy of the existing aerial photography, orthophotos, monument locations, and survey control markers previously established (under a separate delivery order) in the Dolly Sods Wilderness, Cabin Mountain, and Black Bird Knob areas. The contractor shall, following the guidance provided by the following paragraphs, map all grid locations and UXO removed from the project locations. If multiple UXO are removed from an area, that area may be marked as a grid and the corner of the grid located on the map (not each individual UXO).

**3.3.1 Control Points.** Plastic or wooden hubs shall be used for all basic control points. Horizontal control (1:10,000) referenced to the North American Datum of 1983 (NAD83), and vertical control (1:5,000) referenced to the North American Vertical Datum of 1988 (NAV88) of "Third Order" or better shall be established for the network required for all monuments.

All coordinates and all elevations are to be shown to the closest one hundredth of a foot (0.01). All the control points recovered and/or established at this site shall be plotted at the appropriate coordinate point on a reproducible (Mylar) planimetric or topographic map at a scale of 1 inch = 200 feet.

These points shall be identified on the map by their name or number, final coordinates, and final adjusted elevations. A tabulated list, and a "Description Card" of all control points used, shall be submitted IAW paragraph 3.3.3 of this SOW. The Description Card shall show a sketch of each monument; its location relative to reference marks, buildings, roads, railroads, towers, etc; a typed description telling how to locate the monument from a known point; the monuments name or number; and, the final adjusted coordinates and elevations. The Description Cards shall be 5 inches by 8 inches with one monument per description per card, or two monuments being described on an 8.5 inch by 11 inch sheet of bond paper.

**3.3.2 Mapping.** The location, identification, coordinates, and evaluations of all the control points recovered and/or established at the site, and the corners of all of the areas that are cleared of UXO, shall be plotted on a reproducible (Mylar) planimetric or topographic map (at a scale no smaller than 1 inch = 200 feet) to show their location with respect to all the surface and planimetric features within the project area. In addition, all UXO that are located in the field shall be plotted and shown on the map in their respective locations.

**3.3.3 Items and data to be submitted to CEHNC as follows:**

**3.3.3.1 Field Survey.** The original copies of all field books, layout sheets, computation sheets, abstracts, and computer printouts. All of these items shall be suitably bound, clearly marked, and identified.

**3.3.3.2** A tabulated list of all control points showing the adjusted coordinates and elevations (to the closest one-hundredth of a foot) established and/or used for this survey.

**3.3.3.3** A "Report on Establishment of Survey Mark" (Description Card) on each permanent control monument used for the survey. In addition to the name or ID number of the monument, the cards shall show the adjusted coordinates, the adjusted elevations (to the closest 0.01 foot), a written description for locating the monument, and a sketch showing how to locate the monuments.

**3.3.3.4 Drawings.** All maps shall be drawn at a scale no smaller than 1 inch = 200 feet on reproducible (Mylar) drawings. One original copy and one blue line print of each final drawing

shall be delivered to CEHNC. Grid lines referenced to NAD83, and a true North Arrow and Magnetic North Arrow shall be shown on each map.

**3.3.3.5 Schedule.** All work and services under this paragraph shall be completed and submitted to CEHNC IAW with paragraph 4.1 of this SOW.

**3.3.4** During all field and intrusive activities the survey crew shall be accompanied by an UXO Specialist and magnetometer.

**3.4 (TASK 4) PERFORM UNEXPLODED ORDNANCE REMOVAL.** This task shall be accomplished IAW Section C, paragraph 3.5, of the basic contract.

**3.4.1** The contractor shall furnish all necessary personnel and equipment to perform a surface and subsurface clearance of all OE on the project site to a depth of 1 foot on and along trails and 4 feet in campsites. This action shall include all OE-related scrap. Non OE-related metal scrap will be left.

**3.4.2.** A planned, systematic approach shall be utilized to search and clear the project site that will result in optimum search effectiveness. The proposed methodology shall be outlined in the WP.

**3.4.3** UXO encountered during this project shall be disposed of IAW operational instructions for protection of the Cheat Mountain Salamander (para. 3.2). Manual procedures for armed UXO shall not be utilized unless approved by the on-site CEHNC Safety Specialist, who will have access to all 60-series publications.

**3.4.4** All UXO operations shall comply with the U.S. Army Engineering and Support Center, Huntsville, Safety Concepts and Basic Considerations for Unexploded Explosive Ordnance (UXO). Only CEHNC approved UXO personnel shall perform UXO-related tasks.

**3.4.5** The contractor shall maintain a detailed accounting of all UXO encountered on the project site. This accounting shall include the amounts of UXO, identification, condition, depth located, disposition, and location/mapping. This accounting shall be a part of the Removal Report.

**3.4.5.1** An accountability system shall be used that accounts for all demolition materials expended in the disposal of UXO.

**3.4.6** If a scenario is encountered that precludes detonating an UXO in place, an unidentifiable UXO is found, or a suspected toxic chemical munition is found, the on-site CEHNC Safety Specialist will request EOD support.

**3.4.7** The contractor shall have a contingency plan in place to provide demolition materials in the event the Government supply is depleted and/or resupply is not timely. This shall be outlined in the WP.

3.4.8 During the subsurface operation the contractor shall use a magnetometer capable of detecting a 75mm projectile to a depth of 3 feet. The contractor shall dig to a depth of one foot on and along trails and four feet in campsites to determine the identity of the magnetic anomaly. The on-site CEHNC Safety Specialist may approve deeper excavation if he determines it necessary.

3.4.8.1 Magnetometers shall be field tested daily to ensure that they are operating properly. This shall be accomplished by planting a inert 75mm projectile or similar inert object to a depth of 3 feet and determining the standard indication. If a magnetometer does not meet the standard during the daily check, it shall be calibrated, repaired, or replaced.

3.4.9 If an excavation is required in the potential habitat of an endangered/protected plant or animal, excavation shall proceed only after approval by the Forest Service representative.

3.4.10 Unless approved by the CEHNC Safety Specialist, all recovered UXO shall be disposed of daily.

3.4.11 All access/excavation/detonation holes shall be backfilled IAW Cheat Mountain Salamander operational instructions.

### **3.5 (TASK 5) TURN IN OF RECOVERED INERT UXO AND RELATED SCRAP:**

3.5.1 The contractor shall furnish all necessary personnel and equipment to turn in all recovered inert UXO-related scrap. The methodology to accomplish this task shall be proposed in the WP.

3.5.2 Inert UXO-related scrap shall be segregated from other types of scrap. Inert ordnance items shall be vented IAW Safety Concepts and Basic Considerations prior to turn in.

3.5.3 The contractor shall complete a DD Form 1348-1 and/or local form required by DRMO. The contractor shall prepare, and the Senior UXO Supervisor shall sign, a certificate as follows:

"I certify that the property listed hereon has been inspected by me and, to the best of my knowledge and belief, contains no items of a dangerous nature."

3.5.4 DRMO turn-in documentation receipts shall be submitted as a component of the Removal Report.

### **3.6 (TASK 6) PERFORM QUALITY CONTROL:**

3.6.1 The contractor shall furnish the necessary personnel and equipment to administer a Quality Control (QC) Program to manage, control, and document contractor and subcontractor activities. The methodology to accomplish this task shall be proposed in the WP. The QC activities shall be documented and included in the Removal Report.

**3.6.2** During the Government's periodic QA inspections, if an UXO is located in a grid, that entire grid shall be reswept by the contractor.

**3.7 (TASK 7) PREPARE AND SUBMIT REMOVAL REPORT:** At the conclusion of all field activities, the contractor shall submit the Removal Report which consists of the following:

**3.7.1** All original surveying and mapping data from Task 3.

**3.7.2** Detailed accounting of all UXO and UXO-related materials located and destroyed.

**3.7.3** A daily journal of all activities associated with this SOW.

**3.7.4** A recapitulation of exposure data. This shall include total number of man-hours worked on site, total motor vehicle mileage, total number of personnel flying hours, and number of flights.

**3.7.5** QC documentation.

**3.7.6** DRMO turn-in documentation.

**3.7.7** A minimum of 20 4" X 6" color photographs shall be included in the report depicting major action items and UXO discoveries. The original Final Report furnished to CEHNC shall include original photographic prints. Photographs contained in draft submissions and copies of final submissions shall be color reproductions. Further, a minimum of 45 minutes of narrated video tape depicting all activities shall be provided in three copies to CEHNC.

**3.8 CONTRACTOR QUALIFICATIONS:** The contractor shall furnish a staff that is qualified through education, training, and experience that shall accomplish the objective and tasks of this SOW. Federal military and civilian employees shall not be employed by the contractor in the performance of any work under the contract (eg: during off-duty hours, regular hours, or while on annual or terminal leave). Resumes for UXO and other personnel, which document the following qualifications, shall be included in the WP for approval. If UXO personnel are substituted at the project site, their resumes shall be approved by CEHNC representatives prior to their admittance onto the site.

**3.8.1** Training and medical screening IAW 29CFR 1910.120(e) is required for this project.

**4.0 SUBMITTALS:** The contractor shall furnish copies of the plans, maps, and reports as identified in paragraph 4.1 to each addressee listed below in the quantities indicated. The contractor shall use express mail services for delivering these plans and reports. Following each submission, comments generated as a result of their review shall be incorporated.

<b>ADDRESSEE</b>	<b>COPIES</b>
US Army Engineering and Support Center, Huntsville ATTN: CEHNC-PM-OT (Mr. Bill Sargent) PO BOX 1600 Huntsville, Alabama 35807-4301	10
US Army Engineer District, Huntington ATTN: CEORH-DL-M (Mr. Richard Meadows) 502 8th St Huntington, WV 25701-2070	2
USDA Forest Service Potomac Ranger District ATTN: (N. Feakes) HC 59, Box 240 Petersburg, WV 26847	3
Mr. B. Durham Supervisors Office, Monongahela National Forest 200 Sycamore St. Elkins, WV 26241	3
Commander, 542th Ordnance Detachment (EODCT) Fort Dix, NJ 08640-5000	1

**4.1 Submittals and Due Dates:**

<b>SUBMITTAL</b>	<b>DUE DATES</b>
Disposal Feasibility Letter	5 calendar days after site visit
Draft Work Plan	18 calendar days after site visit
Final Work Plan	48 calendar days after site visit
Draft Removal Report	30 calendar days after completion of field work

Final Removal Report      30 calendar days after receiving review comments

**5.0 PUBLIC AFFAIRS:** The contractor shall not make available or publicly disclose any data generated or reviewed under this contract or any subcontract unless specifically authorized by the Contracting Officer and the Huntington District Public Affairs Office (PAO). When approached by any person or entity requesting information about the subject of this contract, the contractor shall defer to the PAO for response. Reports and data generated under this contract shall become the property of the Government and distribution to any other source by the contractor is prohibited unless authorized by the Contracting Officer.

**6.0 REFERENCES:**

6.1 DOD Manual 4160.21.M, Defense Utilization and Disposal Manual.

6.2 AR 200-1, Environmental Protection and Enhancement.

6.3 AR 385-40 with USACE Supplement.

6.4 EM 385-1-1, USACE Safety and Health Requirements Manual.

6.5 TM 9-1300-206, Ammunition and Explosive Standards.

6.6 CEHNC Safety Concepts and Basic Considerations for UXO.

**7.0 GOVERNMENT FURNISHED.**

7.1 UXO technical publications/information (CEHNC).

7.2 Available equipment (CEHNC)

7.3 Mapping and GIS Data as described in Task 3 (CEHNC).



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Human Factors Applications, Inc.  
ORDNANCE & EXPLOSIVE WASTE REMEDIATION  
4950 Route 202, Building 1 Suite 2A, Holicong, PA 18928-0615

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ORDNANCE REMOVAL ACTION

**FORMER WEST VIRGINIA  
MANEUVER AREA,  
DOLLY SODS, WEST VIRGINIA  
SITE-SPECIFIC SAFETY  
& HEALTH PLAN**

**CONTRACT NUMBER:** DACA87-94-D-0019  
**DELIVERY ORDER:** #020  
**CLIENT NAME:** U.S. Army Corps of Engineers  
**PRIME CONTRACTOR:** Human Factors Applications, Inc.  
**PROJECT TITLE:** Ordnance Removal Action  
**PROJECT LOCATION:** Former West Virginia Maneuver  
Area, Elkins, WV

**Date Prepared:** \_\_\_\_\_

**Prepared By:** \_\_\_\_\_  
Richard T. Thiel, Project Manager

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**CHAPTER 15**

**ACCIDENT PREVENTION**

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**LIST OF ABBREVIATIONS AND ACRONYMS**

AGA	American Gas Association
ANSI	American National Standards Institute
APP	Accident Prevention Plan
ASME	American Society of Mechanical Engineers
ASR	Archives Search Report
BZ	Breathing Zone
CEHNC	U.S. Army Engineering & Support Center, Huntsville
CERCLA	Comprehensive Environment Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CPR	Cardiopulmonary Resuscitation
CRC	Contamination Reduction Corridor
CRZ	Contamination Reduction Zone
CWM	Chemical Warfare Material
DERP-FUDS	Defense Environmental Restoration Program-Formerly Used Defense Sites
DRMO	Defense Reutilization Marketing Office
EE/CA	Engineering Evaluation/Cost Analysis
EEDS	Electrical Explosive Devices
EMM	Earth-Moving Machinery
EOD	Explosive Ordnance Disposal
EPA	U.S. Environmental Protection Agency
ESS	Explosive Safety Submission
EZ	Exclusion Zone
F	Fahrenheit
GFCI	Ground Fault Circuit Interrupters
HAF	Hazard Analysis Form
HBV	Hepatitis B Vaccinations
HE	High Explosives
HEAT	High Explosive Anti-Tank
HFA	Human Factors Applications, Inc.
HTRW	Hazardous, Toxic, and Radioactive Waste
IAW	In accordance with
IDLH	Immediately Dangerous to Life or Health
MSDSs	Material Safety Data Sheets
mm	Millimeter
NA	Not Applicable
NAD	North America Datum
NCP	National Contingency Plan
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NESC	National Electrical Safety Code
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health

OE	Ordnance and Explosive
OOU	Ordnance Operable Units
OSHA	Occupational Safety and Health Administration
PPE	Personal Protective Equipment
PM	Project Manager
PZ	Piezoelectric
SHM	Safety and Health Manager
SUXOS	Senior UXO Supervisor
QC	Quality Control
QCO	Quality Control Officer
RASP	Remedial Action Safety Plan
RCRA	Resource Conservation and Recover Act
RFI	RCRA Facility Investigation
SOP	Standing Operating Procedures
SSO	Site Safety Officer
SSHPS	Specific Safety and Health Plans
SWMUs	Solid Waste Management Units
TCRA	Time-Critical Removal Action
TERC	Total Environmental Restoration Contract
TEU	Technical Escort Unit
TO	Task Order
SZ	Support Zone
TWA	Time-Weighed Average
USACE	U.S. Army Corps of Engineers
USATHAMA	U.S. Army Toxic and Hazardous Material Agency
USCG	United States Coast Guard
UST	Underground Storage Tank
UXO	Unexploded Ordnance
WWII	World War II

## REVIEWS AND APPROVALS

  
\_\_\_\_\_  
Project Manager  
HFA, Inc.

9-12-96  
Date

  
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Health and Safety Manager  
HFA, Inc.

9/12/96  
Date

  
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Corporate CIH Director

9/19/96  
Date



# CHAPTER 1

## SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION

### 1.1 INTRODUCTION

#### 1.1.1 OBJECTIVE

**1.1.1.1** This Site Specific Safety and Health Plan (SSHP) has been prepared in conformance with U.S. Army Corps of Engineers (USACE) Safety and Health Requirements Manual EM 385-1-1, Occupational Safety and Health Administration (OSHA) Title 29 Code of Federal Regulations (CFR) 1910.120 - Hazardous Waste Site Operations and Emergency Response, 29 CFR 1910.134 - Respiratory Protection, and USACE ER 385-1-92 - Safety and Occupational Health Document Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) and Ordnance and Explosive (OE) Activities.

**1.1.1.2** This SSHP establishes the work practices, health, safety, accident, and fire protection standards and procedures necessary to help ensure protection of HFA personnel and subcontractors during the removal of OE and OE-related scrap from the Former West Virginia Maneuver Area, near the city of Elkins, West Virginia. All on-site personnel will read the SSHP and sign the acknowledgement form prior to starting any tasks on the site. The levels of personal protective equipment (PPE) and other controls specified in this SSHP are based on the best available information from references documents, site characterization data, and current site conditions. The SSHP is a living document and may be modified as site conditions change. Any changes in site conditions or changes in Statement of Work (SOW) that reflect changes to the SSHP must be approved by the CEHNC Contracting Officer.

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

**1.1.1.4** All site operations will be performed in accordance with applicable state, local, and HFA regulations and procedures, OSHA requirements, and client requirements. All HFA employees and subcontractors will comply with the requirements of this plan. All site personnel will exercise caution at all times and immediately report any site conditions which may pose safety or health hazards to personnel.

#### 1.1.2 SITE/FACILITY LOCATION

**1.1.2.1** The Former West Virginia Maneuver Area consists of approximately 10,215 acres and is located approximately 35-40 miles east of Elkins, West Virginia. The work areas are divided into 9 sub areas located in the Dolly Sods Wilderness Area. They total approximately 113.9 acres and are designated as:

**1.1.2.1.1** Area 1. 4 campsites, 2.35 miles of trails. Total area acreage is 1,648. Maximum clearance acreage: 0.6 acre campsites; 12.8 acres trails.

**1.1.2.1.2** Area 2. 2 campsites, 1.05 miles of trails. Total area acreage is 735. Maximum clearance acreage: 0.03 acre campsites; 5.7 acres trails.

**1.1.2.1.3** Area 3. 1 campsites, 0.44 miles of trails. Total area acreage is 1.05. Maximum clearance acreage: 0.01 acre campsites 2.4 acres trails.

**1.1.2.1.4** Area 4. 5 campsites, 1.63 miles of trails. Total area acreage is 767, Maximum clearance acreage 0.07 acres campsites, 8.9 acres trails.

**1.1.2.1.5** Area 5. 41 campsites, 7.88 miles of trails. Total area acreage is 1,565. Maximum clearance acreage: 0.60 acres campsites 43 acres trails.

**1.1.2.1.6** Area 6. 21 campsites, .34 miles of trails. Total area acreage is 2,156. Maximum clearance acreage: 0.30 acres campsites; 18.2 acres trails.

**1.1.2.1.7** Area 7. 5 campsites, 0.69 miles of trails. Total area ~acreage-e is 282. Maximum clearance acreage: 0.07 acre campsites; 3.8 acres trails.

**1.1.2.1.8** Area 8. 15 campsites, 2.50 miles of trails. Total area acreage is 1,192. Maximum clearance acreage: 0.22 acres campsites, 13.6 acres trails.

**1.1.2.1.9** Area 9. 7 campsites, 1.01 miles of trails. Total area acreage is 819. Maximum clearance acreage: 0.1 acres campsites; 5.5 acres trails.

### **1.1.3 PHYSICAL CHARACTERISTICS OF THE SITES**

**1.1.3.1** The terrain is undeveloped, mountainous, rocky, and rugged. Portions are covered with dense brush and are heavily vegetated. Plant and animal life are comparable to northern Canada. Endangered species include the Cheat Mountain Salamander. There are also areas of archaeological significance

### **1.1.4 POLICY STATEMENT**

**1.1.4.1** It is the policy of HFA to provide a safe and healthful work environment for all its employees. HFA considers no phase of operations or administration to be of greater importance than the prevention of injury and illness. Every occupational illness, accident, injury, and spill is avoidable, and HFA will take every reasonable step to reduce the possibility of injury, occupational illness, accident or spill.

**1.1.4.2** We believe in two fundamental principles of safety: all accidents, injuries and occupational illnesses are preventable and/or reducible. To put these principles into practice, every employee will

receive the appropriate training, equipment, and other resources necessary to complete assigned tasks in a safe and efficient manner.

**1.1.4.3** There is no "safe" procedure for dealing with UXO, merely procedures which are considered least dangerous. However, maximum safety in any UXO operation can be achieved through adherence to applicable safety precautions, a planned approach and intensive supervision.

**1.1.4.4** This SSHP prescribes the procedures that must be followed by all site personnel. Operational changes which could affect the health and safety of personnel, the community, or the environment will not be made without prior approval of the Project Manager, H&S Manager, CIH, and the CEHNC Contracting Officer.

## **1.2 REFERENCES**

**1.2.1** This SSHP complies with applicable OSHA and EPA regulations. This plan follows the guidelines established in the following documents:

- Standard Operating Safety Guides (United States Environmental Protection Agency (EPA) July 1988);
- Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (National Institute for Occupational Safety and Health (NIOSH) 85-115);
- Title 29 of the Code of Federal Regulations, Part 1910.120 (29 CFR 1910.120) (United States Department of Labor/Occupational Safety and Health Agency (USDOL/OSHA));
- Safety and Occupational Health Document Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) and Ordnance and Explosive Waste (OEW) Activities ER 385-1-92;
- Safety and Health Requirements Manual EM 385-1-1 (United States Army Corps of Engineers (USACE), Revised October 1992);
- AR 385-40, USACE Supplements, Accident Reporting and Records;
- TM 60A-1-1-31, EOD Disposal Procedures;
- DOD 6055.9 - STD, DOD Ammunition and Explosives Safety Standards; and
- NIOSH/OSHA/USCG/EPA, Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities.

## CHAPTER 2

# HAZARD/RISK ANALYSIS

**2.1** Preliminary evaluation has been conducted using available information from site characterization data and task hazard information. The Hazard Analysis forms (See Chapter 15) reflect the hazards anticipated for this site and the potential risk to personnel. The Hazard Analysis forms also indicate the hazard control and mitigation methods and procedures, and any specialized equipment, training or inspection which may be required to safely perform given tasks. The types of hazards which can be expected during removal activities include: exposure to explosives and explosive residue, biological, and physical hazards. Biological and physical hazards will be consistent throughout the site with variations attributed to the amount of vegetation at the site, the ruggedness of the terrain, etc.

**2.2** All known or potential hazards that may pose a threat to the health and safety of site personnel have been identified and the risk of exposure assessed to ensure personnel are informed and protected. All site personnel must conduct evaluation of the work site characteristics and hazards throughout the duration of the project. All personnel will be alert to recognizing hazards at the site and bring them to the attention of supervisors.

**2.3** The probability of occupational exposure is greatest by exposure to physical and biological site hazards. The potential for exposure to military chemical agent is not anticipated, based on previous site sampling and the Archive Search Report.

### **2.4 SCOPE OF WORK**

**2.4.1** HFA will perform an ordnance, ammunition, and explosive removal action of the sites described in the following paragraphs. Campsites vary in size and the width of hiking trails vary from a narrow path to the width of a vehicle road bed. The trails will be cleared to a depth of one foot to include 20 feet on either side of the trail. Each of the campsites will be subsurface cleared to a depth of 4 feet. Working in these areas requires close coordination between the on-site Forest Service representative and HFA's SUXOS. No brush and tree cutting, trimming or clearance will be done on this site, areas where the brush is too thick to penetrate and efficiently sweep will be left undone and appropriately marked on their respective grid sheets.

**2.4.1.1** Area 1. 4 campsites, 2.35 miles of trails. Total area acreage is 1,648. Maximum clearance acreage: 0.6 acre campsites; 12.8 acres trails.

**2.4.1.2** Area 2. 2 campsites, 1.05 miles of trails. Total area acreage is 735. Maximum clearance acreage: 0.03 acre campsites; 5.7 acres trails.

**2.4.1.3** Area 3. 1 campsite, 0.44 miles of trails. Total area acreage is 1.05. Maximum clearance acreage: 0.01 acre campsites 2.4 acres trails.

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**2.4.1.8** Area 8. 15 campsites, 2.50 miles of trails. Total area acreage is 1,192. Maximum clearance acreage: 0.22 acres campsites, 13.6 acres trails.

**2.4.1.9** Area 9. 7 campsites, 1.01 miles of trails. Total area acreage is 819. Maximum clearance acreage: 0.10 acres campsites; 5.5 acres trails.

**2.4.2** This will include the following tasks:

- Location Surveying and Mapping/Site Preparation;
- Ordnance and Explosive Removal;
- Turn-in of Recovered OE-Related Scrap; and
- Quality Control.

## **2.5 JOB HAZARD ASSESSMENT BY TASK**

**2.5.1** The Hazard Assessment identifies potential safety, health, and environmental hazards and provides for the protection of personnel, the community, and the environment. Because of the complexity and numerous locations in the project, supervisors must continually inspect the work site to identify potential hazards. At any time during site activities drums, medical waste, and any items not positively identified as Ordnance, Ammunition or Explosives or related scrap or benign (Non-HTW) metal scrap are encountered, employees will not handle or manipulate them under this SSHP. Work will discontinue until the Project Manager, SUXOS, CEHNC Safety Specialist, and the Health and Safety Manager have been notified and the situation evaluated.

**2.5.2** If a UXO cannot be positively identified as conventional ordnance, personnel will immediately evacuate the area in an upwind direction. The UXO Supervisor will notify the SUXOS and CEHNC Safety Representative, who will in turn request for EOD/TEU support personnel. Other UXO teams will be notified, whether or not to remain where they are, or evacuate. This assessment will be made by the SSO.

### **2.5.3 SURVEYING AND MAPPING BOUNDARIES AND GRIDS/SITE PREPARATION**

**2.5.3.1** The area boundaries were previously established and mapped, HFA will establish grids, and

search lanes on the site. These activities will be completed at each work area prior to conducting UXO removal operations.

### **2.5.3.2 Physical Hazards**

**2.5.3.2.1** During this task, employees will be exposed to various slip, trip, and fall hazards. Care and attention must be paid to where employees are walking, since hidden debris can result in puncture wounds or lacerations. Biological hazards such as poisonous plants, insects, and animals may also be a concern to project personnel. Heat stress will not be a concern during this initial phase of the project; but it will be a concern during the follow on work in the spring and summer. Section 2.8.2 includes a thorough discussion on the signs and symptoms of heat stress.

**2.5.3.2.2** NO brush will be cut, trimmed or removed at any place within this site. There will be NO power or hand operated cutting machinery or tools used or allowed within the Dolly Sods Wilderness Area. Therefore the precautions normally applied for the protection of HFA personnel are not applicable.

### **2.5.3.3 Chemical Hazards**

**2.5.3.3.1** The potential for exposure to chemical hazards during this phase is not anticipated.

### **2.5.3.4 Biological Hazards**

**2.5.3.4.1** The potential for exposure to biological hazards during this phase will be minimal. Personnel will be alert for signs and symptoms of biological exposures discussed in Section 2.10.

## **2.5.4 ORDNANCE AND EXPLOSIVES REMOVAL ACTION**

**2.5.4.1** HFA will perform a surface and sub-surface clearance of ordnance and explosives; mapping; and disposing of all UXO. This removal action will include the removal and disposal of all ordnance, ammunition, and explosive and target-related scrap. This will be accomplished using magnetometers and hand excavation.

### **2.5.4.2 Physical Hazards**

**2.5.4.2.1** The physical hazards involved in this task are related to the removal and excavation of suspected UXO. UXO pose a significant threat to people if they are not carefully controlled. There exists a chance for a UXO to detonate if it is not excavated properly or safely handled. Employees must pay careful attention to what they are doing or risk serious injury. UXOs will not be handled, moved, or disturbed unless first positively identified, all initial movements will be done remotely. Exposure of UXO will be done by careful hand shovelling to remove soil, maintaining positive control at all times. UXO will generally be detonated in place.

**2.5.4.2.2** All excavations will be completed by hand and will pose no confined space hazards.

**2.5.4.2.3** Noise will not present a hazard at this site.

### **2.5.4.3** Chemical Hazards

**2.5.4.3.1** The potential for airborne exposure during this phase is not anticipated. However, employees must be alert for signs and symptoms of chemical and explosive exposure as described in Section 2.6. If any unusual conditions arise pertaining to the release of liquid, vapors, and/or gases, work will immediately cease and personnel will be evacuated.

### **2.5.5** TURN-IN OF RECOVERED ORDNANCE AND EXPLOSIVES RELATED SCRAP

**2.5.5.1** HFA will collect ordnance and explosive related scrap from the grids. This scrap will be turned-in to the nearest DRMO. However, if the DRMO refuses to accept the scrap, arrangements will be made with a local scrap contractor to pick up the material at no cost to the government.

### **2.5.5.2** Physical Hazards

**2.5.5.2.1** The physical hazards involved with this task are related to the removal of scrap. Because of the poor footing and long distances that scrap must be hand carried UXO personnel must pay particular attention to what they are doing, and where they are walking, or risk injury. Handling procedures for preventing injuries will include wearing leather gloves, lifting with the legs, using two individuals when lifting scrap >50 pounds, placing scrap in proper containers, and maintaining positive control of the scrap at all times.

### **2.5.5.3** Chemical Hazards

**2.5.5.3.1** There are no chemical hazards, other than exposure to explosive and explosive residue, involved with this project. Therefore chemical exposure is considered minimal. Care will be taken to avoid being cut while handling scrap items, to prevent infection.

### **2.5.6** QUALITY CONTROL

**2.5.6.1** HFA will administer a quality control (QC) program to manage, control, and document all activities. This QC action will include observing/inspecting field operations and verifying that all ordnance, ammunition, and explosive-related scrap has been removed from the grids. This will be accomplished using magnetometers and hand excavation as necessary.

### **2.5.6.2** Physical Hazards

**2.5.6.2.1** The physical hazards involved in this task are related to the removal and excavation of suspected UXO. UXO pose a significant threat to personnel if not carefully controlled. There exists a chance for a UXO to detonate if it is not excavated properly or safely handled. Employees must pay careful attention to what they are doing or risk serious injury. UXOs will not be handled, moved, or disturbed unless first positively identified, all initial movements will be done remotely. Exposure of UXO will be done by careful hand shovelling to remove soil, maintaining positive control at all

times. Excavations completed by hand will pose no confined space hazards.

### **2.5.6.3 Chemical Hazards**

**2.5.6.3.1** The potential for airborne exposure during this phase is not anticipated. However, employees must be alert for signs and symptoms of chemical and explosive exposure as described in Section 2.6. Should any release of liquid, vapors, or gases occur, work will immediately cease and personnel will be evacuated.

## **2.6 SAFETY**

### **2.6.1 HEAVY EQUIPMENT, EARTH MOVING MACHINERY(EMM)**

**2.6.1.1** EMM or other heavy equipment will not be used at this site.

### **2.6.2 CONFINED SPACE ENTRY**

**2.6.2.1** Authorized field activities at this site do not include entry into areas which could be considered confined spaces. The field activities planned at this site will not create a confined space. If a confined space is encountered, and it is determined that entry is required, then a written confined space plan will be developed IAW 29 CFR 1910.146 and 1926 and submitted for approval. **The Contracting Officer must approve the plan before work can take place in a confined space.**

### **2.6.3 ELECTRICAL**

**2.6.3.1** There are no above or below ground utility lines to pose a hazard to team members during field activities.

### **2.6.4 ULTRAVIOLET RADIATION**

**2.6.4.1** The sun emits ultraviolet radiation (UV) as heat and light. The skin's natural defense mechanisms attempt to reject the UV by distributing melanin pigmentation where needed. However, overexposure to direct sunlight can cause inflammation or blistering of the skin (sunburn). The optional use of long sleeve shirts and wide brim hats can help prevent sunburn. Chronic exposure to UV radiation is known to cause skin cancer. In case of sunburn, do not apply burn ointment, cold cream or butter, to relieve pain. Use a dry dressing and get medical attention for severe, extensive sunburns.

### **2.6.5 LIGHTNING**

**2.6.5.1** Electrical storms commonly occur in the Dolly Sods region during spring and summer. The resulting lightning poses a safety hazard to field personnel. Since the storms are sometimes fast moving, field personnel should watch for indications of electrical storms. The distance to an electrical storm can be estimated by observing the interval between the lightning flash and the sound of thunder. Since sound travels approximately 1,100 feet per second, an interval of 5 seconds corresponds to a

storm distance of approximately 1 mile.

**2.6.5.2** If an electrical storm is observed within five miles of the sites, field personnel will cease outside activities and proceed to the site office for further instructions. If caught in the open by an electrical storm, all personnel will immediately seek shelter in their vehicle and proceed as above. In the event that their vehicle is inaccessible, they will move to a topographically low area away from tall objects and conductors (e.g., transformer, power lines, metal sheds) and wait for the storm to leave the area.

## **2.6.6 WALKING AND WORKING IN MOUNTAIN TERRAIN**

**2.6.6.1** Field personnel will become familiar with the general terrain of the site and potential physical hazards (fallen trees, streams and rivers, uneven terrain) which would be associated with accidental slips, trips, and falls.

**2.6.6.2** Be cautious after periods of heavy rainfall, which may cause earth movement and slides, and also cause streams and rivers to rise and run swiftly.

**2.6.6.3** Be attentive where you walk since pits, holes, or similar hazards may be partially covered or visually obstructed by vegetation, or water.

**2.6.6.4** Be cautious around soil or terrain which recently may have been disturbed, relocated, or otherwise made less stable.

**2.6.6.5** Avoid the top edges of drop-off areas whether they have been disturbed or not.

**2.6.6.6** All personnel will wear orange safety vests.

## **2.6.7 HAZARD COMMUNICATION**

**2.6.7.1** In order to comply with the OSHA Hazard Communication standard 29 CFR 1910.1200 and to ensure that site personnel are informed of hazards associated with the materials with which they could work, the following will apply to all commercial products containing hazardous materials which are brought on-site:

**2.6.7.1.1** MSDS's will be maintained for each product containing a hazardous substance on-site.

**2.6.7.1.2** All containers will be adequately labeled.

**2.6.7.1.3** All personnel will be trained in accordance with 29 CFR 1910.1200 and Chapter 4 of the SSHP.

**2.6.7.1.4** An inventory of all products containing hazardous substances used on-site will be maintained and available to the site HazMat team.

## **2.7 CHEMICAL HAZARDS**

**2.7.1** This section discusses the potential chemical hazards associated with the Former West Virginia Maneuver Area. The potential air release of toxic, flammable, and radioactive hazards is not anticipated at this site. However, precautions will always be taken to minimize the potential of contact with Hazardous, Toxic, Radioactive Waste (HTRW) and Chemical Warfare Material (CWM). The Health and Safety Manager will update this section as information developed during this project warrants.

**2.7.2** The potential exposure to explosive chemical hazards or chemical warfare material on this site is not anticipated. However, if UXOs are eroded to a condition where the explosive is exposed, there exists a slight possibility of chemical exposure through skin absorption. There is no hazard from inhalation since the explosives are cast into the round. Therefore, if personnel are required to move UXO to the demolition site, outer leather gloves and inner nitrile gloves will be worn if UXO showing exposed explosives are encountered. The explosives sections of Tables 2-1 and 2-2 refer to the possible contamination from the residues of UXO being detonated and demolition materials that may have been used.

**2.7.3** If a scenario is encountered that precludes detonating a UXO in place, an unidentifiable UXO is found, or a suspected toxic chemical munition is found, the on-site CEHNC Safety representative will be notified, who in turn will request EOD support.

### **2.7.4 CHEMICALS OF CONCERN**

**2.7.4.1** Table 2-1 identifies contaminants which may pose an occupational health threat.

### **2.7.5 EXPOSURE LIMITS**

**2.7.5.1** Occupational exposure limits are based on experimental and epidemiological studies and are promulgated by organizations such as Occupational Safety and Health Administration (OSHA), the American Conference of Governmental Industrial Hygienists (ACGIH), and the National Institute of Occupational Safety and Health (NIOSH). Each organization assigns a different term to its exposure limit: OSHA establishes permissible exposure limits (PEL), the ACGIH develops threshold limit values (TLV), and NIOSH publishes recommended exposure limits (REL). A central concept in the development of exposure limits is the dose-response relationship between a given substance and the health effects associated with exposure to the substance. The exposure limits do not guarantee a discrete, fixed boundary between "safe" and "unhealthful." The effect of a given substance varies with each individual and environmental conditions such as temperature, humidity, exposure concentration, route of entry, and the presence of other substances.

**POTENTIAL CONTAMINANTS**  
**TABLE 2-1**

CONTAMINANT	EXPOSURE <sup>1</sup> LIMIT (PEL or TLV)	IONIZATION POTENTIAL (eV)	IDLH <sup>1</sup>
<b>EXPLOSIVES</b>			
Cyclomethylene trinitramine (RDX)	1.5 mg/m <sup>3</sup> (TLV-skin) <sup>2</sup>	N/A	N/A
1, 3-Dinitrobenzene	1 mg/m <sup>3</sup> (PEL-skin) <sup>2</sup> 0.15 (TLV- skin) <sup>2</sup>	10.43	200 mg/m <sup>3</sup>
1, 3, 5 - Trinitrobenzene	N/A	N/A	N/A
N-methyl-N,2,4,6,- tetranitroaniline(Tetryl)	1.5 mg/m <sup>3</sup> (skin) <sup>2</sup>	N/A	N/A
Pentaerythritol tetranitrate (PETN)	N/A	N/A	N/A
Composition B	N/A	N/A	N/A
Trinitroluene (TNT)	0.5 mg/m <sup>3</sup> (TLV-skin) <sup>2</sup> 1.5 mg/m <sup>3</sup> (PEL-Skin) <sup>2</sup>	10.59	N/A
<b>SCREENING SMOKE</b>			
White Phosphorous (WP)	0.1 mg/m <sup>3</sup>	N/A	N/A

<sup>1</sup> Exposure limits expressed in mg/m<sup>3</sup> except where noted;

<sup>2</sup> Indicated that exposure limit was established to prevent dermal absorption

N/A Not Assigned, Not Available, or Not Applicable

**2.7.5.2** The PEL, TLV, and REL are not interchangeable or equivalent. Of the three, only the PEL is legally enforceable; the TLV and REL are guides which recommend limits below which the ACGIH and NIOSH believe nearly all workers may be exposed repeatedly, for eight hours per day (TLV) or ten hours per day (REL) and 40 hours per week without adverse side effects. Although the TLV and REL are not law, they frequently become law when they are incorporated into codes, regulations, and standards.

**2.7.5.3** The exposure limits listed in the section are time-weighted averages, based on exposures for eight hours per day (TLV) or ten hours per day (REL) and 40 hours per week unless otherwise noted.

#### **2.7.6 RECOGNITION OF SYMPTOMS AND SIGNS**

**2.7.6.1** Table 2-2 summarizes the symptoms and effects of exposure for each substance identified as a potential contaminant.

**SYMPTOMS OF POTENTIAL CONTAMINANTS  
TABLE 2-2**

CONTAMINANT	SYMPTOMS AND EFFECTS
<b>EXPLOSIVES</b>	
Cyclotrimethylene trinitramine (RDX)	Respiratory tract irritation, unconsciousness, convulsions, headache, dizziness, nausea, and vomiting. Possible irritation to eyes.
1,3-Dinitrobenzene	Irritant to the respiratory tract, unpleasant taste in mouth, burning or dryness of the throat, headaches, cyanosis, weakness, dizziness, dyspnea, nausea, vomiting, drowsiness, chest pains, staggering gait, and coma. Skin and eye contact may cause a yellow discoloration.
1,3,5-Trinitrobenzene	May cause cyanosis, nausea, headache, dizziness, dyspnea, confusion, hypertension, lethargy, convulsions, and coma.
Nmethyl-N,2,4,6.-tetranitroaniline (TETRYL)	Respiratory tract irritation, fatigue, headache, weakness or weariness, nausea, vomiting, anemia, liver and kidney damage, bright yellow/orange stain on skin, and skin and eye irritation.
Pentaerythritol tetranitrate (PETN)	Human systemic effects by ingestion. A skin irritant. It can cause respiratory difficulties and death due to respiratory paralysis by ingestion. The acute symptoms are headaches, nausea, vomiting, abdominal cramps, convulsions, circulatory collapse, reduced blood pressure, excitement, vertigo, fainting, respiratory rales (any sound or noises in the lungs that should not be there), and cyanosis. Toxic effects may occur by ingestion, inhalation of dust, or absorption through contact with the skin.
Trinitrotoluene (TNT)	Orange staining on exposed skin, nosebleeds, papules (small, solid, usually conical elevation of the skin), severe (redness, itching, and oozing vesicular lesions), headache, dizziness, cyanosis, convulsions, and death. Eye contact may cause redness, pain, excessive discharge of tears, and blurred vision.
<b>SCREENING SMOKE</b>	
White Phosphorous (WP)	If ingested, can cause nausea, vomiting, severe abdominal pain and liver damage. Inhalation overexposure can produce irritation, severe burns, anemia, loss of appetite, gastrointestinal complaints, chronic cough, paleness, and slack jaw.

## 2.8 PHYSICAL HAZARDS

### 2.8.1 NOISE

**2.8.1.1** Direct sources of noise may be produced by vehicles, heavy equipment, and electrical equipment and detonations. Personnel operating equipment will wear appropriate hearing protection (ear plugs or ear muffs) if the noise levels exceed the permissible exposure limits. Hearing protection will also be necessary in the vicinity of heavy equipment if potentially harmful noise levels are projected into the work area.

**2.8.1.2** A standard guideline for knowing when hearing protection is required is, if people three feet apart must raise their voices to be heard in normal conversation. The Threshold Limit Value for noise is 85 dBA (85 decibels on the A-weighted scale).

**2.8.1.3** The SSO will perform noise monitoring whenever equipment or machinery being used on-site creates a high noise exposure potential. When 85 dBA, 8 hour TWA, is reached, the SSO will issue personal hearing protection devices and perform noise dosimetry to evaluate the workers' 8 hour TWA exposure.

**2.8.1.4** The noise TLVs in Table 2-3 refer to sound pressure levels and durations of exposure that represent conditions under which it is believed that nearly all workers may be repeatedly exposed without adverse effects on their ability to hear and understand normal speech.

**THRESHOLD LIMIT VALUES FOR NOISE**  
**TABLE 2-3**

Duration per Day Hours	Sound Level dBA*
16	82
8	85
4	88
2	91
1	94
1/2	97
1/4	100
1/8	103

\* *Sound levels in decibels are measured on a sound level meter and set to use the A weighted network with slow meter response.*

## **2.8.2 HEAT STRESS**

**2.8.2.1** Field operations during the summer months can create a variety of hazards to the employee. Heat cramps, heat exhaustion, and heat stroke can be experienced and, if not remedied, can threaten life or health. Therefore, it is important that all employees are able to recognize the symptoms of these conditions and be capable of resolving them as quickly as possible. The work-rest regime and monitoring for heat stress is detailed in Chapter 8 of this SSHP.

### **2.8.2.2 The Effects of Heat**

**2.8.2.2.1** As the result of normal oxidation processes within the body, a predictable amount of heat is generated. If the heat is liberated as it is formed, there is no change in body temperature. If the heat is liberated more rapidly, the body cools to a point at which the production of heat is accelerated and the excess is available to bring the body temperature back to normal.

**2.8.2.2.2** Interference with the elimination of heat leads to its accumulation and thus to the elevation

of body temperature. As a result, the person is said to have a fever. When such a condition exists, it produces a vicious cycle in which certain body processes speed up and generate additional heat. Then the body must eliminate not only the normal but also the additional quantities of heat.

**2.8.2.2.3** Heat produced within the body is brought to the surface largely by the bloodstream and escapes to the cooler surroundings by conduction and radiation. If air movement or a breeze strikes the body, additional heat is lost by convection. However, when the temperature of the surrounding air becomes equal to or rises above that of the body, all of the heat must be lost by vaporization of the moisture or sweat from the skin surface. As the air becomes more humid (contains more moisture), vaporization from the skin slows down. Thus, on a day when the temperature is 95 to 100°F, with high humidity and little or no breeze, conditions are ideal for the retention of heat within the body. It is on such a day, or more commonly a succession of such days (a heat wave), that medical emergencies due to heat are likely to occur.

### **2.8.2.3** Heat Cramps

**2.8.2.3.1** Heat cramps usually affect people who work in hot environments and perspire a great deal. Loss of salt from the body causes very painful cramps of the leg and abdominal muscles. Heat cramps also may result from drinking iced water or other drinks either too quickly or in too large a quantity.

#### **2.8.2.3.1.1** Heat Cramps Symptoms

- Muscle cramps in legs and abdomen
- Pain accompanying the cramps
- Faintness
- Profuse perspiration

### **2.8.2.4** Heat Exhaustion

**2.8.2.4.1** Heat exhaustion occurs in individuals working in hot environments, and may be associated with heat cramps. Heat exhaustion is caused by the pooling of blood in the vessels of the skin. The heat is transported from the interior of the body to the surface by the blood. The blood vessels in the skin become dilated and a large amount of blood is pooled in the skin. This condition, plus the blood pooled in the lower extremities when an individual is in an upright position, may lead to an inadequate return of blood to the heart and eventually to physical collapse.

#### **2.8.2.4.2** Heat Exhaustion Symptoms

- Weak pulse
- Rapid and usually shallow breathing
- Generalized weakness
- Pale, clammy skin
- Profuse perspiration
- Dizziness
- Unconsciousness

- Appearance of having fainted (the patient responds to the same treatment administered in cases of fainting)

#### **2.8.2.4.3 Heat Exhaustion Emergency Care**

- Remove the patient to a cool place and remove as much clothing as possible.
- Administer cool water, "Gatorade," or its equivalent.
- If possible, fan the patient continually to remove heat by convection, but do not allow chilling or overcooling.
- Treat the patient for shock, and remove him/her to a medical facility if there is any indication of a more serious problem.

#### **2.8.2.5 Heat Stroke**

**2.8.2.5.1** Heat stroke is a profound disturbance of the heat-regulating mechanism, associated with high fever and collapse. Sometimes this condition results in convulsions, unconsciousness, and even death. Direct exposure to sun, poor air circulation, poor physical condition, and advanced age (over 40) bear directly on the tendency to heat stroke. It is a serious threat to life and carries a 20 percent mortality rate. Alcoholics are extremely susceptible.

#### **2.8.2.5.2 Heat Stroke Symptoms**

- Sudden onset
- Dry, hot, and flushed skin
- Dilated pupils
- Early loss of consciousness
- Full and fast pulse
- Breathing deep at first, later shallow and almost absent
- Muscle twitching, growing into convulsions
- Body temperature reaching 105°F to 106°F or higher

#### **2.8.2.5.3 Heat Stroke Emergency Care**

- Remember that this is a true emergency.
- Transportation to a medical facility should not be delayed.
- Remove the patient to a cool environment if possible, and remove as much clothing as possible.
- Assure an open airway.
- Reduce body temperature promptly, preferably by wrapping in a wet sheet or else by dousing the body with water.
- If cold packs are available, place them under the arms, around the neck, at the ankles, or at any place where blood vessels that lie close to the skin can be cooled.
- Protect the patient from injury during convulsions, especially from tongue biting.

### **2.8.2.6 Avoidance of Heat-Related Emergencies**

**2.8.2.6.1** In the case of heat cramps or heat exhaustion, "Gatorade" or its equivalent is suggested as part of the treatment regime. The reason for this type of liquid is that such beverages will return much-needed electrolytes to the system. Without these electrolytes, body systems cannot function properly, thereby increasing the represented health hazard. Therefore, when personnel are working in situations where the ambient temperatures and humidity are high, and especially in situations where protection Levels A, B, and C may be required, the site safety officer must:

**2.8.2.6.2** Assure that all employees drink plenty of fluids.

**2.8.2.6.3** Assure that frequent breaks are scheduled so overheating does not occur.

**2.8.2.6.4** Revise work schedules, when necessary, to take advantage of the cooler parts of the day (e.g., 5:00 a.m. to 1:00 p.m. and 6:00 p.m. to nightfall).

**2.8.2.6.5** Assure that workers are acclimated before allowing them to work for extended periods. Heat induces a series of physiological and psychological stresses that the individual worker must adjust to during the first week of heat exposure. Workers should slowly work into their peak work performance over a two-week period. Workers absent from the site several days must be allowed to become reacclimated.

## **2.9 COLD STRESS**

**2.9.1** The effects experienced by site personnel when working in cold environments depend upon environmental and personal factors, such as air temperature, windspeed, duration of exposure, PPE worn, type of work, level of physical effort, and health status of the worker. Overexposure can cause significant stress upon the body, which can lead to serious and permanent injury. The following paragraphs discuss the most common cold stress disorders, their signs, symptoms, effects, and control techniques.

### **2.9.2 Cold Stress Disorders**

#### **2.9.2.1 Frostbite**

**2.9.2.1.1** Frostbite occurs when the water contained in body tissues freezes. This usually occurs when temperatures are below freezing, but excessive wind can result in frostbite with temperatures above freezing. The extremities are usually effected first, since the body's initial response to cold stress involves decreasing bloodflow to the extremities, resulting in heat loss. During the initial phases of frostbite, the skin may have a prickly or tingling sensation and will later become numb with cold. The appearance of the effected skin may range from superficial redness to white, hard, frozen looking tissues.

### **2.9.2.2 Hypothermia**

**2.9.2.2.1** Hypothermia results when the body loses heat faster than it can be produced. This occurs when the blood vessels in the skin and extremities constrict, reducing bloodflow to those areas which have a high surface area to volume ratio. The reduction in blood flow reduces heat loss and usually effects the extremities first. Some of the symptoms include; pain, numbness, shivering, speech difficulty, reduced mental alertness, forgetfulness, loss of manual dexterity, collapse, unconsciousness, and finally, death.

### **2.9.3 Treating Cold Stress Disorders**

**2.9.3.1** Cold stress treatment is to bring the deep body core temperature back to its normal temperature of 98.6° F. Personnel exhibiting signs and symptoms of cold stress should be brought to a warm area and allowed to rest and warm up. Warm, non-alcohol, decaffeinated drinks (not coffee) or soup should be given to increase body temperature, and rewarming should be gradual.

#### **2.9.3.2 Frostbite Emergency Treatment**

**2.9.3.2.1** The victim should be sheltered from the wind and cold and given warm drinks. If superficial, the frozen area(s) 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 effected area(s). 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, ( the effected area is frozen and hard to the touch), immediate medical attention should be obtained.

#### **2.9.3.3 Hypothermia Emergency Treatment**

**2.9.3.3.1** All stages of hypothermia are treated by either passive or active rewarming. This is accomplished by better conservation of the patient's body heat. However, the victim's thermoregulatory mechanisms must be intact. It is important to note that if a victim is found in a remote area, despite the death-like appearance, the person may be saved. All attempts should be made to revive the victim. Active rewarming means heat is applied to the victim by an external source, either to the skin surface and/or through the core. Treatment includes:

**2.9.3.3.2** Preventing further heat loss. Remove the victim to a warm, dry place (out of wind, cold, and rain/snow.)

**2.9.3.3.3** Remove wet clothing piece-by-piece and dry underlying skin.

**2.9.3.3.4** Re dress the victim in several layers of warm, dry clothing, giving preference to the central body core rather than the extremities.

**2.9.3.3.5** Cover the victim's head, then wrap the victim in blankets.

**2.9.3.3.6** If the victim is conscious, allow him/her to drink hot fluids.

**2.9.3.3.7** Monitor oral body temperature every 15 minutes. If body temperature falls below 96.8° F, the team member should not be allowed outside until body temperature returns to normal.

**2.9.3.3.8** In more severe cases of hypothermia, implement the above treatment but also institute some type of active rewarming, including:

- Electric pads or blankets
- Hot-air blowers or heaters
- Heated blankets or clothes
- Use of human body heat

**2.9.3.3.9** It is important to watch for signs of the return of normal thermoregulatory mechanisms (shivering, teeth chattering, “goose flesh”, etc.) and to monitor the victims mental status.

**2.9.3.3.10** The victim should be transferred to a medical facility after the emergency care steps have been initiated and should not be allowed to return to work for at least 48 hours.

**2.9.3.3.11** If there has been severe hypothermia, the victim should not be considered dead, despite his/her appearance. Treat the victim as stated above and prepare to transfer to a medical facility. If the victim is pulseless and not breathing, perform CPR.

## **2.9.4 Avoiding Cold-Related Emergencies**

**2.9.4.1** In cold environments, the SSO will use tailgate safety meetings to inform personnel of temperature and wind conditions anticipated for that day’s activities. The SSO will advise personnel of the general practices, listed below, that can be utilized in the prevention and control of cold stress.

**2.9.4.1.1** Wearing layered clothing, including a water repellant outer layer.

**2.9.4.1.2** Wearing gloves, socks, and a hat that are synthetic or wool insulated.

**2.9.4.1.3** Removing outer layers of clothing during breaks to prevent inner layers from getting wet from perspiration.

**2.9.4.1.4** Eating well balanced meals and maintaining adequate intake of fluids.

**2.9.4.1.5** Seeking shelter in a warm protected area when signs and symptoms of cold stress become evident.

## **2.10 RADIOLOGICAL HAZARD**

**2.10.1** Radiological hazards are not anticipated and monitoring is not required, based on the information from the EE/CA sampling of the sites.

## **2.11 BIOLOGICAL HAZARDS**

### **2.11.1 POISONOUS PLANTS**

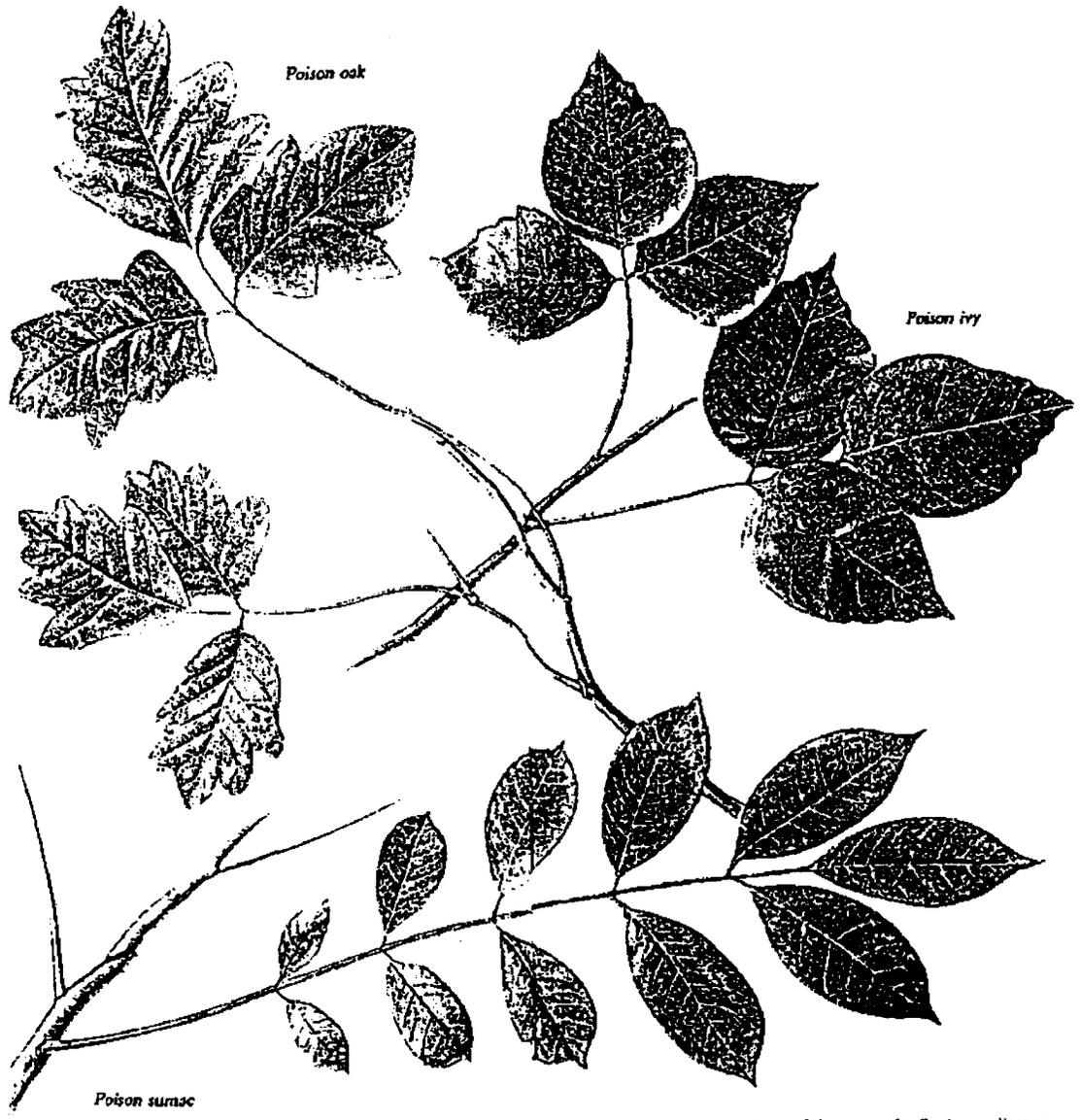
#### **2.11.1.1 Poisonous Plant Avoidance Procedures**

**2.11.1.1.1** The best way to prevent symptoms from poisonous plants is to avoid them. This is accomplished by learning to recognize the various poison plants (See Figure 2-1) and stay away from them. Poison ivy and oak are identified by three leaves and sumac with five leaves radiating from a stem. Poison ivy is a vine, while oak and sumac are bush-like. The plant tissues have an oleoresin which is active in live, dead, and dried parts. The oleoresin may be carried via smoke, dust, contaminated clothing, and hair.

#### **2.11.1.2 First Aid for Poisonous Plants**

**2.11.1.2.1** Signs and symptoms included redness, swelling, and sometimes intense itching. Blisters form during the subsequent 24 to 36 hours. Crusting and scaling occurs within a few days. In the absence of complications, healing is complete in about ten days. Wash any exposed skin with a mild soap and water; do not scrub the area.

POISONOUS PLANTS  
FIGURE 2 - 1



*Three irritating members of the sumac family, Anacardiaceae.*

## 2.11.2 INSECTS AND TICKS

### 2.11.2.1 Ants, Bees, Wasps, and Hornets

**2.11.2.1.1** Stings of these insects are responsible for more deaths in the United States than bites and stings of all other venomous creatures. This is due to the sensitization by the victim to the venom from repeated stings, which can result in anaphylactic reactions. The stinger may remain in the skin and should be removed by teasing or scraping rather than pulling. An ice cube placed over the sting will reduce pain. An analgesic-corticosteroid lotion is often used. People with known hypersensitivity to such stings should carry a kit containing antihistamine and epinephrine.

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

**2.11.2.1.2.1** If a worker knows he is hypersensitive to bee, wasps or hornet stings, he will inform the SSO of this condition prior to site activities and carry a kit similar to that listed above.

**2.11.2.1.2.2** All site personnel will be watchful for the presences of stinging insects, any nest location will be flagged off and site personnel notified of its location.

**2.11.2.1.2.3** A can of wasp spray will be carried by each team.

**2.11.2.1.2.4** If stung, immediately notify the SSO to obtain treatment and be observe for allergic reaction.

**2.11.2.1.2.5** Personnel with a known hypersensitivity are required to keep emergency medication on or near their persons at all times.

### 2.11.2.2 Ticks and Tickborne Diseases

#### 2.11.2.2.1 Lyme Disease

**2.11.2.2.1.1** Lyme disease is an illness caused by a bacterium which may be transmitted by the bite of the tick *Ixodes dammini*, commonly referred as the deer tick. Not all ticks are infected with the bacterium; however, when an infected tick bites, the bacterium is passed into the bloodstream of the host where it multiplies. Current findings indicate that the tick must be attached to its host for several hours to transmit the bacterium. The deer tick is commonly found on-site living in grassy and wooded areas feeding on mammals such as mice, shrews, raccoons, opossums, deer, and humans.

**2.11.2.2.1.2** The illness typically occurs in the summer and is characterized by a slowly expanding red rash that develops in a few days to a few weeks after the bite of an infected tick. This may be accompanied by flu-like symptoms along with headache, stiff neck, fever, muscle aches, and/or general malaise. At this stage, treatment by a physician usually is effective. If left alone, these early symptoms may disappear, but more serious problems may follow. The most common late symptom of the untreated disease is arthritis. Other problems which may occur include meningitis, neurological

abnormalities, and cardiac abnormalities. It is important to note that some people do not get the characterized rash and may have diminished progress to the later manifestations. Treatment of later symptoms is more difficult than early symptoms and is not always successful.

#### **2.11.2.2.2 Tick Avoidance Procedures**

**2.11.2.2.2.1** When in an area suspected of harboring ticks (grass, bushes, woodland) the following precautions can minimize the chances of being bitten by a tick:

- Wear work clothing/coveralls
- Wear light colored clothing so ticks can be easily spotted.
- Attempt to avoid, and/or not linger on game trails.
- Wear tick repellents.
- Do not sit on ground.
- Inspect clothing frequently while in tick habitat.
- Perform a personal inspection for ticks after being in a suspected area, closely inspecting legs, groin, neck, ears, and hair.

#### **2.11.2.2.3 First Aid for Tick Bites**

**2.11.2.2.3.1** Removal of ticks is best accomplished using small tweezers. Do not squeeze the tick's body. Grasp it where the mouth parts enter the skin and tug gently, but firmly, until it releases its hold on the skin. Save the tick in a jar labeled with a date, body location of the bite, and place it where it may have been acquired.

**2.11.2.2.3.2** Wipe the bite thoroughly with an antiseptic and notify the safety officer as soon as possible. The various stages and symptoms are well recognized and if detected can be treated with antibiotics. Early detection and treatment with antibiotics significantly reduces the severity of Lyme disease. If necessary, seek medical attention.

#### **2.11.2.3 Spiders**

##### **2.11.2.3.1 Black Widow Spider**

**2.11.2.3.1.1** The black widow spider ranges in color from gray to brown to black, depending on the species. The abdomen is shiny black with a red hourglass. The person bitten may recall receiving a sharp, pinprick-like bite, but in some cases the bite is so minor that it goes unnoticed. Rarely is there any local skin reaction. The initial pain is sometimes followed by a dull, occasionally numbing pain affecting extremity, and by pain and cramps in one or several of the large muscles. Sweating and

weakness are common, as well as varying degrees of headache and dizziness. In severe cases, there is rigidity of the abdominal muscles and pain in the lower back, thighs, or abdomen. There is no effective first aid treatment. Treat for shock and transport to the nearest medical facility.

#### 2.11.2.3.2 Brown Recluse Spider

2.11.2.3.2.1 The brown recluse spider has an abdomen which ranges in color from grayish through orange and reddish-brown to dark brown. The bite of the spider produces about the same degree of pain as the sting of an ant, but sometimes the person is completely unaware of the bite. A localized burning sensation develops which may last for 30 to 60 minutes. The area often itches, becomes red and warm, with a small blanched area around the immediate bite. The reddened area enlarges and becomes purplish during the subsequent one to eight hours. A small blister forms at the bite site, increasing in size and subsequently ruptures. The whole area may become swollen and painful. Some other symptoms include fever, stomach cramps, nausea, and vomiting. In severe cases, there may be breakdown of the red blood cells, renal failure, and death. All first aid measures should be avoided as the natural appearance of the bite is most important in determining the diagnosis. Treat for shock and transport to the nearest medical facility.

#### 2.11.2.4 Poisonous Snakes

##### 2.11.2.4.1 Snake Avoidance Procedures

2.11.2.4.1.1 The best avoidance procedure is to be familiar with snake habitat, and observation in the field. Snakes can be found under debris and overgrown vegetation. All field personnel will exercise caution and maintain alertness to this hazard when in the field.

##### 2.11.2.4.2 First Aid for Snake Bites

2.11.2.4.2.1 All reactions from snakebites are aggravated by acute fear and anxiety. The severity of local and general reaction from poisonous snakebites depends upon the amount of venom injected and the speed of absorption, size of the victim, protection from clothing, speed at which anti-venom can be provided, and the location of the bite.

2.11.2.4.2.2 The basic rule is: **Treat all snakebites as poisonous.**

2.11.2.4.2.3 Instruct the patient to remain calm and keep the affected area below heart level, sit down and relax. Watch victim for signs of shock and monitor ABCs. Contact the UXO Supervisor for assistance, who will contact the SUXOS and the SSO via radio. SUXOS will call for an ambulance or transport the victim to the hospital. If possible, kill the snake and take it along with the patient to the medical facility for identification. This can greatly aid in proper treatment.

#### 2.11.2.5 Animals

2.11.2.5.1 The only effective measure to preclude animal bites is avoidance. Contact with all wild animals at Dolly Sods Wilderness Area will be avoided at all times. Persons bitten by an animal

should seek medical assistance immediately, especially if it is suspected that the animal is rabid. Aggressive or disoriented behavior, as well as foaming of the mouth can be signs of rabid animals. Until medical assistance can be reached, persons should watch for symptoms of severe swelling, nausea, and shock.

**2.11.2.5.2** There are no known HantaVirus cases in the former Dolly Sods Wilderness Area. However, personnel will be alert for any rodent nest when performing intrusive activities. If a nest is encountered, excavation on that contact will cease **until a Personal Protective Equipment Plan requiring Level C PPE is approved by the Contracting Officer**, Level C PPE is donned, and the nest is treated with bleach.

## **CHAPTER 3**

# **STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES**

### **3.1 PERSONNEL**

**3.1.1** All personnel are responsible for continuous adherence to these SSHP procedures during the performance of their work. No person may work in a manner that conflicts with the intent or the inherent safety and environment precautions expressed in these procedures. To ensure compliance with the provisions of this document, this section outlines the safety and health organizational structure and the roles and responsibilities of the personnel involved.

#### **3.1.2 CERTIFIED INDUSTRIAL HYGIENIST (CIH)**

**3.1.2.1** The CIH is responsible for the oversight of HFA's Safety and Health Program and Site-Specific Safety and Health Plans. The CIH will approve all SSHPs by reading, signing, and dating them.

#### **3.1.3 HEALTH AND SAFETY MANAGER (H&S)**

**3.1.3.1** The H&S Manager is responsible for developing and coordinating the SSHP and addenda as required. This plan complies with applicable regulations in all respects and includes medical surveillance and training requirements, hazard assessment, PPE specifications, field implementation procedures, and audits. The H&S Manager will issue addenda to the SSHP if changed conditions warrant. The H&S Manager is the contact for regulatory agencies on matters of safety and health.

#### **3.1.4 PROJECT MANAGER**

**3.1.4.1** The Project Manager (PM) is responsible for ensuring that all project activities are completed in accordance with the requirements set forth in this plan.

#### **3.1.5 SENIOR UXO SUPERVISOR**

**3.1.5.1** The Senior UXO Supervisor (SUXOS) is responsible to the PM for the direct supervision of UXO site activities. He is responsible for executing the requirements of the Work Plan (WP) and Site-Specific Safety and Health Plan (SSHP), and has the authority to stop and correct any evolution/situation that is not in accordance with the WP, SSHP, or other established standard practices. The SUXOS acts for the PM in his absence.

#### **3.1.6 SITE SAFETY OFFICER (SSO)**

**3.1.6.1** The Site Safety Officer is responsible to the H & S Manager and CIH for all aspects on site safety. He advises the PM and SUXOS on all matters concerning site safety. He performs safety

inspections on site equipment and work practices to ensure they are in compliance with the WP, SSHP, and other established safety practices and procedures. The SSO conducts regular daily safety meetings as well as other safety training as required. He participates in all accident investigations and has the prime input concerning safety issues. He has the authority to stop any work that is not in conformance with the WP, SSHP, or other safety practices, and not allow work to continue until all deficiencies have been corrected. The SSO acts as the emergency coordinator during all site emergencies.

### **3.1.7 UXO SUPERVISOR**

**3.1.7.1** The UXO Supervisors are responsible for the direct supervision and safety of personnel under their control. They are responsible to ensure their workers comply with all provision of the WP and SSHP. UXO Supervisors may provide additional safety meetings and training as needed, specifically covering safety issues concerning their team members or work areas. They will report all violations of safety and personnel injuries to the SSO and SUXOS.

### **3.1.8 UXO SPECIALIST AN QUALITY CONTROL SPECIALIST**

**3.1.8.1** All UXO Specialists are required to comply with the provisions of this SSHP and all applicable federal, state and local regulations. Each person is responsible for their own safety and health for completing tasks in a safe and professional manner, and for reporting any unsafe acts or conditions to the SSO, SUXOS, or PM. Personnel will monitor themselves and their fellow employees for signs and symptoms of heat stress and chemical exposure.

### **3.1.9 SUBCONTRACTORS AND VISITORS**

**3.1.9.1** On-site subcontractors and visitors are required to read and acknowledge their understanding of this SSHP. In addition, all personnel are expected to abide by the requirements of this SSHP and cooperate with UXO Supervisors to ensure a safe and healthful work site. All subcontractors and visitors are required to follow these requirements:

- Be escorted by an qualified UXO personnel;
- Report accidents and injuries, no matter how small;
- Report any symptoms of exposure to a hazardous substance; and
- Report any unsafe or malfunctioning equipment.

### **3.1.10 OCCUPATIONAL PHYSICIAN**

**3.1.10.1** Conmed, Inc., (Dr. H.M. Haft) provides direction and oversight for HFA, Inc.'s medical surveillance program. The medical examiner reviews the results of each medical examination and provides HFA with a letter summarizing the findings and evaluating fitness for work, including the use of respiratory protection. A copy of this letter is retained in the Waldorf, Maryland office.

**3.1.10.2** Copies of the Physicians Statement in accordance with 29 CFR 1910.120 & 134 will be maintained on-site for each employee at HFA's site command post.

## CHAPTER 4

### TRAINING

#### 4.1 TRAINING & INITIAL INDOCTRINATION

4.1.1 All HFA UXO personnel working at this site have successfully completed Naval Explosive Ordnance Disposal Training (USNAVSCOLEOD), which details procedures for evaluating and disposing of UXOs containing high explosives and other fillers.

4.1.2 All employees who work at this job site will have completed a training program which complies with OSHA Regulations 29 CFR 1910.120e(9). HFA employees receive a training program which includes an equivalent of 40 hours of training off site and a minimum of three days of actual field experience under the direct supervision of a trained, experienced supervisor. The following is a general list of topics covered in a 40 hour course:

##### 4.1.2.1 Basic Safety Operations Training

4.1.2.1.1 This course stresses the fundamentals of safety including the causes and prevention of slip, trip, and fall hazards, confined space entry, heat and/or cold stress illness and prevention, and materials handling.

##### 4.1.2.2 Hazards and Protection

4.1.2.2.1 This course deals with the identification, recognition, and safe work practices with toxic materials. The use and limitation of applicable protective clothing, respirators, and decontamination procedures. Respiratory fit-test is provided to each employee attending the course.

##### 4.1.2.3 First Aid and CPR

4.1.2.3.1 It is necessary for some employees in this project group to have completed both first aid and CPR training.

##### 4.1.2.4 Project Specific Safety Training

4.1.2.4.1 This course covers the mandates of a project health and safety plan. In particular, this stresses emergency response procedures, and physical and chemical health hazards.

##### 4.1.2.5 Hazard Communications Training

4.1.2.5.1 This training covers how to detect the presence or release of a hazardous chemical, physical and health hazards of the chemical, how to protect yourself, the labeling system, and material safety data sheets information.



## **4.2 SITE SPECIFIC TRAINING**

**4.2.1** Site specific training will be given by the SSO and SUXOS to inform the UXO members of site specific hazards and hazardous activities. Training will be provided prior to initial site entry and each morning in conjunction with the daily tailgate safety meeting.

**4.2.2** Specific site and safety training will be ongoing and conducted throughout the term of the Former West Virginia Maneuver Area project. Inclement days may be used for this purpose. When unforeseen circumstances or situations dictate the need for additional training, it will be provided as needed.

**4.2.3** Daily safety briefings will be conducted on-site each morning. Topics will cover site specific hazards and safety aspects of that day's scheduled work.

**4.2.4** Weekly meetings will be held for all supervisors. Topics for discussion will be the events of the previous week, safety discrepancies noted, corrective actions required or taken, and the next week's activities with special emphasis on safety.

### **4.2.5 SAFETY MEETINGS**

**4.2.5.1** Safety meetings will be conducted at the beginning of each workshift, or whenever new employees arrive on the job site. The health and safety considerations for the particular day's activities will be reviewed, and the protective equipment and other materials necessary to perform the work will be outlined.

**4.2.5.2** All safety training and meetings will be documented in the SSO Daily Report.

### **4.2.6 MATERIAL SAFETY DATA SHEETS (MSDS)**

**4.2.6.1** MSDS will be obtained for every chemical product HFA introduces on-site and the potential chemical hazards that may be encountered. This information will be readily available to all employees upon request and kept on-site.

### **4.2.7 HEALTH & SAFETY PLANS**

**4.2.7.1** HFA prepares a SSHP for each project falling within the scope and application of 29 CFR 1910.120. The SSO presents the SSHP and discusses it with everyone assigned to the project. Site workers and site visitors must read and sign the SSHP acknowledging acceptance of site rules and understanding of site hazards before entering.

## **4.3 ADDITIONAL TRAINING**

**4.3.1** UXO site related training will be provided by HFA to all other non-UXO personnel working on this site. No personnel will be permitted to work on this project until they have received this training. Listed below are topics which will be included.

#### 4.3.1.1 Project Scope

4.3.1.1.1 Project Scope training topics will include staff responsibilities; chain of command; relationship to other agency and contract personnel; and range history, facilities, access, egress, description, controls and other general information.

#### 4.3.1.2 Safety

4.3.1.2.1 Safety training topics will include safe work practices; physical hazards; on/off-site emergencies; site and work area evacuation (routes); emergency numbers; emergency equipment; medical emergencies; and other safety information.

#### 4.3.1.3 Personnel Protective Equipment (PPE)

4.3.1.3.1 All site personnel will receive training outlined in HFA's Personnel Protective Equipment Program.

#### 4.3.1.4 Chemical Warfare Material (CWM) Training

4.3.1.4.1 Safety training regarding CWM will include the following topics: contamination avoidance; personal protection; decontamination procedures; buddy-aid; self-aid; first aid practices; engineering controls; explanation of MSDS; recognition of CWM signs, symptoms and odors; and evacuation/notification procedures.

**4.3.1.4.2 Potential exposure to CWM materials on this site is not anticipated. If HFA UXO personnel encounter any UXO that cannot be positively identified as a conventional UXO, HFA personnel will withdraw from the site and request assistance from the nearest Technical Escort Unit (TEU) through the on site CEHNC Safety Specialist. HFA personnel will take emergency non-invasive actions such as covering the item with plastic sheeting and securing the area until the post authorities and TEU can establish the appropriate exclusion and safety zones.**

#### 4.3.1.5 Blood Borne Pathogen Training

4.3.1.5.1 As required by 29 CFR 1910.1030(g)(2), all personnel with a potential for occupational exposure to blood or other potentially infectious materials will receive training outlined in HFA's Blood Borne Pathogen Exposure Control Plan. Due to the hazards of working with UXO. All onsite personnel, when feasible, will receive the required training.

#### 4.3.1.6 Hearing Conservation Training

4.3.1.6.1 As specified by 29 CFR 1910.95, all site personnel exposed to noise levels exceeding 85 dBA 8 hour time-weighted average (TWA) will receive training in the following topics; physical and psychological effects of high noise, noise exposure limits, purpose of hearing test, and selection, fitting, use, and limitation of hearing protection.

## CHAPTER 5 PERSONAL PROTECTIVE PROGRAM

### 5.1 RESPIRATORY PROTECTIVE EQUIPMENT AND PROTOCOL

5.1.1 Personnel Protective Equipment (PPE) will be maintained at a level deemed appropriate to protect UXO personnel and other workers. No contamination is anticipated; therefore, normal working clothing will be Level D. A hardhat is not required unless a possible head injury could result from the use of heavy equipment and overhead hazards.

5.1.2 The level of protection used in the work is are based on what is known about the sites and the tasks to be accomplished. The levels of protection may be changed as site conditions change and information about the site becomes known. The decision to downgrade or upgrade will require consultation of the SUXOS and SSO. Under no circumstances will the level of protection be downgraded without seeking consultation and permission beforehand. If protection is upgraded or downgraded two levels beyond what is required by the SSHP, the SSO will immediately contact the Senior Project Manager and the Health and Safety Manager prior to conducting the task. Rationale for up or downgrading PPE is provided in Table 5-1.

**REASONS TO UPGRADE OR DOWNGRADE LEVEL OF PPE**  
**TABLE 5-1**

<b>UPGRADE</b>	<b>DOWNGRADE</b>
<ul style="list-style-type: none"> <li>• Request of individual performing task.</li> <li>• Change in work task that will increase contact or potential contact with hazardous materials.</li> <li>• Occurrence or likely occurrence of gas or vapor emission.</li> <li>• Known or suspected presence of dermal hazard.</li> <li>• Known or suspected presence of airborne radioactive material.</li> </ul>	<ul style="list-style-type: none"> <li>• New information indicating that situation is less hazardous than originally thought.</li> <li>• Change in site condition that decreases the hazard.</li> <li>• Change in work task that will reduce contact with hazardous material.</li> </ul>

5.1.3 Level C PPE is not anticipated.

#### 5.1.4 LEVEL D

5.1.4.1 The minimal level of protection that will be required of HFA personnel and subcontractors at the site will be Level D.

5.1.4.2 The following equipment will be used for Level D protection:

- Coveralls
- Boots/shoes (steel toe or equivalent when working around heavy equipment)
- Safety glasses or goggles
- Hard hat (if necessary)
- Leather gloves (inner disposable nitrile gloves if handling raw explosives)
- Hearing protection (if necessary)

5.2 LEVEL OF PPE FOR SITE ACTIVITIES

5.2.1 Table 5-2 summarizes the PPE for each level of protection identified for site activities.

**PPE CONSIDERATIONS**  
**TABLE 5-2**

TASK	LEVEL	LIMITATIONS
Surveying & Mapping/Site Preparation	D	Contaminant concentrations must be less than actions levels.  Oxygen concentration must be at least 19.5%.
Ordnance and Explosive Removal	D	
Turn-in of Recovered Ordnance and Explosive Related Scrap	D	
Quality Control	D	

## CHAPTER 6

### MEDICAL SURVEILLANCE

**6.1** All personnel on site will have successfully completed a pre-placement or periodic (annual) physical examination. This will comply with the requirements of 29 CFR 1910.120, OSHA's regulation regarding Hazardous Waste Operations.

**6.2** Documentation of medical examinations is maintained at the HFA, Inc., Waldorf, Maryland office. The documentation will be complete, accurate and be kept on file for 30 years after termination of employment. A minimum of the following information will be kept: (1) name and social security number; (2) physician name, written opinions, recommendations, limitations, and test results; and (3) employee medical complaints related to hazardous waste operations. Copies of the Physician's Statement will be maintained at HFA's Command Post for all on-site personnel.

#### **6.3 MEDICAL EXAMINATION**

**6.3.1** Tests that are normally performed for employment physical include the following:

- Medical and occupational history on past gastrointestinal, hematologic, renal cardiovascular, reproductive, immunological and neurologic problems, as well as information and history of respiratory disease and personal smoking habits.
- Blood pressure measurements
- Complete blood count and differential to include hemoglobin and hematocrit determinations, red cell indices, and smear of peripheral morphology.
- Blood urea nitrogen and serum creatinine
- Urinalysis (dipstick and microscopic examination)
- Audiometric examination
- Pulmonary function test ( $^{FEV}_{1.0}$  and FVC)
- SMA-24 or equivalent liver function test
- EKG for employees over 45 years old or when other complications indicate the necessity
- Drug and alcohol screen
- Slit lamp examination (if required)

**6.3.2** Table 6-1 shows the employees' participation in the medical surveillance program. It includes the employees' name, date of last examination, and name of reviewing occupational physician.



Policy. Personnel exhibiting irregular or unusual actions will not be permitted on the work site. Personnel identified as substance abusers will be dismissed.

## **CHAPTER 7**

# **EXPOSURE MONITORING/AIR SAMPLING PROGRAM**

### **7.1 EXPOSURE MONITORING**

**7.1.1** The findings, based on the previous sampling actions, indicates that there will be no toxic, radioactive, and flammable atmospheres; therefore, no exposure monitoring will be performed in accordance with ER 385-1-92 and 29 CFR 1910.120. However, personnel will be alert for any indicators of potential exposure to hazardous substances such as dead animals or vegetation, pools of liquids, oils on liquid surfaces, containers, and possible landfill areas.

**7.1.2** Site personnel will observe themselves and their team members for signs and symptoms of exposure to explosives, and screening smoke (see in Table 2-2).

## CHAPTER 8

# HEAT AND COLD STRESS MONITORING

### 8.1 HEAT STRESS MONITORING

**8.1.1** For site conditions where personnel are working in Level D PPE, and the ambient temperature is greater than 75°F, the SSO will conduct Wet Bulb, Dry Globe Temperature (WBGT) monitoring to assist in controlling the potential for site workers experiencing heat related affects.

**8.1.2** The SSO will use a real-time direct reading WBGT monitor, and after estimating the work load, use the values expressed in Table 8-1 to determine the work/rest schedule to be implemented. The values outlined in this table are designed so that nearly all acclimatized, fully clothed personnel with adequate salt and water intake will be able to function without the body temperature exceeding 100.4°F. If conditions and/or work loads warrant, the SSO may also implement the Oral Temperature (OT) and weight loss monitoring outlined in paragraphs 8.2 and 8.3.

#### PERMISSIBLE WBGT HEAT EXPOSURE THRESHOLD LIMIT VALUES<sup>a</sup>

TABLE 8-1

WORK/REST REGIMEN	WORK LOAD		
	LIGHT*	Moderate*	Heavy*
Continuous work	86 (30.0)	80 (26.7)	77 (25.0)
75% Work - 25% Rest, each hour	87 (30.6)	82 (28.0)	78 (25.5)
50% Work - 50% Rest, each hour	89 (31.4)	85 (29.4)	82 (27.9)
25% Work - 75% Rest, each hour	90 (32.2)	88 (31.1)	86 (30.0)

\* Consult the ACGIH TLV booklet for definitions of Light, Moderate and Heavy work loads. Values are given in °F and (°C) WBGT, and are intended for personnel wearing single layer summer type clothing. As workload increases, the heat stress impact on an unacclimatized worker is exacerbated. For unacclimatized personnel performing a moderate level of work, the permissible heat exposure TLV should be reduced by approximately 2.5°C.

a Source: American Conference of Governmental Industrial Hygienist (ACGIH). 1993 - 1994 Threshold Limit Values and Biological Exposure Indices. Cincinnati, OH.

## 8.2 ORAL TEMPERATURE MONITORING

**8.2.1** If deemed necessary by the SSO, oral temperature (OT) monitoring will be conducted. The worker's OT will be taken and recorded prior to initiation of site activities using a clinical thermometer placed under the tongue. The OT must be taken prior to consumption of cool liquids and will be done at the end of each work period. Whenever the OT exceeds 99.6°F, the work cycle must be shortened by  $\frac{1}{3}$ , without changing the length of the rest period. If a worker's OT exceeds 99.6°F, test the OT again at the end of the rest period, and do not allow the worker to return to work until the OT drops below 99.6°F. If the worker's OT exceeds 100.4°F, the worker will not be allowed to wear semi-or impermeable PPE for the remainder of that workday.

## 8.3 BODY WEIGHT LOSS

**8.3.1** When site conditions and work requirements have the potential for causing excessive fluid loss, the SSO will monitor the workers' fluid loss by weighing each worker prior to and again at the conclusion of each workday. This is to ensure that proper hydration is being maintained and that total amount of water weight loss throughout the day does not exceed 1.5% of the worker's body weight. Calculation of the water weight loss, and assessing the effectiveness of hydration will be conducted as follows:

**8.3.1.1** Subtract the ending weight ( $W_{\text{ending}}$ ) from the daily starting weight ( $W_{\text{start}}$ ) to obtain the weight lost ( $W_{\text{lost}}$ ) for a given work period:  $(W_{\text{start}}) - (W_{\text{ending}}) = (W_{\text{lost}})$ .

**8.3.1.2** Multiply the starting weight by 1.5% to obtain permissible weight loss ( $W_{\text{perm}}$ ):  $(W_{\text{start}}) \times 0.015 = (W_{\text{perm}})$ .

**8.3.1.3** Compare ( $W_{\text{lost}}$ ) to the ( $W_{\text{perm}}$ ), if ( $W_{\text{lost}}$ ) is less than or equal to ( $W_{\text{perm}}$ ), then hydration during the measured period has been adequate, but if ( $W_{\text{lost}}$ ) is greater than ( $W_{\text{perm}}$ ), then hydration should be increased during the next work period.

## 8.4 HEAT STRESS DOCUMENTATION

**8.4.1** The SSO will be responsible for recording all heat stress related information. This will include training sessions, WBGT, OT, water loss calculation and physiological monitoring data. The WBGT, OT and/or water loss calculations will be recorded in the Site Safety Log.

## 8.5 COLD STRESS MONITORING

**8.5.1** Two factors influence the development of a cold injury: ambient temperature and wind velocity. Windchill is used to describe the chilling effect of moving air in combination with low temperatures. Table 8-2 shows a windchill chart. As a general rule, the greatest incremental gain in windchill occurs when a wind velocity increases from 5 mph to 10 mph. Additionally, water conducts heat 240 times faster than air. Therefore, the body cools dramatically when personal protective equipment is removed and clothing underneath is perspiration-soaked.

## **8.5.2 WORK-WARMING REGIMEN**

**8.5.2.1** If work is performed continuously in the cold at an equivalent chill temperature (ECT) or below  $-7^{\circ}\text{C}$  ( $20^{\circ}\text{F}$ ), heated warming shelters (tents, cabins, rest rooms, etc.) will be made available nearby and the workers encouraged to use these shelters at regular intervals, the frequency depending on the severity of the environmental exposure. Table 8-3 lists Threshold Limit Values for working in the cold. The onset of heavy shivering, frostnip, the feeling of excessive fatigue, drowsiness, irritability, or euphoria, are indications for immediate return to the shelter. When entering the heated shelter the outer layer of clothing will be removed and the remainder of the clothing loosened to permit sweat evaporation or a change of dry work clothing provided. A change of dry work clothing will be provided as necessary to prevent workers from returning to their work with wet clothing. Dehydration, or the loss of body fluids, occurs insidiously in the cold environment and may increase the susceptibility of the worker to cold injury due to a significant change in blood flow to the extremities. Warm sweet drinks and soups should be provided at the work site to provide caloric intake and fluid volume. The intake of coffee should be limited because of diuretic and circulatory effect.

**8.5.2.2** For work practices at or below  $-12^{\circ}\text{C}$  ( $10^{\circ}\text{F}$ ), the following will apply:

**8.5.2.2.1** The worker will be under constant protective observation (buddy system or supervision).

**8.5.2.2.2** The work rate should not be so high as to cause heavy sweating that will result in wet clothing; if heavy work must be done, rest periods must be taken in heated shelters and opportunity for changing into dry clothing will be provided.

**8.5.2.2.3** New employees will not be required to work full-time in cold in the first days until they become accustomed to the working conditions and required protective clothing.

**8.5.2.2.4** The weight and bulkiness of clothing will be included in estimating the required work performance and weights to be lifted by the worker.

**8.5.2.2.5** The work will be arranged in such a way that sitting still or standing still for long periods is minimized. Unprotected metal chairs seats will not be used. The worker should be protected from drafts to the greatest extent possible.

**8.5.2.2.6** The workers will be instructed in safety and health procedures. The training program will include as a minimum instruction in:

- Proper rewarming procedures and appropriate first aid treatment.
- Proper clothing practices.
- Proper eating and drinking habits.
- Recognition of impending frostbite.
- Recognition signs and symptoms of impending hypothermia or excessive cooling of the body even when shivering does not occur.
- Safe work practices.

**8.5.2.2.7** Special caution will be exercised when working with toxic substances. Cold exposure may require reduced exposure limits.

**8.5.2.2.8** Eye protection for workers employed out-of-doors in a snow and/or ice-covered terrain will be supplied. Special safety goggles to protect against ultraviolet light and glare (which can produce temporary conjunctivitis and/or temporary loss of vision) and blowing ice crystals are required where there is an expanse of snow coverage causing a potential eye exposure hazard.

**8.5.3** Workplace monitoring is required as follows:

**8.5.3.1** Suitable thermometry should be arranged at any workplace where the environmental temperature is below 16°C (60°F) to enable overall compliance with the requirements of the TLV to be maintained.

**8.5.3.2** Whenever the air temperature at a workplace falls below -1°C (30°F), the dry bulb temperature should be measured and recorded at least every four hours.

**8.5.3.3** In indoor workplaces, the wind speed should be recorded at least every four hours whenever the rate of air movement exceeds two meters per second (5 mph).

**8.5.3.4** In outdoor work situations, the wind speed should be measured and recorded together with the air temperature whenever the air temperature is below -1°C (30°F).

**8.5.3.5** The equivalent chill temperature will be obtained from Table 8-3 in all cases where air movement measurements are required, and will be recorded with the other data whenever the equivalent chill temperature is below -7°C (20°F).

**8.5.3.6** Employees will be excluded from work in cold at -1°C (30°F) or below if they are suffering from disease or taking medication which interferes with normal body temperature regulation or reduces tolerance to work in cold environments. Workers who are routinely exposed to temperatures below -24°C (-10°F) with wind speeds less than 5 mph, or air temperatures below -18°C (0°F) with wind speeds above 5 mph should be medically certified as suitable for such exposures.

**8.5.3.7** Trauma sustained in freezing or subzero conditions requires special attention, because an injured worker is predisposed to secondary cold injury. Special provisions must be made to prevent hypothermia and secondary freezing of damaged tissues, in addition to providing for first aid treatment.

**TABLE 8-2  
COOLING POWER OF WIND ON EXPOSED FLESH AS EQUIVALENT TEMPERATURE**

Estimated Wind Speed (in mph)	Actual Temperature Reading (°F)											
	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	-23	-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 40mph have little additional effects)	<b>LITTLE DANGER</b> In <hr with dry skin, maximum danger of false sense of security				<b>INCREASING DANGER</b> Danger from freezing of exposed flesh within one minute				<b>GREAT DANGER</b> Flesh may freeze within 30 seconds			
(a) Developed by U.S. Army Research Institute of Environmental Medicine, Natick, Massachusetts.												
NOTE: Trenchfoot and immersion foot may occur at any point on this chart.												

**TABLE 8-3**  
**THRESHOLD LIMIT VALUES WORK/WARM-UP SCHEDULE FOR FOUR-HOUR SHIFT<sup>a</sup>**

AIR TEMPERATURE-SUNNY SKY		NO NOTICEABLE WIND		5 MPH WIND		10 MPH WIND		15 MPH WIND		20 MPH WIND	
°C (approx.)	°F (approx.)	Max. Work Period	No. of Breaks								
-26 to -28	-15 to -19	(NB)	1	(NB)	1	75 min	2	55 min	3	40 min	4
-29 to -31	-20 to -24	(NB)	1	75 min	2	55 min	3	40 min	4	30 min	5
-32 to -34	-25 to -29	75 min	2	55 min	3	40 min	4	30 min	5	Non-emergency work should cease	
-35 to -37	-30 to -34	55 min	3	40 min	4	30 min	5	Non-emergency work should cease			
-38 to -39	-35 to -39	40 min	4	30 min	5	Non-emergency work should cease					
-40 to -42	-40 to -44	30 min	5	Non-emergency work should cease							
-43 and below	-45 and below	Non-emergency work should cease									

(a) Adopted from Occupational Health and Safety Division, Saskatchewan Department of Labor.

NOTE: 1. Schedule applies to any 4-hour work period with moderate to heavy work activities, with warm-up periods in a warm location and with an extended break (e.g., lunch) at the end of the 4-hour period in a warm location. For light-to-moderate work (limited physical movement), apply the schedule one step lower. For example, at -35°C (-30°F) with no noticeable wind, 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.

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 sheets; 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 would be: (1) special warm-up breaks should be initiated at a wind chill cooling rate of about 1,750 W/m<sup>2</sup>\*; all non-emergency work should have ceased at or before a wind chill of 2,250 W/m<sup>2</sup>. In general, the warm-up schedule provided above slightly under-compensates for the wind at warmer temperatures, assuming acclimatization and clothing appropriate for winter work. On the other hand, the chart slightly over-compensates for the actual temperatures in colder ranges because windy conditions rarely prevail at extremely low temperatures.

4. Threshold Limit Values apply for workers in dry clothing.

\* Wind chill cooling rate is defined as heat loss from a body expressed in watts per meter squared which is a function of the air temperature and wind velocity upon the exposed body.

## **CHAPTER 9**

# **STANDARD OPERATING SAFETY PROCEDURES, ENGINEERING CONTROLS AND WORK PRACTICES**

### **9.1 GENERAL PRACTICES**

**9.1.1** The Dolly Sods site contains potential hazards to project personnel. All HFA personnel and subcontractors will be familiar with these hazards, and strictly adhere to the appropriate safety procedures. The potential hazards and the appropriate controls will be presented to project personnel during Daily Safety Meetings.

**9.1.2** Only authorized personnel will be permitted in the work area. These authorized individuals must have successfully completed a medical exam and have been properly trained in accordance with 29 CFR 1910.120 and specific health and safety hazards. All visitors will check in with the HFA or client representative.

**9.1.3** Personnel will be prohibited from being transported by any other means than those prescribed for movement of personnel. When trucks or other heavy equipment enters or leaves the site, a ground guide will direct the driver.

**9.1.4** A fire extinguisher rated at least 10BC will be at the work site. In the event of an emergency, it will be readily available for the team's use.

**9.1.5** Smoking will not be permitted on the premises except in the support area or other specified location. Any employee not willing to comply with this or any other SSHP procedures may be subject to disciplinary action.

**9.1.6** At least two qualified persons competent in both First Aid techniques and cardiopulmonary resuscitation (CPR) will be part of the project team. A complete first-aid kit will be readily available on site. If a serious injury occurs, the local hospital and ambulance will be summoned to evacuate the injured or ill person.

**9.1.7** No electrical equipment will be permitted in areas where a flammable atmosphere may exist. All static ignition sources will be identified and eliminated by the use of bonding and grounding techniques.

**9.1.8** Material Safety Data Sheets (MSDS) will be obtained for every chemical product used on site. This information will be made readily available to all employees upon request and stored in a central location. MSDS or applicable information will be available with regard to materials used in the soil collection and drilling process. All containers of any chemical products will be properly labeled to comply with the Federal OSHA Hazard Communication Standard (29 CFR 1910.1200).

## **9.2 BUDDY SYSTEM**

**9.2.1** All work being performed at this site will use the “buddy” system. Team members will keep in visual contact with each other at all times. One member will be responsible to ensure the safety of the other team member. Team members will be aware of any slip, trip, fall, and all lifting hazards along with any potential exposure to chemical substances, heat stress, and general hazards within the work areas.

## **9.3 EXCAVATION AND TRENCH SAFETY**

**9.3.1** No entry will be made into an excavation unless it can be done safely. Excavations or trenches of four feet or greater in depth are not anticipated. If such excavation are made and must be entered, an Excavation Plan addendum to this plan must be prepared by the Health and Safety Manager. Safe and secure access and egress will be provided. Employees will be protected at all times from cave ins. Employees will be protected from hazardous atmospheres.

**9.3.2** Digging the excavation/trench and all work in the excavation/trench will conform to the requirements of 29 CFR 1926 and EM385-1-1.

## **9.4 FALL PROTECTION**

**9.4.1** Workers will not approach the edge of unsloped excavations closer than five feet from the edge unless protected from falling in by a standard guard rail or other approved fall protection.

## **9.5 HAZARD COMMUNICATION**

**9.5.1** The Hazard Communication Standard is different from other OSHA health rules as it covers all hazardous chemicals. A “downstream flow of information” means that producers of the chemicals have the primary responsibility for generating and disseminating information, while users of chemicals must obtain the information and transmit it to their employees.

## **9.6 ILLUMINATION**

**9.6.1** All field activities will be performed in daylight. No sources of intense light (e.g., infrared or ultraviolet) other than natural light are associated with planned activities. If adequate light is not available (e.g., at least five foot candle for general work), field activities will cease until adequate light is available.

## **9.7 SANITATION**

**9.7.1** All site cleanliness and sanitation requirements will be in accordance with 29 CFR 1910.120(n) and EM 385-1-1.

**9.7.2** HFA will maintain appropriate project on-site housekeeping practices during the course of the UXO services project. All waste generated by HFA will be collected and properly disposed of.

**9.7.3** Portable toilet facilities will be provided and located as conveniently to the site as possible.

**9.7.4** Potable water, soap, and towels will be brought to the site each day for drinking and washing hands/face. All personnel will wash hands and face prior to eating or drinking, and at the end of the work day.

## **9.8 UNEXPLODED ORDNANCE SAFETY PRECAUTIONS AND RULES**

**9.8.1** The following safety precautions and rules will be observed by all non UXO personnel present on a UXO survey site:

- Do not go souvenir hunting.
- Do not pick up or disturb unidentified items.
- Report all UXOs or unidentified objects.
- Do not enter the uncleared area of the site.
- Do not carry fire or spark producing devices into the site.
- Do not smoke except in areas specifically designated for smoking.
- Avoid inhalation and skin contact with explosives.
- Remove from the area any person showing evidence of explosive poisoning or dermatitis.
- Do not allow one person to work alone during any operations.
- Prohibit unnecessary personnel from visiting the operations site.
- Suspend all operations immediately upon approach of an electrical storm.
- Do not attempt to extinguish burning explosives or any fire which might involve explosive materials.
- If explosive materials are burning or their ignition is imminent, immediately evacuate the area.
- Have a vehicle in the area in case of an accident or emergency.
- Have communications equipment in the area in case of an accident or emergency.
- Any work involving electrical tools or equipment will be conducted using ground fault circuit interrupters, to protect workers from electrocution.
- If clothing becomes contaminated, remove immediately.

## **9.9 ADVERSE WEATHER CONDITIONS**

**9.9.1** In the event of adverse weather conditions, the SSO will determine if operations can continue without the potential for injury to personnel. Conditions that may cause concern, as well as assist in the determination of whether or not to continue field operations, include, but are not limited to, the following:

- Potential for heat or cold stress
- Severe thunderstorms
- Tornadoes
- Hailstorms
- Poor visibility

**9.9.2** If it is determined prior to departing to the work site that no work can be accomplished that day, the SUXOS will call each UXO team's supervisor and have the UXO Supervisor call or pass the word to his UXO team. The SUXOS will be notified when all team members have been made aware of the situation by each team UXO Supervisor.

## **CHAPTER 10**

### **SITE CONTROL MEASURES**

#### **10.1 AUTHORIZATION TO ENTER**

**10.1.1** Access to contaminated work areas is regulated and limited to authorized personnel. Only those who have completed the required training and medical requirements will be allowed to enter. Representatives from regulatory agencies will be permitted to enter the site at any time during business hours or at other reasonable times, provided they have completed the required training and medical requirements. Representatives of the news media and other visitors must receive authorization from the client and the Project Manager before entering.

#### **10.2 HAZARD BRIEFING**

**10.2.1** The SSO will brief this SSHP to all personnel, including subcontractors entering the site to inform them of the potential site hazards. All personnel will acknowledge this briefing by signing the SSHP.

#### **10.3 DOCUMENTATION OF CERTIFICATES**

**10.3.1** Personnel entering the site to work will have satisfied the medical and training requirements of 29 CFR 1910.120. The project file will contain copies of certificates documenting status for all on-site personnel. All subcontractors must present documentation of current training and medical status before being granted access.

#### **10.4 SITE SPECIFIC CONTROL PLAN**

**10.4.1** The goal of the Site Specific Control Plan (SSCP) is to outline the site requirements needed to protect on-site personnel, the environment and the general public from task hazards and exposures to OE. One of the most effective methods for reducing or eliminating the potential for personnel exposure to OE is through the use and enforcement of site control zones and access control points.

**10.4.2** The boundaries and access control points for each site will be clearly identified with signs and segregated with ways to prevent accidental intrusion by personnel who are not authorized to be in the area during site operations. It will be the SSO's responsibility to ensure that the control zones and access points are created and then evaluated daily, in such a manner as to ensure that hazards found inside the sites do not migrate outside the sites.

#### **10.5 EXCLUSION ZONES (EZ)/FRAGMENTATION DISTANCE**

**10.5.1** The EZ is a work area where the greatest hazard potential for exposure to safety and health hazards may exist. All personnel entering the EZ must wear the prescribed level of PPE. Entry and exit points will be established at the EZ to regulate the flow of personnel and equipment into and out

of the sites. At anytime an non-UXO qualified personnel enter the EZ, all intrusive activities will cease while they are within the EZ/fragmentation distance.

## **10.6 ENTRY LOGS**

**10.6.1** The SSO keeps a daily roster of all on-site personnel and records the time of entry into and exit from the site.

## **10.7 ENTRY REQUIREMENTS**

**10.7.1** All personnel entering the site will be in the proper PPE for the task at hand.

## **10.8 EMERGENCY ENTRY AND EXIT**

**10.8.1** In case of emergency, personnel will exit the site and travel to the designated place of refuge. The refuge will be located upwind of the site location. The Project Manager/SUXOS and the SSO will determine the severity of the emergency. If the emergency warrants site evacuation, the SUXOS will do so. The place of refuge will be determined daily by the SSO and provided to the work crews during each morning's safety briefing.

## **10.9 TRAFFIC CONTROL**

**10.9.1** The work at the site may at times impede local traffic and inconvenience the local population, or persons visiting the Dolly Sods Wilderness Area. Traffic control will be required during demolition operations and work will be halted if a vehicle passes the site or an unauthorized person enters the site. The Forest Service will coordinate traffic control, for demolition operations in close proximity to public roads.

**10.9.2** Emergency routes will be established by law enforcement and fire protection personnel as they are needed. All emergency contact will be via radio or cellular telephone, telephone numbers are provided in Table 14-1. The SUXOS will act as the project coordinator and he will coordinate with emergency services providers.

## **10.10 COMMUNICATIONS**

**10.10.1** Cellular telephones will be the primary/emergency and the routine method of communication with off site agencies.

**10.10.2** Portable radios will be used as site communications between site supervisory personnel and UXO Supervisors. Radios will also serve as the secondary emergency link between field personnel and the headquarters facilities.

**10.10.3** All communications will be tested at least once daily, normally in the morning after the daily safety briefing. It is anticipated the routine daily communications will suffice to indicate each unit is operating. This does not preclude supervisors from asking for radio checks if they feel their

equipment may not be operating as expected.

**10.10.4** If at anytime there is a breakdown of radio and cellular phone communications, operations will cease in that sector until the situation is corrected.

**10.10.5** Table 10-1 list the primary and secondary means of communication.

**COMMUNICATION PRIORITIES  
TABLE 10-1**

<b>LOCATION</b>	<b>PRIMARY</b>	<b>SECONDARY</b>
On-site	Radios or voice	Hand signals or air horn
On-site to Headquarters	Radios	Cellular Phone
Headquarters to Off-site	Cellular Phone	Cellular Phone

# CHAPTER 11

## PERSONAL HYGIENE AND DECONTAMINATION

### 11.1 SANITARY FACILITIES

11.1.1 HFA will provide and maintain portable sanitary facilities with at least one unit for each 15 workers. Each temporary toilet will be naturally lighted, have ventilation, lockable from the inside, and be serviced weekly.

### 11.2 WASHING FACILITIES

11.2.1 HFA will provide washing facilities, convenient to the work area, including portable washing water and soap. All washing facilities will be supplied with liquid soap, paper towels, and trash receptacles. All washing facilities or areas will be kept clean and free of trash.

11.2.2 All field personnel will wash their hands and face prior to eating, drinking, and leaving the site for the day.

### 11.3 PERSONNEL DECONTAMINATION

11.3.1 Effective decontamination is not simply removing contamination, it begins with preventing contamination. Personal protective equipment prevents the wearer from becoming contaminated, and good work practices reduce contamination of protective clothing and equipment. Some basic examples of effective contamination prevention are:

- Adhering to work practices that minimize contact with hazardous substances; and
- Using remote sampling techniques.

11.3.2 Even with these safeguards, contamination may occur. Since planned activities will be performed in Level D, only Level D decontamination procedures will be discussed.

11.3.3 Level D personnel decontamination consists of following step:

- Wash hands and face with soap and water.

11.3.4 Equipment required for decontamination of personnel and personal protective equipment (PPE) includes:

- collection containers, such as plastic bags for storing discarded paper towels;
- soap and water; and
- paper or cloth towels for drying hands and face.

## **11.4 WASTE CONTROL AND DISPOSAL**

**11.4.1** Solid trash, paper towels, and items used in the work zones, are to be classified as industrial solid waste and will be containerized and disposed of as such.

## **CHAPTER 12**

# **EQUIPMENT DECONTAMINATION**

**12.1** No equipment decontamination is required for this project.

**12.2** All rental heavy equipment and vehicles must be washed free of dirt, when excessively dirty and at the completion of the project. The Site Safety Officer will verify that equipment and vehicles leaving the site is washed according to the following procedures:

### **12.2.1 HEAVY EQUIPMENT AND VEHICLES**

**12.2.1.1** Prior to removal from the site, thoroughly wash the equipment/vehicles with nonphosphate detergent and rinse with water.

## CHAPTER 13

### EMERGENCY EQUIPMENT & FIRST AID REQUIREMENTS

#### 13.1 EMERGENCY EQUIPMENT

**13.1.1** The emergency equipment listed in Table 13-1 will be on-site, stored in the location indicated, and available for use during site operations. Emergency equipment will be maintained and inspected weekly by the SSO or designed to ensure completeness and proper working condition. The selection of emergency equipment to be kept at the site is specific to the hazards and risks associated with the site and the tasks to be performed. For ordnance, ammunition, and explosives removal action, the following on-site emergency equipment will be maintained by HFA:

#### EMERGENCY EQUIPMENT REQUIREMENTS

**TABLE 13-1**

Emergency Equipment	Locations where Emergency Equipment is to be Stored	Operations where Emergency Equipment is Required
Standard industrial first aid kit	Each Team , SSO Vehicle, and CP	All Operations
burn kit/blanket	Cached on site, and CP	
fire extinguisher, rated at least 1A, 10BC	SSO Vehicle, and CP	
portable stretcher	Cached on site, SSO Vehicle	
15 minute eyewash	SSO Vehicle	
CPR mask/shield	Cached on site, SSO Vehicle, and CP	
Airhorn	Each Team , SSO Vehicle, and CP	
Portable eyewash kit	Each Team , SSO Vehicle, and CP	

#### 13.2 FIRST AID REQUIREMENTS

**13.2.1** At least two employees current in First Aid and CPR will be assigned to the project and will be on site when HFA employees are working. CPR certification must be refreshed annually. First Aid must be renewed every three years.

#### 13.3 SPILL CONTROL

**13.3.1** Spill control is required for materials (e.g., gasoline and engine oil). Materials such as gasoline and engine oil will be stored in small amounts. Gasoline will be stored in OSHA approved safety cans. When materials are being transported in field vehicles (pickups), they will be secured to reduce the potential for a spill. All hazardous waste spills will be in accordance with HFA's CEHNC approved Heavy Equipment SOP, Spill Response Procedures, (Section 5.0).

### **13.3.2 SPILL CONTROL EQUIPMENT**

#### **13.3.2.1 Spill response equipment for cleanup of small scale releases will include:**

- absorbent material; and
- containers to put the absorbent into.

## CHAPTER 14

# EMERGENCY RESPONSE & CONTINGENCY PROCEDURES

### 14.1 GENERAL

**14.1.1** Emergencies must be dealt with in a manner to minimize the health and safety risk to all site personnel. Work activities will be conducted in groups of at least two workers (buddy system) to provide continuous signal monitoring in the event of an emergency. Site emergency phone numbers and the hospital route will be posted in the site command post and placed in each vehicle on-site leased or owned by HFA.

**14.1.2** All emergency response agencies and the hospital were notified of potential site hazards and the type of work to be completed by HFA at the initial site visit.

**14.1.3** If a UXO cannot be detonated or a suspected chemical munition is encountered, the on-site CEHNC Safety Specialist will be notified, who in turn will notify the nearest EOD/TEU unit, as appropriate, for support. If the CEHNC Safety Specialist is not available, the SUXOS will immediately notify CEHNC Safety.

### 14.2 PRE-EMERGENCY PLANNING AND PROCEDURES

**14.2.1** In the event of an emergency situation, such as fire, explosion, or significant release of a hazardous substance, an air horn or vehicle horn will be sounded three times with five second intervals between blasts to signal the initiation of evacuation procedures. All personnel will evacuate the site and assemble at an upwind safe haven. **The safe haven will be established daily during the tailgate safety briefings.** The SUXOS will initiate proper action if outside services are required. Under no circumstances will incoming personnel or visitors be allowed to proceed into the area once the emergency signal has been given. The SSO will ensure that access for emergency equipment is provided and that all sources of combustion have been shut down once the alarm has been sounded. Once the safety of all personnel has been established, emergency contacts will be notified. Table 14-1 lists emergency contacts, and Figure 14-1 delineates basic emergency response procedures. Evacuation procedures will be discussed regularly with all personnel.

**EMERGENCY CONTACTS  
TABLE 14-1**

ORGANIZATION	CONTACT NAME & PHONE NUMBER
ONSITE	
Police Department (State Police)	(304) 637-0200
Fire Department (Forest Service District Ranger)	(304) 257-4488
Medical Facility (Davis Memorial Hospital)	(304) 637-3337
Emergency Medical Services	(304) 257-1212
Forest Service Representative	On Site
HFA, Inc.	
Senior Project Manager (Richard Thiel)	301-705-5044
Health and Safety Manager (Michael L. Winningham)	301-705-5044
EOD/TEU	
48th Ord Det. (Fort Jackson, SC)	(803) 751-5126
TEU (APG Edgewood Area)	410-671-2773
USACE	
Project Manager (Mr. Bill Sargent)	205-895-1562
CEHNC Safety Office	205-895-1587/1580
Other	
CHEMTRAC	800-424-9300
Explosives Division (Department of the Treasury)	202-927-7920

**14.3 RESPONSIBILITIES**

**14.3.1** The Project Manager or SUXOS will have the responsibility for directing the response activity in the event of an emergency. The responsibilities are described below:

*Note: If the Project Manager or SUXOS is the individual who is injured, the next senior person will take charge (SSO, UXO Supervisors, etc.).*

### **14.3.2 Assessing the Emergency**

**14.3.2.1** Available information related to the emergency, onsite capabilities should be evaluated, and the information listed below should be obtained possible:

**14.3.2.1.1** What happened:

- Type of incident;
- Cause of incident;
- Extent of chemical release, include extent and route of migration; and
- Extent of damage to structures, equipment and terrain.

**14.3.2.1.2** Casualties involved:

- Victims (number, location and condition);
- Treatment required; and
- Missing personnel.

**14.3.2.1.3** What could happen from this point; consider:

- Types of chemicals onsite;
- Potential for fire or explosion, coupled with the release of hazardous materials;
- Location of all personnel in relation to hazardous areas; and
- Potential for emergency affecting the general public or the environment.

**14.3.2.1.4** What can be done to remediate the situation; consider:

- Equipment and personnel needed for rescue and hazard migration;
- Number of uninjured personnel available for response;
- Resources available onsite;
- Resources available from offsite response groups and agencies;
- Time needed for offsite response groups to reach the site; and
- Hazards involved in rescue and response.

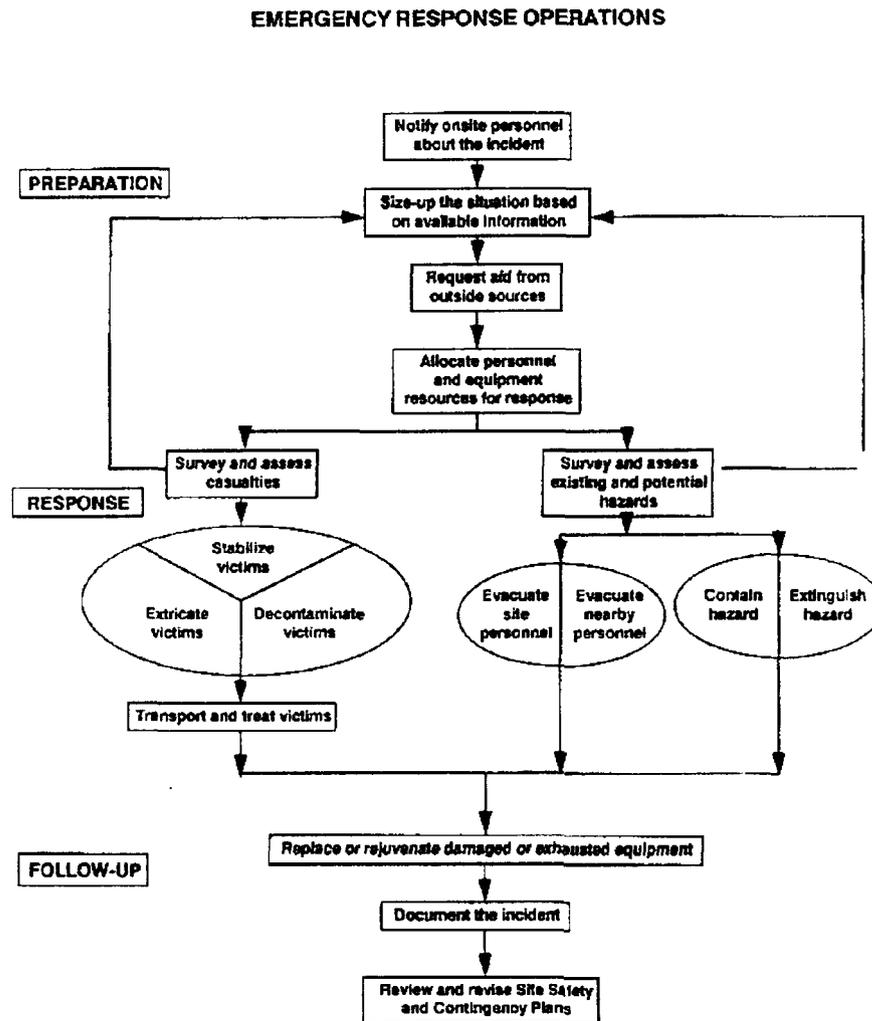
**14.3.2.2** While assessing the emergency situation, notify appropriate emergency personnel and the CEHNC Safety Specialist.

**14.3.2.3** Determine and coordinate the on-site personnel actions for the particular emergency situation.

**14.3.2.4** Contact and coordinate with appropriate client representative(s).

**EMERGENCY RESPONSE OPERATIONS**

**FIGURE 14-1**



14.3.2.5 Immediately start a incident/accident log.

14.3.2.6 Immediately contact HFA's Health and Safety Manager @ 301-705-5044.

**14.4 RESCUE AND RESPONSE ACTIONS**

14.4.1 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 attempt

emergency response/rescue until the situation has been assessed and the appropriate response outlined by the SUXOS or SSO.

**14.4.1.1 Enforce the Buddy System:**

- Allow no one enter a contaminated area without a partner.
- Personnel in the EZ should be in line-of-sight or in communication with SUXOS/SSO.

**14.4.1.2 Survey casualties:**

- Locate all victims and assess their condition.
- Determine resources needed for stabilization and transport.

**14.4.1.3 Assess Existing and Potential Hazards and Determine:**

- Whether and how to respond.
- The need for evacuation of site personnel and offsite population.
- The resources needed for evacuation and response.

**14.4.1.4 Request Aid:**

- Contact the required off and onsite personnel or facilities, such as ambulance, fire department, police, COR, etc..

**14.4.1.5 Allocate Resources:**

- Allocate onsite personnel and equipment to rescue and initiate incident response operations.

**14.4.1.6 Control:**

- Assist in bringing the hazardous situation under complete or temporary control and use measures to prevent the spread of the emergency.

**14.4.1.7 Assign PPE:**

- In the event of a suspected chemical release, emergency/rescue PPE is required. This will be accomplished by the responding local HazMat personnel.

**14.4.1.8 Extricate:**

- Remove or assist victims from the area.

**14.4.1.9 Decontaminate:**

- Use established procedures to decontaminate uninjured personnel in the decontamination area.

- If the emergency makes the PDS area unsafe, establish a new area at the appropriate distance.
- Decontaminate victims before or after stabilization as their medical condition indicates.
- If the victims can not be decontaminated, place on a tarp or plastic sheets to allow handling of the victim without the threat of contaminating support personnel.

**14.4.1.10 Stabilize:**

- Administer any medical procedures that are necessary before the victims can be transported.
- Stabilize or permanently fix the hazardous condition.
- Attend to what caused the emergency and anything damaged or endangered by the emergency.

**14.4.1.11 Transport:**

- No one will be transported without being decontaminated, unless injuries are life-threatening.
- Take measures to minimize contamination of the transport vehicles.

**14.4.1.12 Casualty Logging:**

- Record who, time, destination and condition upon transport.

**14.4.1.13 Evacuate:**

- Move site personnel to a safe distance upwind of the incident.
- Monitor the incident for significant changes; hazards that may have diminished, permitting personnel to reenter the site, or hazards may have increased and require public evacuation.

**14.4.1.14 Casualty Tracking:**

- Record disposition, condition and location.

**14.5 FIRE PROTECTION AND EMERGENCY SERVICE**

**14.5.1** Fire protection and emergency services can be obtained from the Forest Fire Department @ (803) 582-3533 and emergency medical services by dialing (304) 637-3337 or dialing 911.

**14.5.2** Anytime emergency services are requested of any agency, the caller will stay on the line and provide information and directions to the responding emergency personnel; the emergency service personnel will inform the caller when to hang up.

**14.6 FIRST AID NOTIFICATION PROCEDURES**

**14.6.1** If onsite HFA personnel or offsite emergency personnel are to enter the site in response to the emergency. The SUXOS or SSO will to the extent possible, notify the response personnel about the

nature of the emergency, to include:

**14.6.1.1** What happened and when it happened.

**14.6.1.2** Where onsite the emergency situation occurred.

**14.6.1.3** Who is involved and, if possible, the cause of the emergency.

**14.6.1.4** The extent of damage and what hazards may be involved.

**14.6.1.5** What actions should be taken.

**14.6.2** Each team will be equipped with a first aid kit, and one portable eyewash per active work site.

**14.6.3** First aid will be rendered for minor injuries on site. The SSO will determine if the injury requires further treatment. If emergency treatment is required, the injured person will be transported to an emergency evacuation point, (determined daily) for further transport to the Hospital. If further treatment is required, but determined to be routine, or of a non emergency nature the injured person will be transported to the Davis Memorial Hospital via company vehicle for treatment. (see Emergency Medical Route, attached)

**14.6.4** Requests for transportation of injured personnel via Emergency Medical Services (EMS) will be coordinated with the Davis Memorial Hospital Emergency Services at (304) 637-3337. EMS personnel will take the injured person(s) to the hospital and start the immediate treatment required.

**14.6.5** Once the injured person(s) arrives at the hospital emergency room (ER), ER personnel will determine how severe the injury is and decide if the injured person(s) need MedEvac "Life Flight" transportation to another hospital. This will all be coordinated through Hospital.

## **14.7 FIRE/UNPLANNED EXPLOSION**

**14.7.1** In the event of a fire and/or unplanned detonation, the SUXOS will be notified immediately.

**14.7.2** Fires will always be reported no matter how small. Site personnel will attempt to contain the fire until the fire fighters arrive. If the fire gets out of hand, involves burning explosives, or is beyond the capabilities of HFA personnel, they will withdraw immediately until help arrives.

**14.7.3** All personnel will evacuate the site and proceed to a rally spot determined at the beginning of the day by the SUXOS. He will determine the rally spot based on the wind conditions, the location of the work groups, and the ease and safety of reaching the rally spot.

**14.7.4** Upon receiving directions by the UXO Supervisor, all persons will proceed immediately to the designated rally spot. The senior person present will muster and account for all persons and report to the PM or SUXOS.

**14.7.5** The SUXOS will standby to receive any additional instructions from the fire fighters and to assist as requested.

#### **14.8 AIRBORNE RELEASE OF HTRW CHEMICALS**

**14.8.1** If an airborne release of HTRW contaminants occurs, personnel immediately move upwind and evacuate the area. The UXOS will notify the SUXOS and SSO of the release, who will in turn notify the Forest Service Representative, and then follow the applicable procedures from paragraph 14.4. After exiting the area, personnel will proceed to the designated assembly point and report to the SSO. Personnel will be monitored for unusual signs or symptoms while waiting for HazMat and medical personnel. HFA personnel will assist with the evacuation and security of the site as requested, or required.

#### **14.9 FIRST AID AND CPR**

**14.9.1** Minor cuts, abrasions, or other minor injuries deemed by the HFA SUXOS or SSO to be treatable on-site by first aid, will be treated using the site first aid kit.

**14.9.2** If any CPR or first aid is required to be performed by HFA employees, all such employees will do so while observing “universal precautions” and assume that all blood and saliva are infected with the Hepatitis B and Human Immunodeficiency Viruses. HFA employees responsible for performing such services have been trained in CPR and first aid, the hazards of HIV/HBV, and have received the Hepatitis B vaccination consistent with the requirements of 29 CFR 1910.1030(g)(2) “Bloodborne Pathogens.” Any employee who sustains exposure to his blood or mucus membranes (eyes, nose, mouth) by blood or blood containing body fluid of another person while performing CPR or first aid will be immediately evaluated by a physician.

#### **14.10 MEDICAL EMERGENCIES**

**14.10.1** The types of emergencies outlined below are not all inclusive and the corresponding response procedures will not be considered inflexible. Each accident presents a unique event that must be dealt with by key trained personnel. The prime considerations are to provide the appropriate initial response to assist those in jeopardy without placing other personnel at unnecessary risk.

**14.10.2** If a person working in an area is physically injured, First Aid procedures will be followed. Depending upon the severity of the injury or illness, emergency medical response may be obtained accordingly. If the person can be moved, that person will be taken to a location from the work area where emergency first aid treatment can be administered. The local emergency medical facility should be contacted along with an ambulance.

**14.10.3** The UXO Supervisor will prepare a written report detailing the particular accident, its causes, and consequences within 24 hours of the accident.

#### **14.11 DECONTAMINATION**

**14.11.1** Life saving care should be instituted immediately without waiting for decontamination (if required) of the injured employee. The injured person's garments may be removed if this does not cause delays, interfere with treatment, or irritate the problem. If garments can not be safely removed, the individual should be wrapped in plastic, rubber, or blankets to minimize contamination of medical personnel and facilities. No attempt to wash or rinse the victim should be attempted unless it is known that he has been contaminated with an extremely corrosive or toxic material which could cause injury or loss of life.

**14.11.2** When the site personnel are injured (non-life threatening) or overcome by illness, the following procedures will be followed:

**14.11.2.1** Upon notification of the incident, the SUXOS/SSO, if necessary, summon the EMS personnel, if they are not already onsite;

**14.11.2.2** Other site personnel will transport the injured/ill victim to the PDS using the stretcher;

**14.11.2.3** The SSO or EMS personnel will assess the severity of the injury/illness, and direct the immediate life support if required;

**14.11.2.4** If immediate life support is not required, or the victim is stabilized, and if contact with hazardous materials are suspect, decontamination of the victim with soapy water and clean water rinse will occur;

**14.11.2.5** Site personnel will remove the victims clothing, exercising care not to aggravate the injury;

**14.11.2.6** The victim will be transferred to the evacuation point, or EMS personnel;

**14.11.2.7** EMS personnel will, determine the extent of injuries, and, transport victim to the medical facility for further attention.

#### **14.12 POST EMERGENCY FOLLOW-UP**

**14.12.1** Before normal site activities can resume, the site and personnel must be prepared and equipped to handle another emergency. Restock and clean all equipment and supplies utilized or damaged in the emergency.

#### **14.13 DOCUMENTATION**

**14.13.1** Documentation related to the emergency will be recorded in an accurate, authentic, and complete fashion. Documentation will 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 included:

**14.13.1.1** A chronological record of events;

**14.13.1.2** A list of the personnel involved, including personnel onsite, site personnel who responded, personnel in charge, and offsite groups that responded;

**14.13.1.3** A list of the actions taken to minimize the effects or mitigate the emergency;

**14.13.1.4** An assessment of the potential exposures received by site personnel and the surrounding public; and

**14.13.1.5** A record of the injuries or illnesses which occurred as a result of the emergency.

**14.14 COMMUNICATION PROCEDURES (INTERNAL AND EXTERNAL)**

**14.14.1** Internal communication systems alert personnel to danger, convey safety information, and maintain site control. The system will include radio communication, horns, and hand signals. Personnel will be trained in the meaning of each signal, and the signals will be practiced regularly.

**14.14.2** External communications will be accomplished using the telephone to obtain assistance or inform emergency contacts. Cellular telephones and/or two-way radios will be available in vehicles when vehicles are occupied by personnel.

**14.15 EQUIPMENT**

**14.15.1** All communication equipment used on site will be intrinsically safe and will be capable of transmitting above background noise. Equipment will include two-way radios, cellular telephones, and at least one of the following:

- an air horn;
- a megaphone;
- a siren; or
- a whistle.

**14.16 SIGNALS**

**14.16.1** Emergency communication signals will be clear to all personnel. Table 14-2 lists signals for different communication devices and situations.

## COMMUNICATION SIGNALS

TABLE 14-2

DEVICE	SIGNAL
Radio	Established Code Words
Air Horn/Siren/Whistle	One long blast (repeated three times with 5 seconds intervals between blasts): Evacuate area by nearest direction
	Two short blast: Localized problem, not dangerous to workers.
	Two long blasts: All clear
Visual signals: Hand and whole body movements	Hand clutching throat: Can't breathe.
	Hands waving over top of head: Need assistance now.
	Thumbs up: OK/I'm all right/I understand.
	Thumbs down: No/Negative.
	Grasp partner's wrist or both hands around partner's waist: Leave area immediately.

## 14.17 MAPS

14.17.1 Appendix C, Site Map, shows the location of emergency medical facilities and emergency telephone numbers.

## **CHAPTER 15**

### **ACCIDENT PREVENTION**

### **LOGS, REPORTS AND RECORDKEEPING**

#### **15.1 REPORTING INJURIES AND ILLNESSES**

**15.1.1** Employees will report all injuries to their supervisor immediately and report illnesses as soon as the employee knows he is sick. Supervisors will have employees showing signs of illnesses or injuries evaluated by a physician immediately and submit completed "Report of Injury" to the H&S Manager within 24 hours of the occurrence. If there is any indication that any illness is work-related, the supervisor will submit a completed "Report of Injury" to the H&S Manager within 24 hours after notification by the employee.

**15.1.2** HFA will report all on-duty accidents, injuries, and work related illnesses to the CEHNC Safety Specialist immediately.

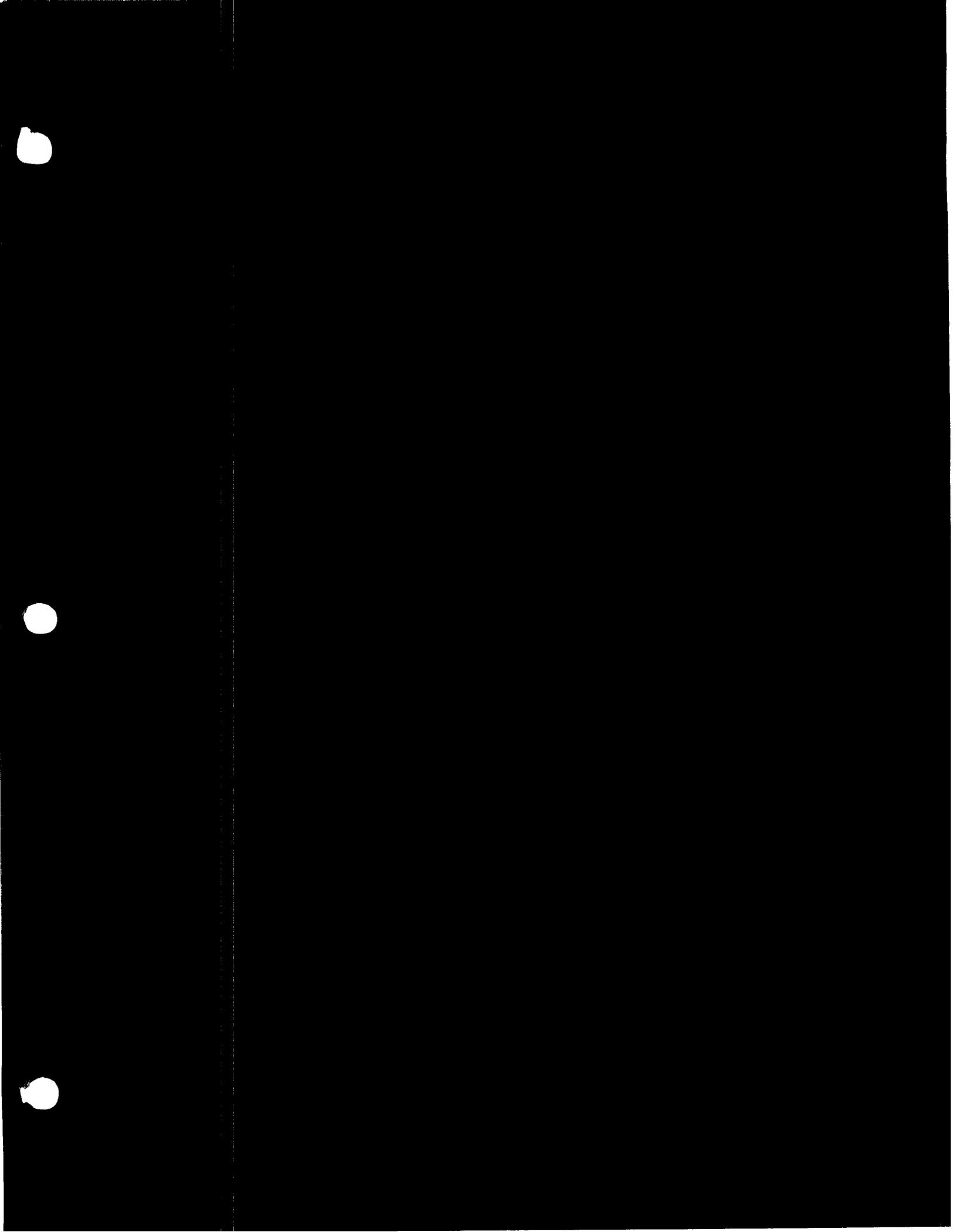
#### **15.2 USACE ACCIDENT REPORTING**

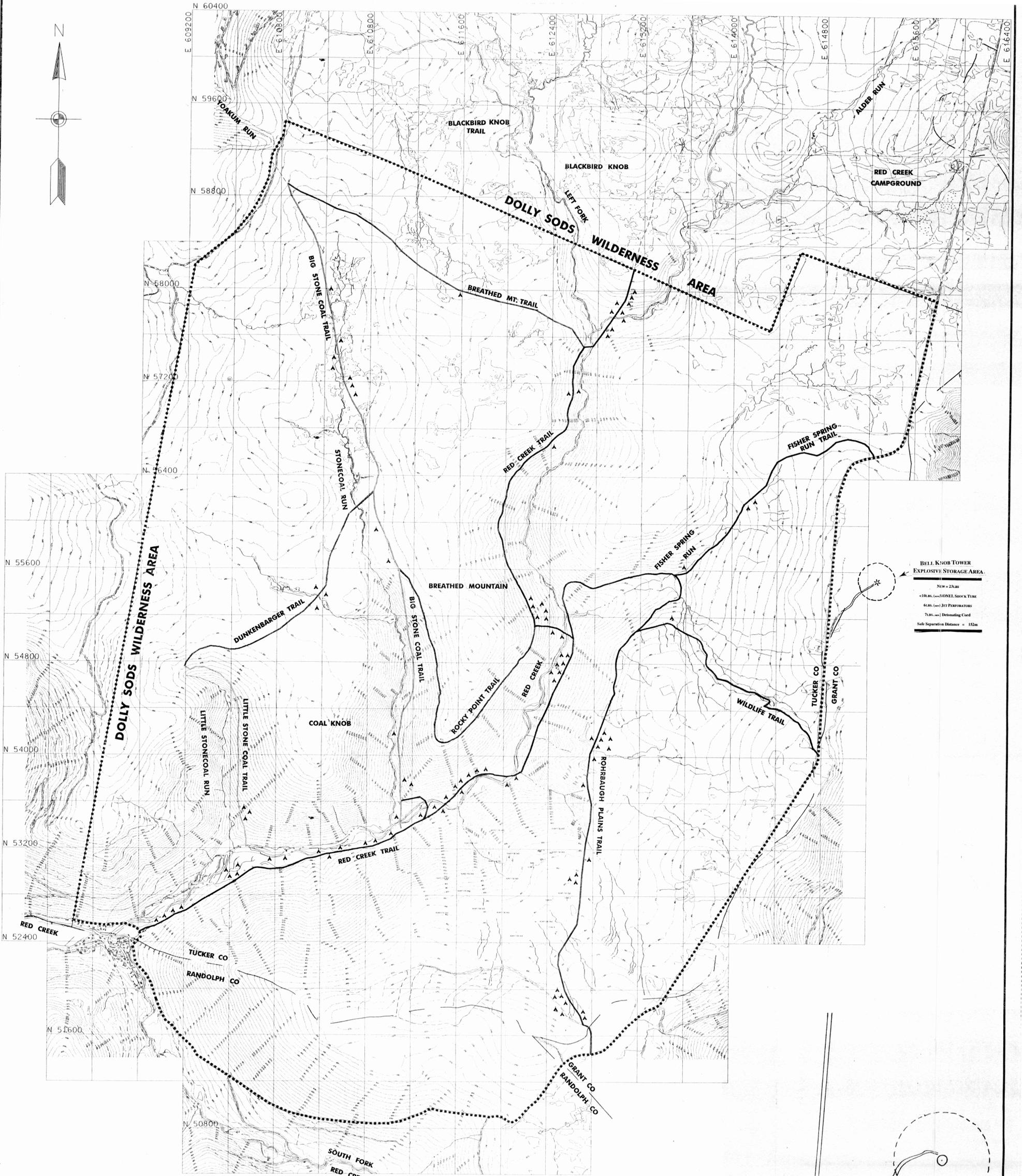
**15.2.1** Accident reporting and Recordkeeping will be accomplished in accordance with AR 385-40 with USACE Supplement, ENG Form 3394, and EM 385-1-1.

#### **15.3 LOGS, REPORTS, AND RECORDKEEPING**

**15.3.1** The following logs, reports, and records (if required) will be maintained on-site:

- training logs (site-specific and visitors);
- safety inspection logs;
- equipment inspection logs;
- site visitors, entry, and dress out logs; and
- environmental, personal exposure, sampling results, decontamination, and calibration logs.





BELL KNOB TOWER  
EXPLOSIVE STORAGE AREA

NUM = 23128

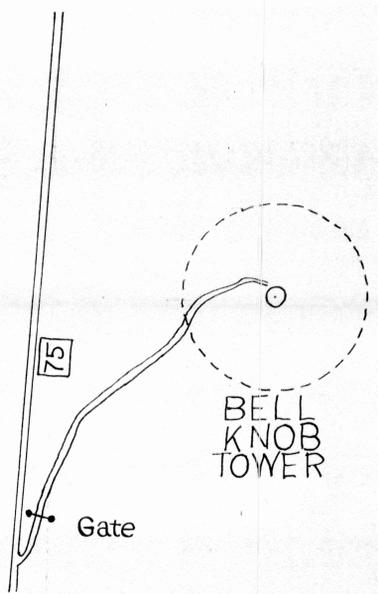
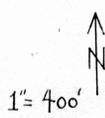
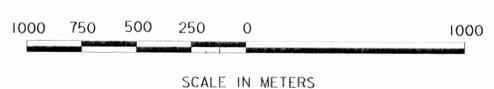
1000.00 GONEL SHOCK TUBE

61.00.00 JET PERFORATORS

71.00.00 Detonating Cord

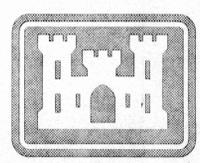
Safe Separation Distance = 152m

## DOLLY SODS WILDERNESS AREA



### LEGEND

- ..... DOLLY SODS WILDERNESS AREA BOUNDARY
- ▲ IDENTIFIED CAMPSITES
- TRAIL SEARCH AREAS



**U.S. Army Corps  
of Engineers  
Huntington District**



Revised February 16, 1996

**U.S. Army Engineering and Support Center, Huntsville  
SAFETY CONCEPTS AND BASIC CONSIDERATIONS FOR  
UNEXPLODED ORDNANCE (UXO) OPERATIONS**

1. **Introduction.** There is no "safe" procedure for dealing with UXO, merely procedures which are considered least dangerous. However, maximum safety in any UXO operation can be achieved through adherence to applicable safety precautions, a planned approach and intensive supervision. Only those personnel absolutely essential to the operation shall be allowed in the restricted/exclusion area during UXO operations (DoD 6055.9-STD). Safety must become a firmly established habit when working with UXO. Safety is the leading edge of quality.

2. **References.** The following documents form a part of this document to the extent referenced.

ATFP 5400.7	Alcohol Tobacco and Firearms Explosives Laws and Regulations
27 CFR Part 55	Commerce in Explosives
29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
49 CFR 100-199	Transportation
DoD 6055.9-STD	DoD Ammunition and Explosives Safety Standards
DA Pam 385-64	Ammunition and Explosives Safety Standards
ETL 385-1-2	Generic Scope of Work for Ordnance Avoidance Activities
TM 9-1300-200	Ammunition General
TM 9-1300-214	Military Explosives
TM 9-1375-213-12	Operator's and Organization Maintenance Manual (Including Repair Parts and Special Tools List); Demolition Materials

### **3. Definitions**

a. **Unexploded Ordnance (UXO).** An item of ordnance which has failed to function as designed, or has been abandoned or discarded, and is still capable of functioning and causing injury to personnel or damage to material.

b. **UXO Procedures.** UXO procedures include but are not limited to the following actions:

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

(2) Identifying and assessing condition of surface UXO.

(3) Recovery and final disposal of all UXO.

c. **UXO Related procedures:** UXO related procedures include but are not limited to the following:

(1) Location and marking of subsurface anomalies.

(2) Location and marking of suspected surface UXO.

(3) Transportation and storage of recovered UXO.

(4) Utilizing Earth Moving Machinery (EMM) to excavate soil to no closer than approximately 12 inches of a subsurface anomaly.

d. **UXO Qualified Personnel:** UXO qualified personnel are US citizens who have graduated from the US Army Bomb Disposal School, Aberdeen, MD, or the US Naval Explosive Ordnance Disposal (EOD) School, Indian Head, MD. Graduates of the EOD assistant Course, Redstone Arsenal, AL, or Elign AFB, FL with more than three years combined active duty military EOD and contractor UXO experience shall also be UXO qualified.

### **4. General Safety Concerns.**

a. UXO operations shall not be conducted until a complete plan for the operation involved is prepared and approved. Plans shall be based upon limiting exposure to a minimum number of personnel, for a minimum time, to the minimum amount of UXO, consistent with safe and efficient operations.

b. Only UXO qualified personnel shall be involved in UXO procedures. Non-UXO qualified personnel may be utilized to perform UXO related procedures when supervised by UXO qualified personnel. All personnel engaged in operations shall be thoroughly trained in explosive safety and be capable of recognizing hazardous explosive exposures.

c. The use of electroexplosive devices (EED) susceptible to electromagnetic radiation (EMR) devices in the radio frequency (RF) range, that is, radio, radar, and television transmitters, has become almost universal.

d. Some ordnance is particularly susceptible to EMR (RF) emission.. A knowledge of ordnance that is normally unsafe in the presence of EMR (RF) is important so preventive steps can be taken if the ordnance is encountered in a suspected EMR (RF) field.

(2) The presence of antennas, communication and RADAR devices should be NOTED on initial site visits and/or preliminary assessments.

(3) When potential EMR hazards exist, the site shall be electronically surveyed for EMR/RF emissions and the appropriate actions will be taken. Minimum safe distances from EMR/RF sources are listed in Tables 2-2, 2-3, and 2-4 of TM 9-1375-213-12.

f. Do not wear outer or undergarments made of materials which have high static generating characteristics when working on UXOs. Materials of 100 percent polyester, nylon, silk, or wool are highly static-producing. Any person handling a UXO suspected of containing EEDs will ground himself/herself prior to touching the UXO. Refer to DA Pam 385-64 for more information regarding non-static producing attire.

## 5. UXO Safety Precautions for Site Characterization.

a. Make every effort to identify the UXO. Visually examine the item for markings and other identifying features such as shape, size, and external fittings. However, do not move the item to inspect it. If an unknown UXO is encountered, the US Army Engineering and Support Center, Huntsville (USAESCH) representative will be notified.

b. Foreign UXO were returned to the United States for exploitation and disposal. When a records search indicates the possibility of foreign UXO being on a site, appropriate safety precautions and procedures will be incorporated into UXO operation plans.

c. Any time a suspected chemical munition is encountered, all personnel will

withdraw up wind from the munition. A two person UXO team, located upwind, shall secure the munition until relieved by the Technical Escort Unit (TEU) or Explosive Ordnance Disposal (EOD) personnel.

d. Ordnance items which penetrate the earth to a depth where the force of the explosion is not enough to rupture the earth's surface forms an underground cavity called a camouflet. Camouflets will be filled with the end product of the explosion, carbon monoxide gas. Camouflet detection and precautions must be considered if a records search indicates the site was used as an impact area.

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

f. Consider UXO which has been exposed to fire and detonation as extremely hazardous. Chemical and physical changes may have occurred to the contents which render it much more sensitive than it was in its original state.

g. Do not rely on the color coding of UXO for positive identification of contents. Munitions having incomplete, or improper color coding have been encountered.

h. Avoid the area forward of the nose of a munition until it can be ascertained the item does not contain a shaped charge. The explosive jet can be fatal at great distances forward of the longitudinal axis of the item. Assume any shaped charge munitions to contain a piezoelectric (PZ) fuzing system until the fuzing system is positively identified. A PZ fuze is extremely sensitive, can function at the slightest physical change, and may remain hazardous for an indefinite period of time.

i. Examine a projectile for the presence or absence of an unfired tracer. Also examine the item for the presence or absence of a rotating band and it's condition.

j. Approach an unfired rocket motor from the side. Ignition will create a missile hazard and hot exhaust.

(1) Do not expose rocket motors to any EMR source.

(2) If an unfired rocket motor must be transported, it shall be positioned in the direction which offers the least exposure to personnel in the event of an accidental ignition.

k. Consider an emplaced landmine armed until proven otherwise. It may not be possible to tell, or it may be intentionally rigged to deceive.

(1) Many training mines contain firing indicator charges capable of inflicting serious

injury.

(2) Exercise care with wooden mines that have been buried for a long time. Because of soil conditions, the wood deteriorates and the slightest inadvertent pressure/movement may initiate the fuze.

l. Assume a practice UXO contains a live charge until it can be determined otherwise. Expended pyrotechnic/practice devices may contain red/white phosphorus residue. Due to incomplete combustion, phosphorous may be present and reignite spontaneously if subjected to friction or the crust is broken and the contents exposed to air."

m. Do not approach a smoking white phosphorus (WP) UXO. Burning WP may detonate the burster or dispersal explosive charge at any time.

n. If the positive identification of suspected explosive materials is required, procedures in Chapter 13, TM 9-1300-214, "Military Explosives" or other approved explosives analysis shall be used to identify the explosives.

#### 6. Ordnance Avoidance for HTRW Activities.

a. Investigative activities on potential ordnance contaminated sites will be accomplished using approved ordnance avoidance procedures.

b. HTRW ordnance avoidance procedures are detailed in Engineering Technical Letter 385-1-2. This ETL is available on the Internet, or through the Quality and Technology team at USAESCH.

#### 7. Restricted/Exclusion Area Operations.

a. On Ordnance and Explosives sites, the contractor's site safety personnel shall establish a restricted/exclusion area for each UXO team operating on the site. The purpose of the area is for the protection of the public and other personnel from the blast and fragmentation hazards of an accidental detonation. The area shall be established based on the following minimum factors:

(1) Previous site use that caused the contamination: impact area, open burn/ open detonation, burial, etc..

(2) Project type: surface clearance, subsurface clearance, sifting operation, sampling, etc..

(3) Known ordnance contamination, distances to public exposure, terrain, etc..

b. When multiple UXO teams are operating on a site, the restricted/exclusion area and team separation distances shall never be less than 200 feet.

c. During the time frame that UXO operations are being accomplished, only personnel necessary for the UXO operation shall be within the restricted/exclusion area. When non-essential personnel enter the restricted/exclusion area, all UXO operations will cease.

(1) Plan for, provide, and know the measures to be taken in the event of an accident.

(2) Provide a designated emergency vehicle in the area in case of an accident or other emergency.

(3) Coordination with the appropriate airspace representative shall be conducted and the appropriate notification procedures arranged.

(4) When non-essential personnel must enter the restricted/exclusion area, the following must be accomplished: a) The individual must receive a safety briefing, b) be escorted by a UXO qualified individual; and c) All UXO operations must cease within the fragmentation radius of the largest item expected to be encountered within the area.

d. Before any movement of a UXO, the fuze condition must be ascertained. If the condition is questionable, consider the fuze to be armed. The fuze is considered the most hazardous component of a UXO, regardless of type or condition.

(1) In general, a projectile containing a Base Detonating (BD) fuze is to be considered armed if the projectile has been fired.

(2) Arming wires and pop out pins on unarmed fuzes should be secured by taping in place prior to movement.

(3) Do Not dismantle or strip any UXO.

(4) Do Not depress plungers, turn vanes, or rotate spindle, levers, setting rings, or other external fittings on UXO's. Such actions may arm, actuate, or function the UXO.

(5) Do Not subject mechanical time fuzes to any unnecessary movement.

(6) Do Not remove any fuzes from UXO's.

(7) Some ordnance items do not contain any positive safety features. Positively identify and review all safety precautions prior to handling any ordnance.

e. Personnel working within the Restricted area/Exclusion zone shall comply with the following:

(1) Do not conduct operations without an approved Site Specific Safety and Health Plan and an approved Work Plan.

(2) Do not smoke, except in authorized areas.

(3) Do not have fires for heating or cooking, except in authorized areas.

(4) Do not conduct explosive operations during electrical, sand, dust, or snow storms.

(5) Explosive operations will be conducted during daylight only.

(6) During magnetometer operations, UXO teams shall not wear safety shoes or other footwear which would cause the magnetometer to present a false indication.

f. Do not undertake the handling or disposal of liquid propellant fuels or oxidizers if not familiar with the characteristics of the material.

g. Civil War projectiles shall be treated as any other UXO.

h. If records search indicated WP munitions were fired or destroyed in the area, extra care shall be taken when uncovering a buried UXO. A buried WP munition may be damaged and when exposed to air, may start burning and detonate. An ample supply of water and mud shall be immediately available if excavation reveals a WP UXO. Appropriate protective equipment (leather gloves, face shield, and flame-retardant clothing) and first aid shall also be immediately available.

## 8. Storage.

a. During Ordnance and Explosives projects, storage of explosives and UXO fall into two categories.

(1) On-DoD Installations.

(2) Off-DoD Installations.

b. On-DoD Installation Storage.

(1) The provisions of DoD 6055.9-STD shall be followed. Generally, an installation should have an explosive storage area that meets requirements in DoD 6055.9-STD.

Permitting and compliance requirements for existing facilities are an installation responsibility. Compatibility of explosives found in Chapter 3, DoD 6055.9 -STD shall be complied with. UXO awaiting disposal shall not be stored with other explosives.

(2) If an installation does not have an existing storage facility, the provisions of paragraph c. below shall apply.

**c. Off-DoD Installation Storage.**

(1) Generally, the contractor is responsible for construction of a temporary explosive storage area that meets all local, state, ATF requirements, and as much of DoD 6055.9-STD that is practical to implement.

(2) When establishing an explosive storage area, the following requirements must be met.

(a) The area shall, 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 DoD 6055.9-STD, then a proposed barricading and berm plan to protect the public from accidental detonation must be submitted and approved.

(b) Magazines must meet requirements of ATF Regulations, and each magazine must have a Net Explosive Weight established for the explosives to be stored.

(c) Each magazine must have lightning protection IAW Chapter 7, DoD 6055.9-STD.

(d) Magazines must meet intramagazine distances as defined in Chapter 9, DoD 6055.9-STD.

(e) A physical security survey shall be conducted to determine if fencing or guards are required. Generally, a fence around the magazines is needed, but the contractor is responsible to determine the degree of protection required to prevent the theft of explosives and UXO.

d. A fire plan for the storage area shall be prepared and coordination with the nearby fire department shall be conducted. Placarding of magazines shall be in accordance with local, state, and federal requirements.

**9. Excavation Operations.**

a. The usual method for uncovering buried UXO is to excavate by hand. Hand excavation is the most reliable method for uncovering UXO, but unless the UXO is very

near the surface, hand excavation exposes more people to the hazard of detonation for a longer period of time than any other method. Hand excavation will be accomplished only by UXO qualified personnel.

b. Earth moving machinery (EMM) may be used to excavate buried UXO, if the UXO is estimated to be deeper than 12 inches. EMM shall not be used to excavate within 12 inches of an UXO. When excavation gets within approximately 12 inches of an UXO, hand excavation shall be used to uncover the UXO. EMM may be operated by non-UXO personnel, under the direct supervision of UXO personnel.

(1) If more than one EMM will be used on the same site, they will be separated by the same separation distances required for multiple teams on that site.

(2) During excavation operations, only those personnel absolutely necessary for the operation shall be within the restricted area/exclusion zone.

(3) Excavation and trenching shall comply with the provisions of 29 CFR 1926 subpart P.

## 10. Disposal Operations.

a. As a general rule, UXO will be detonated in place when the situation allows. All detonation-in-place operations shall be conducted by electrical means to assure maximum control of the site, except in situations where static electricity or EMR hazards are present. Non-electrical means can be used when the situation dictates.

(1) Do not allow one person to work alone in disposal operations. At least one person shall be available near the disposal site to give warning and assist in rescue activities in the event of an accident.

(2) Loose initiating explosives include lead azide, mercury fulminate, lead styphnate, and tetracene. These explosives manifest extreme sensitivity to friction, heat, and impact. Extra precautions may be required when handling these types of explosives. Keep initiating explosives in a water-wet condition at all times until ready for final preparation for detonation, the sensitivity of these explosives is greatly increased when dry.

(3) Only condition "Code A" or "Code C" explosive items shall be used as donor explosives for disposal operations.

(4) Exercise extreme care in handling and preparing high explosives for detonation. They are subject to detonation by heat, shock, and friction.

(5) Do not pack bomb fuze wells with explosives unless it can be positively confirmed that the fuze well does not contain any fuze components.

(6) Photo flash bombs must be handled with the same care as black powder filled munitions.

(7) WP UXO shall not be detonated into the ground. The UXO shall be counter-charged on the bottom center line when possible.

b. The following safety rules will be adhered to at all times:

(1) Carry blasting caps in approved containers and keep them out of the direct rays of the sun, and located at least 25 feet from other explosives, until they are needed for priming.

(2) Do not handle, use, or remain near explosives during the approach or progress of an electrical storm. All persons should retire to a place of safety.

(3) Do not use explosives or accessory equipment that is obviously deteriorated or damaged. They may cause a premature detonation or fail completely.

(4) Always point the explosive end of a blasting cap, detonators, and explosive devices away from the body during handling.

(5) Use only standard blasting caps of at least the equivalent of a commercial No. 8 blasting cap.

(6) Use electric blasting caps of the same manufacture for each demolition shot involving more than one cap.

(7) Do not bury blasting caps. Use detonating cord to position blasting caps above the ground. Buried blasting caps are subject to unobserved pressures and movement which could lead to premature firing or misfires.

(8) Test electric blasting caps for continuity at least 25 feet from any other explosives prior to connecting them to the firing circuit. Upon completion of testing, the lead wires will be short-circuited by twisting the bare ends of the wires together. The wires will remain shunted until ready to be connected to the firing circuit.

c. When disposing of explosives by detonation, do not approach the disposal site for at least thirty minutes, after the expected detonation time, in the event of a misfire.

When conducting non-electric procedures, the wait time shall be thirty minutes plus time fuse burn time.

d. A post-search of the detonation site shall be conducted to assure a complete disposal was accomplished.

e. If the situation dictates, protective measures to reduce shock, blast, and fragmentation shall be taken. Army Technical Manual (TM) 5-855-1, Fundamentals of Protective Design for Conventional Weapons, contains data on blast effects, ground shock, cratering, ejection, and fragmentation. The following distances shall be used unless protective measures are implemented.

(1) For non-fragmenting explosive materials, evacuation distance should be a minimum of 1250 feet.

(2) For fragmenting explosive materials, evacuation distance should be a minimum of 2500 feet. For bombs and projectiles with caliber 5-inch or greater, use a minimum evacuation distance of 4000 feet.

(3) Items with lugs, strong backs, tail plate sections, etc., should be oriented away from personnel locations as these items tend to travel further than normal fragmentation.

f. Consideration should be given to tamping the UXO to control fragments, if the situation warrants. Fragments shall be minimized not only to protect personnel but also property, such as buildings, trees, etc.

g. Open burning of explosives and smokeless powder or chemical decomposition of explosives shall not be accomplished without prior approval of the contracting officer.

(1) Do not inhale the smoke or fumes of burning pyrotechnic or incendiary materials. The fumes and dust from many of these materials are irritating and/or toxic if inhaled.

(2) Do not use water on incendiary fires. Water may induce a violent reaction or be completely ineffective, depending on the mixture.

(3) Anticipate a high order detonation when burning pyrotechnics or incendiary-loaded UXO. Safety measures for personnel and property must be based upon this possibility.

h. Inert Ordnance will not be disposed of or sold for scrap until the internal fillers

have been exposed and unconfined. Heat generated during a reclamation operation can cause the inert filler, moisture, or air to expand and burst the sealed casings. Venting or exposure may be accomplished in any way necessary to preclude rupture due to confined pressure.

## 11. Transportation.

- a. If UXO must be transported off-site for disposal, the provisions of 49 CFR 100-199, DA Pam 385-64, state and local laws shall be followed.
- b. Armed fuzes will only be transported when absolutely necessary and when all other avenues of "in place" disposal have been exhausted. Transportation to an on-site disposal area for these items is preferred.
- c. Do not transport WP munitions unless it is immersed in water, mud, or wet sand.
- d. If loose pyrotechnic, tracer, flare, and similar mixtures are to be transported, they shall be placed in #10 mineral oil or equivalent to minimize fire and explosion hazards.
- e. 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.
- f. If an unfired rocket motor must be transported, it shall be positioned in such a manner as to offer the maximum protection to personnel in the event of an accident.
- g. If base-ejection type projectiles must be transported to a disposal area or collection point, the base will be oriented to the rear of the vehicle and the projectile secured, in the event the ejection charge functions in route.
- h. If an UXO, with exposed hazardous filler (HE, etc), has to be moved to a disposal area, the item shall be placed in an appropriate container with packing materials to prevent migration of the hazardous filler. Padding should also be added to protect the exposed filler from heat, shock, and friction.



HFA GRID LOCATION FORM

Each square is 5 feet by 5 feet

AREA:	SITE:	GRID:	PLAN:	CONTACTS:	DIGS:															
TEAM:			DATE:																	
200																				
195																				
190																				
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SW	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100

1. \_\_\_\_\_ depth
2. \_\_\_\_\_ depth
3. \_\_\_\_\_ depth
4. \_\_\_\_\_ depth
5. \_\_\_\_\_ depth
6. \_\_\_\_\_ depth
- Small Arms: \_\_\_\_\_
- Small Arms: \_\_\_\_\_



# STANDARD OPERATING PROCEDURE FOR NOTIFICATION OF UXO OPERATIONS

- PURPOSE:** The purpose of this Standard Operating Procedure (SOP) is to provide guidance for responsibilities in the event a UXO must be disposed of by HFA, Inc. This SOP identifies the responsibilities of the various agencies for coordination, control, and detonation of UXO on the former West Virginia Maneuver Area, Dolly Sods, WV.
- SCOPE:** For unexploded ordnance being detonated within the site boundaries, the SUXOS has the lead responsibility for initial response. In the event a suspected toxic chemical munition is encountered, the CEHNC Safety Representative will request necessary support. When the local EOD unit is mobilized and arrives on-site and verifies munition is chemical, the EOD unit will assume lead agency responsibility from CEHNC.
- EMERGENCIES:** In all cases of emergencies, notification will be made directly to the Forest Service Representative at (304) 257-4488 via the cellular telephone. In all cases, stay on the line until help arrives.
- ROUTINE:** The HFA Project Manager/SUXOS will notify the CEHNC Safety Representative of all significant events occurring within the workday, including detonation of UXO. In turn, they will notify the remaining organizations listed below.
- COMMUNICATIONS:**
- |                                 |              |
|---------------------------------|--------------|
| State Police                    | 304-637-0200 |
| Forest Service Representative   | 304-257-4488 |
| Fire Department (same as above) | 304-257-4488 |
| Emergency Medical Services      | 304-257-1212 |

For demolition operations, the above authorities will be notified at least **two hours** in advance of detonation.





(Employee Name)

(Employee Number)

Organization Unit)

**CLIENT ASSIGNMENTS (See Back of Timesheet)**

CLIENT NAME			Field	Non-field															Total Hours		
Contract	D.O./Task	Labor Category																			
			Field																		
			Non-field																		
			Field																		
			Non-field																		
			Field																		
			Non-field																		
			Field																		
			Non-field																		
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			Field																		
			Non-field																		
			Field																		
			Non-field																		

**BID & PROPOSAL**


**GENERAL**

C	ADMINISTRATION																				
D	PAID TIME OFF																				
E	PERSONAL LEAVE																				
F	OVERHEAD																				
	TOTAL HOURS																				

SIGNATURES: \_\_\_\_\_  
 (Employee)

\_\_\_\_\_  
 (Project Manager/Supervisor)

Non-field: Travel, Office, or Field Office  
 Overhead: Indirect Labor, Training, Downtime, Special Programs, Physicals

**NOTE:** Time sheets are due in the Holicong office by the close of business on the Monday following the end of the pay period covered. If you are giving your time sheet to your Supervisor or Project Manager, he or she will make sure it gets to Holicong on time. If you are sending it to Holicong directly, FAX it there (FAX # 215-794-7353) and send the original in the mail. **DO NOT** rely on the Post Office, FedEx, or any other delivery service to get it there on time. We have external constraints that require us to run the payroll Tuesday morning, so if we do not have your time sheet we can not pay you until the next payroll, two weeks later. If you have any question about whether or not we have received your time sheet call Meg at 215-794-3535.



EXPENSE RECORD		(Employee Name)	
		CASH	\$ AMOUNT \$ CHARGE
T R A V E L E X P E N D I T U R E S	COMMON CARRIER (Train, Bus, Plane, Etc.)		
	PERSONAL AUTOMOBILE _____ Miles @ \$30		
	TAXI OR LOCAL BUS		
	AUTOMOBILE RENTAL		
	OTHER (SPECIFY)		
	DEPARTING DAY (Full or Partial)		
	AWAY DAYS (Full)		
	RETURNING DAY (Full or Partial)		
	HOTEL (Attach Receipt)		
	TELEPHONE		
MISCELLANEOUS			
TOTAL CASH EXPENDITURES			
TRAVEL ADVANCE			
CASH PAYMENT DUE (HFA/EMPLOYEE)			
TOTAL AMOUNT CHARGED			

TRAVEL RECORD	(Date)		(Number)	
	DATE	TIME		
FROM				
TO				
RETURNED TO				

DESCRIPTION OF WORK:

ACCOUNTING DISTRIBUTION (for Holicong use only, leave blank)		
Project #	Account #	Amount

REMARKS:

I certify the charges on this voucher are true and correct.

Employee Signature

Authorized Signature

<b>TRAVEL VOUCHER OR SUBVOUCHER</b>				<i>(Complete by typewriter, ink, or ball point pen (PRESS HARD) do not use pencil)</i>				<b>FOR DO USE ONLY</b>					
<b>READ PRIVACY ACT STATEMENT ON REVERSE PRIOR TO COMPLETING THIS FORM.</b>													
LAST NAME FIRST NAME MIDDLE INITIAL (Print/Type)						GRADE/RANK		SSN					
CHECK MAILING ADDRESS (Include ZIP Code)								DUTY PHONE NO.					
ORGANIZATION AND STATION													
TRAVEL ORDERS (Paragraph, S.O. No., Issuing Hq., Date) (Include amending orders)													
PRIOR TRAVEL PAYMENTS OR ADVANCES UNDER THESE ORDERS (Amount, DO Voucher No., Date Received, Place paid, or DO Station No. If none, so state)													
<b>1. ITINERARY (See Item 25 for Symbols)</b>													
DATE	LOCAL TIME (24 Hour Clock)		PLACE (Home, Office, Base, Activity, City and State; City and Country, etc.)				MODE OF TRAVEL	REASON FOR STOP	2. COST OF LODGING		3. NUMBER OF MEALS GOVT. / OPEN MESS		4. POC MILES
19	DEP												
	ARR												
	DEP												
	ARR												
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<b>5. REIMBURSABLE EXPENSES/CHARGE FOR DEDUCTIBLE MEALS (See Item 24)</b>													
DATE		NATURE AND EXPLANATION						AMT CLAIMED		ALLOWED			
<b>SUMMARY OF PAYMENT</b>													
										Per Diem			
										Actual Expense			
										Mileage or Transp Allowances			
										Reimbursable Expenses			
										Total Entitlement			
										Less Previous Payments			
										Less Voucher Deductions			
										Amt Charged to Acctg Class			
<b>6. Long distance telephone calls are certified as necessary in the interest of the Government.</b>													
										<b>APPROVING OFFICER (31 USC 680a)</b>			
<b>7. TRIPMENTS (If none, so state)</b>													
NUMBER		FROM				TO							
<b>11. PAYMENT DESIRED</b>													
										<input type="checkbox"/> CHECK		<input type="checkbox"/> CASH	
<b>8. LEAVE STATEMENT:</b> _____ days _____ hours taken between _____ and _____													
<b>9. POC TRAVEL</b> <input type="checkbox"/> OWNER/OPERATOR (See Item 22d) <input type="checkbox"/> PASSENGER													
<b>12. PER DIEM REQUESTED</b>													
<b>13. BAS RATE</b>													
<b>PENALTY: The penalty for willfully making a false claim is: A MAXIMUM FINE OF \$10,000 OR MAXIMUM IMPRISONMENT OF 3 YEARS, OR BOTH (U.S. Code, Title 18, Section 287.)</b>													
I hereby claim any amount due me. The statements on face, reverse, and attached are true and complete. Payment or credit has not been received.										<b>14. SIGNATURE OF CLAIMANT</b>		DATE	
<b>15. ACCOUNTING CLASSIFICATION</b>													
<b>16. COLLECTION DATA</b>													
<b>17. COMPUTED BY</b>			<b>18. AUDITED BY</b>			<b>19. TVL FORM POSTED BY</b>		<b>20. RECEIVED (Payee signature and date or check no.)</b>			<b>21. AMOUNT PAID</b>		









PERSONNEL ON LEAVE OR SICK

NAME	POSITION	TEAM #	MON	TUE	WED	THU	FRI

# BROKEN EQUIPMENT STATUS REPORT

WEEK ENDING		LOCATION
CONTRACT # DACA 87-94-D-0019		TASK ORDER #
SUXOS		PM
TYPE EQUIPMENT	SERIAL NUMBER	ACTION TAKEN
COMMENTS:		

**TOTAL MAN HOURS EXPENDED FOR THE**

WEEK ENDING						LOCATION					
CONTRACT # DACA 87-94-D-0019						TASK ORDER #					
SUXOS						PM					
NUMBER OF PERS ON SITE BY DAY						TOTAL NUMBER OF MAN HRS BY DAY					
CATEGORY	MN	TU	WD	TH	FR	MN	TU	WD	TH	FR	TOT HRS
PM											
SUXOS											
TYPIST											
SSO											
Q\C											
UXO SUP											
UXO SPEC											
UXO ASST											
MAG OP											
LABORER											
OTHER											
OTHER											
OTHER											

**\*\* THE HOURS LISTED ON THIS REPORT MUST REFLECT ONLY THE HOURS PERSONNEL PHYSICALLY WORKED ON THE SITE, DO NOT INCLUDE HOURS CHARGED TO ANNUAL LEAVE, SICK LEAVE OR HOLIDAY PAY.**

COMMENTS:

## DEMOLITION MATERIALS EXPENDED REPORT

WEEK ENDING				LOCATION			
CONTRACT # DACA 87-94-D-0019				TASK ORDER #			
SUXOS				PM			
DATE	HIGH EXP	NONELEC CAPS	ELECT CAPS	TIME FUZE	FUZE LIGHTER	DET CORD	JET PERF
BAL ON HAND							

\*\* INDICATE DEMOLITION MATERIALS RECEIVED BY CIRCLING QUANTITY \*\*

**UXO'S BLOWN IN PLACE**

DATE	UXO NOMENCLATURE	UXO LOCATION
<b>COMMENTS :</b>		



WEEKLY SUMMARY

WEEK ENDING	LOCATION
CONTRACT # DACA 87-94-D-0019	TASK ORDER #
SUXOS	PM
CEHND SAFETY REP ON SITE	
GRIDS CLEARED THIS WEEK	
TOTAL GRIDS CLEARED TO DATE	
PER CENT OF PROJECT COMPLETED	
TOTAL GRIDS Q\C ed THIS WEEK	
TOTAL GRIDS Q\C ed TO DATE	
TOTAL GRIDS Q\A ed THIS WEEK	
TOTAL GRIDS Q\A ed TO DATE	
TOTAL UXO'S RECOVERED THIS WEEK	
TOTAL UXO'S RECOVERED TO DATE	
TOTAL SMALL ARMS RECOVERED THIS WEEK	
TOTAL SMALL ARMS RECOVERED TO DATE	
SCRAP REMOVED THIS WEEK, IN POUNDS	LBS
SCRAP REMOVED TO DATE, IN POUNDS	LBS

**WEEKLY SUMMARY**

<b>WEEK ENDING</b>	<b>TASK ORDER #</b>
<b>SIGNIFICANT COMMENTS CONCERNING THE DAILY OPERATIONS</b>	
<b>COMMENTS ON: SIGNIFICANT OPERATIONS PLANNED FOR NEXT WEEK</b>	

















# ON-SITE SAFETY MEETING RECORD

Page 1 of 2

PROJECT NAME: \_\_\_\_\_ JOB NO: \_\_\_\_\_

DATE: \_\_\_\_\_ TIME: \_\_\_\_\_ LOCATION: \_\_\_\_\_

REASON FOR MEETING: (check all that apply)

- Initial site safety briefing.
- Beginning of new task. Task: \_\_\_\_\_
- Periodic safety meeting.
- New site procedures.
- New site information.
- Review of site incident.
- Other (explain) \_\_\_\_\_

MEETING ATTENDEES:

	<u>Name</u>	<u>Affiliation</u>
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____
6.	_____	_____
7.	_____	_____
8.	_____	_____
9.	_____	_____
10.	_____	_____

# ON-SITE SAFETY MEETING RECORD

Page 2 of 2

PROJECT NAME: \_\_\_\_\_ JOB No: \_\_\_\_\_

DATE: \_\_\_\_\_ TIME: \_\_\_\_\_ LOCATION: \_\_\_\_\_

## SAFETY TOPICS PRESENTED:

- |   |  |
|---|--|
| <input type="checkbox"/> Site Safety Personnel            | <input type="checkbox"/> Decontamination Procedures      |
| <input type="checkbox"/> Site Description                 | <input type="checkbox"/> Emergency Response Plan         |
| <input type="checkbox"/> Work Area Description            | <input type="checkbox"/> Emergency Response Personnel    |
| <input type="checkbox"/> Site Characterization            | <input type="checkbox"/> On-site Emergency               |
| <input type="checkbox"/> Work Area Characterization       | <input type="checkbox"/> Off-site Emergencies            |
| <input type="checkbox"/> Chemical Hazard Evaluation       | <input type="checkbox"/> Site Evacuation Procedures      |
| <input type="checkbox"/> Physical Hazard Evaluation       | <input type="checkbox"/> Work Area Evacuation Procedures |
| <input type="checkbox"/> Toxicological Review             | <input type="checkbox"/> Places of Refuge                |
| <input type="checkbox"/> Heat Stress                      | <input type="checkbox"/> Emergency Decontamination       |
| <input type="checkbox"/> Cold Stress                      | <input type="checkbox"/> Emergency Equipment             |
| <input type="checkbox"/> Site Layout and Control Measures | <input type="checkbox"/> Emergency Telephone Numbers     |
| <input type="checkbox"/> Work Zones                       | <input type="checkbox"/> Directions to Hospital          |
| <input type="checkbox"/> Personnel Protective Equipment   | <input type="checkbox"/> Medical Monitoring              |
| <input type="checkbox"/> Air Monitoring                   | <input type="checkbox"/> Training                        |
| <input type="checkbox"/> Safe Work Practices - General    | <input type="checkbox"/> Safe Work Practices - Task      |

Other Topics or Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

NAME OF PRESENTER: \_\_\_\_\_

TITLE OF PRESENTER: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

# INCIDENT REPORT

Page 1 of 9

Inc. rpt. no.: \_\_\_\_\_

Date of Report: \_\_\_\_\_

SITE: \_\_\_\_\_

SITE LOCATION: \_\_\_\_\_

REPORT PREPARED BY: \_\_\_\_\_

(Printed Name/Title)

## INCIDENT CATEGORY

(Check all that apply)

Injury

Illness

Property Damage

Near Miss

Fire

Chemical Exposure

Motor Vehicle

On-site Equipment

Electrical

Mechanical

Explosive

Death

Other

DATE AND TIME OF INCIDENT: \_\_\_\_\_

### Narrative Report of Incident:

(Provide sufficient detail so that the reader may fully understand the actions leading to or contributing to the incident, the occurrence, and actions following the incident. Append additional sheets of paper if necessary.)

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# INCIDENT REPORT

Page 2 of 9

Inc. rpt. no.: \_\_\_\_\_

## WITNESS TO INCIDENT

1. NAME: \_\_\_\_\_ COMPANY: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

TELEPHONE NUMBER: \_\_\_\_\_

2. NAME: \_\_\_\_\_ COMPANY: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

TELEPHONE NUMBER: \_\_\_\_\_

## INJURIES

### FIRST INJURED PERSON

Name and Address of Injured: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

SSN: \_\_\_\_\_ Age: \_\_\_\_\_ Sex: \_\_\_\_\_

Years of Service: \_\_\_\_\_ Time on Present Job: \_\_\_\_\_

Title/Classification: \_\_\_\_\_

Severity of Injury or Illness:

\_\_\_\_\_ Disability \_\_\_\_\_ Non-disability

# INCIDENT REPORT

Page 3 of 9

Inc. rpt. no.: \_\_\_\_\_

\_\_\_\_\_ Fatality

\_\_\_\_\_ Medical Treatment

Estimated Number of Days Away From Job: \_\_\_\_\_

Nature of Injury or Illness: \_\_\_\_\_

## Classification of Injury:

\_\_\_ Fractures

\_\_\_ Heat Burns

\_\_\_ Cold Exposure

\_\_\_ Dislocations

\_\_\_ Chemical Burns

\_\_\_ Frostbite

\_\_\_ Sprains

\_\_\_ Bruises

\_\_\_ Heat Exhaustion

\_\_\_ Lacerations

\_\_\_ Blisters

\_\_\_ Concussion

\_\_\_ Punctures

\_\_\_ Bites

\_\_\_ Faint/Dizziness

\_\_\_ Respiratory Allergy

\_\_\_ Toxic Respiratory Exposure

\_\_\_ Dermal Allergy

\_\_\_ Toxic Ingestion

Part of Body Affected: \_\_\_\_\_

Degree of Disability: \_\_\_\_\_

Where Medical Care was Received: \_\_\_\_\_

Address (If off-site): \_\_\_\_\_

# INCIDENT REPORT

Page 4 of 9

Inc. rpt. no.: \_\_\_\_\_

If Hospitalized:

Name, Address and Telephone Number of Hospital: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

Name, Address and Telephone Number of Physician: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

SECOND INJURED PERSON

Name and Address of Injured: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

SSN: \_\_\_\_\_ Age: \_\_\_\_\_ Sex: \_\_\_\_\_

Years of Service: \_\_\_\_\_ Time on Present Job: \_\_\_\_\_

Title/Classification: \_\_\_\_\_

Severity of Injury or Illness:

\_\_\_\_\_ Disability \_\_\_\_\_ Non-disability

# INCIDENT REPORT

Page 5 of 9

Inc. rpt no.: \_\_\_\_\_

Medical Treatment Facility: \_\_\_\_\_

Estimated Number of Days Away From Job: \_\_\_\_\_

Nature of Injury or Illness: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

## OF INJURY:

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> FRACTURES           | <input type="checkbox"/> HEAT BURNS                 | <input type="checkbox"/> COLD EXPOSURE   |
| <input type="checkbox"/> DISLOCATIONS        | <input type="checkbox"/> CHEMICAL BURNS             | <input type="checkbox"/> FROSTBITE       |
| <input type="checkbox"/> SPRAINS             | <input type="checkbox"/> BRUISES                    | <input type="checkbox"/> HEAT EXHAUSTION |
| <input type="checkbox"/> LACERATIONS         | <input type="checkbox"/> BLISTERS                   | <input type="checkbox"/> CONCUSSION      |
| <input type="checkbox"/> PUNCTURES           | <input type="checkbox"/> BITES                      | <input type="checkbox"/> FAINT/DIZZINESS |
| <input type="checkbox"/> RESPIRATORY ALLERGY | <input type="checkbox"/> TOXIC RESPIRATORY EXPOSURE |  |
| <input type="checkbox"/> DERMAL ALLERGY      | <input type="checkbox"/> TOXIC INGESTION            |  |

PART OF BODY AFFECTED: \_\_\_\_\_

DEGREE OF DISABILITY: \_\_\_\_\_

WHERE MEDICAL CARE WAS RECEIVED: \_\_\_\_\_

ADDRESS (IF OFF-SITE): \_\_\_\_\_

# INCIDENT REPORT

PAGE 6 OF 9

INC. RPT. NO.: \_\_\_\_\_

IF HOSPITALIZED:

NAME, ADDRESS AND TELEPHONE NUMBER OF HOSPITAL: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

NAME, ADDRESS AND TELEPHONE NUMBER OF PHYSICIAN: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(IF MORE THAN TWO INJURIES, PROVIDE INFORMATION ON SEPARATE SHEET)

PROPERTY DAMAGE:

BRIEF DESCRIPTION OF PROPERTY DAMAGE:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

ESTIMATE OF DAMAGE: \$ \_\_\_\_\_

# INCIDENT REPORT

PAGE 7 OF 9

INC. RPT. NO.: \_\_\_\_\_

INCIDENT LOCATION:

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INCIDENT ANALYSIS:

CAUSATIVE AGENT MOST DIRECTLY RELATED TO ACCIDENT (OBJECT, SUBSTANCE, MATERIAL, MACHINERY, EQUIPMENT, CONDITIONS):

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WAS WEATHER A FACTOR?:     YES                       NO

UNSAFE MECHANICAL/PHYSICAL/ENVIRONMENTAL CONDITION AT TIME OF ACCIDENT (BE SPECIFIC):

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UNSAFE ACT BY INJURED AND/OR OTHERS CONTRIBUTING TO THE ACCIDENT (BE SPECIFIC, MUST BE ANSWERED):

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# INCIDENT REPORT

PAGE 8 OF 9

INC. RPT. NO.: \_\_\_\_\_

PERSONAL FACTORS (IMPROPER ATTITUDE, LACK OF KNOWLEDGE OR SKILL, SLOW REACTION, FATIGUE):

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## ON-SITE INCIDENT:

LEVEL OF PERSONAL PROTECTION EQUIPMENT REQUIRED IN SITE SAFETY PLAN:

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MODIFICATIONS: \_\_\_\_\_

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WAS INJURED USING REQUIRED EQUIPMENT?: \_\_\_\_\_

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IF NOT, HOW DID ACTUAL EQUIPMENT USE DIFFER FROM PLAN?: \_\_\_\_\_

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# INCIDENT REPORT

PAGE 9 OF 9

INC. RPT. NO.: \_\_\_\_\_

ACTION TAKEN TO PREVENT RECURRENCE:

(BE SPECIFIC. WHAT WAS OR WILL BE DONE? WHEN WILL IT BE DONE? WHO IS THE RESPONSIBLE PARTY TO ENSURE THAT THE CORRECTION IS MADE?)

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INCIDENT REPORT COMPLETED BY:

\_\_\_\_\_  
HSO NAME (PRINTED)

\_\_\_\_\_  
HSO SIGNATURE

OTHERS PARTICIPATING IN INVESTIGATION:

\_\_\_\_\_  
NAME (PRINTED)

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
TITLE

# INCIDENT FOLLOW-UP REPORT

Page 1 of 2

Incident Number: \_\_\_\_\_

Date of Incident: \_\_\_\_\_

Site Name: \_\_\_\_\_

Project Number: \_\_\_\_\_

Follow-up Prepared By: \_\_\_\_\_

Date: \_\_\_\_\_

Outcome of Incident: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

## Physician's Recommendations:

First Injured Person: \_\_\_\_\_

\_\_\_\_\_  
Second Injured Person: \_\_\_\_\_

\_\_\_\_\_  
Other Injured Person(s): \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

## Date Returned to Work:

First Injured Person: \_\_\_\_\_

Second Injured Person: \_\_\_\_\_

Other Injured Person(s): \_\_\_\_\_

Have corrective actions recommended by investigation been implemented? If not, explain why not.  
What alternative actions have been taken?:

\_\_\_\_\_

# INCIDENT FOLLOW-UP REPORT

Page 2 of 2

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ATTACH ANY ADDITIONAL INFORMATION

# HEAT STRESS MONITORING

NAME: \_\_\_\_\_ DATE/TIME: \_\_\_\_\_

COMPANY: \_\_\_\_\_ SITE: \_\_\_\_\_

LOCATION: \_\_\_\_\_

Pulse Rate Monitoring (30 second rest prior to first measurement):

Starting Time: \_\_\_\_\_ Pulse Rate: \_\_\_\_\_ beats/minute;

rest 30 sec: \_\_\_\_\_ rest 30: \_\_\_\_\_ b/s;

rest 30 sec: \_\_\_\_\_ rest 60: \_\_\_\_\_ b/s;

rest 60 sec: \_\_\_\_\_ rest 60: \_\_\_\_\_ b/s;

Starting Time: \_\_\_\_\_ Pulse Rate: \_\_\_\_\_ beats/minute;

rest 30 sec: \_\_\_\_\_ rest 30: \_\_\_\_\_ b/s;

rest 30 sec: \_\_\_\_\_ rest 60: \_\_\_\_\_ b/s;

rest 60 sec: \_\_\_\_\_ rest 60: \_\_\_\_\_ b/s;

Starting Time: \_\_\_\_\_ Pulse Rate: \_\_\_\_\_ beats/minute;

rest 30 sec: \_\_\_\_\_ rest 30: \_\_\_\_\_ b/s;

rest 30 sec: \_\_\_\_\_ rest 60: \_\_\_\_\_ b/s;

rest 60 sec: \_\_\_\_\_ rest 60: \_\_\_\_\_ b/s;

Starting Time: \_\_\_\_\_ Pulse Rate: \_\_\_\_\_ beats/minute;

rest 30 sec: \_\_\_\_\_ rest 30: \_\_\_\_\_ b/s;

rest 30 sec: \_\_\_\_\_ rest 60: \_\_\_\_\_ b/s;

rest 60 sec: \_\_\_\_\_ rest 60: \_\_\_\_\_ b/s;

Method of Measurement:

Carotid Artery: \_\_\_\_\_ Instrument (specify type): \_\_\_\_\_

Self-Determined and Reported: \_\_\_\_\_

Site Safety Officer: \_\_\_\_\_ (Contractor): \_\_\_\_\_ (Contract Monitor)

\_\_\_\_\_  
Site Safety Officer

ENVIRONMENTAL SITE CONDITIONS SURVEY SITE DRAWING

PROJECT:	CONTRACT NUMBER:	DELIVERY ORDER NUMBER:	DATE:

# ENVIRONMENTAL SITE CONDITIONS SURVEY REPORT

PROJECT:	CONTRACT NO:
DELIVERY ORDER #:	DATE:
UXO PROJECT LEADER:	SIGNATURE:
GENERAL SITE DESCRIPTION:	
A. TREES:	
B. SHRUBS & GRASSES:	
C. ON/OFF-SITE DRAINAGE:	
C. ACCESS/HAUL ROADS:	
E. DRAIN CULVERTS:	
F. FENCING:	
G. PREEXISTING REFUSE/DEBRIS:	











## VISITOR'S SAFETY BRIEFING

- \_\_\_\_\_1. Point out safe area and restricted areas.
- \_\_\_\_\_2. Point out potential hazards and risks.
- \_\_\_\_\_3. Wear hard hats, safety glasses.
- \_\_\_\_\_4. Watch where walking at all times.
- \_\_\_\_\_5. Do not pick anything up.
- \_\_\_\_\_6. Stay with escort.
- \_\_\_\_\_7. Deposit matches and lighters in receptacles.
- \_\_\_\_\_8. Brief on site evacuation plan and emergency procedures.

HFA SECURITY/POWER LOG

MONTH: \_\_\_\_\_

DATE	TIME	OPENED BY:	SECURED BY:	TIME	REMARKS
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					













**1. ACCIDENT CLASSIFICATION**

PERSONNEL CLASSIFICATION	INJURY/ILLNESS/FATAL	PROPERTY DAMAGE	MOTOR VEHICLE INVOLVED	DIVING
GOVERNMENT <input type="checkbox"/> CIVILIAN <input type="checkbox"/> MILITARY	<input type="checkbox"/>	<input type="checkbox"/> FIRE INVOLVED <input type="checkbox"/> OTHER	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> CONTRACTOR	<input type="checkbox"/>	<input type="checkbox"/> FIRE INVOLVED <input type="checkbox"/> OTHER	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> PUBLIC	<input type="checkbox"/> FATAL <input type="checkbox"/> OTHER		<input type="checkbox"/>	

**2. PERSONAL DATA**

a. NAME (Last, First, MI) \_\_\_\_\_ b. AGE \_\_\_\_\_ c. SEX  MALE  FEMALE

d. SOCIAL SECURITY NUMBER \_\_\_\_\_ e. GRADE \_\_\_\_\_

f. JOB SERIES/TITLE \_\_\_\_\_ g. DUTY STATUS AT TIME OF ACCIDENT  
 ON DUTY  TDY  OFF DUTY

h. EMPLOYMENT STATUS AT TIME OF ACCIDENT  
 ARMY ACTIVE  ARMY RESERVE  VOLUNTEER  
 PERMANENT  FOREIGN NATIONAL  SEASONAL  
 TEMPORARY  STUDENT  
 OTHER (Specify) \_\_\_\_\_

**3. GENERAL INFORMATION**

a. DATE OF ACCIDENT (month/day/year) \_\_\_\_\_ b. TIME OF ACCIDENT (Military time) \_\_\_\_\_ c. EXACT LOCATION OF ACCIDENT \_\_\_\_\_

d. CONTRACTOR'S NAME  
 (1) PRIME: \_\_\_\_\_  
 (2) SUBCONTRACTOR: \_\_\_\_\_

e. CONTRACT NUMBER \_\_\_\_\_ f. TYPE OF CONTRACT  
 CONSTRUCTION  SERVICE  
 CIVIL WORKS  MILITARY  AE  DREDGE  
 OTHER (Specify) \_\_\_\_\_ g. HAZARDOUS/TOXIC WASTE ACTIVITY  
 SUPERFUND  DERP  
 IRP  OTHER (Specify) \_\_\_\_\_

**4. CONSTRUCTION ACTIVITIES ONLY (Fill in line and corresponding code number in box from list - see instructions)**

a. CONSTRUCTION ACTIVITY \_\_\_\_\_ (CODE) \_\_\_\_\_

b. TYPE OF CONSTRUCTION EQUIPMENT \_\_\_\_\_ (CODE) \_\_\_\_\_

**5. INJURY / ILLNESS INFORMATION (include name on line and corresponding code number in box for items e, f & g - see instructions)**

SEVERITY OF ILLNESS / INJURY \_\_\_\_\_ (CODE) \_\_\_\_\_

b. ESTIMATED DAYS LOST \_\_\_\_\_ c. ESTIMATED DAYS HOSPITALIZED \_\_\_\_\_ d. ESTIMATED DAYS RESTRICTED DUTY \_\_\_\_\_

e. BODY PART AFFECTED (CODE) \_\_\_\_\_

PRIMARY \_\_\_\_\_ (CODE) \_\_\_\_\_

SECONDARY \_\_\_\_\_ (CODE) \_\_\_\_\_

f. TYPE AND SOURCE OF INJURY/ILLNESS (CODE) \_\_\_\_\_

TYPE \_\_\_\_\_ (CODE) \_\_\_\_\_

1. NATURE OF ILLNESS / INJURY (CODE) \_\_\_\_\_

SOURCE \_\_\_\_\_ (CODE) \_\_\_\_\_

**6. PUBLIC FATALITY (Fill in line and corresponding code number in box - see instructions)**

a. ACTIVITY AT TIME OF ACCIDENT \_\_\_\_\_ (CODE) \_\_\_\_\_

b. PERSONAL FLOATATION DEVICE USED?  YES  NO  N/A

**7. MOTOR VEHICLE ACCIDENT**

a. TYPE OF VEHICLE  PICKUP/VAN  AUTOMOBILE  TRUCK  OTHER (Specify) \_\_\_\_\_

b. TYPE OF COLLISION  SIDE SWIPE  HEAD ON  REAR END  BROADSIDE  ROLL OVER  BACKING  OTHER (Specify) \_\_\_\_\_

c. SEAT BELTS USED NOT USED NOT AVAILABLE

(1) FRONT SEAT			
(2) REAR SEAT			

**8. PROPERTY/MATERIAL INVOLVED**

a. NAME OF ITEM	b. OWNERSHIP	c. \$ AMOUNT OF DAMAGE
(1)		
(2)		
(3)		

**9. VESSEL / FLOATING PLANT ACCIDENT (Fill in line and corresponding code number in box from list - see instructions)**

a. TYPE OF VESSEL/FLOATING PLANT \_\_\_\_\_ (CODE) \_\_\_\_\_

b. TYPE OF COLLISION/MISHAP \_\_\_\_\_ (CODE) \_\_\_\_\_

ACCIDENT DESCRIPTION (Use additional paper, if necessary)

**CAUSAL FACTOR(S) (Read Instruction Before Completing)**

11	<p>a. (Explain YES answers in item 13)</p> <p><b>DESIGN:</b> Was design of facility, workplace or equipment a factor? <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p><b>INSPECTION/MAINTENANCE:</b> Were inspection &amp; maintenance procedures a factor? <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p><b>PERSON'S PHYSICAL CONDITION:</b> In your opinion, was the physical condition of the person a factor? <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p><b>OPERATING PROCEDURES:</b> Were operating procedures a factor? <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p><b>JOB PRACTICES:</b> Were any job safety/health practices not followed when the accident occurred? <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p><b>HUMAN FACTORS:</b> Did any human factors such as, size or strength of person, etc., contribute to accident? <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p><b>ENVIRONMENTAL FACTORS:</b> Did heat, cold, dust, sun, glare, etc., contribute to the accident? <input type="checkbox"/> YES <input type="checkbox"/> NO</p>	<p>a. (CONTINUED)</p> <p><b>CHEMICAL AND PHYSICAL AGENT FACTORS:</b> Did exposure to chemical agents, such as dust, fumes, mists, vapors or physical agents, such as, noise, radiation, etc., contribute to accident? <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p><b>OFFICE FACTORS:</b> Did office setting such as, lifting office furniture, carrying, stooping, etc., contribute to the accident? <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p><b>SUPPORT FACTORS:</b> Were inappropriate tools/resources provided to properly perform the activity/task? <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p><b>PERSONAL PROTECTIVE EQUIPMENT:</b> Did the improper selection, use or maintenance of personal protective equipment contribute to the accident? <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p><b>DRUGS/ALCOHOL:</b> In your opinion, was drugs or alcohol a factor to the accident? <input type="checkbox"/> YES <input type="checkbox"/> NO</p>	YES	NO
<p>b. WAS A WRITTEN JOB/ACTIVITY HAZARD ANALYSIS COMPLETED FOR TASK BEING PERFORMED AT TIME OF ACCIDENT?</p> <p><input type="checkbox"/> YES (If yes, attach a copy.) <input type="checkbox"/> NO</p>				

12 TRAINING		
<p>a. WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK?</p> <p><input type="checkbox"/> YES <input type="checkbox"/> NO</p>	<p>b. TYPE OF TRAINING</p> <p><input type="checkbox"/> CLASSROOM <input type="checkbox"/> ON JOB</p>	<p>c. DATE OF MOST RECENT FORMAL TRAINING.</p> <p align="center">/ /</p> <p align="center">(Month) (Day) (Year)</p>

13 FULLY EXPLAIN WHAT ALLOWED OR CAUSED THE ACCIDENT; INCLUDE DIRECT AND INDIRECT CAUSES (See instruction for definition of direct and indirect causes.) (Use additional paper, if necessary)

<p>a. DIRECT CAUSE</p>	
<p>b. INDIRECT CAUSE(S)</p>	

14 ACTION(S) TAKEN, ANTICIPATED OR RECOMMENDED TO ELIMINATE CAUSE(S).

DESCRIBE FULLY:

15 DATES FOR ACTIONS IDENTIFIED IN BLOCK 14.

<p>a. BEGINNING (Month/Day/Year) / /</p>	<p>b. ANTICIPATED COMPLETION (Month/Day/Year) / /</p>
--	---

<p>c. SIGNATURE AND TITLE OF SUPERVISOR COMPLETING REPORT</p> <p>CORPS _____</p> <p>CONTRACTOR _____</p>	<p>d. DATE (Mo/Da/Yr)</p> <p>___/___/___</p>	<p>e. ORGANIZATION IDENTIFIER (Div. Br. Sect)</p>	<p>f. OFFICE SYMBOL</p>
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16 MANAGEMENT REVIEW (1st)

a.  CONCUR b.  NON CONCUR c. COMMENTS

SIGNATURE	TITLE	DATE
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17 MANAGEMENT REVIEW (2nd - Chief Operations, Construction, Engineering, etc.)

a.  CONCUR b.  NON CONCUR c. COMMENTS

SIGNATURE	TITLE	DATE
-----------	-------	------

18 SAFETY AND OCCUPATIONAL HEALTH OFFICE REVIEW

a.  CONCUR b.  NON CONCUR c. ADDITIONAL ACTIONS/COMMENTS

SIGNATURE	TITLE	DATE
-----------	-------	------

19 COMMAND APPROVAL

COMMENTS

COMMANDER SIGNATURE	DATE
---------------------	------

1A

**GENERAL.** Complete a separate report for each person who was injured, caused, or contributed to the accident (excluding uninjured personnel and witnesses). Use of this form for reporting USACE employee first-aid type injuries not submitted to the Office of Workers' Compensation Programs (OWCP) shall be at the discretion of the FOA commander. Please type or print legibly. Appropriate items shall be marked with an "X" in box(es). If additional space is needed, provide the information on a separate sheet and attach to the completed form. Ensure that these instructions are forwarded with the completed report to the designated management reviewers indicated in sections 16 and 17.

### INSTRUCTIONS FOR SECTION 1 — ACCIDENT CLASSIFICATION. (Mark All Boxes That Are Applicable.)

- a. **GOVERNMENT.** Mark "CIVILIAN" box if accident involved government civilian employee; mark "MILITARY" box if accident involved U.S. military personnel.
- (1) **INJURY/ILLNESS/FATALITY** — Mark if accident resulted in any government civilian employee injury, illness, or fatality that requires the submission of OWCP Forms CA-1 (injury), CA-2 (illness), or CA-6 (fatality) to OWCP; mark if accident resulted in military personnel lost-time or fatal injury or illness.
  - (2) **PROPERTY DAMAGE** — Mark the appropriate box if accident resulted in any damage of \$1000 or more to government property (including motor vehicles).
  - (3) **VEHICLE INVOLVED** — Mark if accident involved a motor vehicle, regardless of whether "INJURY/ILLNESS/FATALITY" or "PROPERTY DAMAGE" are marked.
  - (4) **DIVING ACTIVITY** — Mark if the accident involved an in-house USACE diving activity.
- b. **CONTRACTOR.**
- (1) **INJURY/ILLNESS/FATALITY** — Mark if accident resulted in any contractor lost-time injury/illness or fatality.
  - (2) **PROPERTY DAMAGE** — Mark the appropriate box if accident resulted in any damage of \$1000 or more to contractor property (including motor vehicles).
  - (3) **VEHICLE INVOLVED** — Mark if accident involved a motor vehicle, regardless of whether "INJURY/ILLNESS/FATALITY" or "PROPERTY DAMAGE" are marked.
  - (4) **DIVING ACTIVITY** — Mark if the accident involved a USACE Contractor diving activity.
- c. **PUBLIC.**
- (1) **INJURY/ILLNESS/FATALITY** — Mark if accident resulted in public fatality or permanent total disability. (The "OTHER" box will be marked when requested by the FOA to report an unusual non-fatal public accident that could result in claims against the government or as otherwise directed by the FOA Commander).
  - (2) **VOID SPACE** — Make no entry.
  - (3) **VEHICLE INVOLVED** — Mark if accident resulted in a fatality to a member of the public and involved a motor vehicle, regardless of whether "INJURY/ILLNESS/FATALITY" is marked.
  - (4) **VOID SPACE** — Make no entry.

### INSTRUCTIONS FOR SECTION 2 — PERSONAL DATA

- a. **NAME** — (MANDATORY FOR GOVERNMENT ACCIDENTS. OPTIONAL AT THE DISCRETION OF THE FOA COMMANDER FOR CONTRACTOR AND PUBLIC ACCIDENTS). Enter last name, first name, middle initial of person involved.
- b. **AGE** — Enter age.
- c. **SEX** — Mark appropriate box.
- d. **SOCIAL SECURITY NUMBER** — (FOR GOVERNMENT PERSONNEL ONLY) Enter the social security number (or other personal identification number if no social security number issued).
- e. **GRADE** — (FOR GOVERNMENT PERSONNEL ONLY) Enter pay grade. Example: O-6; E-7; WG-8; WS-12; GS-11; etc.

- f. **JOB SERIES/TITLE** — For government civilian employees enter pay plan, full series number, and job title, e.g. GS-0810/Civil Engineer. For military personnel enter the primary military occupational specialty (PMOS), e.g., 15A30 or 11G50. For contractor employees enter the job title assigned to the injured person, e.g. carpenter, laborer, surveyor, etc.
- g. **DUTY STATUS** — Mark the appropriate box.
  - (1) **ON DUTY** — Person was at duty station during duty hours or person was away from duty station during duty hours but on official business at time of the accident.
  - (2) **TBY** — Person was on official business, away from the duty station and with travel orders at time of accident. Line-of-duty investigation required.
  - (3) **OFF DUTY** — Person was not on official business at time of accident.

- h. **EMPLOYMENT STATUS** — (FOR GOVERNMENT PERSONNEL ONLY) Mark the most appropriate box. If "OTHER" is marked, specify the employment status of the person.

### INSTRUCTION FOR SECTION 3 — GENERAL INFORMATION

- a. **DATE OF ACCIDENT** — Enter the month, day, and year of accident.
- b. **TIME OF ACCIDENT** — Enter the local time of accident in military time. Example: 1430 hrs (not 2:30 p.m.).
- c. **EXACT LOCATION OF ACCIDENT** — Enter facts needed to locate the accident scene. (Installation/project name, building number, street, direction and distance from closest landmark, etc.).
- d. **CONTRACTOR NAME**
  - (1) **PRIME** — Enter the exact name (title of firm) of the prime contractor.
  - (2) **SUBCONTRACTOR** — Enter the name of any subcontractor involved in the accident.
- e. **CONTRACT NUMBER** — Mark the appropriate box to identify if contract is civil works, military, or other; if "OTHER" is marked, specify contract appropriation on line provided. Enter complete contract number of prime contract, e.g., DACW 09-85-C-0100.
- f. **TYPE OF CONTRACT** — Mark appropriate box. A/E means architect/engineer. If "OTHER" is marked, specify type of contract on line provided.
- g. **HAZARDOUS/TOXIC WASTE ACTIVITY (HTW)** — Mark the box to identify the HTW activity being performed at the time of the accident. For Superfund, DERP, and Installation Restoration Program (IRP) HTW activities include accidents that occurred during inventory, predesign, design, and construction. For the purpose of accident reporting, DERP Formerly Used DoD Site (FUDS) activities and IRP activities will be treated separately. For Civil Works O&M HTW activities mark the "OTHER" box.

### INSTRUCTIONS FOR SECTION 4 — CONSTRUCTION ACTIVITIES

- a. **CONSTRUCTION ACTIVITY** — Select the most appropriate construction activity being performed at time of accident from the list below. Enter the activity name and place the corresponding code number identified in the box.

#### CONSTRUCTION ACTIVITY LIST

- |                         |                            |
|-------------------------|----------------------------|
| 1. MOBILIZATION         | 14. ELECTRICAL             |
| 2. SITE PREPARATION     | 15. SCAFFOLDING/ACCESS     |
| 3. EXCAVATION/TRENCHING | 16. MECHANICAL             |
| 4. GRADING (EARTHWORK)  | 17. PAINTING               |
| 5. PIPING/UTILITIES     | 18. EQUIPMENT/MAINTENANCE  |
| 6. FOUNDATION           | 19. TUNNELING              |
| 7. FORMING              | 20. WAREHOUSING/STORAGE    |
| 8. CONCRETE PLACEMENT   | 21. PAVING                 |
| 9. STEEL ERECTION       | 22. FENCING                |
| 10. ROOFING             | 23. SIGNING                |
| 11. FRAMING             | 24. LANDSCAPING/IRRIGATION |
| 12. MASONRY             | 25. INSULATION             |
| 13. CARPENTRY           | 26. DEMOLITION             |

- b. TYPE OF CONSTRUCTION EQUIPMENT - Select the equipment involved in the accident from the list below. Enter the name and place the corresponding code number identified in the box. If equipment is not included below, use code 24, "OTHER", and write in specific type of equipment.

**CONSTRUCTION EQUIPMENT**

- |                                    |                                |
|------------------------------------|--------------------------------|
| 1. GRADER                          | 13. DUMP TRUCK (OFF HIGHWAY)   |
| 2. DRAGLINE                        | 14. TRUCK (OTHER)              |
| 3. CRANE (ON VESSEL/BARGE)         | 15. FORKLIFT                   |
| 4. CRANE (TRACKED)                 | 16. BACKHOE                    |
| 5. CRANE (RUBBER TIRE)             | 17. FRONT-END LOADER           |
| 6. CRANE (VEHICLE MOUNTED)         | 18. PILE DRIVER                |
| 7. CRANE (TOWER)                   | 19. TRACTOR (UTILITY)          |
| 8. SHOVEL                          | 20. MANLIFT                    |
| 9. SCRAPER                         | 21. DOZER                      |
| 10. PUMP TRUCK (CONCRETE)          | 22. DRILL RIG                  |
| 11. TRUCK (CONCRETE/TRANSIT MIXER) | 23. COMPACTOR/VIBRATORY ROLLER |
| 12. DUMP TRUCK (HIGHWAY)           | 24. OTHER                      |

**INSTRUCTIONS FOR SECTION 5 - INJURY/ILLNESS INFORMATION**

- a. SEVERITY OF INJURY / ILLNESS - Reference para 2-10 of USACE Suppl 1 to AR 385-40 and enter code and description from list below.

- |     |   |
|-----|---|
| NOI | NO INJURY                                       |
| FAT | FATALITY  |
| PTL | PERMANENT TOTAL DISABILITY                      |
| PPR | PERMANENT PARTIAL DISABILITY                    |
| LWD | LOST WORKDAY CASE INVOLVING DAYS AWAY FROM WORK |
| NLW | RECORDABLE CASE WITHOUT LOST WORKDAYS           |
| RFA | RECORDABLE FIRST AID CASE                       |
| NRI | NON-RECORDABLE INJURY                           |

- b. ESTIMATED DAYS LOST - Enter the estimated number of workdays the person will lose from work.
- c. ESTIMATED DAYS HOSPITALIZED - Enter the estimated number of workdays the person will be hospitalized.
- d. ESTIMATED DAYS RESTRICTED DUTY - Enter the estimated number of workdays the person, as a result of the accident, will not be able to perform all of their regular duties.
- e. BODY PART AFFECTED - Select the most appropriate primary and when applicable, secondary body part affected from the list below. Enter body part name on line and place the corresponding code letters identifying that body part in the box.

GENERAL BODY AREA	CODE	BODY PART NAME
ARM/WRIST	AB	ARM AND WRIST
	AS	ARM OR WRIST
TRUNK, EXTERNAL MUSCULATURE	B1	SINGLE BREAST
	B2	BOTH BREASTS
	B3	SINGLE TESTICLE
	B4	BOTH TESTICLES
	BA	ABDOMEN
	BC	CHEST
	BL	LOWER BACK
	BP	PENIS
	BS	SIDE
	BU	UPPER BACK
	BW	WAIST
	BZ	TRUNK OTHER
HEAD, INTERNAL	C1	SINGLE EAR INTERNAL
	C2	BOTH EARS INTERNAL
	C3	SINGLE EYE INTERNAL
	C4	BOTH EYES INTERNAL
	C8	BRAIN
	CC	CRANIAL BONES
	CD	TEETH
	CJ	JAW
	CL	THROAT, LARYNX
	CM	MOUTH

ELBOW	EB	BOTH ELBOWS
	ES	SINGLE ELBOW
FINGER	F1	FIRST FINGER
	F2	BOTH FIRST FINGERS
	F3	SECOND FINGER
	F4	BOTH SECOND FINGERS
	F5	THIRD FINGER
	F6	BOTH THIRD FINGERS
	F7	FOURTH FINGER
	F8	BOTH FOURTH FINGERS
TOE	G1	GREAT TOE
	G2	BOTH GREAT TOES
	G3	TOE OTHER
	G4	TOES OTHER
HEAD, EXTERNAL	H1	EYE EXTERNAL
	H2	BOTH EYES EXTERNAL
	H3	EAR EXTERNAL
	H4	BOTH EARS EXTERNAL
	HC	CHIN
	HF	FACE
	HK	NECK/THROAT
	HM	MOUTH/LIPS
	HN	NOSE
	HS	SCALP
KNEE	KB	BOTH KNEES
	KS	KNEE
LEG, HIP, ANKLE, BUTTOCK	LB	BOTH LEGS/HIPS/ ANKLES/BUTTOCKS
	LS	SINGLE LEG/HIP ANKLE/BUTTOCK
HAND	MB	BOTH HANDS
	MS	SINGLE HAND
FOOT	PB	BOTH FEET
	PS	SINGLE FOOT
TRUNK, BONES	R1	SINGLE COLLAR BONE
	R2	BOTH COLLAR BONES
	R3	SHOULDER BLADE
	R4	BOTH SHOULDER BLADES
	RB	RIB
	RS	STERNUM (BREAST BONE)
	RV	VERTEBRAE (SPINE; DISC)
	RZ	TRUNK BONES OTHER
SHOULDER	S8	BOTH SHOULDERS
	SS	SINGLE SHOULDER
THUMB	TB	BOTH THUMBS
	TS	SINGLE THUMB
TRUNK, INTERNAL ORGANS	V1	LUNG, SINGLE
	V2	LUNGS, BOTH
	V3	KIDNEY, SINGLE
	V4	KIDNEYS, BOTH
	VH	HEART
	VL	LIVER
	VR	REPRODUCTIVE ORGANS
	VS	STOMACH
	VV	INTESTINES
	VZ	TRUNK, INTERNAL; OTHER

- f. NATURE OF INJURY/ILLNESS - Select the most appropriate nature of injury / illness from the list below. This nature of injury / illness shall correspond to the primary body part selected in 5e, above. Enter the nature of injury / illness name on the line and place the corresponding CODE letters in the box provided.

CODE	SOURCE OF INJURY NAME
0200	ENVIRONMENTAL CONDITION
0210	TEMPERATURE EXTREME (INDOOR)
0220	WEATHER (ICE, RAIN, HEAT, ETC.)
0230	FIRE, FLAME, SMOKE (NOT TOBACCO)
0240	NOISE
0250	RADIATION
0260	LIGHT
0270	VENTILATION
0271	TOBACCO SMOKE
0280	STRESS (EMOTIONAL)
0290	CONFINED SPACE
0300	MACHINE OR TOOL
0310	HAND TOOL (POWERED: SAW, GRINDER, ETC.)
0320	HAND TOOL (NONPOWERED)
0330	MECHANICAL POWER TRANSMISSION APPARATUS
0340	GUARD, SHIELD (FIXED, MOVEABLE, INTERLOCK)
0350	VIDEO DISPLAY TERMINAL
0360	PUMP, COMPRESSOR, AIR PRESSURE TOOL
0370	HEATING EQUIPMENT
0380	WELDING EQUIPMENT
0400	VEHICLE
0411	AS DRIVER OF PRIVATELY OWNED/RENTAL VEHICLE
0412	AS PASSENGER OF PRIVATELY OWNED/RENTAL VEHICLE
0421	DRIVER OF GOVERNMENT VEHICLE
0422	PASSENGER OF GOVERNMENT VEHICLE
0430	COMMON CARRIER (AIRLINE, BUS, ETC.)
0440	AIRCRAFT (NOT COMMERCIAL)
0450	BOAT, SHIP, BARGE
0500	MATERIAL HANDLING EQUIPMENT
0510	EARTHMOVER (TRACTOR, BACKHOE, ETC.)
0520	CONVEYOR (FOR MATERIAL AND EQUIPMENT)
0530	ELEVATOR, ESCALATOR, PERSONNEL HOIST
0540	HOIST, SLING CHAIN, JACK
0550	CRANE
0551	FORKLIFT
0560	HANDTRUCK, DOLLY
0600	DUST, VAPOR, ETC.
0610	DUST (SILICA, COAL, ETC.)
0620	FIBERS
0621	ASBESTOS
0630	GASES
0631	CARBON MONOXIDE
0640	MIST, STEAM, VAPOR, FUME
0641	WELDING FUMES
0650	PARTICLES (UNIDENTIFIED)
0700	CHEMICAL PLASTIC, ETC.
0711	DRY CHEMICAL - CORROSIVE
0712	DRY CHEMICAL - TOXIC
0713	DRY CHEMICAL - EXPLOSIVE
0714	DRY CHEMICAL - FLAMMABLE
0721	LIQUID CHEMICAL - CORROSIVE
0722	LIQUID CHEMICAL - TOXIC
0723	LIQUID CHEMICAL - EXPLOSIVE
0724	LIQUID CHEMICAL - FLAMMABLE
0730	PLASTIC
0740	WATER
0750	MEDICINE
0800	INANIMATE OBJECT
0810	BOX, BARREL, ETC.
0820	PAPER
0830	METAL ITEM, MINERAL
0831	NEEDLE
0840	GLASS
0850	SCRAP, TRASH
0860	WOOD
0870	FOOD
0880	CLOTHING, APPAREL, SHOES
0900	ANIMATE OBJECT
0911	DOG
0912	OTHER ANIMAL
0920	PLANT
0930	INSECT
0940	HUMAN (VIOLENCE)
0950	HUMAN (COMMUNICABLE DISEASE)
0960	BACTERIA, VIRUS (NOT HUMAN CONTACT)

CODE	SOURCE OF INJURY NAME
1000	PERSONAL PROTECTIVE EQUIPMENT
1010	PROTECTIVE CLOTHING, SHOES, GLASSES, GOGGLES
1020	RESPIRATOR, MASK
1021	DIVING EQUIPMENT
1030	SAFETY BELT, HARNESS
1040	PARACHUTE

## INSTRUCTIONS FOR SECTION 6 -- PUBLIC FATALITY

- a. **ACTIVITY AT TIME OF ACCIDENT** -- Select the activity being performed at the time of the accident from the list below. Enter the activity name on the line and the corresponding number in the box. If the activity performed is not identified on the list, select from the most appropriate primary activity area (water-related, non-water related or other activity), the code number for "Other", and write in the activity being performed at the time of the accident.

### WATER RELATED RECREATION

- |                                   |  |
|-----------------------------------|--|
| 1. Sailing                        | 9. Swimming/designated area                          |
| 2. Boating -- powered             | 10. Swimming/other area                              |
| 3. Boating -- nonpowered          | 11. Underwater activities (skin diving, scuba, etc.) |
| 4. Water skiing                   | 12. Wading   |
| 5. Fishing from boat              | 13. Attempted rescue                                 |
| 6. Fishing from bank dock or pier | 14. Hunting from boat                                |
| 7. Fishing while wading           | 15. Other  |
| 8. Swimming/supervised area       |  |

### NON-WATER RELATED RECREATION

- |  |   |
|--|---|
| 16. Hiking and walking                   | 23. Sports/summer (baseball, football, etc.)            |
| 17. Climbing (general)                   | 24. Sports/winter (skiing, sledding, snowmobiling etc.) |
| 18. Camping/picnicking authorized area   | 25. Cycling (bicycle, motorcycle, scooter)              |
| 19. Camping/picnicking unauthorized area | 26. Gliding   |
| 20. Guided tours                         | 27. Parachuting   |
| 21. Hunting                              | 28. Other non-water related                             |
| 22. Playground equipment                 |   |

### OTHER ACTIVITIES

- |  |                                  |
|--|----------------------------------|
| 29. Unlawful acts (fights, riots, vandalism, etc.) | 33. Sleeping                     |
| 30. Food preparation/serving                       | 34. Pedestrian struck by vehicle |
| 31. Food consumption                               | 35. Pedestrian other acts        |
| 32. Housekeeping                                   | 36. Suicide                      |
|  | 37. "Other" activities           |

- b. **PERSONAL FLOTATION DEVICE USED** -- If fatality was water-related was the victim wearing a person flotation device? Mark the appropriate box.

## INSTRUCTIONS FOR SECTION 7 -- MOTOR VEHICLE ACCIDENT

- a. **TYPE OF VEHICLE** -- Mark appropriate box for each vehicle involved. If more than one vehicle of the same type is involved, mark both halves of the appropriate box. USACE vehicle(s) involved shall be marked in left half of appropriate box.

- b. **TYPE OF COLLISION** -- Mark appropriate box.

- c. **SEAT BELT** -- Mark appropriate box.

## INSTRUCTIONS FOR SECTION 8 -- PROPERTY/MATERIAL INVOLVED

- a. **NAME OF ITEM** -- Describe all property involved in accident. Property/material involved means material which is damaged or whose use or misuse contributed to the accident. Include the name, type, model; also include the National Stock Number (NSN) whenever applicable.
- b. **OWNERSHIP** -- Enter ownership for each item listed. (Enter one of the following: *USACE; OTHER GOVERNMENT; CONTRACTOR; PRIVATE*)
- c. **\$ AMOUNT OF DAMAGE** -- Enter the total estimated dollar amount of damage (parts and labor), if any.

## INSTRUCTIONS FOR SECTION 9—VESSEL/ FLOATING PLANT ACCIDENT

- a. TYPE OF VESSEL/FLOATING PLANT—Select the most appropriate vessel/floating plant from list below. Enter name and place corresponding number in box. If item is not listed below, enter item number for "OTHER" and write in specific type of vessel/floating plant.

### VESSEL/FLOATING PLANTS

- |                        |                            |
|------------------------|----------------------------|
| 1. ROW BOAT            | 7. DREDGE/DIPPER           |
| 2. SAIL BOAT           | 8. DREDGE/CLAMSHELL BUCKET |
| 3. MOTOR BOAT          | 9. DREDGE/PIPE LINE        |
| 4. BARGE               | 10. DREDGE/DUST PAN        |
| 5. DREDGE/HOPPER       | 11. TUG BOAT               |
| 6. DREDGE/SIDE CASTING | 12. OTHER                  |

- b. COLLISION/MISHAP—Select from the list below the object(s) that contributed to the accident or were damaged in the accident.

### COLLISION/MISHAP

- |                             |                       |
|-----------------------------|-----------------------|
| 1. COLLISION W/OTHER VESSEL | 7. HAULAGE UNIT       |
| 2. UPPER GUIDE WALL         | 8. BREAKING TOW       |
| 3. UPPER LOCK GATES         | 9. TOW BREAKING UP    |
| 4. LOCK WALL                | 10. SWEEP DOWN ON DAM |
| 5. LOWER LOCK GATES         | 11. BUOY/DOLPHIN/CELL |
| 6. LOWER GUIDE WALL         | 12. WHARF OR DOCK     |
|                             | 13. OTHER             |

## INSTRUCTIONS FOR SECTION 10—ACCIDENT DESCRIPTION

DESCRIBE ACCIDENT—Fully describe the accident. Give the sequence of events that describe what happened leading up to and including the accident. Fully identify personnel and equipment involved and their role(s) in the accident. Ensure that relationships between personnel and equipment are clearly specified. Continue on blank sheets if necessary and attach to this report.

## INSTRUCTIONS FOR SECTION 11—CAUSAL FACTORS

- a. Review thoroughly. Answer each question by marking the appropriate block. If any answer is yes, explain in item 13 below. Consider, as a minimum, the following:
- (1) DESIGN—Did inadequacies associated with the building or work site play a role? Would an improved design or layout of the equipment or facilities reduce the likelihood of similar accidents? Were the tools or other equipment designed and intended for the task at hand?
  - (2) INSPECTION/MAINTENANCE—Did inadequately or improperly maintained equipment, tools, workplace, etc. create or worsen any hazards that contributed to the accident? Would better equipment, facility, work site or work activity inspections have helped avoid the accident?
  - (3) PERSON'S PHYSICAL CONDITION—Do you feel that the accident would probably not have occurred if the employee was in "good" physical condition? If the person involved in the accident had been in better physical condition, would the accident have been less severe or avoided altogether? Was over exertion a factor?
  - (4) OPERATING PROCEDURES—Did a lack of or inadequacy within established operating procedures contribute to the accident? Did any aspect of the procedures introduce any hazard to, or increase the risk associated with the work process? Would establishment or improvement of operating procedures reduce the likelihood of similar accidents?
  - (5) JOB PRACTICES—Were any of the provisions of the Safety and Health Requirements Manual (EM 385-1-1) violated? Was the task being accomplished in a manner which was not in compliance with an established job hazard analysis or activity hazard analysis? Did any established job practice (including EM 385-1-1) fail to adequately address the task or work process? Would better job practices improve the safety of the task?

- (6) HUMAN FACTORS—Was the person (either internal or external to the job)? Did the task tend toward overloading the capabilities of the person; i.e., did the job require tracking and reacting to many external inputs such as displays, alarms, or signals? Did the arrangement of the workplace tend to interfere with efficient task performance? Did the task require reach, strength, endurance, agility, etc., at or beyond the capabilities of the employee? Was the work environment ill-adapted to the person? Did the person need more training, experience, or practice in doing the task? Was the person inadequately rested to perform safely?

- (7) ENVIRONMENTAL FACTORS—Did any factors such as moisture, humidity, rain, snow, sleet, hail, ice, fog, cold, heat, sun, temperature changes, wind, tides, floods, currents, dust, mud, glare, pressure changes, lightning, etc., play a part in the accident?

- (8) CHEMICAL AND PHYSICAL AGENT FACTORS—Did exposure to chemical agents (either single shift exposure or long-term exposure) such as dusts, fibers (asbestos, etc.), silica, gases (carbon monoxide, chlorine, etc.), mists, steam, vapors, fumes, smoke, other particulates, liquid or dry chemicals that are corrosive, toxic, explosive or flammable, by-products of combustion or physical agents such as noise, ionizing radiation, non-ionizing radiation (UV radiation created during welding, etc.) contribute to the accident/incident?

- (9) OFFICE FACTORS—Did the fact that the accident occurred in an office setting or to an office worker have a bearing on its cause? For example, office workers tend to have less experience and training in performing tasks such as lifting office furniture. Did physical hazards within the office environment contribute to the hazard?

- (10) SUPPORT FACTORS—Was the person using an improper tool for the job? Was inadequate time available or utilized to safely accomplish the task? Were less than adequate personnel resources (in terms of employee skills, number of workers, and adequate supervision) available to get the job done properly? Was funding available, utilized, and adequate to provide proper tools, equipment, personnel, site preparation, etc?

- (11) PERSONAL PROTECTIVE EQUIPMENT—Did the person fail to use appropriate personal protective equipment (gloves, eye protection, hard-toed shoes, respirator, etc.) for the task or environment? Did protective equipment provided or worn fail to provide adequate protection from the hazard(s)? Did lack of or inadequate maintenance of protective gear contribute to the accident?

- (12) DRUGS/ALCOHOL—Is there any reason to believe the person's mental or physical capabilities, judgement, etc., were impaired or altered by the use of drugs or alcohol? Consider the effects of prescription medicine and over the counter medications as well as illicit drug use. Consider the effect of drug or alcohol induced "hangovers".

- b. WRITTEN JOB/ACTIVITY HAZARD ANALYSIS—Was a written Job/Activity Hazard Analysis completed for the task being performed at the time of the accident? Mark the appropriate box. If one was performed, attach a copy of the analysis to the report.

## INSTRUCTIONS FOR SECTION 12—TRAINING

- a. WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK?—For the purpose of this section "trained" means the person has been provided the necessary information (either formal and/or on-the-job (OJT) training) to competently perform the activity/task in a safe and healthful manner.

- b. TYPE OF TRAINING—Mark the appropriate box that best indicates the type of training; (classroom or on-the-job) that the injured person received before the accident happened.

- c. DATE OF MOST RECENT TRAINING—Enter the month, day, and year of the last formal training completed that covered the activity-task being performed at the time of the accident.

\*The injury or condition selected below must be caused by a specific incident or event which occurred during a single work day or shift.

GENERAL NATURE CATEGORY	CODE	NATURE OF INJURY NAME
TRAUMATIC INJURY OR DISABILITY	TA	AMPUTATION
	TB	BACK STRAIN.
	TC	CONTUSION; BRUISE; ABRASION
	TD	DISLOCATION
	TF	FRACTURE
	TH	HERNIA
	TK	CONCUSSION
	TL	LACERATION, CUT
	TP	PUNCTURE
	TS	STRAIN, MULTIPLE
	TU	BURN, SCALD, SUNBURN
	TI	TRAUMATIC SKIN DISEASES/ CONDITIONS INCLUDING DERMATITIS
	TR	TRAUMATIC RESPIRATORY DISEASE
	TQ	TRAUMATIC FOOD POISONING
	TW	TRAUMATIC TUBERCULOSIS
	TX	TRAUMATIC VIROLOGICAL/ INFECTIVE/PARASITIC DISEASE
	T1	TRAUMATIC CEREBRAL VASCULAR CONDITION/STROKE
	T2	TRAUMATIC HEARING LOSS
T3	TRAUMATIC HEART CONDITION	
T4	TRAUMATIC MENTAL DISORDER; STRESS; NERVOUS CONDITION	
T8	TRAUMATIC INJURY - OTHER (EXCEPT DISEASE, ILLNESS)	

\*\*A nontraumatic physiological harm or loss of capacity produced by systemic infection; continued or repeated stress or strain; exposure to toxins, poisons, fumes, etc.; or other continued and repeated exposures to conditions of the work environment over a long period of time. For practical purposes, an occupational illness/disease or disability is any reported condition which does not meet the definition of traumatic injury or disability as described above.

GENERAL NATURE CATEGORY	CODE	NATURE OF INJURY NAME	
NON-TRAUMATIC ILLNESS/DISEASE OR DISABILITY	RA	ASBESTOSIS	
	RB	BRONCHITIS	
	RE	EMPHYSEMA	
	RP	PNEUMOCONIOSIS	
	RS	SILICOSIS	
	R9	RESPIRATORY DISEASE, OTHER	
	VIROLOGICAL, INFECTIVE & PARASITIC DISEASES	VB	BRUCELLOSIS
		VC	COCCIDIOMYCOSIS
		VF	FOOD POISONING
VH		HEPATITIS	
VM		MALARIA	
VS		STAPHYLOCOCCUS	
VT		TUBERCULOSIS	
V9	VIROLOGICAL/INFECTIVE/ PARASITIC-OTHER		
DISABILITY, OCCUPATIONAL	DA	ARTHRITIS, BURSITIS	
	DB	BACK STRAIN, BACK SPRAIN	
	DC	CEREBRAL VASCULAR CONDITION; STROKE	
	DD	ENDEMIC DISEASE (OTHER THAN CODE TYPES R&S)	
	DE	EFFECT OF ENVIRONMENTAL CONDITION	
	DH	HEARING LOSS	
	DK	HEART CONDITION	
	DM	MENTAL DISORDER, EMOTIONAL STRESS NERVOUS CONDITION	
	DR	RADIATION	
	DS	STRAIN, MULTIPLE	
	DU	ULCER	
	DV	OTHER VASCULAR CONDITIONS	
	D9	DISABILITY, OTHER	

GENERAL NATURE CATEGORY	CODE	NAME
SKIN DISEASE OR CONDITION	S8	BIOLOGICAL
	SC	CHEMICAL
	S9	DERMATITIS, UNCLASSIFIED

9. TYPE AND SOURCE OF INJURY/ILLNESS (CAUSE) - Type and Source Codes are used to describe what caused the incident. The Type Code stands for an ACTION and the Source Code for an OBJECT or SUBSTANCE. Together, they form a brief description of how the incident occurred. Where there are two different sources, code the initiating source of the incident (see example 1, below). Examples:

(1) An employee tripped on carpet and struck his head on a desk.  
TYPE: 210 (fell on same level) SOURCE: 0110 (walking/working surface)

NOTE: This example would NOT be coded 120 (struck against) and 0140 (furniture).

(2) A Park Ranger contracted dermatitis from contact with poison ivy/oak.  
TYPE: 510 (contact) SOURCE: 0920 (plant)

(3) A lock and dam mechanic punctured his finger with a metal siver while grinding a turbine blade.  
TYPE: 410 (punctured by) SOURCE: 0830 (metal)

(4) An employee was driving a government vehicle when it was struck by another vehicle.  
TYPE: 800 (traveling in) SOURCE: 0421 (government-owned vehicle, as driver)

NOTE: The Type Code 800, "Traveling In" is different from the other type codes in that its function is not to identify factors contributing to the injury or fatality, but rather to collect data on the type of vehicle the employee was operating or traveling in at the time of the incident.

Select the most appropriate TYPE and SOURCE identifier from the list below and enter the name on the line and the corresponding code in the appropriate box.

CODE	TYPE OF INJURY NAME
	STRUCK
0110	STRUCK BY
0111	STRUCK BY FALLING OBJECT
0120	STRUCK AGAINST
	FELL, SLIPPED, TRIPPED
0210	FELL ON SAME LEVEL
0220	FELL ON DIFFERENT LEVEL
0230	SLIPPED, TRIPPED (NO FALL)
	CAUGHT
0310	CAUGHT ON
0320	CAUGHT IN
0330	CAUGHT BETWEEN
	PUNCTURED, LACERATED
0410	PUNCTURED BY
0420	CUT BY
0430	STUNG BY
0440	BITTEN BY
	CONTACTED
0510	CONTACTED WITH (INJURED PERSON MOVING)
0520	CONTACTED BY (OBJECT WAS MOVING)
	EXERTED
0610	LIFTED, STRAINED BY (SINGLE ACTION)
0620	STRESSED BY (REPEATED ACTION)
	EXPOSED
0710	INHALED
0720	INGESTED
0730	ABSORBED
0740	EXPOSED TO
0800	TRAVELING IN
CODE	SOURCE OF INJURY NAME
0100	BUILDING OR WORKING AREA
0110	WALKING/WORKING SURFACE (FLOOR, STREET, SIDEWALKS, ETC)
0120	STAIRS, STEPS
0130	LADDER
0140	FURNITURE, FURNISHINGS, OFFICE EQUIPMENT
0150	BOWLER, PRESSURE VESSEL
0160	EQUIPMENT LAYOUT (ERGONOMIC)
0170	WINDOWS, DOORS
0180	ELECTRICITY

## INSTRUCTIONS FOR SECTION 13 — CAUSES

- a. **DIRECT CAUSES**—The direct cause is that single factor which most directly lead to the accident. See examples below.
- b. **INDIRECT CAUSES**—Indirect causes are those factors which contributed to but did not directly initiate the occurrence of the accident.

### Examples for section 13:

- a. Employee was dismantling scaffold and fell 12 feet from unguarded opening.  
*Direct cause:* failure to provide fall protection at elevation.  
*Indirect causes:* failure to enforce USACE safety requirements; improper training/motivation of employee (possibility that employee was not knowledgeable of USACE fall protection requirements or was lax in his attitude towards safety); failure to ensure provision of positive fall protection whenever elevated; failure to address fall protection during scaffold dismantling in phase hazard analysis.
- b. Private citizen had stopped his vehicle at intersection for red light when vehicle was struck in rear by USACE vehicle. (note USACE vehicle was in proper/safe working condition).  
*Direct cause:* failure of USACE driver to maintain control of and stop USACE vehicle within safe distance.  
*Indirect cause:* Failure of employee to pay attention to driving (defensive driving).

## INSTRUCTIONS FOR SECTION 14 — ACTION TO ELIMINATE CAUSE(S)

**DESCRIPTION**—Fully describe all the actions taken, anticipated, and recommended to eliminate the cause(s) and prevent reoccurrence of similar accidents/illnesses. Continue on blank sheets of paper if necessary to fully explain and attach to the completed report form.

## INSTRUCTIONS FOR SECTION 15 — DATES FOR ACTION

- a. **BEGIN DATE**—Enter the date when the corrective action(s) identified in Section 14 will begin.
- b. **COMPLETE DATE**—Enter the date when the corrective action(s) identified in Section 14 will be completed.
- c. **TITLE AND SIGNATURE**—Enter the title and signature of supervisor completing the accident report. For a **GOVERNMENT** employee accident/illness the immediate supervisor will complete and sign the report. For **PUBLIC** accidents the USACE Project Manager/Area Engineer responsible for the USACE property where the accident happened shall complete and sign the report. For **CONTRACTOR** accidents the Contractor's project manager shall complete and sign the report and provide to the USACE supervisor responsible for oversight of that contractor activity. This USACE Supervisor shall also sign the report. Upon entering the information required in 15.d, 15.e and 15.f below, the responsible USACE supervisor shall forward the report for management review as indicated in Section 16.
- d. **DATE SIGNED**—Enter the month, day, and year that the report was signed by the responsible supervisor.
- e. **ORGANIZATION NAME**—For **GOVERNMENT** employee accidents enter the USACE organization name (Division, Branch, Section, etc.) of the injured employee. For **PUBLIC** accidents enter the USACE organization name for the person identified in block 15.c. For **CONTRACTOR** accidents enter the USACE organization name for the USACE office responsible for providing contract administration oversight.

Symbol for the USACE organization identified in block 15.e.

## INSTRUCTIONS FOR SECTION 16 — MANAGEMENT REVIEW (1st)

**1ST REVIEW**—Each USACE FOA shall determine who will provide 1st management review. The responsible USACE supervisor in section 15.c shall forward the completed report to the USACE office designated as the 1st Reviewer by the FOA. Upon receipt, the Chief of the Office shall review the completed report, mark the appropriate box, provide substantive comments, sign, date, and forward to the FOA Staff Chief (2nd review) for review and comment.

## INSTRUCTIONS FOR SECTION 17 — MANAGEMENT REVIEW (2nd)

**2ND REVIEW**—The FOA Staff Chief (i.e., FOA Chief of Construction, Operations, Engineering, Planning, etc.) shall mark the appropriate box, review the completed report, provide substantive comments, sign, date, and return to the FOA Safety and Occupational Health Office.

## INSTRUCTIONS FOR SECTION 18 — SAFETY AND OCCUPATIONAL HEALTH REVIEW

**3RD REVIEW**—The FOA Safety and Occupational Health Office shall review the completed report, mark the appropriate box, ensure that any inadequacies, discrepancies, etc. are rectified by the responsible supervisor and management reviewers, provide substantive comments, sign, date and forward to the FOA Commander for review, comment, and signature.

## INSTRUCTION FOR SECTION 19 — COMMAND APPROVAL

**4TH REVIEW**—The FOA Commander shall (to include the person designated Acting Commander in his absence) review the completed report, comment if required, sign, date, and forward the report to the FOA Safety and Occupational Health Office. Signature authority shall not be delegated.



SITE SPECIFIC

REMEDIAL ACTION SAFETY PLAN

FOR

FORMER WEST VIRGINIA  
MANEUVER AREA

DOLLY SODS WILDERNESS AREA

ELKINS, WEST VIRGINIA

# **FORMER WEST VIRGINIA MANEUVER AREA DOLLY SODS WILDERNESS AREA REMEDIAL ACTION SAFETY PLAN**

## **1.1 SITE LOCATION AND DESCRIPTION**

**1.1.1** The former West Virginia Maneuver Area, 10,215 acres, is located in the Dolly Sods Wilderness. Beginning in August of 1943, the Army used these 10,215 acres for artillery and mortar training and a maneuver area. The former West Virginia Maneuver Area is now frequently used for hiking, fishing, camping, picnics, and hunting. It is estimated that between 45,000 and 76,000 people visit Dolly Sods Wilderness annually. The terrain is undeveloped, mountainous, rocky, and rugged. Portions are covered with dense brush and are heavily vegetated. Plant and animal life are comparable to northern Canada. Endangered species include the Cheat Mountain Salamander. There are also areas of archaeological significance.

**1.1.2** This removal action pertains to 20.89 miles of trails and 101 campsites commonly used in the Dolly Sods Wilderness as designated by the U.S. Forest Service. The total acreage to be cleared of surface and subsurface OE is approximately 113.9 acres. This is further divided into 111.9 acres for trails and 2.0 acres for campsites.

## **1.2 PROJECTED REMOVAL ACTION STARTING DATES**

**1.2.1** The approximate project start date for Dolly Sods Wilderness Area is as follows:

Establishing Boundaries: Site boundaries have been decided during previous actions and they are defined in the Scope of Work for this removal project.

Range Clearance Operations: February 16, 1997

Projected Removal Action: The projected completion date is July of 1997. The anticipated start date is early in October 1996, with a shut down for the winter. Remobilization at the earliest date, will be in the Spring of 1997.

## **1.3 SUSPECTED UXO ITEMS**

**1.3.1** The type of OE contamination located during the 1995 Ordnance Removal Environmental Assessment is listed in Table 1. Additionally this report describes records that "indicate 105mm and 155mm artillery shells were fired during training exercises during World War II." None of these types of UXO have been reported, located or recovered to date on this site.

## OE CONTAMINATION

Table - 1

NAME	MODEL/TYPE	QUANTITY
57mm Projectile	Unknown	Unknown
60mm Mortar	HE/Smoke	Unknown
81mm Mortar	HE/Smoke	Unknown
4.2" Mortar	Unknown	Unknown

### 1.4 HAZARD ASSESSMENT OF MIGRATION OF CONTAMINATION

**1.4.1** There is no indication in previous studies conducted in the Dolly Sods Wilderness Area of explosive and heavy metals' contamination. This removal project will not increase the likelihood that contamination or residue is migrating from the site.

**1.4.2** The Former West Virginia Maneuver Area is not a suspected HTRW or CWM site. However, if at anytime during site activities, personnel encounter suspect HTRW or CWM personnel will pass the word to evacuate the area either orally or using portable air horns (one long and one short blast). After sounding the alarm, personnel will immediately evacuate the area in an upwind direction, or to a predesignated rally point, and report it to the site Safety Officer. Work will be ceased in that area until the Project Manager, SUXOS, CEHNC Safety Specialist and HFA's Health and Safety Manager has been notified and the situation evaluated. If HTRW has been identified, intrusive investigation will cease until the WP/SSHP has been revised.

### 1.5 UXO/OE CONTRACTOR

**1.5.1** HFA, Inc. has been contracted by the U.S. Army Engineering and Support Center, Huntsville, under contract DACA87-94-D-0019 "Remediation of Various Sites East of the Mississippi River." Task Order 020 has been issued to safely locate, identify, and remove all OE and OE/Non-OE related scrap from selected areas of the Former West Virginia Maneuver Area.

### 1.6 DEMOLITION OPERATIONS

**1.6.1** Demolition safety and operations will be conducted in accordance with the basic practices and procedures outlined in TM 60A 1-1-31 and the appropriate specific 60 Series EOD Publications. UXO will only be detonated after positive identification. Jet Perforators initiated by a detonating cord trunk line or ring main system. A NONEL initiated system will be employed as the method of choice for all detonations. All demolition shots will be tamped as outlined in the work plan. HFA UXO Specialists are experienced and knowledgeable in the use of these charges and have used them successfully during previous projects.

**1.6.2** Demolition operations, if required, will take place each day, and all UXO will be disposed of on that day. No UXO will be allowed to remain in the project area overnight. If an event (such as inclement weather) prevents the destruction of any UXO, arrangements will be made to provide security for the site. The SUXOS and the CEHNC Site Safety Specialist are responsible for determining whether minimum safe conditions to conduct demolitions operations are met. The SUXOS will notify the Forest Service Representative and make security arrangements until the UXO can be properly and safely destroyed. HFA personnel will assist the Forest Service personnel if necessary.

## **1.7 DETONATING UXO IN PLACE**

**1.7.1** Detonations will be scheduled, if required, each day at the designated demolition time but not later than 1600 hours. All detonations will be conducted according to TM 60A-1-1-31.

**1.7.2** Detonations will occur only after all unnecessary personnel have left the area and perimeter security has been established.

**1.7.3** The composition of the Demolition Team will be determined by the SUXOS. The team will only be composed of qualified UXO personnel under the direct supervision of a UXOS who is the designated blaster. Additional Demolition Teams may be used at the discretion of the SUXOS if there are large quantities of UXO to detonate.

**1.7.4** The remaining HFA UXO personnel may act as perimeter security, as directed by the SUXOS.

**1.7.5** Notification of detonations will be made according to the Standard Operating Procedures for Notification of UXO Detonations.

**1.7.6** Only Demolitions Team, SUXOS, QC, SSO, and the CEHNC Safety Specialist will be permitted in the area where charges are being assembled and demolition operations are being conducted. However, all of the above authorized personnel should not be in the demolitions operations area simultaneously.

**1.7.7** The area where demolition operations are being conducted will remain secured until the “all clear” is given by the SUXOS or SSO.

**1.7.8** After each detonation, the detonation points will be inspected by the UXOS and the SUXOS or SSO to ensure that a misfire, low order, or a kick out has not occurred.

**1.7.9** All charges will be initiated using NONEL. Detonating cord trunk and branch lines will be used to link multiple shots.

### **1.7.10 Misfire Procedures**

**1.7.10.1** According to 29 CFR 1910-109 (e), (4), vi; EM 385-1-1 §29, and 60A 1-1-31, if a misfire occurs, the following general procedures will be strictly followed:

- The SUXOS will be notified of the time of the suspected misfire, and
- The SUXOS will notify the HFA Project Manager (PM), if on site, and the CEHNC Safety Specialist. All other personnel will be notified of the event via radio and instructed to hold their positions until the “all clear” is given. The circumstances surrounding the misfire will be included in the sites Daily Journal [*see Appendix F HFA Forms*].

### **1.7.10.2 NONEL Misfires**

**1.7.10.2.1** Another attempt will be made to fire the shot.

**1.7.10.2.2** A new primer will be installed in the initiating device and another attempt will be made to fire the shot.

**1.7.10.2.3** If the tube is seen to flash or the tube was heard to fire, thirty minutes will lapse before the inspection of a misfire. If it is suspected that the blasting cap is the problem, no attempt will be made to remove or handle the blasting cap. A new charge will be assembled and placed next to the misfired charge and detonated.

### **1.7.10.3 Detonating Cord Misfires**

**1.7.10.3.1** A new NONEL system will be attached to the remaining detonating cord, with care taken to fasten it properly, and the original charge will be detonated.

**1.7.10.3.2** Branch lines will be treated in the same manner as noted above.

**1.7.10.3.3** If detonating cord leading to the charge detonates but fails to function the charge, the following actions will be taken:

- Investigation will not occur until the charges have stopped burning (30 minutes if the charge is buried).
- A new Jet Perforator will be place on the UXO, reprimed and another attempt will be made to detonate the UXO.

## **1.8 NOTIFICATION**

**1.8.1** Notification will take place as outlined in the Standard Operating Procedures for Notification of UXO Operations.

## **1.9 TRANSPORTATION OF UXO/DEMOLITION MATERIALS ON-SITE**

**1.9.1** Because Dolly Sods is a wilderness area and no motorized vehicles or equipment is allowed in the area, all movement of explosives will be performed by personnel hand carrying or packing the explosives to and from the work area. All explosives will be carried by the SSO and the SUXOS.

## **1.10 READY SERVICE STORAGE**

**1.10.1** Because of the nature of the site, explosives will be transported daily to and from the work areas. Explosives will be temporarily stored near the work location. All explosives will be stored in metal containers at least fifty feet from clearance teams.

## **1.11 TRANSPORTING DEMOLITION MATERIALS FROM STORAGE MAGAZINES**

**1.11.1** Some transportation of demolitions will be required via vehicle to the trail heads and other points where vehicles are authorized.

**1.11.2** All loads will be visually inspected by the SSO to ensure they are properly secured and safe to move. If in his opinion the material is improperly loaded, he shall cause whatever corrective action he deems necessary before he allows the load to move.

**1.11.3** When transporting explosives or UXO, vehicles will not exceed the authorized speed limit. In most areas a prudent speed is less than 25 mph, in which case the driver may not exceed a safe and reasonable speed.

**1.11.4** Blasting caps and demolition materials are placed in suitable, separate metal containers and separated and sand bagged, to ensure containment of premature function of the blasting caps. The internal space of the container will be padded and the boxes will be separated in the bed of the truck by the largest distance possible. The containers will remain closed always, unless using the materials.

**1.11.5** Vehicles hauling UXO will remain covered at all times, unless actually loading or unloading, and a flame resistant tarpaulin or a metal container with a flame resistant lid (such as a metal ammunition box) may be used for this purpose.

**1.11.6** Vehicles transporting explosives and UXO will be placarded with a Department of Transportation "Explosives Class 1.1" placard. Class 1.1 consists of explosives that have a mass explosion hazard.

## **1.12 STORAGE OF EXPLOSIVE AND DEMOLITION MATERIALS**

**1.12.1** All explosives and demolition materials will be stored in two ATF approved, portable magazines located on Forest Service property. The magazines will be fitted with approved lightning arrestor and grounding systems as outlined in DOD 6055-9 . The Bell Knob Tower is currently fitted with a lightning arrestor and grounding system. This system will be inspected and repaired(if required) for use during this project.

**1.12.2** The SUXOS will record usage data of explosives and the quantities of UXO destroyed in place. The SUXOS will be responsible for the proper storage, issue, and maintenance of all explosives and explosives' records.

**1.12.3** The SUXOS will record usage data of explosives and the quantities of UXO destroyed in place. The SUXOS will record the location and type of UXO detonated in place so that information can be included in the final report.

## **1.13 ESTABLISHMENT OF QUANTITY OF EXPLOSIVES AND FRAGMENTATION DISTANCES**

**1.13.1** The Dolly Sods Wilderness Area is unsecured and potentially open to the public. The Forest Service will close and mark with signs, the trails and campsites closed to the public during OE operations. UXO Supervisors are responsible for controlling their work zones, stop all work and report unauthorized persons entering their areas. The Forest Service will provide security in controlling access and closing entry points and trail heads where OE operations are on going. The public areas are patrolled by Forest Service personnel and necessary streets and roads will be closed if the situation requires it.

**1.13.2** All demolition locations will be confined to the boundaries of the sites. There is not a primary demolition area at this site. Demolition sites will exist where UXOs that cannot be moved are detonated in place. UXO will be destroyed in the position where they are found. The location of UXO that must be detonated in place cannot be predicted, and can occur at any point on the site. All UXO that is detonated in place will be documented and the position indicated on the site map. All demolition shots will be tamped with earth to minimize fragmentation and noise emissions as described in the work plan. The following fragmentation distances are in reference to each individual site where potential OE contamination can be found. This fragmentation distance (944') applies only during intrusive activities and is based on a 4.2" mortar. During actual demolition operations, the fragmentation distance may be reduced based on the type, size, and quantity of OE being disposed of.

**1.13.3** Protection of personnel and property are critical elements of any removal operations performed at this site. Because this site is a wilderness area and all materials must be hand carried into and out of the site each day, extensive mechanical engineering controls will not be employed during intrusive activities and/or demolition operations. Earth tamping will be employed to protect structures or persons that may be nearby trail heads. There are no nearby residents nor are there

overhead or underground utilities that require protection. Site personnel will rely on aggressive security measures, an informed public, and audible warning signals to control and perform safe removal and demolition operations.

**1.13.4** All explosives and demolition materials will be stored in two ATF approved magazines located on Forest Service Property, at the Bell Knob Tower site. The Bell Knob Tower has a gated entry which controlled and locked at all times. The SUXOS will be responsible for the safe handling of all explosives.

**1.13.5** Explosive used for demolition operations will be separated into two magazines. One magazine will hold the detonating cord and the jet perforators and the other magazine will contain the NONEL Initiators. The type, amount, class and net explosive weight (NEW) stored in the Magazine/Explosive Storage Area (MESA) is listed in Table 2.

**1.13.6** Based on ATE-P-5400, Explosives Law and Regulations, Table 55.218, the distance in feet to inhabited buildings is 110 feet. The distance in feet to public traffic route is 45 feet. The following distances are in reference to the MESA at Bell Knob Tower, on U S Forest Service property:

- MESA to Public Road (State Road #75) = Approximately 1500 feet.
- MESA to nearest house = Approximately 2 miles.

*Note: If a UXO is detonated in place, the safe separation distance to the nearest uninhabited building may be reduced. Additional tamping with sand or sandbags will occur to limit and control the effects of the blast and fragmentation.*

**1.13.7** Because this site is unsecured, it may be necessary to temporarily close roads and reroute traffic. This will be decided by the proximity of the UXO to the site boundaries, the type, the minimum tamp of UXO, and amount of tamping material (sand/earth) covering the UXO. Local Forest Service personnel will secure public roads, or access routes into the Dolly Sods Wilderness Area. Site control will be maintained by HFA UXO personnel. Road block positions will vary and be coordinated between the CEHNC Safety Specialist, the Forest Service, and HFA SUXOS.

#### **1.14 MAGAZINE REQUIREMENTS**

**1.14.1** HFA has contracted with a security service for a 24 hours on-site security guard. The magazines will be under constant surveillance. Two portable ATF approved magazines will be used for explosives storage on site. Magazine construction is according to DOD 6055.9 STD. Each door is to be equipped with one of the following locks:

- S&G 833C, Padlock, Key Operated, High Security, Shrouded Shackle,
- S&G 831B, Padlock, Key Operated, High Security, Shrouded Shackle,
- HI SHEAR LK1200, High Security Padlock,

**1.14.2** The property where outdoor type magazines are located will be posted with signs reading "EXPLOSIVES - KEEP OUT," in letters not less than three inches high on a reflective surface. The signs will be located to reduce the possibility of a bullet traveling in the direction of the magazine if anyone should shoot at the sign. A hazard identification for fire fighting personnel (showed by a distinctive symbol to be recognized by the fire fighters approaching the fire scene) will be the only sign displayed. For identifying the symbol from long range, the symbol shape is as follows: Octagon shape with an orange background, 10" high by 2" thick black number one, and with each side of the octagon 10" in length. Class One (explosive) Division 1.1 placards as prescribed by the U.S. Department of Transportation in Title 49 CFR Parts 171 - 180, and 390 - 397, will not be placed on the outside the magazines.

**1.14.3** Packages of explosives stored within the magazine shall be laid flat with top up on wooden pallets. Corresponding grades or brands shall be stored together in such a manner that brands/grade marks show. They can be easily counted, checked, and stacked in a stable manner. Packages of explosives shall not be unpacked or repacked in a magazine nor within 50 feet of a magazine. Tools used for opening packages of explosives shall be constructed of nonsparking materials. Open packages of explosives shall be securely closed before being returned to the magazine.

**1.14.4** Smoking, matches, open flames, spark-producing devices, and firearms shall not be permitted inside or within 50 feet of magazines. The land surrounding the magazines shall be kept clear of all combustible materials for a distance of at least 25 feet. Combustible materials shall not be stored within 50 feet of magazines.

## **1.15 LIGHTNING PROTECTION**

**1.15.1** It is required by DOD 6055.9 to install lightning protection on buildings and structures used for processing, handling, or storage of explosives, ammunition, explosive ingredients, and other hazardous materials, particularly where operations cannot be shut down during electrical storms or in areas with more than five thunderstorm days per year.

**1.15.2** HFA will install some lightning protection systems that conform to the standards of DOD 6055.9, DOD 4145.26M and National Fire Protection Association (NFPA) Standard No. 78.

**1.15.3** There are four types of lightning protection systems acceptable for the protection of structures housing ammunition and explosives. HFA will use the currently installed system on the Bell Knob Tower if after inspection it proves satisfactory. Use of Bell Knob Tower system is equal to a Separately Mounted Shielding System (Mast Type). If the current Bell Knob Tower system is unsatisfactory, HFA will install an appropriate Separately Mounted Shielding System (Mast Type).

**1.15.3.1** If a separate system is required it will be constructed as follows:

**1.15.3.1.1** A metal pole will be used, the pole will act as both the down conductor and a ground. Air terminals need not be provided for this type of system and if the resistance of the pole to ground is 10 ohms or less, additional grounding is unnecessary. When the resistance exceeds 10 ohms, additional grounding rods will be installed and the ground connection will be securely fastened to the metal pole and the ground rod.

**1.15.3.2** If a ground rod is necessary, it will be driven approximately six feet from the base of the pole. The grounding rod will be ten feet long, 3/4 inch solid steel or copper driven into the ground, with the top of the grounding rod at least one foot below the surface. If the resistance to ground of this rod is more than 10 ohms, additional rods will be installed no closer than 10 feet from the first rod.

**1.15.4** Testing - After the system is installed, it will be tested and inspected according to the following schedule and standards:

**1.15.4.1** Seven-Month Test - The lightning protection system shall be inspected visually every seven months for evidence of corrosion or broken wires or loose connections. All repairs will be made immediately.

**1.15.4.2** Fourteen-Month Test - The lightning protection system shall be tested electrically every 14 months to afford testing of the system during all seasons. The test shall be conducted according to the appropriate instrument manufacturer's instructions, by personnel familiar with lightning protection systems.

**1.15.4.3** Test Equipment - Only instruments designed for earth-ground system testing are acceptable. The instrument can measure 10 ohms plus or minus 10 percent for ground resistance testing, and one ohm plus or minus 10 percent for bonding testing. The most recent test results will be kept on file.

Table - 2  
Demolition Explosives

Description	Class/Division	Quantity	NEW	Storage Compatibility Group
NONEL Shock Tube & Initiators	1.1B	5000 Ft.	Less than 10lb	B
Jet Perforators (Shape Charge)	1.4S	80 ea	6.0lbs	D
Detonating Cord (80 gr. per foot)	1.1	1000 ft	7.0lbs	D

Table - 3  
Inhabited Building and Public Traffic Route Distances  
Class 1, Division 1

NEW		Distance in Feet to Inhabited Building from II Magazine Type		Distance in Feet to Public Traffic Route from II Magazine Type	
Over	Not Over	Barricaded	Barricaded	Barricaded	Barricaded
10lbs	20lbs	110	95	95	90

**1.16 HAZARDOUS ASSESSMENT AND MITIGATION**

**1.16.1** Precautions to be taken if hazardous toxic, and radioactive waste or chemical warfare materials are encountered are according to the Site-Specific Safety and Health Plan, Section 2.

**1.16.2** The only known contamination with respect to the site might be the explosive residue from demolition materials and explosive fillers from the UXOs. The migration of any explosive residue contamination is not anticipated and will not be sample for.

**1.17 OFF-SITE DISPOSAL PLAN**

**1.18** No off-site disposal will take place during this Task Order.