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**U.S. Army  
Environmental  
Center**

**Final Health and Safety Plan  
Remedial Investigation and Feasibility Study  
of the  
Defense Property Disposal Office  
Fort George G. Meade, Maryland**

Submitted to

U.S. Army Environmental  
Center (USAEC)  
Aberdeen, Maryland

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Prepared by:

Engineering Technologies Associates, Inc.  
3458 Ellicott Center Drive #101  
Ellicott City, MD 21043

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## 1.0 INTRODUCTION

The purpose of this document is to establish procedures and protocols that will be followed to protect on-site personnel, visitors, and the public from physical harm and exposure to hazardous material or wastes during the remedial investigation/feasibility study of the Defense Reutilization and Marketing Office (DRMO) Site (formerly referred to as the Defense Property Disposal Organization (DPDO) Site) on Fort George G. Meade near Laurel, Maryland. Engineering Technologies Associates, Inc. (ETA) and subcontractor personnel involved in remedial investigations at sites where hazardous substances are present may potentially be exposed to a variety of chemical, physical, environmental, biological, and ergonomic hazards, including:

- Inhalation of toxic airborne contaminants;
- Skin contact with contaminated soil and water;
- Presence of flammable/combustible vapors;
- Explosives or unexploded ordnance;
- Oxygen-deficient atmospheres;
- Heat stress due to protective clothing and environmental conditions;
- Cold stress due to environmental conditions;
- Etiologic agents and biological hazards; and
- Physical hazards associated with field operations (e.g., working near heavy equipment, slips, trips, falls, etc.).

This Health and Safety Plan (HASP) was prepared for the United States Army Environmental Center (AEC), Base Closure Division for use by ETA and subcontractor personnel during the Remedial Investigation and Feasibility Study (RI/FS) at the DRMO Site at Fort Meade. This work is being performed as Delivery Order No. 10 under Contract No. DACA31-92-D-0045. This plan is intended to fulfill general AEC procedures for health and safety as well as those regulations required under the Comprehensive Environmental Responsibility, Compensation, and Liability Act (CERCLA)/Superfund Amendment and Reauthorization Act (SARA) as contained in 29 Code of Federal Regulations (CFR) 1910.120.

All personnel covered by this plan shall comply with all the requirements contained within the plan. The overall purpose of this HASP is to provide personnel protection standards and mandatory safe practices, procedures, and contingencies while performing the tasks outlined in the Work Plan. Any discrepancies between the requirements of this HASP and actions or conditions on site should immediately be brought to the attention of the Site Health and Safety Officer (HSO). The ETA Health and Safety Officer reserves the right to modify contents of this HASP at any point during the project as required or in light of new information.

This plan will be periodically reviewed to ensure that it correctly reflects on-site activities and the proper procedures needed to conduct these activities in a safe manner.

This plan has been reviewed prior to submission to the AEC project officer to ensure that all stated tasks, procedures, and protocol are correct.

\_\_\_\_\_  
Edward F. Miles, ETA Corporate Health and Safety Officer

\_\_\_\_\_  
Date

## **2.0 PROJECT INFORMATION AND BACKGROUND**

### **2.1 Site Location**

Fort George G. Meade is located in Anne Arundel County, Maryland, between Washington, D.C. and Baltimore, Maryland (Figure 1). It encompasses approximately 13,000 acres. The closest town is Laurel, Maryland which is located less than five miles to the west.

The Baltimore-Washington Parkway (U.S. Route 295) and Route 197 are located west and south of Fort Meade, respectively. Route 198 spans the facility from east to west and Route 175 crosses Fort Meade's northeast corner. The Baltimore and Ohio Railroad has tracks across Fort Meade's northern half and Amtrak has rails that run along the southeast border. The Universal Transverse Mercator (UTM) coordinates for the furthest extents of the base are 4332400 north, 0352100 west, 4321900 north, and 0341600 west.

### **2.2 Site Description**

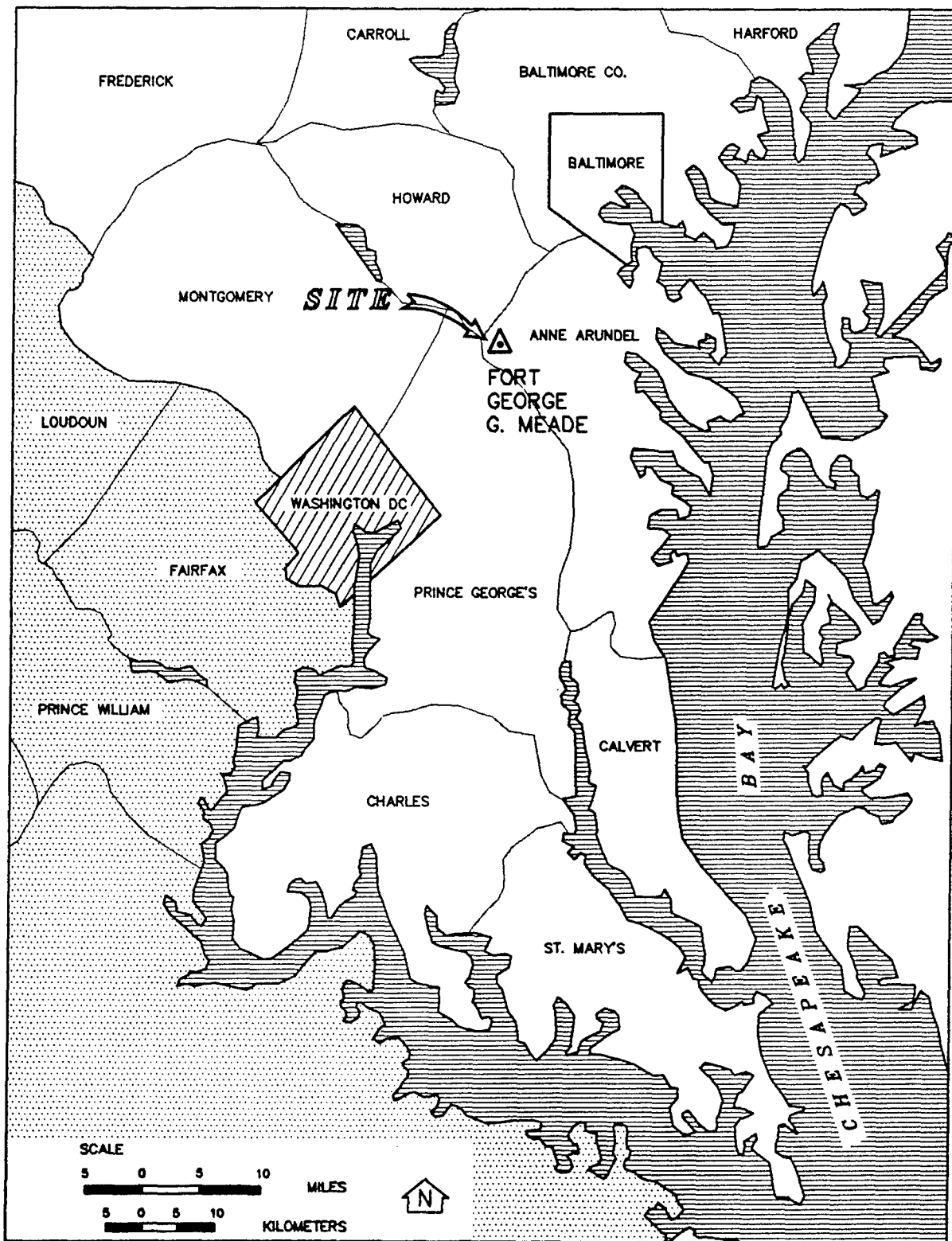
Fort Meade has been a permanent U.S. Army installation since 1917. The installation contains administrative, recreational, and housing facilities. It also contains limited training areas and firing/combat ranges. The Fort Meade community consists of a residential population and daytime work force of approximately 20,000.

The DRMO Site (Figure 2), located north of Route 32 and northeast of the Tipton Army Airfield, was formerly used as a storage area for polychlorinated biphenyl (PCB) containing transformers and heavy equipment. As a result of these activities there is a potential for contamination of the surficial soils and groundwater. The possible contaminants include PCBs, volatile organic compounds (VOCs), and metals. Although the possibility of UXO in the area of the DRMO Site is not high, precautions will be taken during the RI to minimize the risk involved with the installation of monitoring wells.

### **2.3 Site History and Prior Investigations**

In 1988, the U.S. Army Base Realignment and Closure Act (BRAC) recommended that 9,000 acres of the 13,000-acre facility be closed or excessed. The 9,000-acre area encompassed the southernmost two-thirds of the installation. On October 1, 1991, the U.S. Army transferred 7,600 of the 9,000 acres to the Patuxent Wildlife Research Center (PWRC), a Department of the Interior facility.





SOURCE: ESE, 1986

DESIGNED	EM.	10/84
DRAWN	SP.	10/84
CHECKED	LL	10/84
APPROVED	DK	10/84

**ENGINEERING TECHNOLOGIES ASSOCIATES, INC.**

ENGINEERS • PLANNERS • SURVEYORS

3408 ELIZABETH CENTER DRIVE SUITE 104  
 ELLSWORTH CITY, MARYLAND 21040  
 (410) 421-0200 FAX: (410) 421-0200

Figure 1  
**FORT GEORGE G. MEADE  
 LOCATION MAP**

SCALE: AS SHOWN CONTRACT NO. E2307.010 DATE: OCT. 13, 1984 SHEET

E 08000      E 07000      E 06500      E 071000

N 458110

N 458000

N 457300

N 457000



OPEN STORAGE AREA

INACTIVE LANDFILL NO. 4

ROUTE 32

DRY  
SITE

GRAPHIC SCALE



1 Inch = 250 Feet

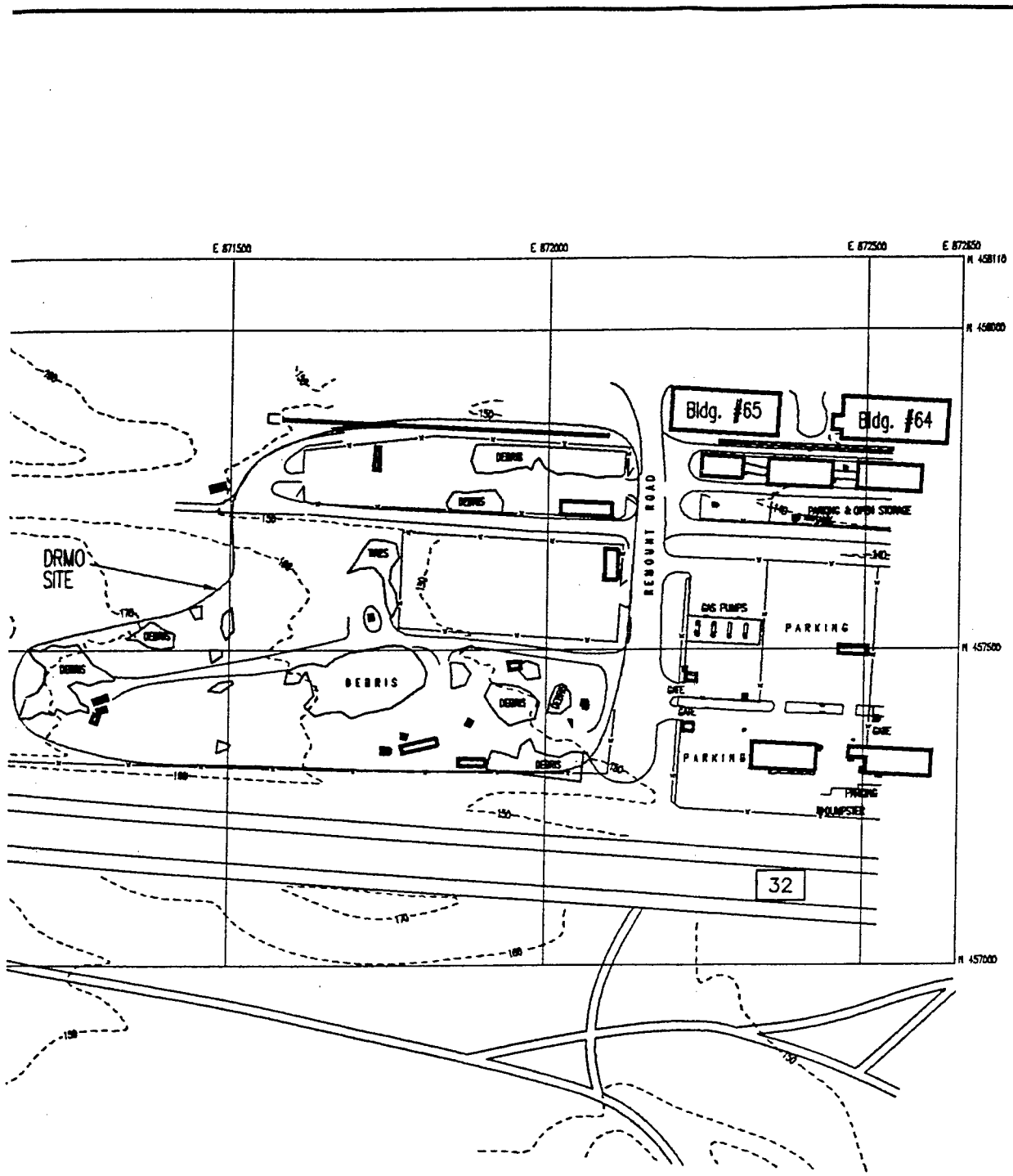


FIGURE NO. 2

**DRMO**  
**SITE LOCATION**  
**FORT MEADE, MARYLAND**

SCALE: AS SHOWN      CONTRACT NO: 92307.010      DATE: 04/95      SHEET: 1

**ENGINEERING TECHNOLOGIES ASSOCIATES, INC.**

ENGINEERS \* PLANNERS \* SURVEYORS  
 3458 ELLICOTT CENTER DRIVE SUITE 101  
 ELLICOTT CITY, MARYLAND 21043  
 BALTO. 481-9800 WASH. 621-4480

LEGEND

TOPOGRAPHIC CONTOUR



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DESIGNED	K.W.	4/95
DRAWN	S.P.	4/95
CHECKED	K.W.	4/95
APPROVED	D.K.	4/95

Several environmental investigations have been conducted at Fort Meade since the BRAC decisions, including an Enhanced Preliminary Assessment, a study by the Maryland Department of Natural Resources, an Environmental Impact Statement, a Wetland Identification Study, a Remedial Investigation, a Site Inspection Study, and a Feasibility Study.

The Enhanced Preliminary Assessment was conducted by Argonne National Laboratory in 1989. The report includes a review of all available records related to air, soil, surface water, and groundwater. It identified six areas of concern at Fort Meade including active and inactive landfills, underground storage tanks, asbestos, unexploded ordnance, surface water, and burning grounds.

The Maryland Department of Natural Resources conducted an evaluation of the surplus property in January of 1990. The study described the natural features and land uses associated with the 9,000 acres to be excessed from Fort Meade and contained discussions pertaining to the degree of development of the remaining land.

An Environmental Impact Statement (EIS) was conducted for Fort Meade, Fort Holabird, Maryland, and Fort Belvoir, Virginia in January 1990 by Rogers, Golden & Halpern, Inc. (RGH). The report focused on the affected environmental areas of these installations. The EIS described the existing conditions on the 9,000 acres scheduled to be excessed and evaluated the consequences of several use/reuse scenarios.

A Wetland Identification Study was performed in January 1991 by RGH and CH<sub>2</sub>M Hill, Inc. This study was designed to complete the study for the closure and use/reuse alternatives for the 9,000 acres to be excessed. The report described the methods used to identify wetlands and included a map of wetlands distribution.

A final Environmental Impact Statement for the comprehensive base realignment and partial closure for Fort Meade and Fort Holabird was prepared by the U.S. Army Corps of Engineers, Baltimore District in July 1991. The Final EIS covers only 1,400 acres of the 9,000-acre parcel of Fort Meade. The remainder of the parcel was scheduled for transfer to the PWRC at the time of the final report.

A draft Remedial Investigation report was prepared by EA Engineering, Science and Technology, Inc. in November 1991. This report focused on an active sanitary landfill and a clean fill dump. The final report was issued in October 1992.

A draft Site Inspection report was submitted by EA Engineering, Science and Technology, Inc. in January 1992. This report discusses conditions at a helicopter hanger, four inactive landfills, the DRMO Salvage Yard, a fire training area, an ordnance demolition area, underground storage tanks, and asbestos. The final report was submitted in October 1992.

The AEC has estimated a preliminary Hazard Ranking System (HRS) score for several sites at Fort Meade. The calculated score, 50.0 was well above the score necessary for inclusion on the

National Priorities List (NPL). The groundwater pathway had a high numerical score due to the likelihood of release of hazardous substances into the groundwater, the waste characteristics, and the potential receptors within a four-mile radius.

The Feasibility Study Conducted by A.D. Little, Inc. in 1993 focused on seven areas of concern on Fort Meade including the DRMO Salvage Yard and Transformer Storage Area.

## **2.4 Purpose of Work**

The purpose of this Delivery Order is to conduct a focused Remedial Investigation and Feasibility Study of the DRMO Site at Fort Meade. The purpose of this HASP is to provide personnel protection standards and mandatory safe practices, procedures, and contingencies while performing the tasks outlined in the Work Plan. Detailed objectives for each deliverable and activity in the task are included in the ETA Fort Meade Technical Work Plan, which has been provided as a separate document.

The overall purpose of the RI is to evaluate the extent and rate of migration of contamination at sites which, according to historical and site data, may have the potential to adversely effect the environment. This RI is intended to determine if contaminated groundwater at the DRMO Site is migrating towards an area that is scheduled to be excised.

Personnel conducting the RI may encounter various chemical, physical, and environmental hazards. This site-specific HASP has been prepared to establish necessary work precautions and procedures to minimize the anticipated hazards to which on-site personnel may be exposed.

The overall objective of this HASP is to provide on-site personnel with the required procedures to ensure safe working conditions. The safety organization and procedures contained in this plan have been established based on an analysis of potential site hazards. Personnel protection measures have been selected in response to these hazards.

All work will be conducted in accordance with applicable Federal, state, and local regulations, including the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) requirements of 29 Code of Federal Regulations (CFR) 1910 and 1926. This plan is primarily intended to address the requirements of the Hazardous Waste Operations and Emergency Response Standard, 29 CFR 1910.120. Other work place standards or guidelines shall be used in place of the OSHA standards when they are more stringent than OSHA standards, or when no OSHA standard exists. Examples of such guidelines include recommendations proposed by the American Conference of Governmental Industrial Hygienists (ACGIH), the National Institute of Occupational Safety and Health (NIOSH), and existing U.S. Army standards. This plan shall also be implemented in accordance with the U.S. Environmental Protection Agency's (EPA) protocol, Guidelines for Conducting Remedial Investigations and Feasibility Studies under CERCLA (EPA 540/G-89/004). The ETA Corporate Health and Safety Plan shall be the reference document for other ETA-specific health and safety policies and procedures regarding work at hazardous waste sites.

## **2.5 Work Tasks**

The field tasks included in this focused RI and covered by this HASP are:

- Task 1 - A preliminary site reconnaissance and data review.
- Task 4 - The actual remedial investigation, including UXO screening, monitoring well installation and soil sampling, surveying, groundwater level measurements, and groundwater, surface water, and sediment sampling and analysis.
- Task 5 - The feasibility study will involve the collection of a number of ecological samples from the site.

A more detailed discussion of each of these tasks can be found in the ETA Fort Meade Technical Work Plan.

### **3.0 SITE HAZARD SUMMARY**

Hazards that may be encountered at this site can be classified into four general categories: explosives and unexploded ordnance; chemical and radioactive hazards; physical hazards; and environmental hazards. Explosives and unexploded ordnance (UXO) pose a threat to on-site personnel due to the risk of detonation or burning. Chemical and radioactive hazards involve the potential exposure of site personnel to chemical or radiological contaminants in soil and groundwater. Physical hazards are generally occupationally-specific and may involve some type of accident, exposure to noise, electrical hazards, etc. Environmental hazards are created by natural environmental circumstances such as weather, poisonous plants or animals, insect bites, etc. To minimize the likelihood of an accident, all on-site personnel shall be familiar with the Accident Prevention Plan in Appendix A.

#### **3.1 Explosives and Unexploded Ordnance and Abatement Procedures**

UXO represent a special hazard based upon the potential for bodily injury and death. Therefore, those areas which have been identified as areas which potentially contain UXO, based upon historical research and reported findings will be screened before and during site activity by a subcontractor with experience in UXO screening.

Any work, surface or intrusive, will be performed in accordance with the AEC UXO contractor requirements. The UXO subcontractor will provide qualified personnel and equipment necessary to locate and avoid all ordnance, energetic, and explosive items from work areas. In the event that UXO is found, the UXO subcontractor will immediately notify the Project Manager and the AEC representative. The AEC will be responsible for the removal and disposal of any ordnance known or suspected to contain chemicals agents.

The Site HSO will accompany the UXO subcontractor on site at all times. The subcontractor's standard operating procedures for UXO is included as Appendix B.

#### **3.2 Chemical and Radioactive Hazards and Abatement Procedures**

Information concerning the primary contaminants at the Fort Meade DRMO Site is presented in Appendix C. These contaminants, including aluminum, Bromacil (pesticide), carbon tetrachloride, chloroform, chromium, 1,1-dichloroethene, iron, lead, manganese, polychlorinated biphenyls (PCBs), tetrachloroethylene (perchloroethylene (PCE)), 1,1,1-trichloroethane, and trichlorofluoromethane, may be present in the soil, surface water, sediment, and groundwater at the site. Contaminants of concern were selected based on their toxicity and the concentrations that have previously been detected at the site. Although several of the contaminants are known human carcinogens, it is unlikely that all of the chemicals listed will be encountered during the RI.

As a routine precaution, a general radiation survey will be conducted with a geiger counter at each work site to determine if radioactive materials are present at levels requiring special health and safety procedures.

Although the potential acute symptoms of overexposure to site contaminants is considered low, the most likely source of overexposure would be VOCs. Common symptoms of overexposure to VOCs include: headaches, dizziness, nausea, eye irritation, fatigue, loss of coordination, visual disturbances, abdominal pains, and cardiac arrhythmia.

### **3.3 Physical Hazards and Abatement Procedures**

All personnel, including ETA employees and subcontractors will be exposed to potentially harmful physical dangers as a result of site activities. The physical hazards expected to be present at the site during the RI include:

- Irregular work surfaces;
- Snapping cables, slings, and ropes;
- Drilling equipment;
- Moving equipment and vehicles;
- Sharp objects;
- Fire or explosion;
- Buried utility lines and systems
- Excessive noise;
- Improper use of drilling equipment;
- Fixatives in sample containers;
- Slips, trips, and falls; and
- Improper lifting of heavy objects.

Most of the physical hazards identified in Section 3.3 will be abated through the use of safe work practices and common sense. However, some of these hazards require special precautionary procedures. Although confined space entry as defined under 29 CFR 1910.146 is not foreseen for this task, under no circumstances will an ETA employee or subcontractor enter a confined space under this assignment.

#### **3.3.1 Fire or Explosion Hazard**

Whenever the site work involves the disturbance of hydrocarbon-contaminated soils, the potential for a fire or explosion may be present. The primary source of flammable gases and vapors at the DRMO Site is vapors from VOCs in the soil, sediments, surface water and groundwater. During invasive operations, periodic monitoring of flammable vapors/gases will be accomplished by using a combustible gas indicator. Air monitoring requirements are included in Section 8.1.2 of the HASP. ABC fire extinguishers will be available to on-site personnel. All on-site personnel will be trained in their proper use. The emergency response aspects of fire suppression are included in Section 10.5 of the HASP.



### 3.3.2 Buried Utility Lines or Systems

Fort Meade Engineering staff will be contacted prior to any drilling or digging activity to determine the presence and locations of any underground cables, utility lines, pipes and storage tanks at the DRMO Site. Utility maps will be also reviewed to determine if there are any subsurface conflicts with proposed activities. Miss Utility will be notified at least 48 hours prior to any invasive operations to mark public and private utility lines and underground equipment. Drilling locations will also be screened for underground hazards using a pipe and cable locator prior to drilling operations.

### 3.3.3 Excessive Noise

If noise levels at the site are likely to exceed 85 dBA for any portion of the drilling operation, hearing protection will be required to be worn by all personnel in the work area. As a general guideline, if site workers (standing next to each other) must shout to communicate with each other, hearing protection should be worn.

### 3.3.4 Improper Use of Drilling Equipment

Overhead power lines and obstructions will be surveyed prior to commencing drilling operations. The drilling foreman and the Site HSO will check the overhead area and the area surrounding the rig prior to raising the mast on the drill rig. No drilling will be conducted within 50 feet of an overhead power line or obstruction. When rotary drilling/sampling, drill rods will not be racked more than one and one-half times the height of the mast. During rig setup, drilling operations, and rig takedown, all personnel who enter the Exclusion Zone will wear hard hats, steel-toed safety boots or shoes, and safety glasses or face shields. Respiratory protection may be required based on area and personnel monitoring. If there is any indication of underground tanks, drums, or other containers during drilling operations, the drilling will be halted immediately and the Site HSO notified. Indications that a container may have been hit include: a change in the speed or momentum of the auger; visual examination of the cuttings; odor noted in the cuttings; or the presence of airborne VOCs as measured with the air monitoring equipment.

### 3.3.5 Fixatives in Sample Containers

Fixatives will be used for some of the samples collected in the field. The possibility exists for direct contact with these fixatives, some of which are potentially hazardous substances. To mitigate this hazard, personal protective equipment will be worn in accordance with Section 8.1.4 of the HASP. Material Safety Data Sheets (MSDS) for all hazardous materials will be maintained on site.

### **3.4 Environmental Hazards and Abatement Procedures**

Environmental hazards such as inclement weather, poisonous plants, animals, and insects cannot always be avoided. Hazards brought on by heat and cold stress also cannot always be avoided. Based on available information and current site conditions, the Site HSO and site personnel shall use their best judgement and the following procedures to mitigate these potential hazards.

#### **3.4.1 Insect and Pest Hazards and Abatement Procedures**

Insects and pests (e.e., ticks, mosquitos, bees, snakes, and rats) are potentially present on site. The site work will likely take place in the late fall or early winter which will mitigate these hazards. However, suitable precautions shall be taken based on the nature and severity of the hazard. Personnel shall wear long-sleeved shirts, long pants, and boots that extend above the ankle or socks pulled over the cuffs of the pants. Pants may be tucked into boots. Insect repellent containing DEET may be used liberally in accordance with directions on the containers. If DEET-containing compounds are used, special care must be taken to avoid contamination of samples and equipment. Boots will be steel-toed and puncture resistant. Light-weight overclothing such as Tyvek pants, jackets, and hoods will be worn in extreme circumstances. If these measures are required, all clothing interfaces should be taped with duct tape. Individuals should periodically check each other, particularly in the hair and around garment interfaces for ticks and other insects. ETA will maintain an emergency snake bite kit on site at all times. For site workers who are known or suspected to be allergic to bee stings, as well as any other insect bites, the Project Manager and Site HSO should be notified. These site workers must carry appropriate medication during site activities.

Ticks in the area of the site can carry several disease organisms, including Lyme's Disease and Rocky Mountain Spotted Fever. Symptoms of Lyme's Disease include flu-like symptoms; stiffness in joints; crippling arthritis; multiple sclerosis-like symptoms; and a "bull's eye" rash (small welt in center; not all victims will develop the rash). Symptoms of Rocky Mountain Spotted Fever include chills; fever; headache; fatigue; stiff neck; and bone pain. A red rash of red spots under the skin will appear three to ten days after the tick bite. In both cases, if symptoms appear, workers should seek medical attention. If workers discover a tick attached to the skin, it is best to grasp the tick with fine pointed tweezers or rounded forceps, making sure to remove the pincers. Disinfect the area and bandage. Observe the area for at least one month.

#### **3.4.2 Heat Stress Hazard and Abatement Procedures**

On-site workers can easily be exposed to heat stress during site activities. The wearing of personal protective clothing can place a worker at considerable risk of developing heat stress. This can result in health effects ranging from transient heat fatigue to serious illness or death. Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, work load, and the individual characteristics of the worker. Because heat stress is probably one of the most common, and potentially most serious illness at project sites, regular

monitoring and other precautions are vital. ETA employees have received awareness training and should be able to recognize the onset of heat stress. Heat stress monitoring shall begin when personnel are wearing protective clothing, including Tyvek coveralls, and the ambient temperature exceeds 70 degrees Fahrenheit. If cotton coverall work garments are worn, monitoring shall commence at 85 degrees Fahrenheit. The Site HSO will establish work and rest periods based on ambient temperature and cloud cover in accordance with Table 1.

**Table 1 Work/Rest Periods for Site Workers**

<b>Adjusted Temperature (degrees Fahrenheit)</b>	<b>Work Period in Level C/D Ensemble</b>	<b>Rest Period</b>
90 or above	45 minutes	15 minutes
87.5 to 90	60 minutes	15 minutes
82.5 to 87.5	90 minutes	15 minutes
77.5 to 82.5	120 minutes	15 minutes
below 77.5	150 minutes	15 minutes

Many control measures and procedures are available to mitigate the effects of heat stress, including:

- Provision of adequate liquids to replace lost body fluids. Employees must replace water and salts lost from sweating. ETA employees and subcontractors shall be encouraged to drink more than the amount necessary to satisfy thirst. Thirst satisfaction is not an adequate indicator of adequate fluid and salt replacement. Replacement fluids including commercial electrolyte supplements such as Gatorade will be provided to ETA employees in conjunction with fresh, cool water.
- A work regimen will be established to provide adequate rest periods in shaded areas. If necessary, additional shifts of workers will be added.
- If necessary, cooling devices such as vortex tubes or cooling vests may be worn beneath protective garments.
- ETA employees shall remove impermeable protective garments during rest periods.
- ETA employees shall not be assigned to other tasks during rest periods.
- All ETA employees will receive information concerning the importance of adequate rest, acclimation, and proper diet in the prevention of heat stress.

During periods of high temperature and/or humidity, the Site HSO will continually observe site workers for symptoms of heat stress. The first symptoms of heat stress include fatigue, irritability, anxiety, and a decrease in concentration and movement. As early as possible during a rest period, the radial pulse should be taken for at least 30 seconds. The workers oral temperature should also be taken before drinking. If the pulse count exceeds 110 beats per minute or the body temperature exceeds 99.6 degrees Fahrenheit, the following work cycle will be shortened by one-third. Rest periods will remain the same. If the pulse count exceeds 110 beats per minute or the body temperature exceeds 99.6 degrees Fahrenheit after the next work cycle, the following work cycle will be shortened by one-third. Site workers will not wear semipermeable or impermeable garments when the body temperature exceeds 100.6 degrees Fahrenheit.

More serious situations can develop from simple heat stress, including heat rash, heat cramps, heat exhaustion, and heat stroke. Heat rash is caused by continual exposure to heat and humid air, and is aggravated by chafing clothes. Heat rash decreases a person's ability to tolerate heat and can become an irritating nuisance. Heat cramps are caused by profuse sweating with inadequate water and electrolyte replacement. Heat cramps result in muscle spasms and pain in the extremities and abdomen. Heat exhaustion is caused by increased stress on various organs that are being pushed to meet increasing demands to cool the body. Symptoms include: shallow breathing; pale, cool, moist skin; profuse sweating; dizziness; and lethargy. Heat stroke is the most severe form of heat stress. Symptoms include: red, hot, dry skin; no perspiration; nausea; dizziness and confusion; strong, rapid pulse; and coma. A person suffering heat stroke must be treated immediately by cooling the body. Death can occur very quickly.

In the event of a heat stress related injury or illness, ETA personnel will render the appropriate level of first-aid, and, if necessary, request assistance from emergency medical personnel and the Fort Meade Hospital.

### 3.4.3 Cold Stress Hazards and Abatement Procedures

Persons working outdoors in temperatures at or below freezing may experience cold stress and frostbite. Extreme cold for a short time may cause severe injury to the skin, or result in generalized cooling which could lead to death. Areas of the body that have a high surface area to volume ratio such as fingers, toes and ears are most susceptible.

Two factors influence the development of a cold stress-related injury: ambient temperature and wind velocity. Wind chill is used to describe the chilling effect of moving air in combination with low temperature. The wind chill factor associated with a particular wind/temperature combination is equivalent to the still-air temperature that would have the same chilling effect. This effect is heightened if the site worker removes chemical-protective clothing and exposes perspiration-soaked clothing.

Local injury resulting from cold stress is generally referred to as frostbite. There are several degrees of damage, including: frost nip or initial frost bite; superficial frostbite; and deep

frostbite. Frost nip or initial frostbite is characterized by sudden blanching or whitening of the skin. Superficial frostbite is characterized by skin taking on a waxy or white appearance that is firm to the touch. Deep tissue is still resilient. Deep frostbite results in tissue that is cold, pale and solid. Deep frost bite is extremely serious and professional care must be sought immediately.

Hypothermia is caused by exposure to freezing or rapidly dropping temperature. It can also be brought on by temperatures well above freezing. Its symptoms are usually exhibit in five stages: shivering; apathy, listlessness, sleepiness; unconsciousness, glassy stare, slow pulse, and slow respiratory rate; freezing of the extremities; and death.

Thermal socks, long cotton or thermal underwear, hard hat liners, or other cold weather gear can aid in the prevention of hypothermia. ETA employees will be directed to don the proper equipment by the Site HSO. Blankets, warm drinks (non-caffeinated), and warm rest areas will be provided as required. ETA employees have received awareness training and should be able to recognize the onset of cold stress or hypothermia. All ETA employees will try to stay dry and warm. If a site worker does get wet in a cold environment, the Site HSO will ensure that the worker immediately dries off and changes clothes.

### **3.5 Initial and Periodic Site Evaluation**

A preliminary site evaluation will be accomplished by the Health and Safety Officer to ensure that all site activities, personnel protection, and emergency response are consistent with the levels of contaminants expected to be encountered during work at the site. Additional data obtained during the course of the work will be incorporated, and, if necessary, the HASP will be updated. If additional contaminants are encountered on site, all personnel will be made fully aware of their hazardous properties and appropriate procedures will be added to the HASP to prevent exposure.

## 4.0 PROJECT ORGANIZATION

### 4.1 Project Staff and Health and Safety Organization

ETA will serve as the prime contractor for the RI to be performed at the DRMO Site on Fort Meade. ETA will monitor site activities and will have limited direct contact with known or suspected contaminants. The UXO screening; drilling and installation of the groundwater monitoring wells; and laboratory analysis of the groundwater and soil will be performed by subcontractors who will be directly contracted by ETA.

#### 4.1.1 AEC Personnel

- Contracting Officer Representative: Mr. Scott Hill
- Health and Safety Officer: Ms. Vivian Graham

#### 4.1.2 Engineering Technologies Associates, Inc. Personnel

- Program Manager/Principal: Mr. Donald Koch, P.E.
- Project Manager: Mr. Larry Lumeh
- Corporate Health and Safety Officer: Mr. Edward Miles
- Project Certified Industrial Hygienist: Mr. Phillip L. Jones (Woodward Clyde Federal Services)
- Project Field Supervisor: Mr. Larry Lumeh
- Site Health and Safety Officer: To be determined
- On-Site Technicians and Field Personnel

### 4.2 Responsibilities

#### 4.2.1 Program Manager/Principal/Project Manager

- Acts as day-to-day liaison with AEC Project Manager.
- Reviews and approves the initial site-specific HASP and any future revisions or amendments.
- Assures that the fieldwork proceeds according to the requirements of the HASP.
- Coordinates with the Corporate HSO and the Site HSO.
- Responsible for on-site implementation and enforcement of the HASP by all personnel.
- Designates field personnel who meet qualification requirements of the HASP.
- Coordinates with all ETA subcontractors to ensure that they are informed of, agree to, and comply with, all requirements of the HASP.

#### 4.2.2 Corporate Health and Safety Officer

- Gives final authority on all health and safety issues, concerns, or conflicts that impact the project.

- Supervises and controls the corporate health and safety program.
- Prepares the site-specific HASP.
- Provides ongoing safety support to the project.
- Acts as the primary health and safety liaison to the AEC.
- Conducts health and safety site orientations, training, and periodic safety inspections and audits, as required.
- Stops work at the job site when unacceptable health and safety risks are found to exist.
- Consults with project Certified Industrial Hygienist (CIH) on matters of safety at the site and proposed modifications to the site-specific HASP.

#### 4.2.3 Project Field Supervisor

- Coordinates and supervises all field work.

#### 4.2.4 Site Health and Safety Officer

- Coordinates all on-site health and safety activities.
- Provides health and safety briefings.
- Monitors all field activities to ensure compliance with the Corporate HASP and the site-specific HASP.
- Reports deviations from the HASP to the Project Field Supervisor and the Health and Safety Officer.
- Recommends modifications of the site-specific HASP to the Corporate HSO.
- Oversees the distribution, use, maintenance, and disposal of personal protective equipment and clothing.
- Establishes Exclusion zones.
- Coordinates the exclusion of non-essential personnel from the Exclusion Zone.
- Uses appropriate portable field instruments and personnel as specified in the HASP to monitor site conditions in the Exclusion Zone.
- Maintains a log of field activities, monitoring, and site orientations, and submits appropriate summary reports.
- Prepares any incident reports.
- Stops work when unacceptable health and safety risks exist.
- Acts as Emergency Coordinator until relieved by Fort Meade Emergency Response Team.
- Recommends consultation with project CIH as appropriate.

#### 4.2.5 On-Site Technicians and Field Personnel

- Comply with the requirements of this HASP.
- Immediately notify the Site HSO of hazardous, potentially hazardous, or unsafe work conditions or environments that are not addressed or are not adequately addressed in the site-specific HASP.
- Conduct work consistent with normal safe working practices.

- Attend all on- and off-site Health and Safety Briefings.
- Comply with current training and medical surveillance requirements.

### **4.3 Subcontractors**

Subcontractors and respective services provided for the site investigation include:

- Harford Drilling Services: provide drilling and installation of groundwater monitoring wells
- Woodward Clyde Federal Services: site visits, risk assessments, and CIH services
- UXB International: provide screening for UXO
- DataChem Laboratories: provide analytical services

If additional subcontractors are required for site activities, the names and services provided will be added to the HASP as an appendix.

All subcontractors will:

- Comply with the requirements of this HASP.
- Immediately notify the Site HSO of hazardous, potentially hazardous, or unsafe work conditions or environments that are not addressed or are not adequately addressed in the HASP.
- Conduct work consistent with normal safe working practices.
- Attend all on- and off-site Health and Safety Briefings that are appropriate to their respective tasking.
- Comply with current training and medical surveillance requirements.



## **5.0 REGULATORY REQUIREMENTS AND PERSONNEL QUALIFICATIONS**

In order to be authorized for project fieldwork all ETA and subcontractor personnel must be certified as having met the minimum requirements described in the sections below.

### **5.1 Medical Surveillance**

In compliance with OSHA medical surveillance requirements (29 CFR 1910.120), supervisory personnel and field personnel, including subcontractor personnel, shall have received an examination by a licensed physician. The most recent exam shall have been given within the 12-month period proceeding this work, and each employee shall have been determined by the attending physician to be physically able to perform the work and to use respiratory and other protective equipment as typically required for a field investigation of this nature. ETA's Hazardous Waste Site Medical Surveillance program is coordinated through the Baltimore Industrial Medical Center in Baltimore, Maryland. Additional material concerning ETA's Medical Monitoring Program is contained in Appendix D.

### **5.2 Health and Safety Training**

All on-site management and field personnel, including subcontractor personnel, shall have received training and/or experience that, at a minimum, satisfies the OSHA regulations for hazardous waste and emergency response (29 CFR 1910.120). Once basic training has been received, annual refresher training must also be completed in accordance with ETA's scheduling requirements. Basic training topics are provided in Appendix E. The field operations supervisor must have received eight hours of additional training in accordance with OSHA requirements. At least one of the field team members must be first aid and/or CPR trained. Due to the on-site hazards, ETA field staff and subcontractor personnel involved with the UXO screening shall attend a special briefing on explosives and ordnance safety conducted by the UXO subcontractor.

### **5.3 Respirator Training**

All personnel, including subcontractor personnel, who will be within any established Exclusion Zone shall have completed a respiratory protection program that at a minimum satisfies the OSHA regulations (29 CFR 1910.134). This program shall include: (1) instruction in the proper use, limitations, and care of respirators; (2) proper fitting of personnel for a respirator, using either a qualitative or quantitative fit test method; and (3) teaching personnel how to conduct either a positive and negative pressure fit test. Personnel shall be fit tested and assigned a respirator model and size that will be available to them for site work.

### **5.4 Health and Safety Site Orientation Meeting**

All site personnel shall be required to read this HASP and attend the initial Health and Safety Site Orientation and all site Health and Safety Briefings relevant to their site work. All subcontractors shall conduct their work in accordance with the policies and procedures outlined

in this Health and Safety Plan, or provide to the HSO a health and safety plan that meets or exceeds the requirements of this plan.

### **5.5 Documentation of Personnel Training and Medical Surveillance**

Records of training and medical surveillance are maintained at ETA's corporate office in Ellicott City, Maryland. Site visitors and other individuals who enter the Exclusion Zone must attend a pre-entry briefing where they will be briefed about site operations, potential hazards, and the necessary precautions. All visitors must be accompanied by an ETA escort at the site.

## **6.0 SITE CONTROL**

The purpose of the site control measures discussed in this section are to maintain order at the site and to minimize chemical and physical hazards to on-site personnel, visitors, and the public. Only personnel identified as "authorized" will be permitted to enter the site. A master list of authorized personnel will be available and will only include personnel who have received the appropriate training and medical certification required by this HASP and OSHA requirements.

### **6.1 Work Zones**

Work zones are designed to prevent employees, visitors, and the surrounding environment from exposure to contamination during all aspects of site investigation activities. All work zones and support areas will be established by ETA. Movement of personnel and equipment between zones and on and off the site will be controlled by means of designated access points. Minimum personal protective equipment (PPE) for work in each zone is described in Section 8.1.4.

### **6.2 Exclusion Zones**

During select on-site operations, the Site HSO may determine that it is necessary to establish and maintain Exclusion Zones. The Exclusion Zones may be marked using plastic caution tape supported by metal or wood stanchions, safety cones and flagging tape, or other equivalent demarcation methods. The Exclusion Zone encompasses the surface areas within a 50-foot radius around the location of drilling operations. A formal Exclusion Zone may not need to be established for other planned operations; however, steps must be taken to ensure that personnel and equipment are properly decontaminated (See Section 8.1.6) and that contaminated materials are not removed from the work area.

The Site HSO will be responsible for coordinating the prohibition of non-essential personnel within the Exclusion Zone boundaries. Prior to entering the Exclusion Zone, site personnel shall have donned the proper PPE for expected site conditions and the particular operation, as determined by the Site HSO (see Section 8.1.4).

### **6.3 Contamination Reduction/Decontamination Zones**

The Contamination Reduction Zone will be established as a buffer zone between the Exclusion Zone and the Support Zone of each drilling site. All personnel and equipment leaving the Exclusion Zone will do so through the Contamination Reduction Zone. The personnel and equipment decontamination stations, described in Section 8.1.6, will be located in this zone.

Contamination Reduction Zones, or decontamination zones, shall be established adjacent to the Exclusion Zones. Personnel exiting the Exclusion Zones shall undergo appropriate decontamination activities as directed by task-specific procedures in Section 8.0.

## **6.4 Support Zone**

The Support Zone will be established near the site entrance. No special clothing or protective equipment, except hard hats and leather or chemically resistant boots with steel toes, is required in this area. Operational and support facilities (supplies, equipment, storage, and maintenance areas) will be located in this area.

## **6.5 Site Entry and Exit**

All persons entering an Exclusion Zone will be required to wear the personal protective equipment specified in Section 8.1.4.

The following protocols will be followed when leaving the Exclusion Zone and Contamination Reduction Zone:

- All personnel will exit through the designated exit points.
- All personnel will proceed through appropriate decontamination, as specified in Section 8.1.6.

All protective equipment will be removed in the Contamination Reduction Zone.

## **6.6 Site Access and Parking**

No personal vehicles are to travel beyond the van used as the base of operations to help accomplish work tasks. Other vehicles should not be driven on the site unless necessary and approved by the project Field Supervisor.

## **6.7 Communications**

Communication on site, including into or out of the Exclusion Zone, will generally be accomplished by voice; however, walkie-talkie devices and cellular phones will be available during on-site activities. If more than two people require or request the use of the walkie-talkies for the same day, the site supervisor shall resolve who has priority, provide additional communication devices, reschedule one or more tasks, or otherwise resolve this situation to the satisfaction of interested parties and the Site HSO. Prior to conducting work in a particular area, the project Field Supervisor will locate the nearest telephone and instruct all personnel regarding its location. A cellular telephone(s) will also be available on site for the sole purpose of emergency notification.

## **6.8 Buddy System**

All work operations will be scheduled so that no employee works alone on site at any time. Each worker will maintain visual contact with another specified worker at all times. The buddy system will ensure against an employee becoming stressed, ill or injured without a co-worker

being aware of his or her condition. Workers must watch out for each other while working close to potential chemical and physical hazards.

## **7.0 GENERAL HEALTH AND SAFETY WORK PROCEDURES AND PRECAUTIONS**

### **7.1 Health and Safety Site Orientation**

The Site HSO shall conduct a health and safety site orientation prior to the initiation of field activities. The orientation will cover all aspects of the site-specific HASP with special emphasis on explosives and ordnance safety. This session will also serve as a formal review of site hazards and potential health effects, the Accident Prevention Plan (Appendix A), safe work procedures and precautionary measures, use of personal protective equipment, decontamination procedures and emergency response procedures. All field staff are required to attend these briefings. This orientation, in addition to periodic Health and Safety Briefings, shall act as the informational programs in accordance with OSHA 1910.120. Material Safety Data Sheets (MSDSs) for chemicals used on site shall be maintained by the Site HSO and will be accessible to all personnel upon request. All site personnel will be required to sign off in the HASP Review Record prior to conducting on-site activities. This form shall become part of the site record.

### **7.2 Health and Safety Briefings**

The Site HSO will conduct a daily Health and Safety Briefing. Topics to be covered, as needed, include personal protective equipment, personnel and equipment decontamination procedures, accident prevention, emergency notification, and any modifications or amendments to the HASP. On-site field staff are required to attend the briefing and attendance will be documented in the field log book.

### **7.3 Field Station**

If required, a field station shall be established at the site in a space provided by Fort Meade. Fort Meade will provide all power and office facilities.

### **7.4 Accident Prevention Plan**

ETA's Accident Prevention Plan is provided in Appendix A. This plan addresses general site safety, including training, sanitation, fire prevention, housekeeping, protective equipment, equipment maintenance, and site inspections. The provisions of this plan must be adhered to by all on-site personnel and subcontractors.

### **7.5 Safe Work Practices**

#### **7.5.1 General**

Safe work practices, which must be followed by all site workers, include, but are not limited to, the following:

- Eating, drinking, chewing gum or tobacco, and smoking are strictly prohibited in the Exclusion and Contamination Reduction Zones and in the vicinity of all work operations. Break areas will be designated by the Site HSO for these activities.
- Do not sit or kneel in areas of potential contamination.
- Hands and face must be thoroughly washed upon leaving the work area. Good personal hygiene is imperative.
- Immediately repair or replace any defective PPE.
- Prescription drugs must not be taken by personnel unless specifically approved by a qualified physician.
- Personnel on site must use the buddy system; visual contact must be maintained between team members at all times.
- Report any unsafe conditions and accidents immediately to the Site HSO.

### 7.5.2 Daily Start-up and Shutdown Procedures

The following protocols will be followed daily prior to start of work activities:

- The Site HSO will review site conditions to determine if modification of work and safety plans are needed.
- Personnel will be briefed and updated on any new health and safety procedures as well as emergency information.
- All safety equipment will be checked for proper function.
- The Site HSO will ensure that first aid equipment is readily available.
- The Site HSO will initiate appropriate monitoring.

The following protocol will be followed at the end of daily operations and before breaks:

- All personnel will proceed through decontamination procedures and facilities, as appropriate.

## **7.6 Confined Space Entry**

Confined space entry is strictly prohibited during this project.

## **7.7 Tanks, Drums, and Barrels**

Should the field investigations discover or detect unknown tanks, drums, barrels or other containers that are suspected of containing hazardous waste or if the contents are unknown, the following procedures will be followed. Field personnel should mark this location with flagging tape or some similar means and should also mark this location on the site plans. Field personnel should not stay in the immediate area (100-foot radius) any longer than is needed to flag the location of the discovered object. Tanks, drums, and barrels are to be left undisturbed until an action plan and an addendum to the HASP have been approved by the ETA Field Supervisor, the Site HSO, and the AEC Contracting Officer's Representative. If a leaking container is

discovered, follow the procedures outlined in Section 10.6. If a spill absorbent/containment materials are available, and it is safe to do so, deploy them accordingly.

## 7.8 Respiratory Protective Equipment

The following is a list of general provisions regarding the use of respiratory protective equipment. Authorized respirator users must have completed 40-hour HAZWOPER training (and 8-hour annual refresher training, if appropriate), since respiratory protection training (per 29 CFR 1910.134) is an integral part of this training program. Respirator fit test documentation will be maintained.

- Only properly cleaned, inspected and maintained, NIOSH/MSHA-approved respirators shall be used on site.
- Selection of respirators as well as any decisions regarding upgrading or downgrading of respiratory protection will be made by the Site HSO in conjunction with the HSO.
- Air purifying cartridges shall be replaced when "loadup" or "breakthrough" occurs, unless otherwise recommended by the Site HSO.
- Only employees who have had pre-issue and annual qualitative fit tests thereafter, shall be allowed to work in atmospheres where respirators are required.
- If an employee has demonstrated difficulty in breathing during the fit test or during use, he or she shall have their physical condition re-evaluated to determine whether the employee can wear a respirator while performing the required duty.
- No employee shall be assigned to tasks requiring the use of respirators if, based upon the most recent examination, a physician determines that the employee will be unable to function normally wearing a respirator or that the safety or health of the employee or other employees will be impaired by use of respirator.
- Contact lenses are not permitted on site and are not to be worn while using any type of respiratory protection.
- If needed, air supplied respirators shall be assembled per manufacturer's specifications regarding hose length, couplings, valves, regulators, manifolds, etc.
- All air utilized for air supplied respirators will meet the requirements for at least Grade D breathing as specified by the Compressed Gas Association.
- Excessive facial hair (e.g., beards and large moustaches) prohibits proper face fit and effectiveness of air purifying respirators. Persons required to wear respiratory protection must not have any facial hair that interferes with the respirator seal.
- Regular eyeglasses cannot be worn with full face respirators because they break the facepiece seal. Special eyeglass inserts must be utilized.
- The respiratory protection utilized on site will be in compliance with OSHA in 29 CFR 1910.134.
- Respirators are to be cleaned daily per 1910.134. If respirators are not dedicated to individuals, disinfection is also required.
- Where air-purifying respirators are designated for protection against on-site contaminants, the employee shall be permitted to change canisters or cartridges whenever an increase in breathing resistance is detected.



## **7.9 Illumination**

All on-site activities are to be conducted during daylight hours.

## **7.10 Sanitation**

All site personnel will use the toilet facilities in the DRMO office. Personnel are to utilize base facilities for day-to-day washing of their hands and face.

## 8.0 TASK-SPECIFIC HEALTH AND SAFETY PROCEDURES

As stated in Section 2.5, tasks scheduled for this project include site reconnaissance, mobilization, monitoring well installation and sampling, and sediment, surface water, and soil sampling. Health and safety procedures for each of these tasks are presented in the following subsections.

### 8.1 Invasive and Non-Invasive Site Tasks

#### 8.1.1 Personnel

Personnel requirements for these procedures require a minimum of two persons, with each person maintaining visual and/or auditory contact. Any changes to this format shall be agreed upon by the Project Manager, the HSO, and the Site HSO.

#### 8.1.2 Site Monitoring

8.1.2.1 General - The Site HSO shall use a properly calibrated HNu PI-101 photoionization detector (PID), or equivalent instrument, equipped with the appropriate lamp, to:

- A. Monitor organic vapors at several on-site areas at the beginning of each day to establish a background reading.
- B. Monitor organic vapors at the worker's breathing zone, hand auger spoils, and above ground water wells.
- C. If elevated levels of organic vapors are detected, the worker's breathing zone will be monitored continuously while in the area, or for 15-minute periods every half-hour.
- D. Traditional industrial hygiene air monitoring for organic vapors and dusts may also be performed during potential high exposure activities, and at the discretion of the HSO.
- E. Monitor when work begins on a different portion of the site.
- F. Monitor when contaminants other than those previously identified are being handled.
- G. Monitor when a different type of operation is initiated.
- H. Monitor if personnel are working in areas with obvious liquid contamination.
- I. Monitor if a sufficient reasonable interval has passed so that exposures may have significantly increased.

Continuous monitoring shall be accomplished at the anticipated source and in the breathing zone of site personnel during all invasive operations. The HNu will not be used if the relative humidity exceeds 90 percent. Should this level be exceeded, a flame ionization detector will be used for air monitoring. Response action levels for all invasive activities at the site are presented in Table 2.

Instruments shall only be used by employees who have been trained in the proper operation, use, limitations, and calibration of the monitoring instrument and who have demonstrated the skills necessary to operate the instrument.

**Table 2 Action Levels and Emergency Information**

<b>Chemical Vapors</b>	
<b>Action Levels</b>	<b>Emergency Action</b>
Background or below sustained for 5 minutes	Continue at modified level D.
Background to <5 ppm sustained for 5 minutes	Upgrade to level C and continuous monitoring.
Greater than 5 (>5) ppm above background sustained for 5 minutes or a peak reading of 30 ppm or greater	Discontinue operations in immediate area. Characterize airborne contaminants via personnel and area monitoring including contaminants that could be present which are not detected by PID equipment. Contact the HSO or Site HSO for advice on how to proceed. Level B protection may be needed.
<b>Explosive Limit Detection</b>	
<b>Action Level</b>	<b>Emergency Action</b>
10% of lower explosive limit	All workers in the area should retreat immediately and evaluate the situation. Report observations and instrument readings to the Site HSO. Ventilation may be required to resume work in this area.
<b>Radiation Detection</b>	
<b>Action Levels</b>	<b>Emergency Action</b>
< 50 $\mu$ R/hr	Level D normal monitoring during sampling procedures.
> 50 $\mu$ R/hr, < 200 $\mu$ R/hr	Level D periodic monitoring (every 30 minutes).
> 200 $\mu$ R/hr, < 2 mR/hr	Level D continuous monitoring - worker exposures assessed.
> 2 mR/hr	Work site evacuated. Contact HSO.

The monitoring program may be expanded, reduced, or modified by the HSO with concurrence of the Project Manager, based on site conditions and monitoring results. All monitoring will be accomplished by the Site HSO, who will interpret the results with the guidance of the HSO.

**8.1.2.2 Real Time Air Monitoring** - The air monitoring program will include sufficient monitoring of air quality in work zones and other on-site areas to assess levels of potential employee exposure, establish work zones, determine that the work zone designations are valid, and verify that the respiratory protection being worn by personnel is adequate. The air monitoring program is also designed to ensure that contaminants are not migrating off-site in order to minimize exposure of nearby populations, work areas and/or workers.

**8.1.2.3 Perimeter Monitoring** - If detectable concentrations are measured during the on-site activities, monitoring shall also be conducted at least two times each day with a total volatile organics direct-reading instrument at the perimeter of each site. If airborne levels of contaminants exceed background levels at the perimeter of any site, the work will be stopped and the suspected source of the contamination (e.g., borehole or monitoring well) will be covered to eliminate emissions. If the emissions are not reduced in a reasonable period of time (e.g., 15 minutes), the Site HSO and the Project Manager will be notified. A decision will then be made as to how to proceed with the work and how to more fully characterize the airborne emissions.

**8.1.2.4 Flammable/Combustible Gases** - Monitoring at potential sources of combustible gases shall be conducted periodically during operations involving penetration of soils. If instrument readings indicate 10 percent of the lower explosive limit (LEL) or less, work shall continue with increased monitoring. If readings exceed 10 percent of the LEL, operations shall cease and personnel will withdraw until levels subside (at least 15 minutes). If levels do not subside, special arrangements for on-site portable ventilation systems may be needed.

**8.1.2.5 Oxygen Deficiency** - Oxygen levels will be periodically monitored using a direct reading combustible gas/oxygen meter. Special attention is required in low lying areas and during activities on and around the landfill (e.g., from methane). If monitoring indicates less than 19.5 percent oxygen, activities in the area will be stopped until the source causing the oxygen deficiency is identified and controlled. In addition, methane concentrations may be periodically monitored during the landfill activities using Draeger colorimetric indicator tubes. If available, an OVA could also be utilized to detect low levels of methane on site.

**8.1.2.6 Respirable Dust** - Monitoring for respirable dust may be necessary to estimate employee exposure to heavy metals and semivolatile organic compounds that may comprise part of, or be attached to dust particles generated during site operations. The Site HSO will determine if continuous monitoring of the site workers' breathing zone during drilling operations is necessary. If the Site HSO deems that monitoring is required, it will be accomplished by using a direct-reading respirable dust monitor where the generation of dust is likely. The Site HSO may also institute dust suppression techniques if it is deemed appropriate.

8.1.2.7 Calibration and Maintenance - All direct-reading instruments must be calibrated on a daily basis. A known concentration of a specific gas (isobutylene for the PID) will be used. Instructions in the manufacturers' operations manuals regarding cleaning and maintenance of the instruments shall be followed.

Calibration procedures are necessary for both field and laboratory equipment. All instruments used during field operations will be operated and calibrated according to the manufacturer's guidelines and recommendations. The Quality Control Plan (QCP) provides detailed information on the calibration and maintenance of field sampling and monitoring equipment. Operation, calibration and maintenance information will be documented in a field notebook.

Field instruments will be calibrated according to the manufacturers specifications at the start of each day's usage. All data from the calibration procedures will be documented in the field notebook and retained within the project file. Failure of a field instrument in meeting calibration guidelines will be reported to the Field Supervisor and the Site HSO. An instrument that has failed a calibration procedure will not be used in the field. Daily calibration will be accomplished on the following equipment: pH meters, thermometers, conductivity meters, photoionization detectors, combustible gas indicator/oxygen meter, and the geiger counter.

The subcontracted laboratory will be analyzing all samples collected during this investigation. Their analytical instrumentation is calibrated according to an internal calibration program using reference standards. A detailed description of their calibration program is contained in their Quality Assurance Program Plan which is included in the QCP.

8.1.2.8 Recordkeeping Requirements - The results of air monitoring readings shall be recorded in the field logbook. A calibration and maintenance log for each instrument shall also be maintained.

8.1.2.9 Heat Stress - Ambient temperatures at the site combined with the requirements for PPE use may contribute to heat stress. While using nonpermeable PPE when ambient temperatures reach or exceed 70°F, work-rest regimens will be adjusted accordingly.

8.1.2.10 Cold Stress - If weather conditions require, ETA employees will be directed to don the proper equipment by the Site HSO. Blankets, warm drinks (non-caffeinated), and warm rest areas will be provided as required. ETA employees have received awareness training and should be able to recognize the onset of cold stress or hypothermia. All ETA employees will try to stay dry and warm. If a site worker does get wet in a cold environment, the Site HSO will ensure that the worker immediately dries off and changes clothes.

### 8.1.3 Action Levels

Action levels and the appropriate emergency action are summarized in Table 2.

**8.1.3.1 Radiation Detection** - From an initial review of site documentation, radioactive areas are not anticipated to be encountered. However, prior to initiating work, a general survey will be conducted with a geiger counter in each of the drilling areas. If it is determined that a radiation monitoring plan is required, the HSO or Project Manager must be contacted. Site personnel must comply with the action levels detailed in Table 2.

#### **8.1.4 Personal Protective Equipment (PPE)**

This section contains specific provisions for the use of personal protective equipment (PPE). Based on site conditions and action levels (Table 2), the Site HSO may upgrade the PPE used at the site, but shall confer with the corporate HSO prior to downgrading the PPE. The Site HSO will notify the corporate HSO of any change in PPE status as soon as practicable.

Based on the contaminants of concern at the DRMO Site (Appendix C) modified Level D protection shall be used at the start of field work. Modified Level D protection shall include use of the following items:

- Standard work clothes or coveralls
- Disposable white Tyvek coveralls or equivalent
- Hard Hat
- Steel toe/steel shank PVC boots, or similar leather boot with an impervious boot cover
- Safety glasses with side shields (all sunglasses and prescription glasses used on site must also be impact resistant and fitted with side shields)
- Chemical protective gloves (e.g., nitrile) and Silvershield or 4H undergloves shall be worn when collecting surface water, sediments or soil samples or when sampling, bailing or developing wells

No RI activities are planned in the area of potential PCB contamination. If workers are required to operate in this area, they will be required to replace the nitrile gloves with PCB-resistant gloves (e.g., butyl rubber or viton) and don air-purifying respirators equipped with dust/fume/mist and organic vapor cartridges.

Upgrade to level C may be required if the level of VOCs detected in the worker's breathing zone exceeds the background level but is below 5 ppm for 5 minutes (Table 2). Level C protection will include all of the PPE required for Modified Level D plus the following:

- Replace white Tyvek with Saranex Tyvek coveralls
- Use disposable outer boots and an appropriate full face air purifying respirator

The specific respirator for Level C protection shall be the MSA Ultra Twin full-face respirator (APR) with GMC-H combination cartridges (MSA Part No. 460844), or equivalent. The GMC-H cartridge is approved for organic vapors and acid gases (not more than 1,000 ppm), dusts, fumes and mists having a time weighted average less than 0.05 mg/m<sup>3</sup>, radionuclides, and

asbestos (TC 23C-153). Respirator cartridges will be changed at the first sign of breakthrough or loadup, or at the discretion of the Site HSO.

Provisions shall be made for drill rig operators to upgrade to Level B protection if conditions warrant during drilling and other potentially high exposure activities. Level B protection will include all of the PPE required for Level C plus the following:

- Replace the APR with either a pressure-demand SCBA or a pressure-demand airline respirator with an in-line five-minute escape bottle.

It shall be the responsibility of the Site HSO, in coordination with the corporate HSO, to make the determination of the level of PPE to be used by personnel within the particular Exclusion Zones. The decision of the Site HSO will be based on site monitoring and action levels (Table 2) and associated hazards, knowledge of the site, observed site conditions, and applicability of the ETA Corporate HASP.

8.1.4.1 Maintenance and In-use Inspection of Protective Equipment - Effective use of protective equipment requires that the equipment be properly used, maintained, and inspected periodically during the day. Site-specific issues and standard procedures will be reiterated during pre-entry training. Gloves and coveralls will be regularly inspected and replaced promptly if torn. Disposable coveralls will be replaced whenever personnel leave the Exclusion Zone, or daily at a minimum. Reusable gloves will be decontaminated whenever exiting the Exclusion Zone or Contamination Reduction Zone. Non-disposable coveralls must be laundered daily at a minimum. Respirators will be inspected and checked daily for leaks both visually and with negative or positive pressure checks on the wearer. Respirator cartridges will be replaced daily or more frequently if excessive resistance develops or if breakthrough occurs. All respirator maintenance will be performed by the Site HSO. Respirators shall be cleaned on a daily basis.

#### 8.1.5 Exclusion and Decontamination Zones

In recognition of the increased risk to workers of physical injury and exposure to chemical contaminants, Exclusion Zones may need to be established and maintained. Non-essential personnel shall be prohibited from entering these Exclusion Zones. All personnel entering the Exclusion Zones will be required to wear appropriate personal protective equipment in accordance with Section 8.1.4 and as approved by the Site HSO for the particular task.

A Decontamination Zone shall be established adjacent to the Exclusion Zones, and shall consist of wash tubs, a garden-type, pressurized water sprayer, soap, and brushes to be used for removing soils and other contamination from gloves and boots.

#### 8.1.6 Decontamination

Upon leaving the designated Exclusion Zones, all personnel must undergo appropriate decontamination. The nature of the decontamination requirements will depend on whether

immediate re-entry into the Exclusion Zone is planned, or if complete egress from the Exclusion Zone is intended. The extent of decontamination will be decided by the Site HSO. The decontamination requirements will also depend on the level of protection used within the Exclusion Zone and the degree to contamination. Contamination avoidance procedures shall be practiced at all times. The Decontamination Zone will be located immediately outside the access opening of the Exclusion Zones on its apparent upwind side, and will be delineated using caution tape and/or stakes, metal stanchions, or traffic cones. This zone shall contain the decontamination stations necessary to allow rest and beverage breaks and respirator cartridge changes, as well as complete decontamination as required to exit the work area. Beverages (e.g., bottled water) will be provided to personnel adjacent to this area during rest breaks.

The decontamination area will consist of outer glove and boot wash and rinse stations, and a plastic-lined disposal drum. Decontamination wash will be accomplished by dispensing a detergent and water solution from a garden-type pump-spray can, or similar device. The wash shall be followed by a rinse with clean water. Brushes will be supplied for assisting in the removal of solids.

**Partial Decontamination** - Workers must observe the following personnel decontamination procedures prior to respirator cartridge changes or rest breaks in the decontamination area:

**For Modified Level D and Level C**

1. Wash outer gloves.
2. Remove wrist tape (as applicable) and dispose into a plastic-lined disposal drum.
3. Remove outer gloves and dispose into a plastic-lined disposal drum. Continue procedures below, as appropriate.

**To change respirator cartridges only**

4. Remove respirator, change cartridges, clean respirator with respirator wipe, and put respirator back on.
5. Make sure cartridges are properly seated against the gaskets. Fit check the respirator by holding palms over the cartridges and inhaling (negative pressure fit check). If the respirator is properly seated, air cannot be drawn through the respirator in this fashion.
6. Put on clean outer gloves.
7. Tape wrists with duct tape.
8. Re-enter Exclusion Zone.

**For rest breaks**

1. Wash outer gloves.
2. Remove wrist tape and dispose into a plastic-lined disposal drum.
3. Remove outer gloves and dispose into a plastic-lined disposal drum. Continue procedures below, as appropriate.
4. If respirator is being used, remove respirator and place in a clean area.
5. Remove inner gloves, dispose into disposal drum.
6. Wash hands and face at wash station. Dry hands and face with paper towels.



7. Take rest break, drink water from disposable paper cups.
8. Put on glove liners.
9. If respirators are being used, put on respirator.
10. Don outer gloves.
11. Tape wrists.
12. Re-enter Exclusion Zone.

If, in the opinion of the Site HSO, Tyvek jumpsuits or outer boots are severely contaminated, full decontamination must be performed for rest and beverage breaks. The Site HSO will determine the necessary decontamination status.

**Complete Decontamination** - For complete decontamination prior to leaving the site, all personnel must observe the following procedures upon leaving the Exclusion Zone:

1. Get hands and feet screened with a radioactive detector if radiation monitoring program is in effect.
2. Place contaminated sampling and other associated equipment into plastic bag(s) and seal with duct tape.
3. Wash and rinse outer boots and outer gloves.
4. Remove ankle and wrist tape and dispose of in a plastic-lined disposal drum.
5. Remove outer boots. Boots used on site are not to be taken off site. All footwear will be dedicated to site work only.
6. Remove outer gloves and dispose of in a plastic-lined drum.
7. Remove Tyvek suit and dispose of in a plastic-lined drum (if applicable).
8. If using a respirator, remove respirator, dispose of cartridges, wash, disinfect, dry and place respirator in a clean plastic bag.
9. Remove and dispose of under gloves.
10. Exit the Decontamination Zone.

**8.1.6.1 Decontamination Notice to Emergency Personnel** - Base emergency medical personnel and ambulance crews will be notified by ETA before operations begin. They will be advised and warned of the possibility of having to handle contaminated clothes and/or injured workers, and they will be advised of appropriate decontamination procedures.

**8.1.6.2 Equipment Decontamination** - All equipment being used in the Exclusion Zone will be subject to complete decontamination procedures before the equipment is removed from these work areas. Equipment and vehicles that contact potentially contaminated soil will be decontaminated using a detergent solution and a steam cleaner or hot water pressure washer. All contaminated items will be carefully inspected and/or decontaminated to the satisfaction of the Site HSO before being taken off site.

**8.1.6.3 Disposal of Wastes During Investigative Activities** - Waste solids generated by the investigative activities (including used respirator cartridges and disposable protective coveralls) will be drummed, labeled, and stored on site for disposal as hazardous wastes. Suspect

hazardous waste fluids generated during drilling activities will also be containerized in 55-gallon drums and stored in the Contamination Reduction Zone for pick-up and disposal by Fort Meade personnel.

## **9.0 RECORDKEEPING**

### **9.1 Records and Communication**

Records required by the state and Federal government will be kept current. Records of health and safety activity at the site will be maintained, including records of health hazards surveys, evaluation of potential hazards, and control measures taken. These records will document representative exposure levels during waste handling and sampling and the degree of safety measures required for protection from the hazards present. The documented exposure monitoring will serve as a record of assessment of the respiratory hazards at the particular operation of the project and will include the following:

- Determination of personnel activity in the working area:
  - Job routines
  - Work locations
  - Time spent in work areas
  
- Determination of any potential respiratory or dermal hazards:
  - Chemical composition
  - Type of air contamination
  - Toxicity at various concentrations (acute versus chronic)
  - Established concentration limits for inhalation and/or skin contact
  
- Determination of whether to improve the administrative controls.

Applicable data will be available to on-site personnel throughout the project. Records of all sampling methodology, calculations, results, reports, and recommendations will be kept for a period of at least three years after completion of the project.

A daily health and safety log must be maintained by the Site HSO. This log shall include, at a minimum, the following information:

- Description of the field work being conducted
- Any changes in the operation, names of all personnel working at the site
- Types of air monitoring results
- Level of personal protective equipment being worn
- Accidents and injuries
- A description of any unusual occurrences or physical complaints

Copies of the logs must be provided to AEC, Safety and Environmental Services (SES) Branch, weekly during field activities. It is acceptable to fax copies to the SES Branch at (410) 612-6836.

## **10.0 EMERGENCY ACTION PLAN**

On-site emergencies will ultimately be handled by installation emergency support personnel. The initial aspects of an emergency response and first-aid treatment, however, will only be performed by qualified ETA personnel.

### **10.1 Pre-Emergency Planning**

Prior to the start of work, ETA will work with Fort Meade representatives to contact applicable local authorities and inform them of the start date and anticipated scope of work. First-aid kits and at least one ETA employee trained in first aid and cardiopulmonary resuscitation (CPR) will be on site at all times during investigative activities. An emergency action exercise will be conducted prior to the commencement of invasive operations.

### **10.2 Emergency Recognition and Prevention**

Emergency conditions that may be anticipated at the site include:

- Medical emergency
- Heavy equipment accidents
- Discovery of unanticipated buried hazards
- Explosions and fires
- Heat stress/cold stress

To ensure that hazard recognition and accident prevention protocols are being maintained, personnel must follow the requirements of the HASP.

### **10.3 Emergency Equipment**

Emergency equipment for the Exclusion Zone will be kept in the Contamination Reduction Zone or the Support Zone. At a minimum, the equipment must include:

- Portable emergency eye wash system(s)
- Multipurpose (ABC-rated) fire extinguisher (minimum 10 pound)
- Adequately stocked first-aid kits
- Air horns
- Mini-spill containment kits

### **10.4 Operations Shutdown**

The Site HSO has the authority to shut down work operations if, in his or her professional judgment, significant health and safety issues arise. Operations shutdown may also be mandated by the Project Manager or the Project Field Supervisor on recommendation from the Site HSO. Conditions warranting work stoppage will include:

- Uncontrolled fire
- Uncovering potentially dangerous buried material, including chemical agents or explosives
- Heat stress illness exhibited by the crew
- Personal exposures or accidents
- Air contaminant concentrations in excess of the protection factors afforded by the respirators in use

When any of these conditions exist, operations will be stopped and the site secured. All personnel will leave the work area until the Emergency Coordinator and the Site HSO have determined that operations may resume.

### **10.5 Fire and Explosion Response Procedures**

Fires on site can be started by natural events, work activities, or the activities of others. In the event of a fire or explosion, the Fort Meade Post Fire Department shall be immediately notified. All personnel shall move to a safe distance based on the severity of the fire. Fires shall not be fought by ETA personnel if an explosion hazard is present. Personnel should not attempt to fight large fires at the site. ETA will have multipurpose (ABC-rated) fire extinguisher on hand at all times. Personnel have been previously instructed in the use of these fire extinguisher and will attempt control of only very small fires (i.e., ones requiring one extinguisher). The procedure for using a fire extinguisher is to pull the safety pin, point the extinguisher at the base of the flames, and discharge the extinguisher by sweeping the flames from a distance of about 6 feet. The extinguisher operator should move in as the flames are being put out. In the event of a larger or uncontrolled fire, all personnel will immediately evacuate the area and the Emergency Coordinator or the Site HSO will notify and work with the Fort Meade Post Fire Department.

### **10.6 Spills, Releases, Leaks of Hazardous Materials**

In case of a hazardous materials emergency, the Project Field Supervisor will assume full control and direction of the emergency as the Emergency Coordinator. The Emergency Coordinator will work with the Site HSO to identify and evaluate the hazards. All emergency responders and communications will be coordinated and controlled through the Emergency Coordinator. When installation emergency response personnel arrive on site, the Emergency Coordinator shall brief responding installation personnel (e.g., fire department) and relinquish control of the scene to the chief or designated Incident Commander.

The ETA staff will not be organized as a formal Emergency Response Team per HAZWOPER and will only perform defensive containment measures and activities that do not pose a threat to their own health and safety (i.e., incidental releases only). Situations that pose a serious threat to the public health or the environment will be dealt with by notifying the Fort Meade Post Fire Department, the AEC Contracting Officer Representative, the ETA Project Manager,

the corporate HSO, and the appropriate state and local authorities. All spills, regardless of size, shall be reported to the Site HSO.

### **10.7 Evacuation from Work Zones**

Based on the specific work area (i.e., wind direction, severity and type of incident), the evacuation site will be chosen by the Site HSO in concert with Fort Meade emergency representatives and made known to all site workers during the daily pre-entry briefing.

In the event of an emergency that requires workers to evacuate the site or an area of the site, at least one of the following signals will be given -- verbal communication, communication via cellular phone or walkie-talkie, or three blasts on an air horn or vehicle horn. If there is imminent danger anyone may give the evacuation signal. When a site emergency occurs and the evacuation signal is given, the work will be shut down, and all employees will leave the work area. It is the responsibility of individuals to evacuate in a calm, controlled fashion. Use the evacuation route that affords the most direct route away from the site area while avoiding the emergency area. Any changes to suggested evacuation routes will require the Site HSO to hold a Health and Safety Briefing to advise all site personnel of the change. An updated evacuation map will be posted at the field station and in other areas as appropriate.

In case of emergency, evacuated employees may be decontaminated rapidly by removing exterior clothing. If a worker is critically injured in the Exclusion Zone, the worker may be removed immediately from the area; seek medical attention immediately. The worker should be covered below the neck with plastic to limit exposure of contaminants to emergency medical personnel.

The Field Supervisor's log of on-site personnel will be used to ensure that all individuals are present (e.g., head count). If someone is missing, the Site HSO will alert the appropriate emergency personnel listed below. Control of personnel at the rendezvous point is the responsibility of the Field Supervisor or his/her designated assistant.

The name and phone numbers of all personnel and agencies that could be involved in emergency response will be posted by the telephone in the field office. The following phone list contains the agencies and individuals to be notified in an emergency.

#### Fire

Post Fire Department

(410) 677-2117 (Fire/HazMat Response)

(410) 677-4735 (Non-emergency)

#### Police

Provost Marshall's Office

(410) 677-5083

Military Police  
(410) 677-6622

Ambulance/Hospital  
Kimbrough Army Hospital  
(410) 677-8570

Other Important Numbers

Fort Meade EOD Unit - (410) 677-9770 [Office Hours (410) 621-7289]  
Fort Meade Environmental Coordinator - Mr. Paul Robert - (410) 677-9648  
Fort Meade Health and Safety - Ms. Cheryl Riordan - (410) 677-6241  
USAEC Contracting Officer/Representative - Scott Hill - (410) 671-1607  
USAEC Safety Officer - Ms. Vivian Graham - (410) 671-4811  
Maryland Department of the Environment/DNR Police - (410) 974-3551  
USEPA Region III, Oil and Hazardous Material Spills - (215) 597-9800  
NSA Range Control - (301) 688-4776

Engineering Technologies Associates, Inc.  
(410) 461-9920

Written directions from the work site to the hospital are provided in Table 3. A map (Figure 3) will be posted on site that indicates the location of the Kimbrough Army Hospital with respect to the work area.

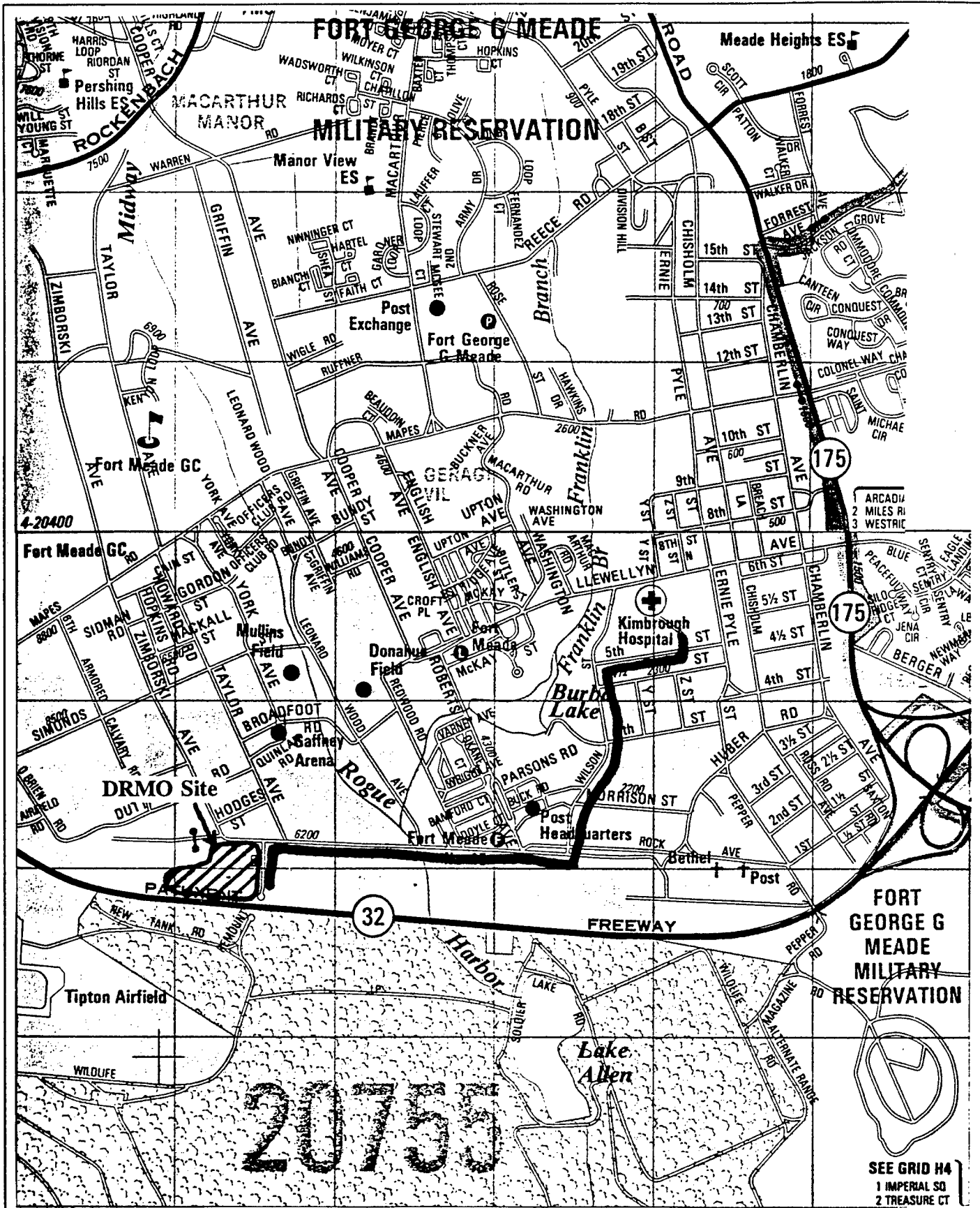
**Table 3 Site-Specific Directions to Kimbrough Army Hospital**

DRMO Salvage Yard and Transformer Storage Area	Remount Rd. to Rock Ave. Right on Rock Ave. to Wilson St. Left on Wilson St. to 5th St. Right on 5th St. Hospital on left
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## 10.8 Reporting Incidents

### 10.8.1 Large-Scale Incidents

In the event of an environmental incident, installation emergency response personnel at the Post Fire Department shall be notified immediately. If UXO or suspected chemical agents are discovered, immediately contact the 144th Explosive Ordnance Disposal (EOD) Unit (Fort Meade) at (410) 677-9770. Initial evacuation of the area in question should be accomplished by the Field Supervisor and the Site HSO. Additionally, ETA's HSO and the USAEC Safety Officer should be notified as soon as possible. Emergency first aid shall be applied on-site as deemed necessary. The injured/ill individual will then be decontaminated (if necessary) and



20753

SEE GRID H4  
1 IMPERIAL SQ  
2 TREASURE CT

DESIGNED	EM.	10/84
DRAWN	EM.	10/84
CHECKED	LL.	10/84
APPROVED	DK.	10/84

**ENGINEERING TECHNOLOGIES ASSOCIATES, INC.**  
ENGINEERS • PLANNERS • SURVEYORS  
3468 ELLICOTT CENTER DRIVE SUITE 101  
ELLICOTT CITY, MARYLAND 21043  
BALTO. 491-8888 WASH. 627-6888

**Figure 3**  
EMERGENCY EVACUATION ROUTE  
FROM DRMO SITE TO KIMBROUGH  
ARMY HOSPITAL

SCALE:	CONTRACT NO.:	DATE:	SHEET:
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transported to the base hospital, if needed. The hospital ambulance personnel will be contacted for transport as necessary in an emergency.

### 10.8.2 Accidents, Injuries, Illnesses

In the event of an accident involving personal injury or illness the Site HSO or Field Supervisor will contact the base hospital immediately. The Site HSO or the Field Supervisor will arrange for administration of appropriate first aid, and arrange transportation for injured personnel to the hospital. The Site HSO will evaluate the site conditions to determine if the causal hazard still exists. Site personnel shall not reenter the Exclusion Zone until the cause of the injury is determined and the Exclusion Zone is designated safe to re-enter by the Site HSO.

As soon as practical after an emergency response, the Site HSO or the Field Supervisor shall brief the Task Manager, and the HSO as to the nature of the incident and response actions taken. The Site HSO will notify the SES Branch point of contact. The Site HSO, with the assistance of the HSO, shall evaluate the site conditions and make a determination regarding any measures that could be taken to prevent incidents of this nature from being repeated.

All incidents shall be reported on the appropriate ETA Accident Investigation Report form. The Field Supervisor must ensure that a copy of the Accident Investigation Report is submitted to the Ellicott City office within 24 hours of the incident.

In accordance with OSHA regulations published in 59 Federal Register 15594, work-related incidents resulting in the death(s) of any employee(s) or the hospitalization of 3 or more employees must be verbally reported to the Department of Labor within 8 hours after the incident is discovered. In addition, accidents/incidents resulting in a fatality, lost-time injury or illness, hospitalization of 3 or more personnel, or property damage to government or contractor property (which occurred during the performance of the contract) equal to or exceeding \$2,000.00 must be telephonically reported to USAEC, SES Branch, (410) 671-4811, as soon as possible, but not later than two hours after occurrence and reported in writing within five days of occurrence on DA Form 285. All other accidents/incidents must be telephonically reported to USAEC, SES Branch, (410) 671-4811, within eight hours of occurrence.

## **10.9 First Aid Emergency Procedures**

### 10.9.1 Chemical Exposures

#### **Inhalation**

1. If site personnel experience symptoms suggesting overexposure to toxic chemicals (lightheadedness, dizziness, headache, nausea, shortness of breath, burning sensation in the mouth, throat, or lungs), the person should be escorted from the contaminated environment to fresh air immediately.

2. If unconscious, the victim should be removed from the contaminated area immediately and brought to the nearest hospital. Rescuers shall wear appropriate personal protective equipment during rescue.
3. If the victim is no longer breathing, he or she shall be moved away from the contaminated area. Mouth-to-mouth resuscitation or some alternate form of effective artificial respiration shall begin immediately.
4. If the victim has no pulse he or she shall be moved away from the contaminated area, and cardio-pulmonary resuscitation (CPR) should begin immediately. It may be necessary for the victim to receive artificial resuscitation and CPR simultaneously.

Should any of the above scenarios be encountered, emergency medical attention and advice must be immediately sought by contacting the Kimbrough Army Hospital.

### **Skin Exposure**

If there is skin contact with toxic or potentially toxic chemicals, the skin should be washed with copious amounts of clean water for at least 15 minutes. If clothing is contaminated, it should be removed immediately and the skin washed thoroughly with running water.

All contaminated parts of the body, including the hair, should be thoroughly washed. It may be necessary to wash repeatedly. Seek medical attention as appropriate.

### **Ingestion**

If site personnel should ingest toxic or possible toxic chemicals, obtain medical attention immediately.

### **Eyes**

If a substance should get into the eyes, they should be washed with generous amounts of water. The eye should be flooded with water so that all surfaces are washed thoroughly. Washing should be continued for at least 15 minutes. Medical attention should be obtained immediately thereafter.

**APPENDIX A**

**ACCIDENT PREVENTION PLAN**

The purpose of this general plan is to assert positive actions to be taken in the recognition, evaluation, and control of safety hazards for the purpose of preventing accidents that may cause personal injury or illness, property damage, or interruption of work.

## **1.0 Responsibilities**

*Management* - Under the Federal Occupational Safety & Health Act Title 29 CFR, ETA management is responsible for planning deliberate accident prevention measures, providing safe equipment and working conditions, training a competent and safety-minded staff, and maintaining prescribed records of accidents, illnesses, and injuries.

*Supervisors* - Responsible for observation, evaluation and correction of deficiencies of unsafe conditions, or defective equipment when detected or reported by employees or government representatives.

*Staff* - Responsible for use of safety equipment, performing all work in a safe manner, working with deliberate thought of the effects of their actions on others, reporting all unsafe conditions, defective equipment, and injuries immediately to the Supervisor.

*Subcontractors* - Responsible for full provisions of this plan and the site-specific HASP.

## **2.0 Training**

Each worker on the site will have been trained in conformance with the provisions of Appendix E. Each employee will also be instructed in the company safety policy, and this Accident Prevention Plan. Additional training will consist of briefings on site-specific toxic or hazardous chemicals, safety hazards, and associated safe work procedures and precautions.

## **3.0 General Safety Precautions**

*Buddy System* - During site-invasive activities, field personnel shall be in visual or audio contact with at least one other field worker. When respiratory protective equipment is employed within an Exclusion Zone, no fewer than two workers shall be in close proximity within the work area.

An approved first aid kit will be maintained at the site. All injuries, no matter how slight, will be reported to the Site HSO for treatment. First aid will be provided at the project site only by those who are qualified through training by the Red Cross. No others will treat any injuries at the project.

No person will be permitted to operate machinery or work in elevated locations while taking antihistamines or other prescription or non-prescription drugs that can adversely affect their mental judgement or physical abilities.

Instruction will be given in identifying, avoiding, and providing first aid for stinging insects, cold or heat exposure, or poison ivy if encountered on the work.

The use of contact lenses is not allowed on-site when required personal protection is level Modified D, Level C, or Level B. Under Level D, prescription safety glasses with side shields must be used. Under Level C and B, prescription inserts must be used.

Consumption of alcoholic beverages prior to and during the work shift is strictly prohibited.

#### **4.0 Sanitation**

Eating, drinking, smoking, chewing gum or tobacco, or other similar practices are prohibited within the Exclusion Zone during invasive site activities.

Hands and face must be thoroughly washed before breaks and prior to leaving the work area.

#### **5.0 Fire Prevention**

A fire extinguisher (minimum 10-pound CO<sub>2</sub>, ABC or other approved types) will be maintained and stationed at the field vehicles.

No brush or debris will be burned at the project site.

Gasoline will be handled only in OSHA-approved safety cans. Engines will be shut off while fueling, with no smoking allowed.

Oily rags and waste will be kept in covered metal containers. All trash and waste will be disposed of daily.

#### **6.0 Housekeeping**

Tripping hazards will be eliminated by removal of hoses, cables, and ropes from walkways, by proper storage of materials, and by disposal of waste material.

All debris shall be removed daily.

Drill rods, pipe casing, and other such equipment will be secured such that they do not roll or fall.

#### **7.0 Individual Protective Equipment**

Only workers who are trained in the proper use of personal protective equipment will be employed at the work site.

All personnel will wear hard hats and eye protection throughout the project.

Ear protection will be worn by drillers, drillers' helpers, and other field personnel exposed to high-level sound intensity.

Heavy reinforced gloves will be worn when handling wire rope, pipe and rods, and hoist.

Steel toe/steel shank work boots shall be worn by all field personnel.

## **8.0 Tools**

All tools shall be in good condition (without mushroomed heads, split handles or other defects); damaged tools will be repaired promptly or removed from service. This includes privately owned equipment of the workers.

Tools shall not be left overhead to fall. Throwing tools is prohibited.

## **9.0 Powered Equipment**

All machines will be examined daily for safety appliances and condition, and all defects repaired promptly. Periodic maintenance schedules will be followed as recommended by the manufacturer.

All machines will be shut down for adjustment or oiling. During repair of all machines, blocks or stops will be set to prevent falling or moving of parts should any hydraulic line or control device fail.

Workers will climb carefully with handholds and grab irons, not jumping on or off any machine, and in no case while the machine is in motion.

All repairs of hydraulic systems will be with new, manufacturer's parts.

Firm and level standing will be prepared for drills and pumps.

## **10.0 Toxic Materials**

All work is to be conducted in accordance with the provisions of the site-specific HASP.

Workers are to be prepared for working safely in the event toxic materials are known to be on site, or are discovered during site activities.

Workers will be protected from contact with toxic materials by wearing appropriate personal protective equipment.

Water, soap and clean towels are to be used immediately in the event splashing, dripping, or settling of dust allows suspected contact of toxic materials with the body. Persons developing skin rash, burning, or discoloration of skin, or other indications of chemical exposure, are to receive immediate medical attention. If possible, a sample of the material encountered should accompany the victim to assist in treatment. Full precautions are to be taken in collecting and transporting any such sample.

## **11.0 Emergencies**

In the event of warning for severe storm, personnel will be evacuated and equipment secured as directed by the Site HSO to prevent loss or damage. If thunderstorms are predicted, all work will be suspended. For tornado watch, equipment will be removed from exposed positions and personnel will be protected. Crane booms will be laid down.

In the event of fire, explosion, chemical exposure, personnel accident or similar emergency, the provisions of the site-specific HASP shall be observed.

## **12.0 Accident Reporting, Analysis and Prevention**

Every accident will be reported immediately to the Site HSO, the Fort Meade Safety Coordinator, and subsequently to the corporate HSO and the Project Manager.

The Project Manager and Site HSO will investigate unsafe conditions, defective equipment, failure of maintenance or improper acts, then initiate appropriate corrective actions including comprehensive training to prevent recurrence.

Supervisory personnel at all levels will follow-up by training and observation directed to prevent accident repetition. Daily Health and Safety/Accident Prevention meetings will review accidents and discuss remedial action by all workers.

## **13.0 Site Safety Inspections**

Site safety inspections shall be conducted as needed by the corporate HSO to ensure compliance with this plan and the site-specific HASP in the field. A complete record and account of each inspection shall be maintained.

**APPENDIX B**

**UXO SUBCONTRACTOR STANDARD OPERATING PROCEDURES**



I. ABBREVIATED SITE-SPECIFIC SAFETY AND HEALTH PLAN  
FOR FORT GEORGE G. MEADE

COVER SHEET

SITE NAME: Fort Meade

SITE LOCATION: Fort Meade, Maryland

SSHP PREPARED BY: Frank Johnson

OFFICE ADDRESS: UXB International, Inc.  
14800 Conference Center Dr., Suite. 100, Chantilly, VA  
22021-3806

PHONE (703) 803-8904, ext. 120

DATE PREPARED: October 11, 1994

SIGNATURE \_\_\_\_\_

DATE \_\_\_\_\_

## 1.0 BACKGROUND

This work plan has been developed for conducting an ordnance survey at Fort George G. Meade, Maryland (FGGM) in support of the installation of monitoring wells. This work plan has been developed under contract to Engineering Technologies Associates, Inc.

The Base Closure and Realignment Act of 1988 mandated the closures or realignment of bases to economically maximize Army activities without adversely affecting military operations. A total of 111 installations were recommended for either closure or realignment by the Base Realignment and Closure Commission. Approximately 9,000 acres of a total of 13,670 at FGGM were designated for closure. The AEC was assigned the responsibility for conducting the environmental evaluation and restoration portion of the Base Closure program.

In October 1989, the AEC completed an enhanced Preliminary Assessment of the 9,000 acres scheduled for closure at FGGM. One of the findings was that an ordnance survey was required for the entire 9,000 acres. Historical records indicate that most of the 9,000 acres have been used for firing ranges, target impact areas, and training areas dating back to 1918. Range boundaries and impact areas have changed through the years and documentation no longer exists identifying their location. The report concluded that unexploded ordnance (UXO) may be present at any training or range area of FGGM and poses a serious human safety concern because of the potential for explosion.

### 1.1 Objective

The objective of this project is completion of a focused remedial investigation (RI) and feasibility study (FS) of the DPDO site at Fort Meade. The focus of the study will be to determine if the DPDO yard is impacted the BRAC parcel to the south via a hydrologic pathway. The key questions to be answered are:

- Does ground water flow south from the DPDO yard to the BRAC parcel?
- Does surface water flow south from the DPDO yard to the BRAC parcel?
- If ground water does flow south, what is the risk to human health for the ground water pathway?
- If surface water does flow south, what is the risk to human health and the ecology from the surface water pathway?

UXB International, Inc. has been retained to screen the sites of the two monitoring wells for unexploded ordnance. The screening will be conducted in accordance with AEC procedures.

1.0 SITE DESCRIPTION AND PREVIOUS INVESTIGATIONS

(Attach a site map to the SSHP)

A. SITE DESCRIPTION

. Size: Approximately 9000 acres

. Present usage

(Check all that apply)

- |  |  |  |
|--|--|--|
| <input checked="" type="checkbox"/> Military     | <input type="checkbox"/> Recreational        | <input type="checkbox"/> Other (Specify) |
| <input type="checkbox"/> Residential             | <input type="checkbox"/> Commercial          | <input type="checkbox"/> _____           |
| <input checked="" type="checkbox"/> Natural Area | <input type="checkbox"/> Industrial          | <input type="checkbox"/> _____           |
| <input type="checkbox"/> Agricultural            | <input type="checkbox"/> Landfill            | <input type="checkbox"/> _____           |
| <input type="checkbox"/> Secured                 | <input type="checkbox"/> Active              | <input type="checkbox"/> Unknown         |
| <input checked="" type="checkbox"/> Unsecured    | <input checked="" type="checkbox"/> Inactive |  |

B. PAST USES

(Brief history of the site. Break it into areas of different history if possible.)

Tank, Artillery, and Troop Live Fire Training

C. SURROUNDING POPULATION

- |                                |   |  |
|--------------------------------|---|--|
| <input type="checkbox"/> Rural | <input checked="" type="checkbox"/> Residential | <input type="checkbox"/> Other (specify) |
| <input type="checkbox"/> Urban | <input checked="" type="checkbox"/> Industrial  | <input type="checkbox"/> _____           |
|                                | <input checked="" type="checkbox"/> Commercial  | <input type="checkbox"/> _____           |

D. PREVIOUS SAMPLING/INVESTIGATION RESULTS

1. OEW ENCOUNTERED (Location and Description)

UXO Survey - 1990 AEC

Projectiles, Bombs, Mines, Grenades, CWM, and Pyrotechnics.

2. SAMPLES (Air, Water, Soil, Vegetation)

Location	Chemical	Concentration	Media
Unknown	At This Time		

2.0 DESCRIPTION OF ON-SITE ACTIVITIES

A. Non-intrusive preliminary assessment

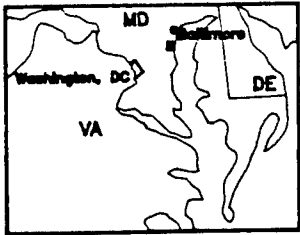
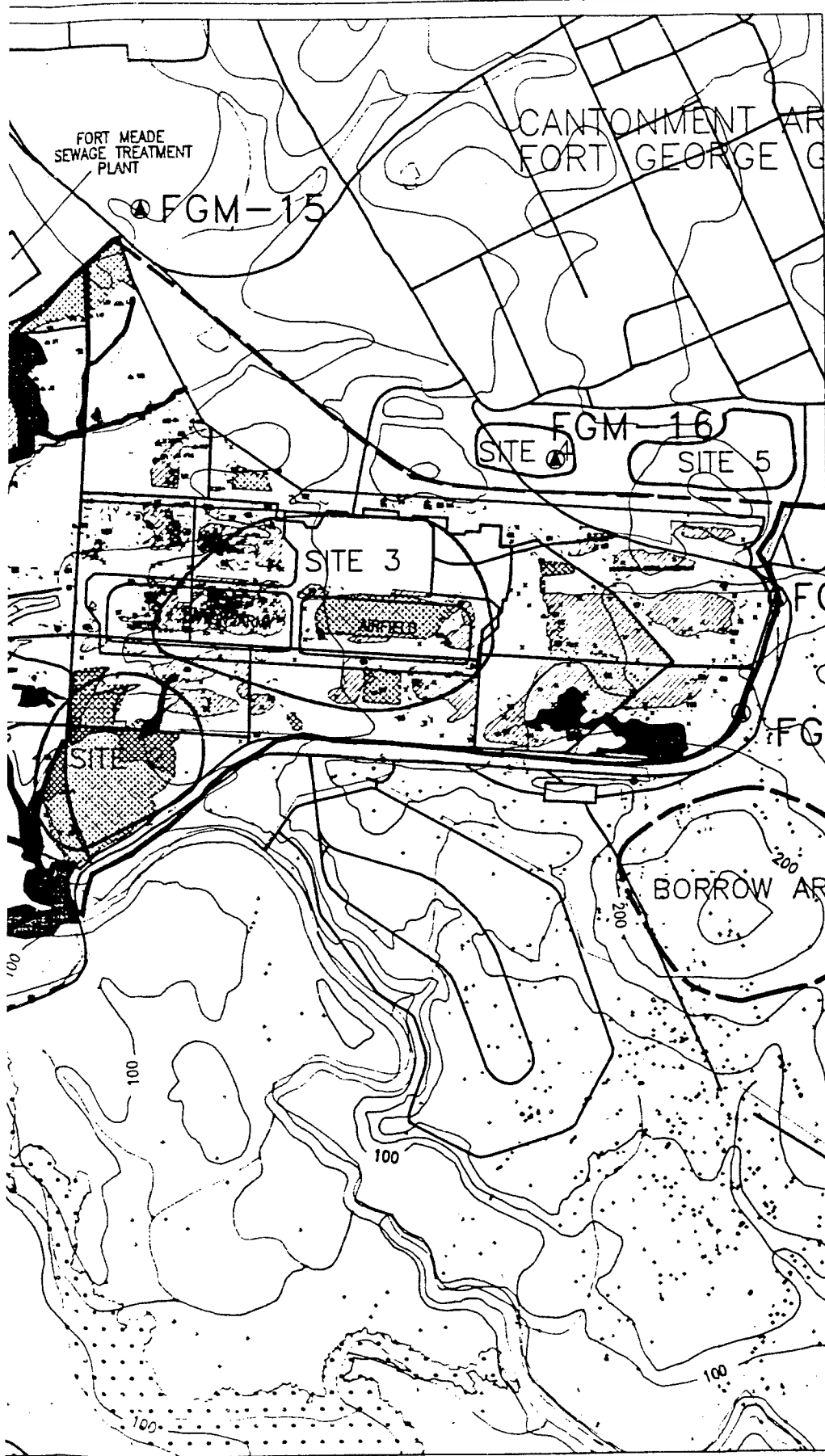
- |                                       |  |
|---------------------------------------|--|
| <input type="checkbox"/> Walk-through | <input type="checkbox"/> Drive-through       |
| <input type="checkbox"/> On road      | <input checked="" type="checkbox"/> Off road |
| <input type="checkbox"/> On path      | <input type="checkbox"/> Off path            |

3.0 SITE PERSONNEL AND RESPONSIBILITIES

A. UXO TEAM LEADER

NAME: Charles Galbreath  
 ADDRESS: UXB International, Inc.  
 14800 Conference Center Dr., Suite 100,  
 Chantilly, VA 22021-3806  
 PHONE: (703) 803-8904





- ⊕ ORDNANCE-NOT FUZED
- ORDNANCE-FUZED
- Surface UXOs
- × UXOs 1" to 6"
- ✕ Sub-Surface UXOs 7" to 24"
- Sub-Surface UXOs 25" to 60"
- Cultural Site
- Historic Site
- Surface Contacts Deeper than 6"
- ▨ Significant Ordnance (OEW) Item Areas
- ⊕ Wetland Boundaries/Endangered Species Habitat
- ▨ Wetland Boundaries/Endangered Species Habitat
- ▨ Landfill
- ▨ Impassable-Wetland
- ▨ Impassable-Debris
- ▨ Impassable-Vegetation
- ▨ IMPASSABLE WETLANDS DELINEATED BY UXB
- ▨ IMPASSABLE WOODLANDS DELINEATED BY UXB
- ⊕ SITE MONUMENT

UXB International, Inc.  
 14800 Conference Center Drive  
 Suite 100  
 Chantilly, Virginia 22021-3808  
 (703) 803-8904

**FORT MEADE, MARYLAND**

	SCALE: 1"=1000'
	DATE: 2/23/94
	REVISED: 3/31/94
	DRAWN BY: SJH
	CHECKED BY: LCF
	SHEET 1 OF 1
File Name:	

**RESPONSIBILITIES:**

Lead technical position for the project. Responsible for the successful completion of all field operations by directing and controlling all teams in performance of delivery order requirements. Reviews work/safety plans and implements tasks as outlined. Assures personnel are provided details of tasks to be performed and are briefed on health and safety requirement. Continually evaluates operations to determine effectiveness and efficiency of established procedures and implements corrective actions. Provides guidance and direction to UXO Supervisors. Collects and compiles data provided by the UXO Supervisors. Prepares project reports and assures timely submission. Reports directly to the on-site Project Manager. Makes the necessary on the spot safety corrections.

**B. UXO SITE SAFETY OFFICER (SSO)/MAGNETOMETER OPERATOR**

NAME: Ted Carlson

ADDRESS: UXB International, Inc.  
14800 Conference Center Dr., Suite 100,  
Chantilly, VA 22021-3806

PHONE: (703) 803-8904

**RESPONSIBILITIES:**

**DUAL-HATTED POSITION:** Performs duties as magnetometer operator during geophysical survey and other duties as directed by the UXO Technician. Responsible for understanding and complying with all requirements of the work/safety plans. Be alert to potential hazardous situations and immediately bring them to the attention of the UXO Team Leader.

**C. TEAM MEMBERS (other than those listed above)**

As Directed by Prime Contractor.

**RESPONSIBILITIES:** To read and comply with the SSO, and to stay alert to hazards at all times. No team member except UXO qualified personnel should ever TOUCH a suspect piece of ordnance. Report all suspicious items to the SSO.

**4.0. HAZARD ANALYSIS**

**A. Safety and health hazards anticipated**

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> Chemical (specify)            |   |   |
| <input checked="" type="checkbox"/> Ordnance (specify) | Projectiles and Grenades                        |   |
| <input checked="" type="checkbox"/> Heat Stress        | <input checked="" type="checkbox"/> Cold Stress | <input checked="" type="checkbox"/> Tripping Hazard |
| <input checked="" type="checkbox"/> Noise              | <input type="checkbox"/> Electrical             | <input type="checkbox"/> Falling Object             |
| <input checked="" type="checkbox"/> Foot Hazard        | <input type="checkbox"/> Biological             | <input type="checkbox"/> Radiological               |
| <input type="checkbox"/> Overhead Hazard               | <input type="checkbox"/> Confined Space         | <input type="checkbox"/> Other (specify)            |
| <input checked="" type="checkbox"/> Explosive          | <input type="checkbox"/> Climbing Hazard        | <input checked="" type="checkbox"/> Overhead Hazard |
| <input checked="" type="checkbox"/> Flammable          |   | - Drill Rig   |

**B. Overall Hazard Evaluation:**

- High                       Moderate                       Low                       Unknown

**JUSTIFICATION:** *(Provide a brief justification supporting the overall hazard evaluation.)*  
A surface search and removal operation has been performed by AEC. Subsurface UXO will be avoided through geophysical detection.

**5.0 ACCIDENT PREVENTION** *(expand or delete as applicable)*

**A. General Precautions**

Prior to commencement of work, all team members will be required to read this SSHP and sign the form acknowledging that they have read it and will comply with it. In addition, the SSO shall hold daily tailgate meetings in which site specific topics regarding the days activities will be discussed. The buddy system will be enforced at all times. If hazardous conditions arise, team members are to stop work, evacuate the area and notify the SSO who will notify the UXO Team Leader who will immediately notify the AEC Site Safety Specialist.

**6.0 STANDARD OPERATION SAFETY PROCEDURES, ENGINEERING CONTROLS AND WORK PRACTICES**

- A. SITE RULES/PROHIBITIONS:** At any sign of hazardous conditions, stop tasks, evacuate area and notify the AEC Site Safety Officer. Smoking, eating and drinking allowed in designated areas only.
- B. MATERIAL HANDLING PROCEDURES:** Do not handle
- C. DRUM HANDLING PROCEDURES:** Do not handle
- D. CONFINED SPACE ENTRY:** Do not enter
- E. IGNITION SOURCE AND ELECTRICAL PROTECTION:** Do not smoke
- F. SPILL CONTAINMENT:** N/A
- G. EXCAVATION SAFETY:** Do not enter trenches
- H. ILLUMINATION:** Work only during the hours between sunrise and sunset.
- I. SANITATION:** N/A
- J. BUDDY SYSTEM:** To be adhered to at all times.
- K. ENGINEERING CONTROLS:** N/A
- L. ORDNANCE:**
  - 1. **Movement.** Before walking in a particular direction, scan your approach with your eyes. Do not walk into uncleared areas without a UXO qualified escort. **REMEMBER -- STAY ALERT, STAY ALIVE!**
  - 2. **Sighting.** Upon sighting a suspicious object, note its size, shape, markings and the specific location. Withdraw from the area and notify all team members. The AEC Safety Specialist will identify the object if possible. **DO NOT TOUCH SUSPICIOUS OBJECTS.** The only team members qualified to touch suspicious objects are the AEC Safety Specialist and active duty military EOD trained personnel.
  - 3. **Actions to be taken by the AEC Safety Specialist.** The Safety Specialist will mark the area with survey tape. If a Army Technical Escort Unit (TEU) member is present, they will inspect the item to determine the potential for chemical ordnance. In the event that the item is identified as a potential chemical item and TEU is not present, the AEC Safety Specialist will notify the 144th Ordnance

Detachment (EOD) and request support. Upon positive identification that the item is chemical, either TEU or the 144th Ordnance detachment will make preliminary notification to the TEU operations. The AEC Safety Specialist will notify AEC Safety Office and the Army Operations Center in accordance with AR 50-6. If the suspicious object is considered to be an immediate threat, the AEC Safety Specialist will remain in the area at a safe distance to warn people of the hazard until the EOD Unit arrives. It is the responsibility of the site supervisor to take notes regarding the suspicious object for future reference and reporting.

4. Safe Distances. Evacuation distance for non-fragmenting explosive materials is 1,250 feet and for fragmenting explosive materials is 2,500 feet.

M. OTHER: (specify)

## 7.0 SITE CONTROL AND COMMUNICATIONS

- A. SITE MAP: Attach copy
- B. SITE WORK ZONES: n/a
- C. BUDDY SYSTEM: To be adhered to at all times.
- D. COMMUNICATIONS:

1. ON-SITE: Verbal communications (via two-way radio and cellular phone) will be used among team members to communicate to each other on-site. If this communication is not possible, the following hand signals will be used.

GRIP PARTNER'S WRIST OR BOTH HANDS AROUND WAIST -- Leave the area immediately.

HAND GRIPING NOSE -- Unusual smell detected

THUMBS UP -- O.k., I am alright or I understand

THUMBS DOWN -- No, negative

2. OFF-SITE: The AEC Safety Specialist will have a cellular phone for contacting emergency services off-site.

NOTE: In the case of small groups, a verbal signal for emergencies shall suffice. The emergency signal for large groups (i.e., airhorn) should be incorporated at the discretion of the SSO.

- E. SAFE WORK PRACTICES/SOP's: Attach SOP's as applicable.

## 8.0 EMERGENCY RESPONSE

- A. Team members are to be alert to the dangers associated with the site at all times. If a hazardous condition arises, stop work, evacuate the area and notify the SSO.
- B. FIRST AID. A first aid kit will be located in the SSO's field car. If qualified persons (i.e., a fire department, medical facility or physician) is not accessible within five minutes of the site at least one team member shall be qualified to administer first aid and CPR.
- C. EMERGENCY TELEPHONE NUMBERS.
  1. MEDICAL FACILITY: 911
  2. FIRE DEPARTMENT: 911



3. POLICE DEPARTMENT: 911
4. POISON CONTROL CENTER: (800) 962-1250
5. AEC SAFETY OFFICE: (410) 671-4811
6. 144th Ordnance Detachment (410) 677-9770/9104
7. TEU: CPT. Talley, (410) 671-4381/4384/2273
8. UXB PROJECT MANAGER: Tom Yancey (703) 803-8904  
(UXB International, Inc.)

**D. HOSPITAL/MEDICAL FACILITY INFORMATION:**

NAME: Kimbrough Army Community Hospital  
 ADDRESS: USA MEDDAC  
 Ft. George/Meade, MD 20755  
 DISTANCE TO HOSPITAL:  
 ROUTE TO HOSPITAL: Refer to map in site-specific HASP.

**9.0 MONITORING EQUIPMENT AND PROCEDURES**

*(Fill in with any site specific monitoring equipment to be utilized. Attach a form for keeping records of the results and calibration.)*

**10.0 PERSONAL PROTECTIVE EQUIPMENT**

*(Fill in additional tasks part B if more than task #1 is to be conducted.)*

**A. GENERAL**

Team members should avoid wearing outer or undergarments made of wool, silk or synthetic textiles such as rayon or nylon. These materials can generate sufficient static charge to ignite explosives. Hard hats will be worn if an overhead hazard exists and safety shoes will be worn if a foot hazard exists.

**B. TASK #1 PRELIMINARY SITE INVESTIGATION (NON-INTRUSIVE)**

Level of Protection:

Initial:             A    B    C    D    Modified (specify)

\_\_\_\_\_ Contingency:  A    B    C    D    Modified (specify)

-or-

X Evacuate site if higher level of protection is needed.

**11.0 DECONTAMINATION PROCEDURES**

*(Tailor as required)*

Decontamination procedures are not anticipated for this site investigation. Team members are cautioned not to walk, kneel or sit on any surface with potential leaks, spills or contamination. Decontamination procedures will be the responsibility of drillers.

**12.0 TRAINING**

All site personnel shall have completed the training required by EM 385-1-1 and 29 CFR 1910.120 (e). Additionally, the SSO shall inform personnel before entering, of any potential site-specific hazards and procedures.

EMPLOYEE	COURSE	LOCATION	DATE
Charles Galbreath	8 hour	UXB Int'l. Inc.	11/29/93
Ted Carlson	8 hour	UXB Int'l. Inc.	11/29/93

### 13.0 MEDICAL SURVEILLANCE PROGRAM

All site workers are on the Medical Surveillance Program.

### 14.0 LOGS, REPORTS AND RECORD KEEPING

Site logs are maintained by the Project Manager. This is to include historical data, personnel authorized to visit the site, all records, standard operating procedures and the SSO.

### 15.0 GENERAL

Request the number of persons visiting the site is kept to as few as possible. The more persons on-site, the greater potential for an accident. The SSO may make recommendations to this SSHP if site conditions warrant and without risking the safety and health of the team members. Any modification to this plan must be approved by the AEC Safety Specialist.

# STANDARD OPERATING PROCEDURES (SOP) - GEOPHYSICAL UXO SURVEYS

## STEP DESCRIPTION AND SPECIFIC INSTRUCTIONS

### 1. Daily Operations

- a. All personnel report to the work site at time designated by the Senior UXO Specialist.
- b. The Senior UXO Specialist will give the daily safety briefing to all site workers and give specific instructions for the day's work.
- c. The project command post (CP) will be designated and all personnel not directly involved in down-range operations will remain at the CP. Visitors requesting to observe down-range operations will be escorted by the Senior UXO Specialist or his representative.
- d. Communications with down-range personnel are mandatory. Radios will be tested prior to beginning UXO operations.
- e. A minimum of two qualified UXO Technicians will be onsite during all UXO operations.
- f. The Senior UXO Specialist will maintain a log detailing all field operations in accordance with direction contained in the work plan.

### 2. Geophysical Survey Procedures

- a. The UXO Supervisor will verify and survey area.
- b. The UXB survey crew, consisting of a minimum of two UXO Technicians, will conduct a visual inspection of the survey area to locate any obvious surface UXO hazards.
- c. The survey area will be divided into six-foot-wide search lanes using wooden stakes and surveyor's line to clearly mark the lanes.
- d. The geophysical instruments to be used to conduct the survey will be assembled and operationally checked in the CP area, by testing the instrument response to known objects buried at known depths, prior to beginning the geophysical survey.
- e. All subsurface metallic contacts will be marked with pin flags.

### 3. UXO Disposal

- a. All confirmed UXO will be identified, recorded, and the 144th Ordnance Detachment (EOD) will be notified of their location, condition, and quantity for disposal.

### 4. Post-Operation Procedures

- a. The Senior UXO Specialist will ensure all equipment is properly stored and secured. Important: Loosen swivel screws on Foerster Ferex before folding probe.
- b. The Senior UXO Specialist will conduct a daily debrief of the project and briefly outline the next day's objectives.
- c. Prior to departing the work site the Senior UXO Specialist will ensure that the project area is clean and free of UXO and industrial hazards.

## GEOPHYSICAL ESCORT

### STEP DESCRIPTION AND SPECIFIC INSTRUCTIONS

#### 1. Daily Operations

- a. All personnel report to the work site at time designated by the Senior UXO Specialist.
- b. The Senior UXO Specialist will give the daily safety briefing to all site workers and give specific instructions for the day's work.
- c. The project command post (CP) will be designated and all personnel not directly involved in down-range operations will remain at the CP.
- d. Communications with down-range personnel are mandatory. Radios will be tested prior to beginning UXO operations.
- e. A minimum of two qualified UXO Technicians will be on site during all UXO operations.
- f. The Senior UXO Specialist will maintain a log detailing all field operations in accordance with direction contained in the work plan.

#### 2. Geophysical Survey Procedures

- a. One UXO Technician will survey the area to be traversed ahead of the samplers and mark location of ordnance items (both surface and subsurface) with biodegradable spray paint or pin flags. These marked areas will be avoided during this and subsequent passage.
- b. Any UXO located is to be left in place and reported to the 144th Ordnance Detachment (EOD) for final disposal.
- c. Areas such as demolition ranges, disposal burn sites, or landfills containing ordnance, will require a UXO Technician to accompany non-ordnance personnel during each excursion within the site boundaries.
- d. Cleared areas will be re-inspected after excavations, heavy rains, or any other terrain-altering disturbances which may have uncovered ordnance.
- e. Any area deemed to be too heavily contaminated with ordnance or explosive waste by the Senior UXO Supervisor to allow non-ordnance personnel to enter for sampling or other activities may require the activities to be performed by a UXO Technician under the instruction of the sampler.

## DOWNHOLE GEOPHYSICS

### STEP DESCRIPTION AND SPECIFIC INSTRUCTIONS

#### 1. Daily Operations

- a. All personnel report to the work site at time designated by the Senior UXO Specialist.
- b. The Senior UXO Specialist will give the daily safety briefing to all site workers and give specific instructions for the day's work.
- c. The project command post (CP) will be designated and all personnel not involved in down-range operations will remain at the CP.
- d. Communications with down-range personnel are mandatory. Radios, if required, will be tested prior to beginning UXO operations.
- e. The Senior UXO Specialist will maintain a log detailing all field operations in accordance with direction contained in the work plan.

#### 2. Downhole Geophysics Procedures

- a. Proposed monitoring well sites will be reviewed with prime contractor for position, physical obstacles, and access paths.
- b. Selected drilling sites will be marked with stakes and flagging tape to identify the cleared radius. Radii will be based on size of drill rig as follows:
  - Minimum.....15 feet
  - 1 ton rig.....30 feet
  - 5 ton rig.....45 feet
  - 10 ton rig.....60 feet
- c. The safety radii will be surveyed with the Foerster Ferex Ordnance Locator and the White's Eagle II detector to a depth of two feet and all metallic contacts excavated and identified. All live ordnance will be marked for visual relocation and reported to cognizant EOD unit (144th Ordnance Detachment (EOD) Ft, Meade, MD. {410-677-9770/9104}).
- d. A 15 foot wide access path from the nearest road to the well site will be marked with stakes and flagging and cleared in the same manner as the safety radius. The stakes will be of sufficient height to be visible to the drill rig driver as he maneuvers from the road to the drill site.
- e. A UXO Technician will hand-auger down two feet at the proposed well site. With the Foerster configured in the underwater mode, the probe will be lowered to the bottom of the hole and monitored for metallic contacts. At this point, the well site will be cleared to a depth of four feet.
- f. Repeat step e. every two feet until a depth of 10 feet (contract specific) is reached.

**APPENDIX C**

**HAZARDOUS SUBSTANCES DETECTED AT THE DRMO SITE AT FORT MEADE**

Contaminant	PEL/TLV(a)	Routes of Exposure	Signs and Symptoms of Exposure
Aluminum	SMCL 0.05-0.2 ppm	Inh, Ing	N/A
Bromacil (Pesticide)	No regulatory limits	Inh, Ing	N/A
Carbon tetrachloride	STEL 12.6 mg/m <sup>3</sup> (2 ppm) IDLH 300 ppm	Inh, Abs, Ing, Derm	Carcinogen; nausea; vomiting; liver, kidney damage; skin irritation
Chloroform	STEL 9.78 mg/m <sup>3</sup> (2 ppm) IDLH 1000 ppm	Inh, Ing, Derm	Carcinogen; dizziness; nausea; irritation to eyes and skin; anesthesia; hepatomegaly
Chromium	0.5 mg/m <sup>3</sup> (Cr <sup>2+</sup> , <sup>3+</sup> ) 0.001 (Cr <sup>6+</sup> )	Inh, Ing	Fibrosis of lungs; carcinogen
1,1-Dichloroethene	5 ppm STEL 20 ppm NIOSH 1 ppm	Inh, Ing, Abs, Derm	Irritation of eyes, nose, mucous membranes; skin blisters; narcotic effect
Iron	SMCL 0.3 ppm	Inh, Ing	N/A
Lead	0.05 mg/m <sup>3</sup>	Inh, Ing, Derm	Insomnia; low weight; malnutrition; constipation; abdominal pain; anemia
Manganese	SMCL 0.05 ppm	Inh, Ing	N/A
Polychlorinated biphenyl (PCB)	0.05 mg/m <sup>3</sup>	Ing, Inh, Derm	Carcinogen, liver pathology, eye irritant
Tetrachloroethylene, perchloroethylene (PCE)	50 ppm	Inh, Ing, Derm	Eye, nose, and throat irritation; nausea; flush face and neck; dizziness; headache; suspect carcinogen
1,1,1-Trichloroethane	350 ppm	Inh, Ing, Derm	Headache; lassitude; CNS depression; poor equilibrium; irritated eyes; dermatitis; cardiac arrhythmia

Contaminant	PEL/TLV(a)	Routes of Exposure	Signs and Symptoms of Exposure
Trichlorofluoromethane (Freon-11)	50 ppm	Inh, Ing, Derm	Headaches; nausea, vomiting; vertigo, eye irritation, cardiac arrhythmia; tremors; dermatitis

(a) Permissible Exposure Level (OSHA) or Threshold Limit Value (ACGIH) for time-weighted average exposure for an 8-hour workday or 40-hour workweek. The most conservative value is listed. Short term exposure limits (STEL), immediately dangerous to life and health (IDLH), and time weighted average (TWA) values are also included as appropriate. In the absence of any of these values, the Maximum Contaminant Level (MCL) or Secondary Maximum Contaminant Level (SMCL) is provided.

Inh = Inhalation  
 Ing = Ingestion  
 Derm = Dermal Contact  
 Abs = Skin Absorption  
 NA = Not Available



**APPENDIX D**

**MEDICAL MONITORING REQUIREMENTS**

Engineering Technologies Associates, Inc. personnel engaged in on-site activities are participants in a Medical Monitoring Program that meets the requirements set forth in 29 CFR 1910.120 (Hazardous Waste Operations and Emergency Response). Participants in the medical monitoring program are required to have initial and annual physical examinations. The ETA Medical Monitoring Program is coordinated through the Baltimore Industrial Medical Center in Baltimore, Maryland. Subcontractors are required to have a medical monitoring program similar to ETA's.

The primary goal of a Medical Monitoring Program is to provide evaluation and ongoing surveillance of the health status of employees potentially exposed to toxic substances as a result of their work-related activities. It is recognized that an active health monitoring program for those employees potentially at risk is an important tool in evaluating the effects of chronic low-level exposures or acute exposures related to operations at hazardous waste sites. The effects of low-level exposures may not become apparent until years after the initial exposure.

The ETA program is a typical medical Monitoring Program that meets 29 CFR 1910.120 requirements and includes laboratory testing, personnel medical history evaluation, physical examination, and specific systemic testing. Each participant undergoes an occupational history evaluation and physical examination, including such parameters as:

- Pulmonary Function Tests
- Complete Blood Count
- Multiphasic Blood Chemistry
- Urinalysis
- Chest X-Ray
- Electrocardiogram
- Vision Test
- General Physical Examination
- Specialized tests, as required (e.g., lead, arsenic, PCB screening)

Following the establishment of each participant's baseline values for the above parameters, an annual re-evaluation is conducted to monitor potential changes due to work with hazardous materials.

In addition to this annual re-examination, provisions are made for specific post-exposure examinations in the event of a suspected exposure during a particular field event. The maximum allowable time lapse between the most recent examination and the initiation of field activities at the site for field personnel is one year.

After each examination, a determination is made by the attending physician regarding the ability of the employee to carry out his or her work assignments, including the use of respirators and other personal protective equipment. Any restrictions recommended by the physician are communicated to the employee and the HSO. An examination is also offered when an employee leaves the company or is reassigned to work that does not involve hazardous wastes.

**APPENDIX E**

**HEALTH AND SAFETY TRAINING REQUIREMENTS**

Supervisory and field personnel have had prior classroom and hands-on training and/or relevant (documented) health and safety experience that satisfies the training requirements of OSHA's regulation for Hazardous Waste Operations and Emergency Response (29 CFR 1910.120)

For workers on site only occasionally, a minimum of twenty-four (24) hours of training and relevant field experience, covering, but not limited to, the following topics, has been obtained:

- General site safety
- Toxicology
- Hazard recognition
- Site investigation
- Use and limitations of personal protective equipment
- Respiratory protection
- Hazardous waste management
- Use of monitoring instrumentation
- Decontamination

A minimum of one day of actual field experience under the direct supervision of a trained experienced supervisor is also required.

It is important to remember that the level of training is consistent with the employee's site and job function and responsibilities. Thus, many individuals will have received the full 40-hours of training appropriate to "site workers." Under all site conditions, individuals with only 24 hours of OSHA training shall be under the direct supervision of someone with 40 hours of OSHA training. If site conditions warrant Level C protection (due to levels of airborne contaminants), 40 hours of OSHA training will be required for all workers in the Exclusion and Decontamination Zones. Personnel with 24-hour training will be limited to tasks that do not require the use of respiratory protection.

On-site management and supervisors directly responsible for, or who supervise, employees working with the Exclusion and Decontamination Zones, shall have received at least eight additional hours of specialized training on managing safety at hazardous waste site operations.

Site personnel who can show, by appropriate documentation from their employer, that their previous work experience and/or training was equivalent to the training requirements for this project, shall be considered as meeting those requirements. Equivalent training includes the training that might have been received from actual on-site training for previous projects. After their initial training, ETA personnel are required to have annual health and safety refresher training. The ETA HSO reserves the right to determine training eligibility for ETA and subcontractor site workers.

## **APPENDIX F**

### **ACRONYMS AND ABBREVIATIONS**

ACGIH	American Council of Governmental Industrial Hygienists
AEC	U.S. Army Environmental Center
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CNS	central nervous system
CP	command post
dB	decibel
DNR	Department of Natural Resources
DPDO	Defense Property and Disposal Office
DRMO	Defense Property Disposal Organization
EIS	Environmental Impact Statement
EOD	Explosive Ordnance Disposal
EPA	U.S. Environmental Protection Agency
ETA	Engineering Technologies Associates, Inc.
FGGM	Fort George G. Meade
FS	Feasibility Study
HASP	Health and Safety Plan
HRS	Hazard Ranking System
HSO	Health and Safety Officer
IDLH	Immediately Dangerous to Life and Health
LEL	lower explosive limit
MCL	Maximum Contaminant Level
mR	milliroentgen
$\mu$ R	microroentgen
MSA	Mine Safety Administration
MSDS	Material Safety Data Sheet
NIOSH	National Institute of Occupational Safety and Health
NPL	National Priorities List
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
PCE	perchloroethylene
PEL	Permissible Exposure Limit
PID	photoionization detector
PPE	personal protective equipment
ppm	parts per million
PWRC	Patuxent Wildlife Research Center
QCP	Quality Control Plan
RGH	Rogers, Golden & Halpern, Inc.
RI	Remedial Investigation
SARA	Superfund Amendments and Reauthorization Act
SCBA	Self-Contained Breathing Apparatus
SES	Safety and Environmental Services