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HEALTH AND SAFETY PLAN FOR MUNITIONS RESPONSE PROGRAM FOR MUNITIONS
AND EXPLOSIVES OF CONCERN SUPPLEMENTAL REMEDIAL INVESTIGATION AT
OPERABLE UNIT 5 (OU 5) SITE 15 BLUE 10 ORDNANCE DISPOSAL AREA NAS CECIL
FIELD FL
04/01/2011
TETRA TECH NUS

Comprehensive Long-term Environmental Action Navy

CONTRACT NUMBER N62470-08-D-1001



Health and Safety Plan for Munitions Response Program

MEC Supplemental Remedial Investigation at Operable Unit 5, Site 15, Blue 10 Ordnance Disposal Area

Naval Air Station Cecil Field
Jacksonville, Florida

Contract Task Order JM09

April 2011



BRAC Program Management Office Southeast
4130 Faber Place Drive, Suite 202
North Charleston, South Carolina 29405

**HEALTH AND SAFETY PLAN
FOR**

MUNITIONS RESPONSE PROGRAM

**MEC SUPPLEMENTAL REMEDIAL INVESTIGATION AT
OPERABLE UNIT 5, SITE 15, BLUE 10 ORDNANCE DISPOSAL AREA**

**NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

**COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION-NAVY (CLEAN) CONTRACT**

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**CONTRACT NUMBER N62470-08-D-1001
CONTRACT TASK ORDER JM09**

APRIL 2011

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ACRONYMS / ABBREVIATIONS

AHA	Activity Hazard Analyses
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CLEAN	Comprehensive Long-Term Environmental Action Navy
CSP	Certified Safety Professional
DoD	Department of Defense
DRI	Direct Reading Instrument
EOD	Explosive Ordnance Disposal
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSM	Health and Safety Manager
IDW	Investigation Derived Waste
MDAS	Material Documented as Safe
MDEH	Material Documented as an Explosive Hazard
MEC	Munition and Explosives of Concern
MPPEH	Material Potentially Presenting an Explosive Hazard
N/A	Not Available
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration (U.S. Department of Labor)
PHSO	Project Health and Safety Officer
PM	Project Manager
PPE	Personal Protective Equipment
SOP	Standard Operating Procedures
SSO	Site Safety Officer
SUXOS	Senior Unexploded Ordnance Supervisor
SWMU	Solid Waste Management Unit
TBD	To be determined
UXO	Unexploded Ordnance
UXOQCS/UXOSO	Unexploded Ordnance Quality Control Specialist/Safety Officer

1.0 INTRODUCTION

The objective of this Health and Safety Plan (HASP) is to provide the safety and health requirements, practices, and procedures for Tetra Tech NUS, Inc. (TtNUS) personnel participating in Munitions Response Program MEC Supplemental Remedial Investigation at Operable Unit 5, Site 15, Blue 10 Ordnance Disposal Area located at the former Naval Air Station (NAS) Cecil Field, Jacksonville, Florida.

This HASP is to be used in conjunction with the Tetra Tech Accident Prevention Plan (APP) found in Attachment I and the Health and Safety Guidance Manual. The Guidance Manual provides detailed information pertaining to hazard recognition and control, and Tetra Tech standard operating procedures. This HASP and the contents of the Guidance Manual were developed to comply with the requirements stipulated in the Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations (CFR) 1910.120 otherwise known as the Hazardous Waste Operations and Emergency Response Standard. Both documents must be present at the site to satisfy these requirements.

This HASP/APP has been written to support proposed tasks and techniques associated with the scope of work as presented in Section 4.0. This support will be performed in accordance with the provisions and guidelines established in the Naval Ordnance Safety and Security Activity (NOSSA) - and The Department of Defense (DoD) Explosives Safety Board (DDESB) - approved Explosive Safety Submission (ESS) for the OU 5, Blue 10 Ordnance Disposal Site. Also, MEC activities will be performed in accordance with local, state, and federal regulations and will include those in Engineer Pamphlet EP-75-1-2 and MMRP Data Item Description (DID) 09-005. The Navy requirements include OP-5 and NOSSA Instruction 8020.15C.

This work is being conducted as part of the Defense Environmental Restoration Program (DERP) MMRP and will be performed in accordance with Comprehensive Environmental Response, Compensation, and Liability Act of 1990 (CERCLA) Sections 104 and 121.

The information contained in this plan, as well as policies on conducting site operations, have been obtained from the Tetra Tech Health and Safety Program, the APP, supporting Standard Operating Procedures (SOPs).

This HASP/APP has been developed using the latest available information regarding suspected MEC and potential physical hazards associated with the proposed work at the site. These documents will be modified if new information becomes available. Changes will be made with the approval of the Tetra Tech Project Health and Safety Officer (PHSO), the Tetra Tech Health and Safety Manager (HSM) and

the Senior UXO Supervisor (SUXOS). Requests for modifications to the HASP will be directed to the UXO Quality Control Specialist (UXOQCS)/UXO Safety Officer (UXOSO), who will determine if the changes are necessary. The UXOQCS/UXOSO will notify the Project Manager (PM), who will notify affected personnel of changes.

1.1 AUTHORITY

This work is authorized under the Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract No. N62470-08-D-1001, Contract Task Order (CTO) JM09, administered through the U.S. Navy, Former Naval Air Station (NAS) Cecil Field Jacksonville, Florida.

2.0 EMERGENCY ACTION PLAN

2.1 INTRODUCTION

This section has been developed as part of a planning effort to direct and guide field personnel in the event of an emergency. In the event of an emergency, the field team will primarily evacuate and assemble to an area unaffected by the emergency and notify the appropriate local emergency response personnel/agencies. When ill or if inflicted with a non-serious injury, may be transported by site personnel to nearby medical facilities, provided that such transport does not aggravate or further endanger the welfare of the injured/ill person. The emergency response agencies listed in this plan are capable of providing the most effective response, and as such, will be designated as the primary responders. These agencies are located within a reasonable distance from the area of site operations, which ensures adequate emergency response time. Tetra Tech personnel may participate in minor event response and emergency prevention activities such as:

- Incipient fire-fighting support and prevention
- Incipient spill control and containment measures and prevention
- Removal of personnel from emergency situations
- Provision of initial medical support for injury/illness requiring only first-aid level support
- Provision of site control and security measures as necessary

2.2 EMERGENCY PLANNING

Through the initial hazard/risk assessment effort, emergencies resulting from chemical, physical, or fire hazards are the types of emergencies which could be encountered during site activities. To minimize or eliminate the potential for these emergency situations, pre-emergency planning activities will include the following: The SUXOS and/or the UXOQCS/UXOSO are responsible for:

- Coordinating with emergency services personnel to ensure that Tetra Tech emergency action activities are compatible with existing emergency response procedures.
- Establishing and maintaining information at the project staging area (support zone) for easy access in the event of an emergency. This information may include the following:
 - Site personnel medical records (Medical Data Sheets).
 - A log book identifying personnel site each day.
 - Hospital route maps with directions (these should also be placed in each site vehicle).
 - Emergency phone numbers.

- Identifying a chain of command for emergency action.
- Educating site workers to the hazards and control measures associated with planned activities at the site, and providing early recognition and prevention, where possible.
- Utilizing the necessary equipment to safely accomplish identified tasks.
- In the event of an emergency the SUXOS will serve as the Incident Commander until Emergency Services arrive.
- Educating site workers to the hazards and control measures associated with planned activities at the site and providing early recognition and prevention where possible. This includes:
 - Site-specific Training
 - Tailgate/Safety Meetings
 - Activity Hazard Analysis (AHA) Review

2.3 EMERGENCY RECOGNITION AND PREVENTION

2.3.1 Recognition

Emergency situations that may be encountered during site activities will generally be recognized by visual observation. Visual observation will also play a role in detecting potential exposure events to some chemical hazards. Tasks to be performed at the site, potential hazards associated with those tasks and the recommended control methods are discussed in detail in Sections 5.0 and 6.0. Additionally, early recognition of hazards will be supported by daily site surveys to eliminate any situation predisposed to an emergency. Survey findings are documented in the site logbook. Where potential hazards exist, Tetra Tech will initiate control measures to prevent adverse effects to human health and the environment.

Foreseeable emergency situations that may be associated with potential MEC will generally be recognizable by visual observation. This will be done by the UXOQCS/UXOSO who will visually scan the surface as well as use magnetometers to detect the potential presence of subsurface MEC-related materials. In addition, the UXOQCS/UXOSO will provide training and instruction on MEC types that may be encountered, avoidance measures, etc. The Tetra Tech UXO SOP is provided as Attachment II of this HASP.

2.3.2 Prevention

Tetra Tech will minimize the potential for emergencies by following the Health and Safety Guidance Manual and ensuring compliance with the HASP and applicable OSHA regulations. Daily site surveys of work areas, prior to the commencement of that day's activities, will also assist in prevention of illness/injuries when hazards are recognized early and control measures initiated.

2.4 EVACUATION ROUTES, PROCEDURES, AND PLACES OF REFUGE

An evacuation will be initiated whenever recommended hazard controls are insufficient to protect the health, safety or welfare of site workers. Specific examples of conditions that may initiate an evacuation include, but are not limited to the following: severe weather conditions; fire or explosion; monitoring instrumentation readings which indicate levels of contamination are greater than instituted action levels; and evidence of personnel overexposure to potential site contaminants.

In the event of an emergency requiring evacuation, personnel will immediately stop activities and report to the designated safe place of refuge unless doing so would pose additional risks. When evacuation to the primary place of refuge is not possible, personnel will proceed to a designated alternate location and remain until further notification. Safe places of refuge will be identified prior to the commencement of site activities and will be conveyed to personnel as part of the pre-activities training session. This information will be reiterated during daily safety meetings. Whenever possible, the safe place of refuge will also serve as the telephone communications point for that area. During an evacuation, personnel will remain at the refuge location until directed otherwise by the Site Incident Commander of the Emergency Response.

Evacuation procedures will be discussed during the pre-activities training session, prior to the initiation of project tasks. Evacuation routes from the site and safe places of refuge are dependent upon the location at which work is being performed and the circumstances under which an evacuation is required. Additionally, site location and meteorological conditions (i.e., wind speed and direction) may dictate evacuation routes. As a result, assembly points will be selected and communicated to the workers relative to the site location where work is being performed. Evacuation should always take place in an upwind direction from the site.

2.5 EMERGENCY CONTACTS

Prior to initiating field activities, personnel will be thoroughly briefed on the emergency procedures to be followed in the event of an accident. Table 2-1 provides a list of emergency contacts and their associated

telephone numbers. This table must be posted where it is readily available to site personnel. Facility maps should also be posted showing potential evacuation routes and designated meeting areas.

TABLE 2-1
EMERGENCY CONTACTS
NAS CECIL FIELD, JACKSONVILLE, FLORIDA

CONTACT	PHONE NUMBER
EMERGENCY (Police, Fire, Ambulance Service)	911
City of Jacksonville Sheriff's Office (non-emergency)	(904) 630-7600
Primary Hospital - St. Vincent Hospital	(904) 308-7300
Navy RPM Art Sanford	(843) 743-2135
NAS-Flight Line Area Contact, Diane Stone	(904) 573-1604
NAS - Cecil Field Point-of-Contact, Ralph Hogan	(904) 771-6397
Tetra Tech - Pittsburgh Office	(412) 921-7090
Tetra Tech - Cecil Field Site Office	(904) 317-9199
Project Manager, Robert F. Simcik, P.E.	(412) 921-8163
Technical Lead, Linda Klink, P.E.	(412) 921-8650
Tetra Tech- UXO Manager, Ralph Brooks	(770) 413-0965 x231 (404) 661-4916 (cell)
Tetra Tech SUXOS , Scott Roberts	(732) 861-0111 (cell)
Tetra Tech UXOQCS/UXOSO, Steve Cassidy	(615) 480-6565 (cell)
Tetra Tech Field UXO Team Leader, Mark Ladd	(918) 619-2608 (cell)
Tetra Tech - HSM, Matthew M. Soltis, CIH, CSP	(412) 921-8912
Tetra Tech - PHSO James K. Laffey	(412) 921-8904 (412) 370-6668 (cell)

2.6 ROUTE TO HOSPITAL

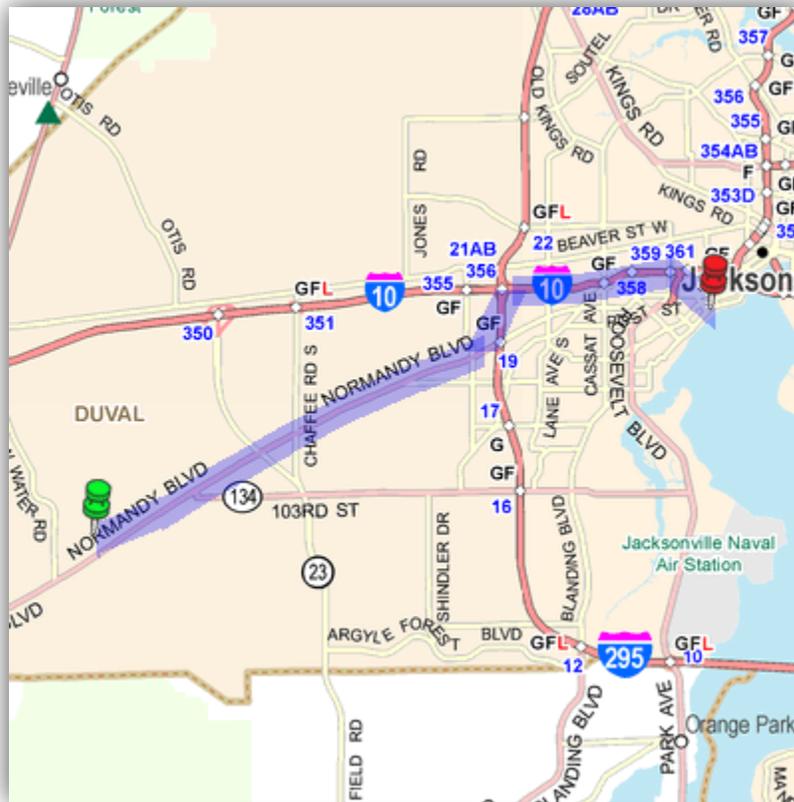
St. Vincent's Hospital
1800 Barrs St
Jacksonville, FL 32204
(904) 308-7494

Distance: 17.3 miles

On Normandy Boulevard heading Northeast
Take I-295 N on Left
Take Exit 21A on Right to I-10 E towards Jacksonville
Take Exit 362 on Right towards Stockton Street
Left onto Stockton Street
Left onto Riverside Avenue
Right onto Barrs Street
Hospital is on the Right

9.8 miles
0.8 miles
5.0 miles
0.1 miles
0.7 miles
0.1 miles
Short distance

**FIGURE 2-1
HOSPITAL ROUTE MAP**



2.7 EMERGENCY ALERTING AND ACTION/RESPONSE PROCEDURES

Site personnel will be working in close proximity at Former Naval Air Station (NAS) Cecil Field. As a result, hand signals, voice commands, and line of site communication will be established to alert site personnel of an emergency.

If an emergency occurs, the following procedures are to be initiated:

- Initiate the evacuation via hand signals, voice commands, or line of site communication
- Report to the designated refuge point
- Once non-essential personnel are evacuated, appropriate response procedures will be taken
- Describe to the Incident Coordinator the pertinent incident details.
- When UXO is discovered the UXO Technician will flag the location.
 - The area, if necessary, will be barricaded or otherwise protected.
 - The NAS Cecil Field POC will be notified and Military EOD will be contacted for treatment if necessary.

Site operations will stop, and the area will be under the control of the UXO Technician until relieved by the Former Naval Air Station (NAS) Cecil Field POC or Military EOD.

In the event that site personnel cannot mitigate the hazardous situation site personnel will:

- Dial 911 and call other pertinent emergency contacts listed in Table 2-1 and report the incident
- Give the emergency operator the location of the emergency, the type of emergency, the number of injured, and a brief description of the incident
- Stay on the phone and follow the instructions given by the operator
- The operator will then notify and dispatch the proper emergency response agencies.

2.8 MEDICAL DATA SHEET

Each field team member, including visitors, entering the exclusion zone(s) shall be required to complete a copy of the Medical Data Sheet (see Attachment III of this HASP). The purpose of this document is to provide site personnel and emergency responders with additional information that may be necessary in order to administer medical attention.

3.0 SITE BACKGROUND

3.1 FACILITY DESCRIPTION

NAS Cecil Field is located 14 miles southwest of Jacksonville, Florida. The majority of Cecil Field is located within Duval County, and the southernmost part of the facility is located in Clay County. NAS Cecil Field was established in 1941 and provided facilities, services, and material support for the operation and maintenance of naval weapons, aircraft, and other units of the operation forces as designated by the Chief of Naval Operations. NAS Cecil Field is subject to the Base Realignment and Closure Law of 1993. Since the closure of NAS Cecil Field in September 1999, most of the facility has been transferred to the Jacksonville Port Authority (now Jacksonville Aviation Authority) and the City of Jacksonville. According to the reuse plan, the facility will have multiple uses, but will be used primarily for aviation-related activities.

3.2 SITE 15 DESCRIPTION AND HISTORY

Site 15 is approximately 1,000 feet by 2,400 feet in size and was used as a skeet range and trap range from the early 1940s to the mid-1950s. Ordnance was disposed of at Site 15 from the mid-1960s through 1977, and disposal consisted of burning of ordnance materials in a large metal chamber and static firing of rockets. The majority of ordnance disposed of at the site was burned and included small arms and munitions up to 20 millimeters (mm) in size, parachute and distress flares, Mark IV signal cartridges, rocket igniters, cartridge-activated devices, and 2.75-inch and 5-inch rockets. Rocket propellant also was reportedly placed on the ground and ignited in the area of the burn chamber. Rockets were disposed of by static firing of both 2.75-inch and 5-inch rockets from a firing pad located south of the burn chamber. An estimated 2.5 tons of ordnance were disposed of at the site each month; overall, an estimated 350 tons of ordnance was disposed of while the site was in operation.

4.0 SCOPE OF WORK

This section discusses the activities that are to be performed at the sites. The Activity Hazard Analysis (AHAs) found in Section 14 of the APP provides information related to each of the tasks that are to be performed as part of the scope of work. As new phases or tasks are to be performed at the sites, the AHAs will be modified accordingly. The proposed Supplemental MEC RI consists of the following:

- Instrument Verification Strip (IVS).
- Vegetation management.
- Detector-aided surface surveys prior to intrusive activities.
- Manual hand-digging intrusive anomaly investigation of shallow subsurface anomalies to a maximum estimated depth of 1 foot below ground surface (bgs).
- Detector-aided surveys of materials removed from any hand excavation.
- Establishment, detector-aided surveying, and surface/subsurface investigation of "step-out" transects in the event that MEC are located within transects along the current extent of the investigation.
- MEC/MPPEH treatment, inspection, certification, and disposal.

If tasks other than those presented in this HASP are performed at the sites, this section of the HASP and the APP will be modified accordingly.

5.0 IDENTIFYING AND COMMUNICATING TASK-SPECIFIC HAZARDS AND GENERAL SAFE WORK PRACTICES

The purpose of this section is to identify the anticipated hazards and appropriate hazard prevention/hazard control measures that are to be observed for each planned task or operation. These topics have been summarized for each planned task through the use of task-specific Activity Hazard Analysis (AHAs), which are to be reviewed in the field with the task participants prior to initiating any task. Additionally, potential hazard and hazard control matters that are relevant but are not necessarily task-specific are addressed in the following portions of this section. Section 6.0 presents additional information on hazard anticipation, recognition, and control relevant to the planned field activities.

5.1 GENERAL SAFE WORK PRACTICES

UXO escort and avoidance will be provided for activities associated with site survey, vegetation management, and debris removal activities. Based on historical site activities, it is conservatively assumed that MEC may be present. In addition to the task-specific work practices and restrictions identified in the AHAs attached to this HASP, the following general safe work practices are to be followed when conducting work on-site.

- Plan and mark entrance, exit, and emergency evacuation routes.
- Rehearse unfamiliar operations prior to implementation.
- Use the “buddy system” and maintain visual contact with other site team members.
- Establish appropriate safety zones including support, contamination reduction, and exclusion zones.
- Prohibit unnecessary personnel from visiting the operations site.
- Non-essential vehicles and equipment should remain within the support zone.
- Establish appropriate decontamination procedures for leaving the site.
- Inform co-workers of potential symptoms of illness, such as headaches, dizziness, nausea, or blurred vision.
- Work will be conducted by a qualified UXO technician, as defined in DDESB TP 18.
- The UXO technician will conduct a detector-aided sweep of designated areas prior to entry and commencement of any activities.
- Surface locations will be screened (visual observation and magnetic detection) for the presence of UXO.
- The traffic routes (foot pathways) and work area dimensions, sufficient in size to conduct the operation, will be marked using flagging indicating an area cleared for access by general personnel.

The following safety precautions and rules will be observed by the site personnel:

- Report UXO or unidentified objects to the UXO Technician.
- Remove from the area any person showing evidence of explosive poisoning or dermatitis.
- Suspend operations immediately upon approach of an electrical storm within ten miles.
- If explosive materials are burning, or their ignition is imminent, immediately evacuate the area.
- Have a vehicle(s) in the area capable of evacuating personnel in case of an accident or emergency.
- Have communications equipment in the area in case of an accident or emergency.

5.2 VEGETATION MANAGEMENT SAFE WORK PRACTICES

The following is a list of general safeties that will be observed during vegetation management activities.

- Avoid insect nesting areas, use commercially available insect repellents.
- Report potential hazards to the UXOQCS/UXOSO.
- Hand tools (rakes, pitch forks, etc.) will be used to pull brush away from piles to avoid nesting areas.
- Do not use hands or feet for this purpose.
- All equipment will be:
 - Only manufacturer approved parts may be used in repair of site equipment.
 - Operated by persons knowledgeable in the maintenance and operation of the equipment. Restrictions to be observed during the operation (All personnel not directly supporting this clearance activity will remain at least 50-100 feet from the point of this operation).
 - Hand signals will be established by the chipper operator prior to the commencement of clearing activities.
 - All personnel will be instructed in the location and operations of the emergency shut off device(s). This device will be tested initially (and then periodically) to insure its operational status.
 - Work areas will be kept clear of clutter to permit escape, if necessary.

5.2.1 Weedeater Operations

- Inspect the Weedeater prior to each use.
- Ensure the blade is adjusted and/or sharp, depending on what style of cutting head you are using, and all parts are lubricated per the manufacturer's instruction.
- All safety devices and controls will be tested prior to the start of work, and checked periodically to insure equipment is safe for operation.

- Buddy system - At least two persons will be in close contact with one another when operating the weedeater. One to be a safety observer to search for the presents of MEC/MPPEH.
- Work gloves, long hair, loose fitting clothing will be secured to avoid snagging and entanglement in brush or moving chipper components.
- In addition to Level D PPE, workers will wear protective equipment including: chaps, hearing protection, a helmet and a face shield, when operating this equipment.
- Monitor, the condition of the weedeater during use, make adjustments, as necessary.
- The equipment operator must be mindful of where the cutting head is and in which direction and how far cuttings are being thrown by the cutting head.
- Personnel that need to approach the weed eater operator should first get the safety observer's or operator's attention and have him or her shutdown before approaching the operator.
- A weedeater will not be used to cut vegetation larger than the equipment is rated to cut.

5.2.2 Chainsaw Operations

- Inspect the chainsaw prior to each use. Insure the blade is adjusted and sharp, and all parts are lubricated per the manufacturer's instruction.
- Test all safety devices initially and then periodically to insure a safe operational status.
- When starting the chainsaw, place it on a firm surface.
- Place your foot in the hand guard at the rear of the saw, grip the top handle, pull the start cord with the free hand.
- Never attempt to start the saw free hand, or by placing it on your knee.
- Never cut with tip of the chain saw blade.

- Plan the cut. Know where the tree will fall. Have a clear escape plan when dropping trees greater than 2 inches in girth.
- Preview the tree to be dropped looking for insect nests bees and hornets that may be nesting in hollowed out trunks and tree tops.
- Do not stand between falling trees, branches, equipment or other trees.
- Never cut above your head.
- Cut only wood with the chain saw.
- Where prescribed safety equipment as described in the Safe Work Permit.
- Monitor, the condition of the saw during use, make adjustments, as necessary.
- When cutting a limb, cut from the opposite side of the trunk, the trunk will act as a shield to protect the worker.
- Be attentive as to how the trunk may move when removing limbs, keep yourself out of the pathway of falling limbs or branches.
- Keep the work area free from clutter to avoid potential slip, trip, and fall hazards.

5.2.3 Hand Tools

Inspect handles to ensure they are in good condition (no cracks, splinters, loose heads/cutting apparatus).

- Check cutting tools edges, all blades should be sharp without knicks or gouges in the blade.
- All hand tools (brush hooks, machetes, etc.) should be kept in a sheath when not in use.
- A 10-foot perimeter will be established around areas where brush clearing is being conducted.

5.2.4 Instrument Verification Strip IVS

Instrument verification will be performed during this investigation which will result in some minor intrusive activity. The procedures outlined below describe anomaly avoidance procedures for intrusive work between 0 and 12 inches below ground surface on a site with known or suspected MEC.

- The UXO technician must conduct an access survey of the routes to and from the proposed investigation site as well as an area around the investigation site.
- The UXO technician must perform a detector aided surface sweep at each proposed IVS site for any indication of MEC.
- If anomalies are detected at a proposed IVS location an alternate location will be selected.

6.0 HAZARD ASSESSMENT AND CONTROLS

This section provides reference information regarding the chemical and physical hazards which may be associated with activities that are to be conducted as part of the scope of work.

6.1 CHEMICAL HAZARDS

This site has been remediated so no contaminants of concern associated with this site exist.

6.2 PHYSICAL HAZARDS

The following is a list of physical hazards that may be encountered at the site or may be present during the performance of site activities.

- Unexploded Ordnance (UXO)
- Slip, trips, and falls
- Heat/Cold stress
- Pinch/compression points
- Natural hazards (snakes, ticks, poisonous plants, etc.)
- Vehicular and equipment traffic
- Inclement weather

These hazards are discussed further below, and are presented relative to each task in the task-specific activity hazard analysis.

6.2.1 Unexploded Ordnance (UXO)

UXO may be present at the ground surface or subsurface and could still be capable of functioning. This HASP and APP details the minimum requirements for performing work in areas of suspected UXO. There is no "safe" procedure for dealing with UXO, merely procedures that are considered less dangerous. Maximum safety in any UXO operation, however, can be achieved through adherence to applicable safety precautions and a thoroughly planned approach. Personnel engaged in UXO operations shall be thoroughly trained in explosive safety and be capable of recognizing hazardous explosive exposures.

6.2.2 Slips, Trips, and Falls

During various site activities there is a potential for slip, trip, and fall hazards associated with wet, steep, or unstable work surfaces. To minimize hazards of this nature, personnel required to work in and along areas prone to these types of hazards will be required to exercise caution, and use appropriate precautions and other means suitable for the task at hand. Site activities will be performed using the buddy system.

6.2.3 Heat/Cold Stress

It is always necessary for the field team to be aware of the signs and symptoms and the measures appropriate to prevent heat/cold stress. This is addressed in detail in Section 4.0 of the Tetra Tech Health and Safety Guidance Manual.

6.2.4 Pinch/Compression Points

Handling of tools, machinery, and other equipment may expose personnel to pinch/compression point hazards during normal work activities. Where applicable, equipment will have intact and functional guarding to prevent personnel contact with hazards. Personnel will exercise caution when working around pinch/compression points, using additional tools or devices (e.g., pinch bars) to assist in completing activities.

6.2.5 Vehicular and Equipment Traffic

Hazards associated with vehicular and equipment traffic is likely to exist during various site activities and whenever site personnel performed work on or near roadways. When working near roadways, site personnel will wear high visibility vests.

6.3 NATURAL HAZARDS

Dressing properly provides your best protection against pests, insects, bugs, mosquitoes, etc. Wear long-sleeved shirts and tuck your pant legs inside heavy wool socks or boot tops to protect your ankles. A hat provides excellent protection from the summer deerflies and horseflies. Wear light-colored clothing and avoid dark colors, especially in the blue and green range, as they tend to attract insects more than other colors. Insect repellents also are very useful.

6.3.1 Insects and Stings

Fire Ants

Various insects and animals may be present and should be considered. For example, fire ants present a unique situation when working outdoors in Florida. Their aggressive behavior and their ability to sting repeatedly can pose a unique health threat. The sting injects venom (formic acid) that causes an extreme burning sensation. Pustules form which can become infected if scratched.



Allergic reactions of people sensitive to the venom include dizziness, swelling, shock and in extreme cases unconsciousness and death. People exhibiting such symptoms should see a physician. Fire ants can be identified by their habitat. They build mounds in open sunny areas sometimes supported by a wall or shrub. The mound has no external opening. The size of the mound can range from a few inches across to some which are in excess of two feet or more in height and diameter. When disturbed, they defend it by swarming out and over the mound, even running up grass blades and sticks.

Black Widow Spider



The female black widow spider has a round, glossy black abdomen one-half inch in diameter with an orange-red hourglass marking her belly. Her painful bite results in redness and warmth at the site as well as muscle cramps, twitching, rigid abdomen, difficulty breathing, weakness, headache, nausea and vomiting. The male black widow spider is solid in color, and his bite is not venomous. If bitten, wash the area with warm, soapy water and call Poison Center immediately

Brown Recluse Spider

The brown recluse spider is small, about one-half inch long with an oval body and a dark violin-shaped marking on its back.

- Its bite causes pain, redness, tenderness and a bull's eye appearance, progressing to ulceration.
- Bites may go unnoticed until a lesion develops.



- If bitten wash the area with warm, soapy water and call Poison Center immediately.

A tetanus booster shot may be needed after a bite from a brown recluse spider.

Site personnel who are allergic to stinging insects such as bees, wasps, hornets, and ants must be particularly careful since severe illness and death may result from allergic reactions. As with any medical condition or allergy, information regarding the condition must be listed on the Medical Data Sheet and the SUXOS and UXOQCS/UXOSO notified.

Tick Borne Illnesses

During warm months (spring through early fall), tick-borne Lyme's Disease and STARI (Southern Tick-Borne Associated Rash Illness) may pose a potential health hazards for field personnel. The longer a disease carrying tick remains attached to the body, the greater the potential for contracting these diseases.

Prevention is typically facilitated through taping pants to boots and using insect repellent as well as performing frequent body checks to prevent long term attachment. Site first aid kits should be equipped with medical forceps and rubbing alcohol to assist in tick removal.

If you find a tick attached, it should be removed immediately. The longer an infected tick is attached, the greater the chance that it will transmit the pathogen. Ticks should be removed with a pair of fine-tipped tweezers. Grasp the tick as close to the skin's surface as possible. Pull upward with a steady, even motion. Do not jerk or twist the tick. Doing so may cause the mouthparts of the tick break off, or stay attached to the skin. If this happens, remove the mouthparts with the tweezers. Be careful not to squeeze or crush the tick. The tick's fluids may contain infectious organisms. Do not handle ticks with bare hands or remove ticks from pets without gloves or tweezers. After removing the tick, disinfect the bite site and wash hands thoroughly with soap and water. You may wish to save the tick for identification in case you become ill 2-3 weeks after the bite. To do so, place the tick in a sealed plastic bag, write the date of the bite on a piece of paper in pencil and place it in the bag. Place the bag in the freezer.



Graphics courtesy of CDC

Mosquito-Borne Illness

Mosquitoes may carry diseases including St. Louis encephalitis, Eastern equine encephalitis, La Crosse encephalitis and West Nile virus.

Mosquitoes become infected after biting infected birds. The symptoms for mosquito-borne illnesses may include headache, moderate to high fever, stiff neck and confusion. In serious cases coma, seizures or paralysis can result. Symptoms usually appear between 5 to 15 days after exposure to infected mosquitoes. Mosquito-borne illnesses may be mild or serious and can lead to death.

West Nile Virus - Encephalitis is an inflammation of the brain and can be caused by bacteria and viruses. West Nile encephalitis is caused by a virus transmitted to humans by mosquitoes. The mosquito becomes infected by feeding on birds infected with the West Nile virus. Infected mosquitoes then transmit the West Nile virus to humans and animals when biting (or taking a blood-meal).

West Nile encephalitis is NOT transmitted from person-to-person. There is no evidence that a person can get the virus from handling live or dead infected birds. However, avoid bare-handed contact when handling any dead animals, including dead birds. Ticks have not been implicated as vectors of West Nile-like virus. Mild infections are common and include fever, headache, and body aches, often with skin rash and swollen lymph glands. More severe infection is marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, occasional convulsions, paralysis and, rarely, and death (especially in the elderly and very young). The incubation period of West Nile encephalitis is usually 3 to 12 days.

Eastern Equine Encephalitis (EEE) - Eastern Equine Encephalitis is spread to horses and humans through the bite of an infected mosquito. The mosquito becomes infected after biting an infected bird. EEE can cause severe complications and even death. Symptoms for EEE in humans begin with high fever, chills, sore throat, nausea and vomiting. The illness can affect the central nervous system, cause sudden fever, severe headache, mental confusion, seizures and coma. Symptoms usually appear between 5 to 15 days after exposure to infected mosquitoes. There is no cure for EEE in humans.

Precautions include:

- Limit outdoor activities during peak mosquito times – at dusk and dawn.
- Avoid standing water.
- Wear long-sleeved shirts and long pants whenever you are outdoors.

- Apply insect repellent according to manufacturer's instruction to exposed skin. An effective repellent will contain 20% to 30% DEET (N,N-diethyl-meta-toluamide). Avoid products containing more than 30% DEET.
- Spray clothing with repellents containing permethrin (such as Permanone) or DEET, mosquitoes may bite through thin clothing.

6.3.2 Animal/Snake Bites

Alligators

Alligators live in the Florida counties but are most common in the major river drainage basins and large lakes in the central and southern portions of the state. They also can be found in marshes, swamps, ponds, drainage canals, phosphate-mine settling ponds, and ditches. Alligators are tolerant of poor water-quality and occasionally inhabit brackish marshes along the coast. A few even venture into salt water.



Mature alligators seek open water areas during the April-to-May courtship and breeding season. After mating, the females move into marsh areas to nest in June and early July where they remain until the following spring. Males generally prefer open and deeper water year-round. Alligators less than four feet long typically inhabit the marshy areas of lakes and rivers. Dense vegetation in these habitats provides protective cover and many of the preferred foods of young alligators.

- Most human attacks associated with alligators occur when they have been fed by humans or when defending their nests.
- Under no circumstances should you approach an alligator closely. They are quite agile, even on land. As with any wild animal, alligators merit a measure of respect.
- Alligators are classified as a threatened species and thus enjoy the protection of state and federal law. Only representatives of the Florida Game and Fresh Water Fish Commission are empowered to handle nuisance alligators.
- It is illegal to feed, tease, harass, molest, capture, or kill alligators.

- If a serious problem does exist, contact the Florida Game and Fresh Water Fish Commission.

Poisonous Snakes

Areas to be investigated could be prime nesting and/or hiding locations for snakes. Personnel should avoid reaching into areas that are not visibly clear of snakes or insects. If a snake is found, leave it alone. Florida snakes are not aggressive and, unless they are cornered, most will flee when humans approach. Occasionally, a snake might be reluctant to flee because it is basking in the sun. Within Florida there are three groups of Pit Vipers (Copperheads, Cottonmouths, and Rattlesnakes) and the Coral Snake that may be encountered in this particular region. One measure to prevent snake bites is for the field team to have a basic understanding of these reptiles as summarized below.

Southern Copperhead

The preferred habitat of the Southern Copperhead is low, wet areas around swamps, stream beds, river bottoms, and damp ravines, but it also occurs on the hillsides above the wet areas. It also is found in suburban neighborhoods near people. Adults usually are 2 to 3 ft. long. Their general appearance is light brown or pinkish with darker, saddle-shaped cross bands. The head is solid brown. Their leaf-pattern camouflage permits copperheads to be sit-and-wait predators, concealed not only from their prey but also from their enemies. Copperheads feed on mice, small birds, lizards, snakes, amphibians, and insects, especially cicadas. Like young cottonmouths, baby copperheads have a bright yellow tail that is used to lure small prey animals. The preferred habitat is low, wet areas around swamps, stream beds, river bottoms, and damp ravines, but it also occurs on the hillsides above the wet areas. It also is found in suburban neighborhoods near people.



Cottonmouths - Water Moccasin



Cottonmouths can be found in any wetlands or waterway in the state. Cottonmouths can be found along streams, springs, rivers, lakes, ponds, marshes, swamps, sloughs, reservoirs, retention pools, canals, and roadside ditches. It occasionally wanders far from water, and has been found in bushes and trees. The venom is more dangerous than a copperhead. Adults reach lengths of 3 to 4 ft. and often are heavy-bodied. The color pattern is variable, but the backs of adults are usually drab brown or olive with darker cross bands. The belly is a combination of dull yellow and brown and the underside of the tail usually is black. This species is unquestionably the most

common venomous snake found in wet-land habitat types. However, the harmless brown water snake, which is very common in aquatic areas frequented by humans, often is mistaken for the venomous cottonmouth. If disturbed, the cottonmouth will often stand its ground and give an open-mouthed threat display. Brown water snakes, when disturbed, will drop from overhanging tree limbs and flee.

Eastern Diamondback Rattlesnake

This is the largest and possibly the most dangerous snake in the United States. Diamondbacks are often found in pine flatwoods, longleaf pine and turkey oak, and sand pine scrub areas. These habitats contain palmetto thickets and gopher tortoise burrows in which the Diamondback may seek refuge. Adults are frequently 3 to 5 ft. long and occasionally are more than 6 ft. Their basic color is light to dark brown with distinct diamonds of a combination of brown and yellow; the tip of the tail is solid black with rattles. Eastern diamondbacks feed on rabbits, rats, and squirrels. This snake, because of its huge size and potent venom, is considered by some to be the most dangerous snake in the United States.



Timber Rattlesnake



When disturbed it usually remains motionless or attempts to crawl away therefore, there are few reports of bites. Though rare, the bites are very painful. Timber rattlesnakes in Florida prefer low bottomlands where it is fairly damp, river beds, hammocks pine flatwoods, swamps, and cane thickets. Heavy-bodied adults are usually 3 to 4, and occasionally 5, ft. long. Their basic color is gray with black cross bands that usually are chevron-shaped. Timber rattlesnakes feed on various rodents, rabbits, and occasionally birds. These rattlesnakes are generally passive if not disturbed or pestered in some way. When a rattlesnake is encountered, the safest reaction is to back away--it will not try to attack you if you leave it alone

Pygmy Rattlesnake

This snake is common in lowland pine flatwoods, prairies, around lakes and ponds, and along the borders of many freshwater marshes and cypress swamps. Individuals are heavy-bodied, but usually are only slightly more than 1 ft. long. The general color of this snake is dull gray with dark gray or brown blotches on the back and sides. The small size of the pygmy's rattles make the "buzz" difficult to hear. This species is so small and well



camouflaged that people seldom see pygmy rattlers that are coiled atop pine straw or dead leaves. This snake feeds on mice, lizards, snakes, and frogs.

Eastern Coral Snake



This snake occupies a variety of habitats, from dry, well-drained flatwoods and scrub areas to low, wet hammocks and the borders of swamps. They are quite secretive and are usually found under debris and in the ground, but occasionally they are found in the open, and have even been seen climbing the trunks of live oaks. Good numbers of them are turned up when pine flatwoods are bulldozed, particularly in south Florida. Adults reach about 2 ft. in length. Red, yellow, and black rings encircle the body. The narrow yellow rings touch the red rings, a pattern distinguishing this species from the scarlet kingsnake and the scarlet snake. The nose is always black, followed by a wide yellow band. This snake feeds on small snakes and lizards. Coral snakes, which belong to the same family as Old World cobras and kraits, have short, fixed fangs in the front of the mouth. The potential seriousness of a bite from this species warrants a universal warning not to pick up a snake in this region--no matter how pretty--without being certain of its identity.

Snake Avoidance Measures

Avoidance will be the first line of defense. If you see them, do not harass them, attempt to capture, move or otherwise disturb them. Leave them alone!

- Do not pick up ground cover as this is a potential nesting area.
- Stick to well-used trails and wear over-the-ankle boots and loose-fitting long pants. Avoid tall grass, weeds and heavy underbrush which snakes commonly frequent. If these areas cannot be avoided, wear snake chaps.
- Be observant in open, sunny areas, as snakes are cold-blooded and need to “sun themselves” to regulate their body temperature.
- Do not put your hands where you cannot see.
- Step ON logs and rocks, never over them, and be especially careful when climbing rocks.

- Snakes will also crawl along buildings and doorways as the building or logs offer protection on one side.
- Examine the area carefully before entering buildings (stepping over door way threshold plates) not regularly used and maintained.

Snakebite Control Measures

The only acceptable treatment for venomous snakebite, involves the use of antivenin. So if someone is bitten by a venomous snake, seek immediate medical attention at the nearest medical facility. Keep the person calm, remove any rings that could restrict circulation if tissues swell, keep the bitten limb below the level of the heart, and immediately seek medical attention.

- If possible obtain a detailed description of the snake. This and the bite mark will enable medical personnel administering medical aid to provide prompt and correct antidotes.
- Immobilize the bite victim to the extent possible. Physical exertion can mobilize the toxins (if poisonous varieties) from the bite point systemically through the body.
- Apply a pressure wrap (for extremities), just above and over the bite area using whatever is available (an article of clothing).
- With a couple wraps of the pressure wrap in place over the bite area to limit movement and restrict toxins from leaving the site of the bite.
- Seek medical attention immediately.

6.3.3 Ambient Temperature Extremes (Heat Stress)

Given the geographic location of the site and the project schedule, overexposure to high ambient temperatures (heat stress) may exist during performance of this work depending on the project schedule. Work performed when ambient temperatures exceed 70°F may result in varying levels of heat stress (heat rash, heat cramps, heat exhaustion, and/or heat stroke) depending on variables such as wind speed, humidity, and percent sunshine, as well as physiological factors such as metabolic rate and skin moisture content. Additionally, work load and level of protective equipment will affect the degree of exposure. Site personnel will be encouraged to drink plenty of fluids to replace those lost through

perspiration. Additional information such as Work-Rest Regimens and personnel monitoring may be found in Section 4.0 of the Health & Safety Guidance Manual.

Temperature extremes are considered inclement weather. Steps should be taken to the extent possible protect site personnel from the effects of heat stress and the sun. Control measures include:

- Watch for signs of heat stress/exhaustion,
- Provide fluid replacement
- Provide adequate number of breaks within a cooler environment.

Sunburn

Care should be exercised when working outdoors due to harmful effects of the sun. To reduce the potential for sunburn and melanoma the following measures should be employed

- Wear a hat that shades the face, neck, and ears.
- Apply sunscreen with a SPF of 15 or higher liberally on any exposed skin at least 15 minutes before going outside, then at least every two hours, more if you are sweating a lot.
- Plan/provide suitable equipment to offer shade to avoid the midday sun since the sun's ultraviolet rays are most intense between 10 A.M. and 4 P.M. and can damage your skin even on hazy days. Portable canopies over the sample station are an example of this.
- Wear wrap-around sunglasses to protect the eyes and delicate skin around them.

6.3.4 Inclement Weather

Project tasks under this Scope of Work will be performed outdoors. As a result, inclement weather may be encountered. In the event that adverse weather conditions arise (electrical storms, hurricanes, etc.), the SUXOS and/or the UXOQCS/UXOSO will be responsible for temporarily suspending or terminating activities until hazardous conditions no longer exist.

Tropical Storms and Hurricanes

As Florida is a tropical storm, hurricane prone area, the following information is supplied to explain the potential severity of these natural hazards. The decision to curtail operations and evacuate the area should be made by the SUXOS, PM, and the HSM.

During the early summer to late fall months, typically from the first of June through the end of November, disturbances migrating off the West Coast of Africa move into the Atlantic Ocean and develop into tropical cyclones known as tropical storms and hurricanes. Many of these cyclones become strong enough to threaten life and property along the Eastern Seaboard and Gulf Coast. There are three main threats associated with tropical storms and hurricanes:

- High winds
- Excessive rainfall
- Storm surge

The impacts of high winds and excessive rainfall occur hours, maybe days, before the tropical storm or hurricane makes landfall. However, the storm surge accompanies the storm or hurricane at the time that landfall occurs.

High Winds

Sustained winds vary greatly from storm to storm, but can range from 39 to 73 miles per hour (wind speeds associated with a tropical storm) to greater than 74 miles per hour (minimal wind speed for a Category 1 hurricane). Table 6-1 compares the type of storm or hurricane and the corresponding wind speed.

TABLE 6-1
TROPICAL STORM/HURRICANE RATING SCALE

TYPE	CATEGORY*	WINDS (MPH)
Tropical Depression	NA	>35-38
Tropical Storm	NA	39 – 73
Hurricane	1	74 – 95
Hurricane	2	96 – 110
Hurricane	3	111 – 130
Hurricane	4	131 – 155
Hurricane	5	>155

Based on the Saffir-Simpson scale

NA – Not Applicable

In addition to strong winds, there is the threat of debris (i.e. building material, trees, etc.) becoming airborne projectiles as they are carried by the high winds. Thunderstorms and tornadoes embedded within the tropical storm or hurricane can further increase the wind speeds on a localized level.

In preparation for high winds and storms – Secure loose articles. Lash empty drums or associated containers together contained within storage areas. During electrical storms/high winds lower mast evacuate to a safe refuge location.

Excessive Rainfall

Heavy rains associated with tropical storms and hurricanes also vary greatly from storm to storm. On average, an inch of rainfall an hour is not uncommon with major hurricanes, somewhat lesser amounts with tropical storms. However, the primary threat is not the intensity of rain, but the duration of rainfall. Since many tropical storms and hurricanes are slow-movers, they are capable of producing sustained heavy rainfall over a long period of time. It is not uncommon for an area to receive nearly 20 inches of rain in 24 hours. Under these conditions, street; stream and creek flooding is inevitable only to be exacerbated by locally heavier rains from thunderstorms.

Storm Surge

The storm surge is an abnormal rise in sea level accompanying a hurricane or tropical storm. The height of the storm surge (usually measured in feet) is the difference in sea level from the observed level (during the storm) and the level that would have occurred in the absence of the storm or hurricane. The more intense the storm or hurricane the higher the storm surge. Storm surges become even higher if they

occur during periods of high tide. Table 6-2 defines some of the terminology and possible calls to action regarding tropical cyclones:

**TABLE 6-2
TROPICAL STORM/HURRICANE
WATCH AND WARNING**

STORM DESCRIPTION	DEFINITION	CALL TO ACTION
Tropical Storm Watch	Tropical storm conditions are possible in the specified area of the watch, usually within 36 hours	Weather conditions should be monitored for further advisories. Prepare for possible evacuation by local officials
Tropical Storm Warning	Tropical storm conditions are expected in the specified area of the warning, usually within 24 hours.	Work should be suspended in areas where lightning, high winds and rainfall could pose a threat to life. Mandatory evacuations may be enforced by local officials.
Hurricane Watch	Hurricane conditions are possible in the specified area of the watch, usually within 36 hours.	Weather conditions should be monitored for further advisories. Prepare for possible evacuation by local officials
Hurricane Warning	Hurricane conditions are expected in the specified area of the warning, usually within 24 hours.	Mandatory evacuations will most likely be enforced by local officials.

A NOAA Weather Radio is the best means to receive watches and warnings from the National Weather Service. The National Weather Service continuously broadcasts updated hurricane advisories that can be received by widely available NOAA Weather Radios.

7.0 DETECTION EQUIPMENT

There are no chemical contaminants expected to have the potential to be present in concentrations that could present an inhalation hazard during planned site activities, therefore air monitoring is not necessary during the activities being conducted under this HASP.

The Schonstedt GA-52Cx or equivalent will be used as the primary survey instrument to conduct the surveys. In addition to the Schonstedt, a White's Spectrum XLT all-metals detector, or equivalent, will be used in surface survey areas to assist in the location of metal targets with little or no ferrous metal content. Given the nature of the site, where ferrous and nonferrous ordnance may be present, this is the best combination of technology for the operation based on industry standards.

In order to test the Schonstedt GA-52Cx and White's for daily operation, the UXO Specialist will place surrogates or industry standard objects (ISO) in a location free from ferrous anomalies to test the capabilities and refine field investigation techniques for the site conditions. The surrogates/ISOs will be covered with a blanket (blanket test) or other material.

The metal detectors to be used by the UXO Team during detector-aided surface surveys have a detection depth that is limited by the size and orientation of the target and soil characteristics of the work area. These instruments provide an audio signal for response but do not store data.

The detector will be checked twice daily at a minimum, before starting MEC activities and at the end of each shift and after any battery change. The UXO Specialist will also conduct random checks during daily operations.

The calibration setting for the Schonstedt magnetic locator instrument is Level 2; setting the instrument to Level 3 or Level 4 will make it more sensitive, and setting the instrument to level 1 will make it less sensitive. The Schonstedt instrument will not detect non-ferrous munitions, such as those made of copper, brass, or aluminum. During the detector-aided surveys, the all-metals detectors, such as the White's Spectrum XLT or equivalent, will be used if non-ferrous metal suspect MEC is present. The all-metals detector will be used either in place of, or in conjunction with, the magnetic locator.

8.0 SITE CONTROL

This section outlines the means by which Tetra Tech will delineate work zones and use these work zones in conjunction with decontamination procedures to prevent the spread of contaminants into previously unaffected areas of the site. It is anticipated that a two-zone approach will be used during work at this site. This approach will be comprised of an exclusion zone and a support zone. It is also anticipated that this approach will control access to site work areas, restricting access by the general public, minimizing the potential for the spread of contaminants, and protecting individuals who are not cleared to enter work areas.

8.1 EXCLUSION ZONE

The exclusion zones for this project will be limited to those areas of the site where active work is being performed plus a designated safe area surrounding the work area. Exclusion zones will be delineated as deemed appropriate, through means such as erecting visibility fencing, barrier tape, cones, and/or postings to inform and direct personnel. Each barricade will be marked with the name and number for the person who can be contacted to request access and a red Bravo flag will be hung from each barricade during active site activities.

An active EZ will be established and maintained before any MEC/MPPEH activities occur due to the potential for encountering explosively configured/fuzed munitions. For this project, the initial EZs will be established at 65 feet, which is the Hazard Fragmentation Distance (HFD) for the Munition with the Greatest Fragmentation Distance (MGFD), the M56A4 20 mm projectile.

If non-site personnel or non-essential non-UXO personnel enter an EZ, all MEC operations will cease until the EZ is re-established. The EZs for the various activities that may occur on this site are summarized in Table 6-2 in the ESS.

8.2 SUPPORT ZONE

The support zone for this project will include a staging area where site vehicles will be parked, equipment will be unloaded, and where food and drink containers will be maintained. The support zones will be established at areas of the site well away from potential exposure to site contaminants during normal working conditions or foreseeable emergencies.

8.3 ACTIVITY HAZARD ANALYSES

Exclusion Zone work conducted in support of this project will be performed using Activity Hazard Analyses (AHAs) to guide and direct field crews on a task by task basis. AHAs for the tasks to be performed at Site 15 are provided in Section 14 in the APP. Use of the AHAs will provide the communication line for reviewing protective measures and hazards associated with each operation. As an ongoing quality assurance effort, the UXOQCS/UXOSO will review operations to ensure elements of the AHAs adequately represent those being conducted. Where deficient, they will be corrected and that information forwarded to the PHSO for inclusion in future such activities.

8.4 SITE SECURITY

Site security will be accomplished using field personnel. Tetra Tech will retain complete control over active operational areas. As this activity takes place at a former Navy facility open to public access, the first line of security will take place using exclusive zone barriers, site work permits, and any existing barriers at the sites to restrict the general public. The second line of security will take place at the work site referring interested parties to the Base Contact. The Base Contact will serve as a focal point for base personnel, interested parties, and serve as the final line of security and the primary enforcement contact.

8.5 SITE MAP

Once the areas of operation, access routes, topography, and dispersion routes are determined, a site map will be generated and adjusted as site conditions change. These maps will be posted to illustrate up-to-date adjustment of zones and access points.

8.6 BUDDY SYSTEM

Personnel engaged in site activities will practice the "buddy system" to ensure the safety of personnel involved in this operation.

8.7 COMMUNICATION

As personnel will be working in close proximity to one another during field activities, a supported means of communication between field crew members will not be necessary.

External communication will be accomplished by using cellular telephones at approved locations. External communication will primarily be used for the purpose of resource and emergency resource communications. Prior to the commencement of activities at the site, it is strongly recommended that cell

signal strength be checked in the work areas and the relevant project phone numbers are programmed on site-worker cell phones. Emergency numbers listed in Table 2-1 should be entered into site cell phones prior the beginning of work. The SUXOS will determine and arrange for telephone communication procedures.

Prior to the commencement of activities at NAS Cecil Field, the SUXOS will approve cellular telephone communications.

9.0 SPILL CONTAINMENT PROGRAM

9.1 SCOPE AND APPLICATION

It is not anticipated that bulk hazardous materials (over 55-gallons) will be generated or handled at any given time as part of this scope of work. It is also not anticipated that any spills would constitute a danger to human health or the environment. There are no anticipated spill areas as there will be no IDW created during these activities.

10.0 CONFINED-SPACE ENTRY

It is not anticipated, under the proposed scope of work, that confined space and permit-required confined space activities will be conducted. **Therefore, personnel under the provisions of this HASP are not allowed, under any circumstances, to enter confined spaces.** A confined space is defined as an area which has one or more of the following characteristics:

- Is large enough and so configured that an employee can bodily enter and perform assigned work.
- Has limited or restricted means for entry or exit (for example, tanks, manholes, sewers, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry).
- Is not designed for continuous employee occupancy.

Additionally, a Permit-Required Confined Space must also have one or more of the following characteristics:

- Contains or has a potential to contain a hazardous atmosphere.
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly caving walls or by a floor that slopes downward and tapers to a smaller cross-section.
- Contains any other recognized, serious, safety or health hazard.

For further information on confined space, consult the Health and Safety Guidance Manual or call the PHSO. If confined space operations are to be performed as part of the scope of work, detailed procedures and training requirements will have to be addressed.

11.0 MATERIALS AND DOCUMENTATION

The Tetra Tech UXOQCS/UXOSO shall ensure the following materials/documents are taken to the project site and used when required.

- A complete copy of this HASP and APP
- Health and Safety Guidance Manual (available on line at <http://intranet.ttnus.com>)
- Incident Reports (Attachment IV)
- Medical Data Sheets
- A OSHA Job Safety and Health Poster
- Training/Medical Surveillance Documentation Form (Blank)
- First-Aid Supply Usage Form
- Emergency Reference Form (Section 2.0)
- Directions to the Hospital

11.1 MATERIALS TO BE POSTED AT THE SITE

The following documentation is to be posted or maintained at the site for quick reference purposes. In situations where posting these documents is not feasible (such as no office trailer), these documents should be separated and immediately accessible and will be located in UXOSO site vehicle.

- **The OSHA Job Safety & Health Protection Poster (posted)** - This poster should be conspicuously posted in places where notices to employees are normally posted, as directed by 29 CFR 1903.2 (a)(1). The UXOQCS/UXOSO shall ensure that this poster is not defaced, altered, or covered by other material. The law also states that reproductions or facsimiles of the poster shall be at least 8 1/2 by 14 inches with 10 point type. See Attachment VI.
- **Site Clearance (maintained)** - This list is found within the training section of the APP (Figure 6-1). This list identifies the site personnel, dates of training (including site-specific training), and medical surveillance. The list indicates not only clearance, but also status. If personnel do not meet these requirements, they do not enter the site while site personnel are engaged in activities.
- **Emergency Phone Numbers and Directions to the Hospital(s) (posted)** - This list of numbers and directions will be maintained at the phone communications points and in each site vehicle.

- **Medical Data Sheets/Cards (maintained)** - Medical Data Sheets will be filled out by site personnel and filed in a central location. The Medical Data Sheet will accompany any injury or illness requiring medical attention to the medical facility. A copy of this sheet or a wallet card will be given to the personnel to be carried on their person.
- **Personnel Monitoring (maintained)** - The results generated through personnel sampling (levels of airborne toxins, noise levels, etc.) will be posted to inform individuals of the results of that effort.

The purpose of maintaining or posting this information, as stated above, is to allow site personnel quick access. Variations concerning location and methods of presentation are acceptable providing the objective is accomplished.

ATTACHMENT I

ACCIDENT PREVENTION PLAN

ACCIDENT PREVENTION PLAN
FOR
MUNITIONS RESPONSE PROGRAM
MEC SUPPLEMENTAL REMEDIAL INVESTIGATION AT
OPERABLE UNIT 5, SITE 15, BLUE 10 ORDNANCE DISPOSAL AREA
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Submitted to:

BRAC Program Management Office Southeast
4130 Faber Place Drive, Suite 202
North Charleston, South Carolina 29405

Submitted by:

Tetra Tech NUS, Inc.
234 Mall Boulevard, Suite 260
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CONTRACT NUMBER N62470-08-D-1001
CONTRACT TASK ORDER JM09

April 2011

PREPARED UNDER THE SUPERVISION OF:

APPROVED FOR SUBMISSION BY:



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APPENDIX

1 Employee Training/Qualifications

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1 Former NAS Cecil Field Activity Hazard Analysis

ACRONYMS

§	Section
dB	decibels
AHA	Activity Hazard Analysis
ANSI	American National Standards Institute
APP	Accident Prevention Plan
BIP	Blow in Place
BBP	Blood borne pathogen
BLS	Bureau of Labor Statistics
CFR	Code of Federal Regulations
CPR	Cardiopulmonary resuscitation
CTO	Contract Task Order
DART	Days Away/Restricted Duty/Transfer
DDESB	Department of Defense Explosives Safety Board
DEET	N, N-diethyl-m-toluamide
EM	Engineer Manual
EMR	Experience Modification Rate
EOD	Explosive Ordnance Disposal
ESS	Explosive Safety Submission
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
MC	Munitions Constituents
MEC	Munitions and Explosives of Concern
MPPEH	Material Potentially Presenting an Explosive Hazard
NAICS	North American Industry Classification System
NAS	Naval Air Station
NAVFAC MA	Naval Facilities Engineering Command Mid-Atlantic
NEHC	Navy Environmental Health Center
NHSO	Navy Health and Safety Officer
NIOSH	National Institute of Occupational Safety and Health
NRR	Noise Reduction Rating
OSHA	Occupational Safety and Health Administration
PM	Project Manager

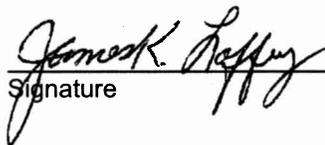
PPE	Personal Protective Equipment
RCIR	Recordable Case Incident Rate
RPM	Remedial Project Manager
SHM	Safety and Health Manager
SUXOS	Senior UXO Supervisor
TP	Technical Paper
UST	Underground Storage Tank
UXO	Unexploded Ordnance
UXOQCS/UXOSO	Unexploded Ordnance Quality Control Specialist/Safety Officer

1.0 SIGNATURE SHEET

CONTRACT NO. N62470-08-D-1001 ACCIDENT PREVENTION PLAN FOR FORMER NAS CECIL FIELD JACKSONVILLE, FLORIDA

Prepared by:

James K. Laffey
Tetra Tech NUS
Project Health and Safety Officer



Signature

(412) 921-8678
Phone

Concurred by:

Matthew M. Soltis, CIH, CSP
Tetra Tech NUS
Safety and Health Manager



Signature

(412) 921-8912
Phone

Approved by:

John Trepanowski
Tetra Tech NUS
Vice President



Signature

(610) 491-9688
Phone

2.0 BACKGROUND INFORMATION

Contractor: Tetra Tech NUS
Contract Number: N62470-08-D-1001, CTO JM 09
Project Name: Munitions Response Program

2.1 PROJECT DESCRIPTION

The objective of this investigation is to perform a Supplemental Munitions and Explosives of Concern (MEC) Remedial Investigation at the Site 15, Blue 10 Ordnance Disposal Area the former Naval Air Station (NAS) Cecil Field.

This Accident Prevention Plan (APP) addresses only the activities for Tetra Tech NUS (Tetra Tech) and their sub-contractor personnel. Other contractors or subcontractors are excluded in this APP and are to be addressed in safety and health planning documents prepared by that employer.

This APP and the associated Site-Specific Health and Safety Plan (HASP) are for use during the filling of the remaining data gaps by intrusively investigating and determining the source of shallow subsurface anomalies (0 to 1 foot below ground surface [bgs]) detected during the MEC RI outside of areas already known to have contained MEC items (Former Ordnance Disposal Area) at the former NAS Cecil Field.

These documents address applicable items specified under the U.S. Army Corps of Engineers Safety and Health Requirements Manual, Engineering Manual (EM) 385-1-1, and United States Occupational Safety and Health Administration (OSHA) Title 29 of Code of Federal Regulations (CFR), § 1910.120(b).

This APP and the accompanying HASP are available to (1) site personnel who may be exposed to hazardous site conditions, including Tetra Tech and subcontractor personnel participating in field activities and UXO activities, and (2) site visitors, including regulatory agency representatives. Site-specific sections of EM 385-1-1 applicable to this field effort are as follows:

- 1 - Program Management
- 2 - Sanitation
- 3 - Medical and First Aid Requirements
- 4 - Temporary Facilities
- 5 - Personal Protective and Safety Equipment
- 6 - Hazardous Substances, Agents, and Environments

- 7 - Lighting
- 8 - Accident Prevention Signs, Tags, Labels, Signals, Piping System Identification, and Traffic Control
- 9 - Fire Prevention and Protection
- 10 - Welding and Cutting
- 11 - Electrical
- 12 - Control of Hazardous Energy
- 13 - Hand and Power Tools
- 14 - Material Handling, Storage, and Disposal
- 15 - Rigging
- 16 - Machinery and Mechanized Equipment
- 17 - Conveyors
- 18 - Motor Vehicles and Aircraft
- 19 - Floating Plant and Marine Activities
- 20 - Pressurized Equipment and Systems
- 21 - Safe Access and Fall Protection
- 22 - Work Platforms
- 23 - Demolition
- 24 - Floor and Wall Holes and Openings
- 25 - Excavations
- 26 - Underground Construction, Shafts, and Caissons
- 27 - Concrete and Masonry Construction and Steel Erection
- 28 - Hazardous Waste Operations and Emergency Response (HAZWOPER)
- 29 - Blasting
- 30 - Contract Diving Operations

2.2 SITE MAPS

A facility location map and a site location map showing the location where Tetra Tech employees will be performing work are included as part of the Sampling and Analysis Plan (SAP) for the work associated with this field effort at former NAS Cecil Field.

2.3 TETRA TECH SAFETY STATISTICS

The following table presents safety statistics for Tetra Tech for the last 3 calendar years compared to the national averages for our industry. This comparison uses data collected by the United States Department of Labor, Bureau of Labor Statistics (BLS) for different types of employers, segregated by North American Industry Classification System (NAICS) codes.

**Comparison of TtNUS and 2009 BLS Data for NAICS Code 541
 (RCIR and DART Case Rates)**

	NAICS 541 Professional, Scientific, and Technical Services 2009	TtNUS 2008	TtNUS 2009	TtNUS 2010
Total Recordable Case Incident Rate (RCIR)	1.2	0.48	0.2	0.7
Days Away/Restricted Duty/Transfer Case Rate (DART)	0.5	0.2	0.2	0.2

The data comparison illustrate that Tetra Tech’s performance compares favorably with the most-recent national averages for the environmental engineering and hazardous waste services industries.

2.3.1 Tetra Tech, Inc. Experience Modification Rates and OSHA Logs:

Policy Year (October 1 - September 30) 2008-2009	0.81
Policy Year 2009 -2010	0.74
Policy Year 2010-2011	0.76

2.4 WORK PHASES

Work on this project will occur in the following phases. Associated dates when Tetra Tech personnel will be on-site performing work will be listed for each phase of the project.

Phase 1 - Mobilization

Phase 2 - UXO survey, intrusive, avoidance field activities

Phase 3 – Demobilization

2.5 SPECIFIC SITE ACTIVITIES

The definable features of work (DFW) for field activities to be performed during this supplemental MEC RI at former Cecil Field, Jacksonville, Florida will include the following:

- Site Preparation (including mobilization)
- Site Surveying
- Vegetation management
- GPS positional data
- Detector-aided visual survey and manual MEC/MPPEH operations
- Manual hand-digging intrusive anomaly investigation
- Detector-aided surveys of materials removed from any excavation.
- MEC management/treatment
- MEC/MPPEH treatment, inspection, certification, and disposal
- Demobilization

For these tasks, detailed Activity Hazard Analyses (AHAs) have been prepared and are provided in Section 14.0 of this APP.

3.0 STATEMENT OF SAFETY AND HEALTH POLICY

Tetra Tech is committed to providing our employees with a safe and healthful workplace. It is the goal of Tetra Tech to continue excellent safety performance on NAVFAC contracts to support the Navy in their safety efforts. Specifically, Tetra Tech will perform work in a manner that is consistent with the Zero Incident Philosophy. It is our goal to plan and perform the work in a manner that integrates safety and health considerations so that worker injuries or illnesses, environmental releases/impacts, or property damage are eliminated. In addition to the line and staff management functions described in this APP and the accompanying HASP, each individual performing work under this contract has the responsibility for their own personal health and safety, as well as assisting in assuring the health and safety of their co-workers. This element is also the first one listed in our corporate Health and Safety Policy Statement, which requires that "each employee recognize a *personal* responsibility for their own health and safety and for actions that affect the health and safety of fellow employees." This employee responsibility includes observing specified health and safety requirements and communicating with the designated UXOQCSS/SO on matters such as the effectiveness of specified control measures, identification of new potential hazards, and other related issues.



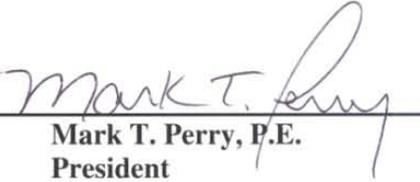
TETRA TECH NUS, INC. HEALTH AND SAFETY POLICY



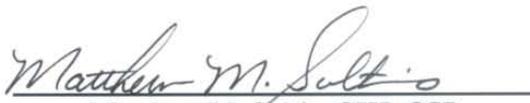
Tetra Tech NUS, Inc., is committed to providing our employees with a safe and healthful workplace. We believe that occupational injuries and illness can be prevented; and we are convinced that a strong Health and Safety Program is essential to achieve this objective.

The principal elements of our program are founded on the requirements that our managers and employees:

- Recognize a *personal responsibility* for their own health and safety and for actions that affect the health and safety of fellow employees.
- Integrate safety and health into *all aspects* of their work, with the well-being of employees as the primary concern in all activities.
- Comply with applicable *federal, state, and local regulations*, as well as with our internal Corporate and our clients' safety and health policies and procedures.
- Take an *active role* in the Health and Safety Program by providing input and constructive criticism for improvements to the program.



Mark T. Perry, P.E.
President



Matthew M. Soltis, CIH, CSP
Health and Safety Manager



Tetra Tech NUS, Inc.
January 2010



An employee's failure to adhere to the requirements of this APP and HASP or to observe specified safety requirements and restrictions or to properly use identified protective equipment may lead to injury or illness. As a result, deviation from safety and health procedures is not tolerated. Failure to comply with health and safety procedures and requirements will lead to reprimand up to and including dismissal.

Health and safety-related information is communicated to employees through meetings, postings, written communications, and reporting of hazards.

The principal elements of our program are founded on the requirements presented in the Health and Safety Policy on the following page.

4.0 RESPONSIBILITIES AND LINES OF AUTHORITY

The Tetra Tech Site Safety Officer for this project has been appointed by the Project Manager (PM) and is responsible for field implementation of tasks and procedures listed in this section. The Site Safety Officer for this project is the UXOQCS/UXOSO. The UXOQCS/UXOSO has completed 40-Hour HAZWOPER and subsequent 8-Hour HAZWOPER Refresher Training, 8-Hour HAZWOPER Supervisor Training, and First Aid/CPR and Blood-borne Pathogen training in accordance with regulatory requirements applicable to the work that will be performed for this project.

The Tetra Tech UXOQCS/UXOSO has primary responsibility for responding to and correcting emergency situations and for taking appropriate measures to ensure the safety of site personnel and the public (e.g., evacuation of personnel from the site area). The UXOQCS/UXOSO is also responsible for ensuring that corrective measures have been implemented, appropriate internal and Navy authorities have been notified, and follow-up reports have been completed.

Individual subcontractors are required to cooperate with the UXOQCS/UXOSO within the parameters of the Scope of Work.

Personnel are required to immediately report injuries, illnesses, spills, fires, and property damage to the UXOQCS/UXOSO. The UXOQCS/UXOSO must be notified of any site emergencies and is responsible for ensuring that the appropriate emergency procedures described in this section are followed. The UXOQCS/UXOSO is also responsible for informing the Navy Remedial Project Manager (RPM) of major incidents and associated corrective actions.

Management at Tetra Tech has the authority and responsibility for implementing and maintaining this APP and HASP. An organization chart presenting the lines of authority for this project is shown on the next page.

The work under this contract, including this field effort, is subject to a comprehensive health and safety program developed, designed, and implemented by Matthew M. Soltis, CIH, CSP. Mr. Soltis serves as Director of Health and Safety for Tetra Tech and as the Safety and Health Manager (SHM) for the planned work addressed in this APP.

4.1 KEY PROJECT PERSONNEL AND ORGANIZATION

This section defines responsibility for site safety and health for Tetra Tech employees engaged in site activities. Personnel assigned to these positions will exercise the primary responsibility for site health and safety. These persons will be the primary point of contact for any questions regarding the safety and health procedures and the selected control measures that are to be implemented for site activities.

4.1.1 Project Manager

The Tetra Tech PM is responsible for the overall direction of health and safety for this project.

4.1.2 Project Health and Safety Officer

The PHSO is responsible for developing this HASP/APP in accordance with applicable OSHA regulations. Specific responsibilities include:

- Providing information regarding site contaminants and physical hazards associated with the site.
- Establishing air monitoring and decontamination procedures.
- Assigning personal protective equipment based on task and potential hazards.
- Determining emergency response procedures and emergency contacts.
- Stipulating training requirements and reviewing training and medical surveillance certificates.
- Providing standard work practices to minimize potential injuries and exposures.
- Modifying this HASP, as necessary.

4.1.3 Senior UXO Supervisor (SUXOS)

The SUXOS is the field operation leader on this project. The SUXOS is responsible for implementation of the HASP with the assistance of an appointed UXOQCS/UXOSO. The SUXOS manages field activities,

executes the work plan, and enforces safety procedures as applicable to the work plan. Other duties include:

- Ensuring that all notifications are given prior to beginning work.
- Conducting intrusive operations.
- Verifying training and medical clearance of site personnel status in relation to site activities.
- Selecting, applying, inspecting, and maintaining personal protective equipment.
- Implementing Hazard Communication, Respiratory Protection Programs, and other health and safety programs as needed.
- Providing site-specific training for site personnel.
- Investigating accidents and injuries (Attachment IV in the HASP – Incident Report Form)

In UXO matters, the SUXOS implements and adheres to the site-specific Work Plan and SOPs. The SUXOS has the overall responsibility for the day-to-day MEC operations at the site, and directs site personnel resources at the site on MEC activity issues to ensure their safety. The SUXOS is responsible for MEC documentation. Other responsibilities of the SUXOS include:

- Scheduling and executing site MEC activities.
- Coordinating with emergency response personnel including establishing communications.
- Training site UXO personnel in accordance with the HASP/APP.
- Establishing and maintaining required work zones including the exclusion zones.
- Implementing the UXO safety program.
- Analyzing MEC and explosives operational risks, hazards, and safety requirements.
- Enforcing personnel limits and safety exclusion zones for MEC operations.
- Conducting safety inspections.
- Participating in site specific training sessions.
- Maintaining familiarity with the Tetra Tech UXO SOPs.
- Conducting daily and in progress functional tests on instruments used in the survey
- Providing input to the PM regarding the need to modify this HASP/APP or other health and safety documents as per site-specific requirements.

4.1.4 UXO Quality Control Specialist (UXOQCS)/UXO Safety Officer (UXOSO)

The UXOQCS/UXOSO is independent from the SUXOS and reports directly to the UXO Program Manager for quality control issues. The UXO Program Manager is responsible for management of the UXO QC Program. This ensures that the QC program will be unbiased. Although the UXOQCS/UXOSO

is separate and independent from the SUXOS, he is part of the problem resolution process and must maintain close and open communication with the SUXOS. The UXOQCS/UXOSO on this site is the Site Quality Control Specialist and is responsible for:

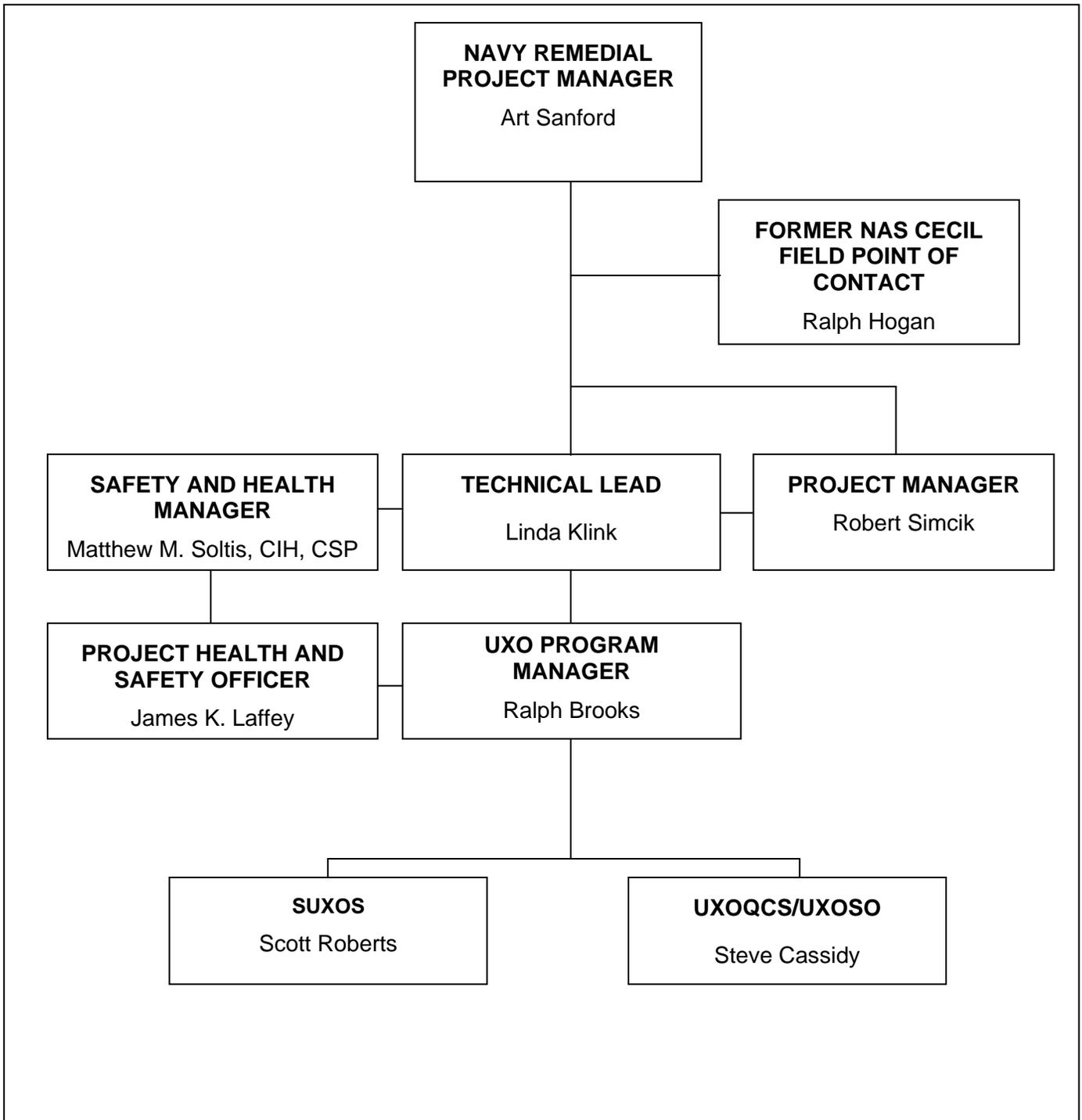
- Issuing Stop Work Requests when conditions warrant
- Implementing the Quality Control Plan
- Conducting quality control indoctrination training for project personnel and for site visitors.
- Initiating QC surveillance and inspection consistent with the QC program/QC policies and procedures
- Identifying, evaluating, initiating, and approving corrective action to ensure work complies with the contract
- Recommending changes to the QC program
- Providing project QC update to the SUXOS
- Communicating with client QA project oversight
- Conducting inspection and surveillance activity
- Completing reports and other documentation; maintaining a daily log of activities
- Implementing the three-phase control process: preparatory, initial, and follow up inspections
- The UXOQCS/UXOSO has the authority to stop-work whenever a condition is identified that has a negative effect on the quality of the product

As site safety officer the UXOSOQC/SO is responsible for:

- Controls specific health and safety-related field operations such as personnel decontamination, monitoring of worker heat or cold stress, and distribution of safety equipment.
- Conducts and documents a daily health and safety briefing each day while on-site.
- Ensures that field personnel comply with all procedures established in the HASP.
- Terminates work if an imminent safety hazard, emergency situation, or other potentially dangerous situation is encountered.
- Ensures the availability and condition of health and safety monitoring equipment.
- Coordinates with the UXO Manager and PM to institute and document any necessary HASP modifications.
- Ensures that facility personnel and subcontractors are adequately advised and kept clear of UXO and potentially contaminated materials.

Compliance with the requirements stipulated in this HASP/APP is monitored by the SUXOS and coordinated through the Tetra Tech HSM. In some cases one person may be designated responsibilities for more than one position. This action will be performed only as credentials, experience, and availability permits..

ORGANIZATION CHART AT FORMER NAS CECIL FIELD



5.0 SUBCONTRACTORS

Tetra Tech will not employ a subcontractor in the performance of work covered by this HASP/APP.

6.0 TRAINING

Personnel who may be exposed to hazardous conditions and who will participate in site activities are required to meet the training requirements outlined in 29 CFR §1910.120, Hazardous Waste Operations and Emergency Response (HAZWOPER). Furthermore, site personnel must satisfy any specialized training requirements that are presented in the AHAs for tasks to be completed under this CTO.

6.1 MANDATORY TRAINING AND CERTIFICATIONS

Tetra Tech personnel qualification and training certification documentation will be obtained by the PM/SUXOS and included in Appendix 1 of this APP, and a copy maintained on-site. Mandatory training and certifications applicable to this project include the following:

- 40 hours of introductory hazardous waste site training prior to performing work at NAS Cecil Field.
- 8 hours of refresher training within the past 12 months before being cleared for site work. (Field personnel who have had introductory training more than 12 months prior to site work must complete this training again.)
- 8-hour supervisory training in accordance with 29 CFR 1910.120(e)(4) will be required for site personnel operating in a supervisory capacity.
- UXOSO shall have received specialized training in safety.
- UXOQCS shall have received specialized training in quality
- Specialized operations (UXO) or responsibilities (blood-borne pathogen-first aid) will also require additional training for personnel filling those roles.
- UXO Technicians will be trained in accordance with DDESB TP-18 for the positions they are assigned.

Documentation of Tetra Tech introductory, supervisory, and refresher training as well as site-specific training will be maintained at the site. UXO Technicians will provide documentation when they arrive on-site. Copies of certificates or other official documentation will be used to fulfill this requirement.

6.2 SITE-SPECIFIC SAFETY AND HEALTH TRAINING

The Tetra Tech will provide site-specific training to Tetra Tech employees who will perform work on this project. This will consist of a brief meeting at the beginning of each day to discuss operations planned for that day and a review of the appropriate AHAs with the planned task participants. Based on field activities, a short meeting may also be held at the end of the day to discuss the operations completed and any problems encountered.

Prior to accessing active work areas of the sites or participating in any intrusive activities, site personnel and visitors will first be required to undergo a site-specific safety and health training session conducted by the UXOQCS/UXOSO, which will include a review of the HASP and signing of the Site-Specific Training Documentation form. In addition, UXO team members will meet the requirements stated in the DDESB TP 18 for their respective assignments.

Before site activities begin, the Tetra Tech SUXOS and UXOQCS/UXOSO will present a briefing for site personnel who will participate in on-site activities. The following topics will be addressed during the pre-work briefing:

- Names of the personnel listed in the organizational chart (Figure 4-1) and designated alternates
- Site history
- Work tasks
- Hazardous chemicals that may be encountered
- Physical hazards that may be encountered
- PPE, including types of respiratory and hearing protection to be used for work tasks
- Mandatory training and certification requirements (e.g., HAZWOPER; MEC-specific)
- Environmental surveillance (air monitoring) equipment use and maintenance
- Action levels and situations requiring an upgrade or downgrade of level of protection
- Site control measures including site communications and control zones
- Decontamination procedures
- Emergency communication signals and codes, including incident reporting procedures
- Environmental accident/emergency procedures
- Personnel exposure and accident emergency procedures
- Fire and explosion emergency procedures
- Emergency telephone numbers
- Emergency routes

Any other health and safety-related issues that may arise before site activities begin are covered during the pre-work briefing by the UXOQCS/UXOSO.

6.3 TRAINING DOCUMENTATION

Figure 6-1 documents the provision and content of the project-specific and associated training. Site personnel will be required to sign this form prior to commencement of site activities. This training documentation identifies personnel who, through record review and attendance of the site-specific training, are cleared for participation in site activities. This document shall be maintained at the site to identify and maintain an active list of trained and cleared site personnel.

6.4 MEDICAL SURVEILLANCE

Site personnel will have had a physical examination that meets the requirements of Tetra Tech's medical surveillance program. Documentation for medical clearances will be maintained in the Tetra Tech Pittsburgh office and made available, as necessary, and will be documented using Figure 6-1 for every employee participating in on-site work activities at the sites.

7.0 SAFETY AND HEALTH INSPECTIONS

It is Tetra Tech's internal policy that job sites involving work for the Navy are subject to audits by corporate safety staff. Daily site safety inspections are conducted by the Tetra Tech UXOQCS/UXOSO during this field effort to ensure safe work areas and compliance with the HASP. The items noted during field audits are reported to the Tetra Tech SHM who maintains a corrective/preventive action database. Responsibility for resolving each item noted during these audits is assigned and tracked through resolution. Results from field audits are also regularly communicated throughout Tetra Tech through training and electronic means as a method of continuous program improvement.

8.0 SAFETY HEALTH EXPECTATIONS AND COMPLIANCE

It is the goal of Tetra Tech to continue excellent safety performance on Navy contracts to support the Navy in their safety efforts. Specifically, Tetra Tech will perform work in a manner that is consistent with the Zero Incident Philosophy. It is our goal to plan and perform the work in a manner that integrates safety and health considerations so that work is accomplished without experiencing any worker injuries or illnesses, environmental releases/impacts, or property damage. In addition to the line and staff management functions described in this APP and the accompanying HASP, each individual performing work under this contract has the responsibility for their own personal health and safety, as well as assisting in assuring the health and safety of their co-workers. This element is also the first one listed in our corporate Health and Safety Policy Statement, which requires that "each employee recognize a *personal* responsibility for their own health and safety and for actions that affect the health and safety of fellow employees." This employee responsibility includes observing specified health and safety requirements and communicating with the designated UXOQCS/UXOSO on matters such as the effectiveness of specified control measures, identification of new potential hazards, and other related issues.

An employee's failure to adhere to the requirements of this APP and HASP or to observe specified safety requirements and restrictions or to properly use identified protective equipment may lead to injury or illness. As a result, deviation from safety and health procedures is not tolerated. Failure to comply with health and safety procedures and requirements will lead to reprimand up to and including dismissal.

Health and safety-related information is communicated to employees through meetings, postings, written communications, and reporting of hazards.

9.0 INCIDENT REPORTING

9.1 INJURY/ILLNESS REPORTING

If any Tetra Tech personnel are injured or develop an illness as a result of working on-site, the Tetra Tech "Incident Report Form" (Attachment IV of the HASP) must be followed. Following this procedure is necessary for documenting of the information obtained at the time of the incident.

9.1.1 TOTAL Incident Reporting System

TOTAL is Tetra Tech's new online incident reporting system. Site employees can use TOTAL to directly report health and safety incidents, notify key personnel, and initiate the process for properly investigating and addressing the causes of incidents, including near-miss events. An incident is considered any unplanned event. It may include several types of near misses, events where no loss was incurred, or incidents that resulted in injuries or illness, property or equipment damage, chemical spills, fires, or damage to motor vehicles.

TOTAL looks like the incident reporting form in the HASP Attachment IV. TOTAL is an intuitive system that will guide you through the necessary steps to report an incident within 24 hours of its occurrence. Behind the scenes, TOTAL is a powerful tool for H&S professionals, and will help Tetra Tech to better track incidents, analyze root causes, implement corrective action plans, and share lessons learned. The ultimate result is a more safe and healthy working environment.

TOTAL is maintained on the Tetra Tech Intranet site at <https://my.tetrattech.com/>

Once on the "My Tetrattech" site, TOTAL can be found under the Health and Safety tab, Incident Reporting section, select "Report an Incident (TOTAL)". This will connect you directly to TOTAL. TOTAL can also be accessed directly from the internet using the following web address: <http://totalhs.tetrattech.com/>

Note: when using the system outside the Tetra Tech Intranet System or when operating in a wireless mode, a VPN connection will be required. The speed of the application may be affected dependent upon outside factors such as connection, signal strength, etc. Enter the system using your network user name and password. The user name should be in the following format - t\nickname.lastname.

10.0 MEDICAL SUPPORT

As required by EM 385-1-1, Tetra Tech will ensure that a minimum of two people have current certifications in CPR, First Aid, and Blood-borne Pathogens. These employees will only render basic CPR and First Aid; however, they are authorized to perform emergency rescue or other duties up to the level of their training.

Attachment III of the HASP is the Medical Data Sheet is to be completed by site personnel and made available in the case of an incident. The closest hospital to the sites and directions to it are included in the HASP, as well as contact numbers for both the hospital and ambulance services. Tetra Tech personnel are to perform a drive by of the hospital to ensure that it is accessible and available and that the most efficient route is well mapped.

11.0 PERSONAL PROTECTION REQUIREMENTS

The levels of personal protection to be used for work tasks at the NAS Cecil Field site have been selected based on the nature of the planned work activities and on the known or anticipated hazards; types and concentrations of contaminants that may be encountered; and contaminant properties, toxicity, exposure routes, and matrixes. Specific PPE selected for this project is listed, by task, in the AHAs located in Section 14.0 of this APP.

PPE is selected by the PHSO when writing the APP and HASP, and is confirmed through a rigorous review process by the Tetra Tech SHM. To assure proper PPE has been selected, both the physical and chemical hazards present at the job site are taken into account in both developing and reviewing safety-related documents. In lieu of a separate hazard assessment document being developed by Tetra Tech for Navy field efforts, the signatures of the SHM and the UXOQCS/UXOSO on the Signature Page of this APP constitute approval of the hazard assessment contained in the HASP. The anticipated levels of protection selected for use by field personnel during site activities is Level D. If site conditions during site activities warrant a higher level of protection, the field personnel will withdraw from the site, immediately notify the UXOQCS/UXOSO, and obtain further instructions.

PPE levels can be upgraded or downgraded based on a change in site conditions or investigation findings. When a significant change in site conditions occurs, hazards will be reassessed. PPE has been selected based on the results of task-specific hazard assessments. Through the completion of employee training (e.g., introductory 40-hour hazardous waste training, annual refresher training, etc.), Tetra Tech

employees have been informed of the proper selection, use, and care of PPE items provided to them. After PPE is provided to an employee, the responsibility for using and caring for it appropriately is the responsibility of that employee. The UXOQCS/UXOSO is responsible for assuring that these responsibilities are fulfilled through daily observations and work area inspections at the sites. The UXOQCS/UXOSO is also responsible for assuring that appropriate and adequate supplies of PPE are maintained such that they are readily available for issuance/replacement and in a clean and sanitary manner and location.

12.0 APPLICABLE SITE SPECIFIC PLANS, PROGRAMS AND PROCEDURES

Listed below are potential site-specific plans and procedures that may be applicable to this Navy field effort. The required plans and safety procedures are included in the HASP and this APP.

- Layout Plan
- Emergency Response Plan
- Spill Plan
- Firefighting Plan
- Posting of Emergency Telephone Numbers
- Wildfire Prevention Plan
- Man Overboard – Abandon Ship
- Hazard Communication Program
- Respiratory Protection Plan
- Health Hazard Control Program
- Lead Abatement Plan
- Asbestos Abatement Plan
- Abrasive Blasting Plan
- Confined Space Entry Plan
- Hazardous Energy Control Plan
- Critical Lift Procedure
- Contingency Plan for Severe Weather
- Access and Haul Road Plan
- Demolition Plan (engineering and asbestos surveys)
- Emergency Rescue (tunneling)
- Underground Construction Fire Prevention and Protection Plan
- Compressed Air Plan
- Formwork and Shoring Erection and Removal Plan
- Jacking Plan (lift) Slab Plan
- Health and Safety Plan
- Blasting Plan
- Diving Plan
- Prevention of Alcohol and Drug Abuse
- Fall Protection Plan
- Steel Erection Plan
- Night Operations Lighting Plan

- Site Sanitation Plan
- Fire Prevention Plan

13.0 CONTRACTOR (TETRA TECH) INFORMATION

Tetra Tech's HASP must accompany this APP on job sites. The HASP contains information specific to the former NAS Cecil field effort and provides requirements that employees must follow to ensure that their activities are carried out in accordance with both OSHA and applicable EM 385-1-1 requirements. Compliance with the HASP by Tetra Tech will be the means used to meet the requirements outlined in this APP.

Additionally, site-specific AHAs (Section 14.0) and the Tetra Tech's UXO SOPs (Attachment II of the HASP and UFPSAP) are developed to comply with OSHA requirements and EM 385-1-1 requirements. By adhering to requirements specified in the AHAs, work is performed on-site in a safe manner. Minor changes to AHAs based on actual site conditions are permitted as necessary and applicable by the UXOQCS/UXOSO in the field. Major changes to AHAs, such as Scope of Work changes, are documented on a revised AHA form and are subject to additional review by the Tetra Tech SHM.

14.0 SITE-SPECIFIC HAZARDS AND CONTROLS

Detailed task-specific hazards and controls are provided in the AHAs attached to this APP. Table 1 details the AHAs for the UXO and sampling activities provided in support of the former NAS Cecil field activities.

TABLE 1
NAS CECIL FIELD ACTIVITY HAZARD ANALYSIS

ACTIVITY: Mobilization/Demobilization

ANALYZED BY/DATE: Ralph Brooks 3/9/11

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS
Site Preparation including mobilization and demobilization	1. Minor cuts, abrasions, or contusions handling equipment and tools	1. Wear cut-resistant gloves when handling items with sharp or rough edges.
Assembling, packing, unpacking equipment and supplies	2. Heavy lifting (muscle strains and pulls)	2. Practice safe lifting techniques (use mechanical lifting devices such as a dolly whenever possible, ensure a clear path of travel and good grasp on object. Lift with legs not back, obtain help when needed to lift large, bulky, or heavy items).
Performing a Site Survey which includes a Jobsite Hazard Evaluation and initial/exit inspections of the intended work areas.	3. Vehicular traffic at the work site	3. Locate vehicle and equipment staging areas. Inform site personnel of equipment areas and of their responsibility to stay clear of moving vehicles. Observe designated and marked travel pathways. Wear safety vests when activities involve encroaching on active traffic ways.
Performing initial clearance of travel pathways (foot/vehicular). Conduct GPS survey.	4. Intermittent high noise levels	<p>4. Although not considered a highly probable event, based on the anticipated activities, the use of hearing protection may occasionally be required (at the UXOQCS/UXOSO discretion). The UXOQCS/UXOSO or the SUXOS will observe the following:</p> <ul style="list-style-type: none"> • Available data or monitoring results collected from similar operations and/or collected during this activity. • Use of hearing protection within an established distance from an operation potentially generating excessive noise levels until these levels can be quantified. For instance, during the operation of heavy equipment (excavator) typical site control boundary will be the length of the boom/bucket plus 10-feet. This is a sufficient distance to remove personnel from excessive noise levels. Inside this boundary personnel will wear hearing protection. • Employees may utilize the following general rule of thumb to help make these determinations: <p><i>If noise levels are such that a worker must raise their voice to communicate with someone who is within arm's reach (approximately 2 feet) of them, excessive noise levels are being approached and hearing protection is required.</i></p> <ul style="list-style-type: none"> • Hearing protection will consist of either ear muffs or ear plugs that have a Noise Reduction Rate (NRR) of at least 25 decibels (dB).
	5. Slip/trip/fall hazards	5. Implement and maintain good housekeeping practices throughout work areas. Preview walking/working areas and maintain them to identify and avoid when possible slipping/tripping hazards. Preview work locations for unstable/uneven terrain.

TABLE 1
NAS CECIL FIELD ACTIVITY HAZARD ANALYSIS

ACTIVITY: Mobilization/Demobilization

ANALYZED BY/DATE: Ralph Brooks 3/9/11

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Hand tools (dollies, hand carts, hand knives, shovels, etc.)	<p>Visual inspection of hand tools prior to use by user.</p> <p>The Senior UXO Supervisor (SUXOS) is to perform regular inspections for housekeeping issues and surveys of operational areas to insure compliance with the HASP.</p>	None required.

**TABLE 1
NAS CECIL FIELD ACTIVITY HAZARD ANALYSIS**

ACTIVITY: Vegetation Clearance

ANALYZED BY/DATE: Ralph Brooks 3/9/11

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS
		<p>surface that has been determined to be safe to move, may be moved for later disposal, or disposed of using BIP procedures. UXO Technicians will clear vehicle and foot travel paths within the area. Support personnel and equipment will wait until the clearance is complete. If MEC is observed, the UXO Technician making the observation will signal to stop operations and take the following precautions:</p> <ul style="list-style-type: none"> • The UXO Technician will visually inspect the MEC/MPPEH to determine the type and condition if possible. This identification and the exact location will be recorded in the logbook. • Any suspect MEC/MPPEH item discovered during UXO Surface Survey operations which has been determined safe to move, may be moved to a designated holding area for later disposal, or treated using blow in place (BIP) procedures as stated in the Work Plan and ESS. • Suspect MEC/MPPEH items discovered will be reported to the Navy RPM by the UXO PM. • An inventory will be maintained by the SUXOS with locations and descriptions for suspect MEC/MPPEH discovered during this operation, and the Navy RPM will be provided an inventory update on a daily basis.
	4. Strains/sprains from heavy or improper lifting	4. Practice safe lifting techniques (use mechanical lifting devices such as a dolly whenever possible, ensure a clear path of travel and good grasp on objects, lift with legs not back, obtain help when needed to lift large, bulky, or heavy items).
	5. Slip/trip/fall hazards	5. Implement and maintain good housekeeping practices throughout work areas. Preview walking/working areas and maintain them to identify and avoid possible slipping/tripping hazards. Preview work locations for unstable/uneven terrain.
	6. Chemical exposure:	6. As direct contact will be minimal given the nature of the work, it is unlikely that exposure will occur.
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<p>Personal Protective Equipment: Minimum: Steel toe boots, hard hats, and safety impact eye protection, work gloves, work clothes. Optional items: Hearing protection at UXOQCS/UXOSO/SUXOS discretion, Chainsaw Chaps and Loggers helmet with full faceshield (when operating chainsaws and handheld brushcutters) High-visibility vests when near active traffic areas. For UXO Technicians - Steel</p>	<p>PPE inspection performed by the SUXOS. Ongoing (prior to each use) inspections are the responsibility of PPE users. One UXO technician will be assigned the responsibility of safety observer to watch for any potential MEC/MPPEH. This individual will not operate equipment or otherwise be involved in vegetation clearance operations.</p>	<p>PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees' 40-hour HAZWOPER training, which is to be verified by the UXOQCS/UXOSO through initial training documentation and reviewed prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities.</p> <p>Explosive handling and transportation will be conducted by qualified UXO Technicians. This training and background is considered sufficient for this task.</p>

TABLE 1
NAS CECIL FIELD ACTIVITY HAZARD ANALYSIS

ACTIVITY: Vegetation Clearance

ANALYZED BY/DATE: Ralph Brooks 3/9/11

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<p>toe/shank boots are required when working in areas where there is a danger of foot injuries due to falling or rolling objects or of objects piercing the sole. If steel toe footwear cannot be worn because of interferences with UXO detection devices, safety impact footwear with non-metallic toe protection (provided that the footwear satisfies ANSI Z-41 requirements for protective footwear) shall be used. HTRW: none</p>		

**TABLE 1
NAS CECIL FIELD ACTIVITY HAZARD ANALYSIS**

ACTIVITY: Detector-Aided Visual Survey and Manual MEC/MPPEH Operations

ANALYZED BY/DATE: Ralph Brooks 3/9/11

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS
<p>Detector-aided visual survey and manual MEC/MPPEH operations.</p> <p>Mechanized (low input) operations.UXO Survey</p>	<p>1. MEC/MPPEH Hazards</p>	<p>1. MEC/MPPEH survey and clearance will be conducted by trained UXO Technicians. Non-UXO personnel will be escorted while in the area of concern. Exclusion zone distances will be defined based on those specified in the Work Plan. Operations within the safe separation distance for team operations will immediately stop if MEC/MPPEH is discovered and UXO Technicians will secure the area. All non-UXO personnel will leave the area.</p> <p>If MEC/MPPEH is observed, the UXO Technician making the observation will signal to stop operations and take the following precautions:</p> <ul style="list-style-type: none"> • The UXO Technician will visually inspect the MEC/MPPEH to determine the type and condition if possible. This identification and the exact location will be recorded in the logbook. • Any suspect MEC/MPPEH item discovered during UXO Surface Survey operations which has been determined to be safe to move, may be moved to a designated holding area for later disposal, or treated using BIP procedures as stated in the Work Plan and ESS. • Suspect MEC/MPPEH items discovered will be reported to the Navy RPM by the UXO PM. <p>An inventory will be maintained by the SUXOS with locations and descriptions for suspect MEC/MPPEH discovered during this operation, and the Navy RPM will be provided an inventory update on a daily basis</p>
	<p>2. Insect/animal bites</p>	<p>2. Tape up joint between bottoms of pant legs and top of work boot with duct tape. Apply insect repellants containing at least 10% DEET. Follow manufacturer's label instructions for proper application and re-application. Perform close body inspections at the end of each day to detect/remove any insects. If walking through high grass or brush areas wear snake chaps and avoid approaching or disturbing potential nesting areas.</p>
	<p>3. Inclement weather</p>	<p>3. If electrical storms or inclement weather are in the area, as determined through local forecasting or weather alerts issued, the SUXOS will suspend outside activities. The 30-30 rule shall be applied, which is "if a time interval of 30 seconds or less is between lightning and its thunder, go inside (building/vehicle) and stay inside for at least 30 minutes." If no additional lightning and/or thunder is noted within this 30 minutes, work may resume at the UXOQCS/UXOSO's/SUXOS' direction. Personnel will be directed to seek suitable shelter that will provide adequate protection from the elements. Lightning threat detection will be coordinated within NAS Cecil Field's existing systems.</p>

**TABLE 1
NAS CECIL FIELD ACTIVITY HAZARD ANALYSIS**

ACTIVITY: Detector-Aided Visual Survey and Manual MEC/MPPEH Operations

ANALYZED BY/DATE: Ralph Brooks 3/9/11

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS
	4. Slips/Trips/Fall Hazards	4. Practice good housekeeping to the extent possible and conduct the following: <ul style="list-style-type: none"> • Maintain clear walking and working areas. • Eliminate, when possible, any debris and rutted areas that may create a tripping hazard. • Remaining hazards should be pointed out to the UXO Technicians. • Personnel will return the site to a neat and orderly condition prior to leaving the site. • Exit and access pathways will be maintained free of obstructions.
	5. Chemical contaminants, MC contaminants, and/or decontamination fluids	5. Exposure to potential site contaminants during this activity is unlikely given the nature of the work and the limited contact with potentially contaminated media. The following precautionary procedures will be implemented: <ul style="list-style-type: none"> • Generation of dusts should be minimized. If airborne dusts are observed, area wetting methods will be used. If area wetting methods are not feasible, termination of activities may be used to minimize exposure to observed airborne dusts. • Use proper protective equipment and good hygiene practices to minimize contact with site contaminants and hazardous decontamination fluids. Obtain manufacturer's MSDS for any decontamination fluids used. These must be used in well-ventilated areas, such as outdoors. Use appropriate PPE as identified on MSDS. All chemicals used must be listed on the Chemical Inventory for the site, and site activities must be consistent with the Hazard Communication section of the Health and Safety Guidance Manual (Section 5). • Decontaminate all equipment and supplies between sampling and prior to leaving the site.
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Personal Protective Equipment: Minimum: <ul style="list-style-type: none"> • Steel toe boots, hard hats, and safety impact eye protection (when in active heavy vehicle operation areas or when handling heavy boxes and/or containers) • Work gloves 	Initial PPE inspection performed by the SUXOS. Ongoing (prior to each use) inspections are the responsibility of PPE users.	PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees' 40-hour HAZWOPER training, which is to be verified by the SUXOS through initial training documentation and reviewed prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities. Explosive handling and transportation will be conducted by qualified

**TABLE 1
NAS CECIL FIELD ACTIVITY HAZARD ANALYSIS**

ACTIVITY: Detector-Aided Visual Survey and Manual MEC/MPPEH Operations

ANALYZED BY/DATE: Ralph Brooks 3/9/11

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<ul style="list-style-type: none"> • Work clothes Optional items: • Hearing protection at UXOQCS/UXOSO/SUXOS's discretion • High-visibility vests when near active traffic areas. Other equipment: • For UXO Technicians - Steel toe/shank boots are required when working in areas where there is a danger of foot injuries due to falling or rolling objects or objects piercing the sole. If steel toe footwear cannot be worn because of interferences with UXO detection devices, safety impact footwear with non-metallic toe protection (provided that the footwear satisfies ANSI Z-41 requirements for protective footwear) shall be used. • Geophysical survey equipment and magnetometers <p>HTRW: none</p>		<p>UXO Technicians. This training and background is considered sufficient for this task.</p>

**TABLE 1
NAS CECIL FIELD ACTIVITY HAZARD ANALYSIS**

ACTIVITY: Anomaly Intrusive Investigation

ANALYZED BY/DATE: Ralph Brooks 3/9/11

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS
Anomaly Intrusive Investigation	1. MEC/MPPEH Hazards	<p>1. MEC/MPPEH and clearance will be conducted by trained UXO Technicians. Non-UXO personnel will be escorted while in the area of concern. Exclusion zone distances will be defined based on those specified in the Work Plan. Operations within the safe separation distance for team operations will immediately stop if MEC/MPPEH is discovered and UXO Technicians will secure the area. All non-UXO personnel will leave the area.</p> <p>If MEC/MPPEH is observed, the UXO Technician making the observation will signal to stop operations and take the following precautions:</p> <ul style="list-style-type: none"> • The UXO Technician will visually inspect the MEC/MPPEH to determine the type and condition if possible. This identification and the exact location will be recorded in the logbook. • Any suspect MEC/MPPEH item discovered during UXO Surface Survey operations which has been determined to be safe to move, may be moved to a designated holding area for later disposal, or treated using BIP procedures as stated in the Work Plan and ESS. • Suspect MEC/MPPEH items discovered will be reported to the Navy RPM by the UXO PM. <p>An inventory will be maintained by the SUXOS with locations and descriptions for suspect MEC/MPPEH discovered during this operation, and the Navy RPM will be provided an inventory update on a daily basis</p>
	2. Strains/sprains from heavy or improper lifting	2. Practice safe lifting techniques (use mechanical lifting devices such as a dolly whenever possible, ensure a clear path of travel and good grasp on objects, lift with legs not back, obtain help when needed to lift large, bulky, or heavy items).
	3. Insect/animal bites	3. Tape up joint between bottoms of pant legs and top of work boot with duct tape. Apply insect repellants containing at least 10% DEET. Follow manufacturer's label instructions for proper application and re-application. Perform close body inspection at the end of each day to detect/remove any insects. If walking through high grass or brush areas wear snake chaps and avoid approaching or disturbing potential nesting areas.
	4. Inclement weather	4. If electrical storms or inclement weather are in the area, as determined through local forecasting or weather alerts issued, the SUXOS will suspend outside activities. The 30-30 rule shall be applied, which is "if a time interval of 30 seconds or less is between lightning and its thunder, go inside (building/vehicle) and stay inside for at least 30 minutes." If no additional

**TABLE 1
NAS CECIL FIELD ACTIVITY HAZARD ANALYSIS**

ACTIVITY: Anomaly Intrusive Investigation

ANALYZED BY/DATE: Ralph Brooks 3/9/11

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS
		lightning and/or thunder is noted within this 30 minutes, work may resume at the UXOQCS/UXOSO's/SUXOS' direction. Personnel will be directed to seek suitable shelter that will provide adequate protection from the elements. Lightning threat detection will be coordinated within NAS CECIL FIELD's existing systems
	5. Slips/Trips/Fall Hazards	5. Practice good housekeeping to the extent possible and conduct the following: <ul style="list-style-type: none"> • Maintain clear walking and working areas. • Eliminate, when possible, any debris and rutted areas that may create a tripping hazard. • Remaining hazards should be pointed out to the UXO Technicians. • Personnel will return the site to a neat and orderly condition prior to leaving the site. • Exit and access pathways will be maintained free of obstructions.
	6. Chemical contaminants, MC contaminants, and/or decontamination fluids	6. Exposure to potential site contaminants during this activity is unlikely given the nature of the work and the limited contact with potentially contaminated media. The following precautionary procedures will be implemented: <ul style="list-style-type: none"> • Generation of dusts should be minimized. If airborne dusts are observed, area wetting methods will be used. If area wetting methods are not feasible, termination of activities may be used to minimize exposure to observed airborne dusts. • Use proper protective equipment and good hygiene practices to minimize contact with site contaminants and hazardous decontamination fluids. Obtain manufacturer's MSDS for any decontamination fluids used. These must be used in well-ventilated areas, such as outdoors. Use appropriate PPE as identified on MSDS. All chemicals used must be listed on the Chemical Inventory for the site, and site activities must be consistent with the Hazard Communication section of the Health and Safety Guidance Manual (Section 5). Decontaminate all equipment and supplies between sampling and prior to leaving the site.
	7. Anomaly Disturbance	7. When locating an anomaly always use proper UXO digging procedures. <ul style="list-style-type: none"> • Always dig from the side never from above. • Once the anomaly is located carefully remove surrounding debris in order to identify the item. • Survey spoils removed from excavation for possible anomalies.

**TABLE 1
NAS CECIL FIELD ACTIVITY HAZARD ANALYSIS**

ACTIVITY: Anomaly Intrusive Investigation

ANALYZED BY/DATE: Ralph Brooks 3/9/11

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<p>Personal Protective Equipment: Minimum:</p> <ul style="list-style-type: none"> • Steel toe boots, hard hats, and safety impact eye protection (when in active heavy vehicle operation areas or when handling heavy boxes and/or containers) • Work gloves • Work clothes <p>Optional items:</p> <ul style="list-style-type: none"> • Hearing protection at UXOQCS/UXOSO/SUXOS's discretion • High-visibility vests when near active traffic areas. <p>Other equipment:</p> <ul style="list-style-type: none"> • For UXO Technicians - Steel toe/shank boots are required when working in areas where there is a danger of foot injuries due to falling or rolling objects or objects piercing the sole. If steel toe footwear cannot be worn because of interferences with UXO detection devices, safety impact footwear with non-metallic toe protection (provided that the footwear satisfies ANSI Z-41 requirements for protective footwear) shall be used. • Geophysical survey equipment and magnetometers • Shovels, hand tools • HTRW: Explosives, detonating devices, MEC/UXO materials. 	<p>PPE inspection performed by the SUXOS. Ongoing (prior to each use) inspections are the responsibility of PPE users. One UXO technician will be assigned the responsibility of safety observer to watch for any potential MEC/MPPEH. This individual will not operate equipment or otherwise be involved in vegetation clearance operations.</p>	<p>PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees' 40-hour HAZWOPER training, which is to be verified by the SUXOS through initial training documentation and reviewed prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities.</p>

**TABLE 1
NAS CECIL FIELD ACTIVITY HAZARD ANALYSIS**

ACTIVITY: Donor Explosive Handling

ANALYZED BY/DATE: Ralph Brooks 3/9/11

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS
<p>Donor Explosives Handling MEC Management/treatment MPPEH Management (inspection and disposal)</p> <p>This activity includes receipt, storage, and transfer of explosives and explosive components.</p> <p>Explosive materials to be handled as part of this activity include:</p> <ul style="list-style-type: none"> • Helix 1.1 lb bars (Non explosive until mixed) <p>Non EI with blasting caps.</p>	1. Explosive handling	1. Only UXO Technicians will be permitted to handle and/or transport explosives and detonators. Only UXO Technicians will be permitted to load and detonate explosive materials per this scope of work.
	2. Initiating explosions	2. Segregation - Strict adherence will be practiced with regard to the segregation of initiating devices (cord and detonators) from the explosives during storage and transport. Non-essential personnel will be restricted from operating area.
	3. Storage Precautions	<p>3. The following requirements shall be adhered to when storing explosives:</p> <ul style="list-style-type: none"> • Store explosives and explosives devices in an authorized storage facility (e.g., secured magazine repository, vault, cubicle, room, or separate facility). • Assure that each container of explosives is properly labeled. • Segregate explosives from detonating devices, incompatible materials. • Environmental conditions within the storage facility shall be maintained as not to subject the explosives to excessive heat and/or cold. Humidity levels above 60% will prevent static electrical accumulation and discharge. If humidity is below 60%, personnel will establish a ground prior to handling explosives. • Stacks of explosives shall be arranged so that air freely circulates to all parts of the stack. • Pallets or appropriate cribbing shall be used to ensure that containers are not stacked directly on the magazine floor. • Maintain a running inventory. • Inspect storage locations and explosives containers at least once a week to ensure continued safe storage. • Storage buildings should be kept clear of combustible or flammable storage/debris at least 25-feet surrounding the perimeter. • If lights are used within the building they shall be intrinsically safe configuration. • All temporary storage facilities will be properly grounded to provide protection against electrical hazards. • Appropriate signage indicating storage content as well as safety signs (NO SMOKING, NO OPEN FLAMES OR SPARK PRODUCING DEVICES) will be placed surrounding the storage.
	4. Hazard communication/ Emergency action	4. Hazard Communication/Emergency Action Procedures – Hazard communication will be an integral part of explosive handling to alert transport workers and emergency response personnel of the presence of explosives, extensive hazard communication

**TABLE 1
NAS CECIL FIELD ACTIVITY HAZARD ANALYSIS**

ACTIVITY: Donor Explosive Handling

ANALYZED BY/DATE: Ralph Brooks 3/9/11

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS
	procedures	<p>requirements apply to explosives. These include identifying materials on transport documents, providing specific emergency response information with the transport document and a 24-hour telephone number where more detailed information may be obtained, markings and labels on packaging as well as placarding of the transport units. Each employee is required to be trained on the hazards of materials they handle and their specific responsibilities.</p> <ul style="list-style-type: none"> • Toxicity - Explosives materials, explosives components (additives or adhesives), and materials such as organic solvents used in the explosives processing procedure that can be toxic when inhaled, ingested, or absorbed through the skin. The most frequently reported effect from working with explosives is a skin rash resulting from skin contact with explosives materials, or with solvents and adhesives used with explosives operations. The following general precautions should be used to: <ul style="list-style-type: none"> - Know the health hazard and controls before beginning operations. Read your MSDS. If you have questions ask the SUXOS and/or the UXOSO for clarification. - Handle materials in a well-ventilated area; where this is not possible local exhaust ventilation is preferred. - Avoid skin contact; use surgeon's gloves when necessary to avoid direct skin contact and absorption. Cotton coveralls are also recommended. The UXOSO may recommend additional PPE based on-site specific conditions. - Practice good work/personal hygiene. Wash before eating, drinking, or smoking (hand to mouth activities), or using toilet facilities; end-of-shift showers
	5. Transportation	5. The motor carrier requirements in 49 CFR 397 include requirements for routing of Explosion Hazard Class Division 1.1, 1.2, and 1.3 explosives away from population centers as well as when these materials should be moved (when traffic is at its lowest point). These standards require that vehicles be operated in accordance with a route plan prepared by the carrier with the intention of avoiding populated areas and critical infrastructure. The regulation also acknowledges that these areas cannot always be avoided and permits reasonable exceptions at the discretion of the carrier or driver. Drivers operating explosive transport vehicles are required to have a Drivers License within their State of Origin with CDL Qualifications.
	6. Strains/sprains from	6. Maintain clear walking working areas and good housekeeping to the extent possible. Practice safe lifting techniques (use mechanical lifting devices such as a dolly whenever

**TABLE 1
NAS CECIL FIELD ACTIVITY HAZARD ANALYSIS**

ACTIVITY: Donor Explosive Handling

ANALYZED BY/DATE: Ralph Brooks 3/9/11

Accident Prevention Plan
Former NAS Cecil Field

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS
	heavy or improper lifting	possible, ensure clear path of travel, good grasp on object, lift with legs not back, obtain help when needed to lift large, bulky, or heavy items).
	7. Electrical storms/ Inclement weather (high winds, heavy rains, etc.)	7. It will be the responsibility of the UXOSO to acquire weather information each time explosives and detonating materials are transported or handled per this scope. If electrical storms or inclement weather are within the area as determined through local forecasting or weather alerts issued by NAS CECIL FIELD, the SUXOS/UXOSO will suspend all explosive handling activities. The 30-30 rule shall be applied which is - If a time interval of 30 seconds or less is between lightning and its thunder go inside and stay inside for at least 30-minutes. If no additional lightning and/or thunder is noted within this 30-minutes work may resume at the SUXOS/UXOSO's direction. All lightning threat detection will be coordinated within NAS CECIL FIELD existing systems.
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<p>Personal Protective Equipment: Minimum:</p> <ul style="list-style-type: none"> • Soft sole shoes without metal fasteners (will not interfere with metal detectors/magnetometers) • Coveralls (No metal fasteners) • Surgeons glove for handling explosives • No outer or inner garments having static-electricity-generating characteristics. • Work gloves for handling sand bags <p>Optional items: high visibility vests HTRW: Explosives, detonating devices, MEC/UXO materials.</p>	<p>Initial PPE inspection performed by UXOSO. Ongoing (prior to each use) inspections will be the responsibility of PPE users.</p>	<p>PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees 40 hour HAZWOPER training, which is to be verified by the SUXOS/UXOSO through initial training documentation and review prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities.</p> <p>Personnel who will be handling military munitions will not wear outer or inner garments having static-electricity-generating characteristics. Materials made of 100-percent polyester, nylon, silk, and wool are highly static producing. Refer to DA Pam 385-64 for more information regarding non-static-producing clothing.</p>

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CTO JMO9

April 2011

**TABLE 1
NAS CECIL FIELD ACTIVITY HAZARD ANALYSIS**

ACTIVITY: MEC Management (Treatment)

ANALYZED BY/DATE: Ralph Brooks 3/9/11

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS
<p>This activity includes receipt, storage, and transfer of explosives and explosive components.</p> <p>Explosive materials to be handled as part of this activity include:</p> <ul style="list-style-type: none"> • Helix 1.1 lb bars (Non explosive until mixed) • Non EI with blasting caps. <p>Treatment of suspect MEC.</p> <p>If the material in question is a fused MEC then it will be detonated in place using explosive charges.</p>	1. Explosive handling	1. Only UXO Technicians will be permitted to handle and/or transport explosives and detonators. Only UXO Technicians will be permitted to load and detonate explosive materials per this scope of work.
	2. Initiating explosions	2. Segregation - Strict adherence will be practiced with regard to the segregation of initiating devices (cord and detonators) from the explosives during storage and transport. Non-essential personnel will be restricted from operating area.
	3. Storage Precautions	<p>3. The following requirements shall be adhered to when storing explosives:</p> <ul style="list-style-type: none"> • Store explosives and explosives devices in an authorized storage facility (e.g., secured magazine repository, vault, cubicle, room, or separate facility). • Assure that each container of explosives is properly labeled. • Segregate explosives from detonating devices, incompatible materials. • Environmental conditions within the storage facility shall be maintained as not to subject the explosives to excessive heat and/or cold. Humidity levels above 60% will prevent static electrical accumulation and discharge. If humidity is below 60%, personnel will establish a ground prior to handling explosives. • Stacks of explosives shall be arranged so that air freely circulates to all parts of the stack. • Pallets or appropriate cribbing shall be used to ensure that containers are not stacked directly on the magazine floor. • Maintain a running inventory. • Inspect storage locations and explosives containers at least once a week to ensure continued safe storage. • Storage buildings should be kept clear of combustible or flammable storage/debris at least 25-feet surrounding the perimeter. • If lights are used within the building they shall be intrinsically safe configuration. • All temporary storage facilities will be properly grounded to provide protection against electrical hazards. • Appropriate signage indicating storage content as well as safety signs (NO SMOKING, NO OPEN FLAMES OR SPARK PRODUCING DEVICES) will be placed surrounding the storage.
	4. Hazard communication/ Emergency action procedures	4. Hazard Communication/Emergency Action Procedures – Hazard communication will be an integral part of explosive handling to alert transport workers and emergency response personnel of the presence of explosives, extensive hazard communication requirements apply to explosives. These include identifying materials on transport

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ACTIVITY: MEC Management (Treatment)

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ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS
		<p>documents, providing specific emergency response information with the transport document and a 24-hour telephone number where more detailed information may be obtained, markings and labels on packaging as well as placarding of the transport units. Each employee is required to be trained on the hazards of materials they handle and their specific responsibilities.</p> <ul style="list-style-type: none"> - Toxicity - Explosives materials, explosives components (additives or adhesives), and materials such as organic solvents used in the explosives processing procedure that can be toxic when inhaled, ingested, or absorbed through the skin. The most frequently reported effect from working with explosives is a skin rash resulting from skin contact with explosives materials, or with solvents and adhesives used with explosives operations. The following general precautions should be used to: <ul style="list-style-type: none"> a) Know the health hazard and controls before beginning operations. Read your MSDS. If you have questions ask the SUXOS and/or the UXOSO for clarification. b) Handle materials in a well-ventilated area; where this is not possible local exhaust ventilation is preferred. c) Avoid skin contact; use surgeon's gloves when necessary to avoid direct skin contact and absorption. Cotton coveralls are also recommended. The UXOSO may recommend additional PPE based on site specific conditions. d) Practice good work/personal hygiene. Wash before eating, drinking, or smoking (hand to mouth activities), or using toilet facilities; end-of-shift showers
	5. Transportation	5. The motor carrier requirements in 49 CFR 397 include requirements for routing of Explosion Hazard Class Division 1.1, 1.2, and 1.3 explosives away from population centers as well as when these materials should be moved (when traffic is at its lowest point). These standards require that vehicles be operated in accordance with a route plan prepared by the carrier with the intention of avoiding populated areas and critical infrastructure. The regulation also acknowledges that these areas cannot always be avoided and permits reasonable exceptions at the discretion of the carrier or driver. Drivers operating explosive transport vehicles are required to have a Drivers License within their State of Origin with CDL Qualifications.
	6. Strains/sprains from heavy or improper lifting	6. Maintain clear walking working areas and good housekeeping to the extent possible. Practice safe lifting techniques (use mechanical lifting devices such as a dolly whenever possible, ensure clear path of travel, good grasp on object, lift with legs not back, obtain help when needed to lift large, bulky, or heavy items).
	7. Electrical storms/ Inclement weather (high winds, heavy	7. It will be the responsibility of the UXOSO to acquire weather information each time explosives and detonating materials are transported or handled per this scope. If

**TABLE 1
NAS CECIL FIELD ACTIVITY HAZARD ANALYSIS**

ACTIVITY: MEC Management (Treatment)

ANALYZED BY/DATE: Ralph Brooks 3/9/11

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS
	rains, etc.)	electrical storms or inclement weather are within the area as determined through local forecasting or weather alerts issued by the National Weather Service the SUXOS/UXOSO will suspend all explosive handling activities. The 30-30 rule shall be applied which is - "If a time interval of 30 seconds or less is between lightning and its thunder go inside and stay inside for at least 30-minutes." If no additional lightning and/or thunder is noted within this 30-minutes work may resume at the SUXOS/UXOSO's direction.
	8. MEC/UXO Hazards	8 UXO Intrusive Activities and treatment- During these activities only trained UXO Technicians will be permitted within the areas of concern and established safety arcs created by the UXO Technician. Once the target anomalies have been unearthed, the UXO Technician or SUXOS will determine treatment methods. If it is to be blown in place the following provisions will apply: <ul style="list-style-type: none"> - Target anomalies within the closest proximity will be treated first (clearing access paths to within the area of concern. - UXO Technicians will determine the charge size, load the hole, string detonation cord. An air gap will be maintained between the cord and slapper blasting control box. These wires shall be insulated from any and all extraneous electrical discharge as well as physical damage. - At this time the UXO Technician may utilize other (Non-UXO) personnel within cleared pathways to transport sand bags that will serve as cover during the treatment of fuzed MEC. - The SUXOS will walk over the area to insure the load and associated engineering controls (sand bags, soil cover, windows cover, etc.) are satisfactory. - Once approved, the SUXOS will notify Ralph Hogan the Cecil Field POC of the time of the planned detonation. The SUXOS will sound a warning signal consisting of <ul style="list-style-type: none"> (1) WARNING SIGNAL - a one-minute series of long audible signals 5 minutes prior to blast signal; (2) BLAST SIGNAL - a series of short audible signals 1 minute prior to the shot; and <ul style="list-style-type: none"> - UXO Technician will initiate detonation. - No persons will enter the area until all dusts settle and the UXO Technician or Technicians perform a detector aided sweep. The purpose is to insure all of the fuzed MEC has been eliminated as well as the explosives used in the treatment process. (3) ALL CLEAR SIGNAL - a prolonged audible signal following the inspection of blast area.

TABLE 1
NAS CECIL FIELD ACTIVITY HAZARD ANALYSIS

ACTIVITY: MEC Management (Treatment)

ANALYZED BY/DATE: Ralph Brooks 3/9/11

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS
		The safety signals shall be given by use of a compressed air whistle, a horn, or equivalent means, and shall be clearly audible at the most distant point in the blast area. It should be noted that several MEC items may be treated at the same time.
Decontamination: The decontamination and disposal of explosive residue from metallic debris left behind as a result of the detonation treatment. This would include the collection of Non-energetic MEC related debris prior to disposal.	9. Minor cuts, abrasions or contusions handling equipment and tools	9. Wear cut-resistant gloves when handling items with sharp or rough edges.
	10. Heavy lifting (muscle strains and pulls)	10. Practice safe lifting techniques (use mechanical lifting devices such as a dolly whenever possible, ensure clear path of travel, good grasp on object, lift with legs not back, obtain help when needed to lift large, bulky, or heavy items). See Section 9.4 for addition instruction concerning proper lifting techniques.
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Hand Tools - Shovels, Bars, buckets, brushes, etc.	SUXOS to inspect each vehicle prior to permitting site access using Equipment Inspection Checklist.	Equipment operators must demonstrate experience in proper vehicle/equipment operations.
Personal Protective Equipment: Minimum: <ul style="list-style-type: none"> • Soft sole shoes without metal fasteners (will not interfere with metal detectors/magnetometers) • Coveralls (No metal fasteners) • Surgeons glove for handling explosives • No outer or inner garments having static-electricity-generating characteristics. • Work gloves for handling sand bags Optional items: high visibility vests HTRW: Explosives, detonating devices, MEC/UXO materials.	Initial PPE inspection performed by UXOSO. Ongoing (prior to each use) inspections will be the responsibility of PPE users.	PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees 40 hour HAZWOPER training, which is to be verified by the SUXOS/UXOSO through initial training documentation and review prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities. Personnel who will be handling military munitions will not wear outer or inner garments having static-electricity-generating characteristics. Materials made of 100-percent polyester, nylon, silk, and wool are highly static producing. Refer to DA Pam 385-64 for more information regarding non-static-producing clothing.

15.0 HEALTH AND SAFETY PLAN

This APP and the site-specific HASP must be used together and be available for site personnel during the duration of this work.

16.0 REFERENCES

United States Army Corps of Engineers (USACE) 2008 Engineer Manual (EM) 385-1-1, Safety and Health Requirements Manual. It is available online at:

<http://www.usace.army.mil/inet/usace-docs/eng-manuals/em385-1-1/entire.pdf>

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April 2011

APPENDIX TO ACCIDENT PREVENTION PLAN

Appendix 1

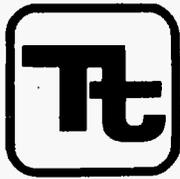
Employee training/qualifications are to be collected and attached by PM/SUXOS prior to the start of site activities.

(40-Hour HAZWOPER Certificates; 8 -Hour HAZWOPER Refresher Certificates; First Aid/CPR Certificates; Employee Resumes as required)

ATTACHMENT II

UXO

STANDARD OPERATING PROCEDURE



TETRA TECH NUS, INC.

STANDARD OPERATING PROCEDURES

Number HS-2.0	Page 1 of 14
Effective Date 09/03	Revision 1
Applicability Tetra Tech NUS, Inc.	
Prepared Earth Sciences Department	

Subject
UNEXPLODED ORDNANCE AND CHEMICAL
WARFARE AGENTS ACTIVITIES

Approved
D. Senovich *DS*

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1.0 GENERAL

This Standard Operating Procedure (SOP) was prepared in accordance with applicable U.S. Army Corps of Engineers procedures and policies governing field activities requiring Unexploded Ordnance (UXO) and Chemical Warfare Material (CWM) operations. All personnel conducting operations under this SOP must read and understand applicable parts of references listed in paragraph 9.1 below prior to commencing any work described within this SOP. Other documents supporting this SOP include project-specific Work Plans and Health and Safety Plans which are prepared for the purpose of accomplishing work that contain a UXO or CWM component.

2.0 PURPOSE

This SOP applies to all operations involving UXO and/or CWM support during field operations at various sites where Tetra Tech NUS (TtNUS) personnel are present. It provides procedural requirements for any activity involving UXO and CWM, as well as detailed procedures for the location, identification, documentation, and emergency response actions pertaining to UXO/CWM activities.

3.0 APPLICABILITY

This SOP applies to persons who may visit any site where TtNUS is performing work that involve some UXO or CWM component. Compliance the content of this SOP is mandatory for all TtNUS personnel, subcontractors, and visitors to any site where UXO/CWM activities are in progress.

4.0 RESPONSIBILITIES

Project Manager

Effective implementation of this SOP at the project level will be the ultimate responsibility of the assigned TtNUS Project Manager. The Project Manager is responsible for ensuring that all applicable rules and regulations are complied with, and that all necessary safety precautions are taken to conduct operations in accordance with this SOP. To fulfill this responsibility, the assigned Project Manager is required to ensure that appropriately-qualified technical staff are involved in all stages of project planning and field work, as well as for ensuring that appropriate resources are marshaled and used on his/her assigned projects. For projects involving UXO and/or CWM, this will involve ensuring that a suitably qualified and experienced UXO technician and a site Health and Safety Officers are part of the project team. In some cases, the assigned UXO Technician may also serve as the project site Health and Safety Officer.

It is also the responsibility of the Project Manager to ensure that all personnel conducting field activities in accordance with this SOP have proper training (including hazard control briefings) and, if required, the proper certifications for the job being performed.

UXO Technician

A suitably qualified and experienced UXO Technician will be included as part of the project team where these types of concern are known or suspected to exist. The UXO Technician will be primarily responsible for advising the Project Manager on all UXO/CWM matters, including on the measures that will be necessary to effectively implement and adhere to this SOP. Other specific duties will include:

- Providing technical expertise and input into project planning activities and documents such as the project-specific Work Plan and Health and Safety Plan
- Clearing worksite areas of UXO/CWM concerns prior to the initiation of any other onsite activities

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- Participating in the development and conductance of site specific training sessions and daily tailgate meetings to communicate UXO/CWM matters to the field personnel
- Maintaining a sound familiarity with the contents of this SOP, the contents of the references listed in section 9.1, and keeping current with new information and technology pertinent to UXO/CWM matters

Site Health and Safety Officer

A suitably qualified and experienced health and safety professional will be assigned to all projects that involve fieldwork. Project-specific responsibilities will include:

- Effectively implementing the requirements and restrictions specified in the project-specific Health and Safety Plan
- Ensuring that all personnel participating in onsite activities have satisfied all appropriate medical and training qualifications prior to participating in any onsite intrusive activities.
- Conduct initial site-specific health and safety training for all personnel participating in onsite activities prior to their participation in any onsite intrusive activities.
- Conduct tail-gate safety briefings prior to the initiation of all tasks, but not less than daily.
- On certain projects, these duties may be assigned to the UXO Technician. This would be considered acceptable on field projects where the predominant concern is contact with UXO and/or CWM, and minimal health concerns or requirements (e.g., chemical exposures or monitoring) exist.

Corporate Health and Safety Manager

Perform periodic project audits and evaluations to determine the ongoing effectiveness of this SOP to address UXO/CWM concerns, and review and evaluate this SOP to determine any revisions that are appropriate.

5.0 LOCATION OF OPERATIONS

Activities where UXO and/or CWM concerns may exist may be encountered in support of various TtNUS contracts, with potential project sites located throughout the continental United States and abroad. Wherever the installation/site is located, it will be necessary to ensure that project planning activities include collecting available historical information that may be pertinent to these issues, as well as identifying and addressing contract/client-specific requirements and any location-specific requirements (e.g., State, local-level, or host-nation requirements). A detailed site description, discussion of known and/or suspected contamination sources, and results of previous studies will be provided to field personnel as part of their field mobilization and initial site-specific training activities.

The initial project evaluation must involve the performance of a preliminary risk assessment, including the investigation of probable contaminants, potential transport pathways, the identification of potential receptors, and a preliminary evaluation of human health and environmental concerns. Preliminary identification of applicable or relevant and appropriate requirements (ARARs) will also be made available to field personnel conducting activities at the installation.

6.0 PERSONNEL QUALIFICATIONS AND REQUIREMENTS

6.1 Personnel Qualifications: Qualifications of those personnel actively involved in UXO/CWM operations shall be as follows:

- a. UXO personnel shall be graduates an accredited Explosive Ordnance Disposal (EOD) School such as Indian Head or Eglin Air Force Base.
- b. The Senior UXO Supervisor (SUXOS) for the operation will have been awarded the Master EOD Badge and have served at least 15 years in military EOD assignments, of which more than 10 years were in a supervisory position.

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- c. UXO personnel are responsible for maintaining current status with training and medical surveillance requirements, as specified in the project-specific Health and Safety Plans and OSHA 29 CFR 1010.120, paragraphs (e) and (f).

6.2 Personnel Requirements: During any activity where the possibility that UXO and or CWM may be encountered (no matter how remote), the following requirements will be met:

- a. One UXO-qualified technician will be required to support each field team engaged in operations in areas that might contain UXO/CWM.
- b. One UXO-qualified technician will be present at the site during all activities to provide UXO/CWM support in the event their services are required.

7.0 PERSONNEL LIMITS

The activities to be conducted under most contracts will not normally be conducted in areas requiring maximum personnel limitations except for intrusive UXO activities. Work will not be permitted unless at least two persons are present in the work area. The provisions of 29 CFR 1910.120 concerning personnel qualifications and requirements will be followed while working on-site. Any additional personnel limitation requirements specified by the client or the project work location (e.g., state, local ordnance, host nation, etc.) will also be identified and adhered to at all times.

7.1 Personnel Limits for UXO Operations:

- a. UXO Avoidance Operations – Two UXO Technicians (one UXO Technician III and one UXO Technician II)
- b. UXO Intrusive Operations - Three UXO Technicians (one UXO Technician III and two UXO Technician II)

8.0 MATERIAL LIMITS

The properties and configurations of specific explosive materials are not addressed in this SOP. That level of detail is required to be addressed in project-specific Work Plans and Health and Safety Plans. This SOP must be maintained onsite along with these project-specific documents to aid in appropriate communication and implementation activities. Bulk liquids to be used for decontamination of equipment will be maintained in 2-gallon containers or less. Material Safety Data Sheets (MSDSs) will be kept on file in the TtNUS Command Post for any chemical substances brought to the project site by TtNUS and TtNUS subcontractor personnel. This is addressed in greater detail in section 5. of the TtNUS Health and Safety Guidance Manual.

9.0 SAFETY REQUIREMENTS

9.1 Referenced Safety Requirements: The safety requirements that apply to the UXO/CWM operations covered under this SOP are:

- a. OSHA 29 CFR 1910.120 and 1926.65 – Hazardous Waste Operations and Emergency Response (HAZWOPER). Available online at:
http://www.osha.gov/pls/oshaweb/owasrch.search_form?p_doc_type=STANDARDS&p_toc_level=0&p_keyvalue=OSHA_Std_toc.html

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- b. US Army Corps of Engineers Engineering Regulation 385-1-92, *Safety and Occupational Health Document Requirements for Hazardous, Toxic and Radioactive Waste (HTRW) and Ordnance and Explosive Waste (OE) Activities*.
- c. US Army Corps of Engineers Engineering Regulation (ER) 385-1-96, *Safety and Health Requirements*. Available on line at:
<http://www.usace.army.mil/publications/eng-manuals/em385-1-1/toc.htm>.
- d. US Army Corps of Engineers Engineering Pamphlet (EP) 1110-1-18, *Ordnance and Explosive (OE) Response*.
- e. US Army Corps of Engineers Engineering Pamphlet (EP) 75-1-2, *Unexploded Ordnance Support for Hazardous, Toxic and Radioactive Waste and Construction Activities*.
- f. US Army Corps of Engineers Engineering Pamphlet (EP) 75-1-3, *Chemical Warfare Material Response*.
- g. US Army Technical Manual 9-1300-206 (TM 9-1300-206), *Ammunition and Explosive Hazards*.
- h. Technical Manual 60A-1-1-31, *Explosive Ordnance Disposal Procedures, General Information on EOD Disposal Procedures*.

9.2 Specific Safety Requirements:

- a. All site operations will be suspended if any site worker encounters an item of suspected UXO/CWM. Site work will remain suspended until the item is inspected and cleared by the UXO Technician.
- b. All site operations will be suspended if so ordered by an authorized client representative (i.e., Installation Range Control and/or Safety Office).
- c. A minimum of two UXO-qualified technicians will be present during all UXO-related activities.
- d. Standard work practices as outlined in project-specific Health and Safety Plans and/or Work Plans will be observed.

9.3 Inherent UXO/CWM Hazards: UXO/CWM operations have inherent safety and health risks associated with the various field activities conducted. All planned activities will be conducted in accordance with the requirements of the references listed in Section 9.1 above, as safety is the primary consideration in all UXO/CWM activities. Every effort should be made to determine all hazards associated with the site through a thorough research of archives, past site/range uses, and any other available information. Some of the hazards to consider are:

- a. Propellant, Explosives, and Pyrotechnics (PEP)
- b. Depleted Uranium (DU)
- c. White Phosphorus (WP)
- d. Corrosive chemicals (acids and bases) and decontamination agents
- e. Toxic gases, liquids and solids
- f. Corroded and damaged containers, munitions bodies, drums, etc.
- g. Fuze conditions
- h. Etiological agents

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10.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Task-specific PPE will be identified in project-specific Health and Safety Plans. Typical PPE for project sites where the principle concern is for UXO/CWM will include the items listed below. Items marked with an asterisk (*) will be available and will be used as specified in the Health and Safety Plan and/or as determined by the TtNUS Site Health and Safety Officer.

- a. Safety glasses
- b. Safety shoes (and protective over boots or steel-toed rubber boots). NOTE: During geophysical survey operations, the UXO technicians will not wear steel-toed boots as they interfere with the magnetometer survey; however, around heavy equipment and activities where foot and overhead hazards may exist, steel-toed boots and hard hats will be worn.
- c. Cotton clothing (with protective coveralls*)
- d. Gloves (type to be specified for each project task in the Health and Safety Plan and/or by the site Health and Safety Officer)
- e. Respiratory protection equipment* (29CFR1910.134)
- f. Hearing protection*
- g. Hard hats*

11.0 EMERGENCY RESPONSE AND CONTINGENCY PLANS

11. Emergency Contacts: The identification of (and means to communicate with) appropriate local emergency response agencies must be identified as part of project planning/mobilization activities, and these agencies must be contacted prior to the initiation of any onsite work. These initial communications must determine the capabilities of these agencies to respond to foreseeable emergency situations, their willingness to respond, and their locations/driving directions/phone numbers. These details must be specified in the project-specific Health and Safety Plan and posted in the site Command Center/Field office.

At a minimum, the names and means of communication (phone number, radio frequency, etc.) of the following parties must be included in the project-specific Emergency Contacts procedure:

- a. Local Emergency Fire Response that will respond (i.e., local Fire Department)
- b. Emergency Medical Assistance (Hospital, Emergency Room, and ambulance service that will respond)
- c. Installation Safety Office or other client safety/emergency response contact
- d. Installation EOD Office/Detachment
- e. Installation Environmental Office

The senior TtNUS managing employee onsite (Project Manager, Site Manager, Site Supervisor, Field Operations Leader) is responsible for initiating these calls in the event of an emergency where such support is needed. If the Project Manager is not onsite at the time of an emergency event, he/she must be added to the above list of contacts.

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In the event of an emergency, all site personnel will be evacuated to a predetermined location away from the work place. Emergency Response Planning will be addressed in the project-specific Health and Safety Plan and will be in accordance with either 29 CFR 1910.38(a) or 1910.120(l). TtNUS will utilize the Installations Base Fire Protection and Emergency Services in emergencies or potential emergencies.

11.2 Contingency Plans: The following contingency plans will be implemented:

- a. Pre-Planning – Upon arrival at the site/installation, the TtNUS Field Operations Leader (FOL) and/or the Site Safety Officer will meet with the Base or local Fire Protection Department, Base Security Personnel or local Police Department, and onsite and/or offsite Emergency services to notify them of the activities that are to be undertaken, when, and where. All site personnel will be required to follow established base/local emergency procedures and will rely on base/local services to handle emergency calls when needed.
- b. Emergency Escape Procedures and Assignments – Upon notification of a site emergency that requires evacuation, all site personnel will proceed to predetermined locations based on emergency location and wind direction. An alternate assembly point will be designated in case personnel cannot reach these locations without danger to their lives and health. These primary and alternate escape routes and meeting places will be designated during the daily hazard control briefing. Personnel will be trained to remain at the assembly points until directed to either resume work or to leave the site.
- c. Procedures to Account for Site Personnel – The site work force is typically small enough that accounting for personnel will not be a problem via visual head counting. On projects with larger field team sizes, roll calls will be taken using the daily sign in logs, logbook entries, or the tail-gate briefing sheets. Accounting for personnel will be the Field Operations Leader's responsibility.
- d. Rescue and Medical Duties – TtNUS personnel will not be authorized to participate in emergency rescue operations. Typical first aid response equipment that is to be on hand at a project site includes suitable first aid kit, an emergency eye wash station, and Class ABC fire extinguishers.
- e. Activation of Emergency Response Procedures - Should an emergency occur which requires the support of outside services, the appropriate contacts will be made by the senior TtNUS managing employee onsite (Project Manager, Site Manager, Site Supervisor, Field Operations Leader). A list of appropriate contacts will be posted at the Command Post. Cellular phones, land-line phones, or hand-held radios will be the primary means of communication.
- f. Airborne Chemical Release Contingency Plan –
 - (1) Chemical Release Monitoring – every member of the site team will be responsible for observing and reporting any gross chemical releases or conditions that could lead to releases. Air monitoring will be performed as described in the project-specific Work Plans and Health and Safety Plans.
 - (2) Responses to Measured Airborne Chemical Releases – the readings on monitoring instrumentation will be compared to the action levels specified in the project-specific Work Plans and Health and Safety Plans. The primary purpose of appropriate real-time monitoring instruments will be monitor worker breathing zone areas for the protection of employee health. The project-specific Health and Safety Plan will specify actions that are to be taken in the event that monitoring instrument readings indicate that detected

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concentrations may represent a health threat to onsite workers. Area and perimeter monitoring as well as sample screening activities may also be called for in the Work Plan or Health and Safety Plan, but these are secondary purposes for the use of these instruments.

Unless otherwise specified in a project-specific Health and Safety Plan, the following monitoring instrument action levels and response measures will be observed on UXO/CWA sites:

<u>Parameter</u>	<u>Action Level</u>
Total Organic Vapors	Any sustained level above background
Airborne particulates	Readings >2.5 mg/m ³
Flammable Vapors	10% of the Lower Explosive Limit (LEL)

If such levels are noted at site perimeters or adjacent to neighboring residential or commercial property, the TtNUS Field Operations Leader and/or the Site Safety Officer will notify the appropriate client or base contacts.

- g. Liquid Release Monitoring – All field team members will be responsible for observing and reporting any liquid chemical releases or conditions that could lead to a release. If field operations on site result in a release of liquid chemicals in the absence of vapors, field personnel will attempt to contain the liquid by means of berms constructed with available equipment. If the work team cannot control the spill, they will leave the area for the assembly point quickly, without panic. The TtNUS Field Operations Leader and/or the Site Safety Officer will notify the appropriate client/base contact. This is not considered to be a significant probability during operations. However, in the unlikely instance that it should occur, field personnel may effect these types of defensive efforts, providing that such a response does not appear to present a chemical overexposure or other personal health or safety threat.

12.0 TYPICAL CLIENT/FACILITY SAFETY POINTS OF CONTACT

The following positions are typically encountered on UXO/CWA projects. Communication and coordination with these positions should be implemented and maintained throughout all project activities (from pre-field operations planning through to project close-out).

- a. Installation Safety Management Office
- b. Installation Ordnance Officer and/or EOD Officer
- c. Installation Radiation Officer
- d. Installation Environmental Office

13.0 TOOLS AND EQUIPMENT

Tools and equipment necessary to safely and effectively accomplish the objectives of a project will be detailed in the project-specific Work Plans and Health and Safety Plans. Items commonly required for UXO/CWM operations are presented below:

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13.1 Personal Protective Equipment

- a. Respiratory Protective Equipment (i.e., air purifying or air supplied devices)
- b. Dermal (chemical resistant) protective equipment (e.g., coveralls, gloves, eye and face protection)
- c. Physical safety PPE (hard hats, hearing protection, safety glasses, safety shoes, etc.)

13.2 Air Monitoring Equipment

- a. Explosive/O₂ Meter (Combustible Gas Indicator)
- b. Direct reading Organic Vapor Analyzer (PID or FID)
- c. Direct reading particulate meter
- d. Radiation Survey Meters and TLD Badges

13.3 Geophysical/Hydrology Survey Instrumentation

- a. Magnetometers (Cesium Vapor, Schonstedt)
- b. Electromagnetic Terrain Conductivity Meter (EM-31)
- c. Time-Domain Electromagnetic All-Metals Detector (EM-61)
- d. Water Level Indicator/Recorder
- e. pH/Temperature/Conductivity Meter for water samples (Horiba, etc.)
- f. Survey Equipment (transit, tripod, level, etc.) as required

13.4 UXO Support Equipment

- a. Schonstedt Magnetic Locators (GA-52Cx or equivalent passive instrument) will be used for UXO surface survey during UXO activities. The GA-52Cx detects the magnetic field of any ferromagnetic object.
- b. Schonstedt MG-220 Magnetic Gradiometer (Down-Hole Magnetometer or equivalent will be used to conduct down hole UXO checks. The MG-220 detects the magnetic field of any ferromagnetic object as it is lowered into a borehole.
- c. Marking tape, pin flags, stakes, utility spray paints, etc.

13.5 CWM Support Equipment

- a. Chemical Agent Identification Kits (M18A2 Kit)
- b. ICAMs (Individual Chemical Agent Monitor)

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13.6 Decontamination Equipment

As required by the level of protection for each site. See Site Health and Safety Plan for specifics.

13.7 Hand Tools/ Miscellaneous Equipment

As may be required.

14.0 ENVIRONMENTAL CONCERNS

The field operations covered by this SOP will be performed in such a manner as to minimize the effects of pollution of air, water, or land and to control noise and dust emissions within reasonable limits.

Every effort will be made to:

- a. Protect the land areas and to preserve them in their existing condition.
- b. Protect water resources, including measures for run-off or run-off controls if applicable.
- c. Implement sediment control measures, where warranted. These measures will also be implemented to control erosion.

Usually, field operations will generate solid and liquid waste (Investigative Derived Waste – IDW) requiring onsite handling and possible offsite disposal. The major types of waste to be generated, their environmental concerns, and their handling and disposition are summarized below:

- a. Personal and equipment decontamination containers disposed offsite following a thorough decontamination. Liquid waste will be included with well purging and development fluids.
- b. Personal Protective Equipment (PPE) will be double-bagged and will be the responsibility of TtNUS to dispose of according to applicable regulations. Disposal will normally be offsite.

It is not anticipated that any chemical releases will occur during the field activities.

The MSDSs for chemicals being brought onto the installation for use in field operations will be listed on a site-specific Chemical Inventory and maintained at the TtNUS Field Command Post. Copies of these documents are to be made available to client and offsite representatives who may be called upon to respond to an emergency event.

15.0 UXO/CWM PROCEDURES FOR FIELD OPERATIONS

15.1 General – field procedures for work on any installation can include any or all of the following tasks:

- a. Initial entry into suspect areas
- b. CWM operations
- c. Surface and subsurface sampling
- d. Monitoring well installation
- e. Exploratory trenching

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- f. Geophysical surveys
- g. Other miscellaneous operations

15.2 Initial Entry – initial entry into suspect areas require an UXO-qualified technician with a magnetometer (GA-52Cx) to screen a path into the area. The screened area is marked with lanes using either pin flags with plastic pins or marking tape. Suspect items on the surface and subsurface magnetic anomalies will be marked, usually with a different color tape or flag, and will be avoided by team members. The site where the work is to be conducted will be thoroughly screened for UXO/CWM contamination prior to any work commencing. All personnel will stay within the cleared areas and not venture out into areas not screened. If an area that has magnetic anomalies cannot be avoided, the UXO-qualified technician will hand excavate down to the anomaly to check to see if a hazard exists. Before excavation begins, the immediate area will be cleared of non-essential personnel outside of what could be a fragmentation zone (as determined by the UXO Technician). If the excavation reveals a hazard, the emergency notification procedures in paragraph 11.0 will apply.

15.3 CWM Operations - prior to conducting CWM operations, an Emergency Response Plan as required by 29CFR1910.120 and DA Pam 50-6 will be developed and implemented. Most of the information required to develop this plan should be obtained from the installation safety office; however, as a minimum, the following elements will be addressed:

- a. Pre-emergency planning and procedures for reporting incidents to appropriate government agencies for potential chemical exposure, person injuries, fire/explosions, environmental spills and releases, and discovery of radioactive materials.
- b. Personnel roles, lines of authority, communications.
- c. Posted instructions and list of emergency contacts: physicians, nearby notified medical facility, fire and police departments, ambulance service, state/local/federal environmental agencies, Certified Industrial Hygienist (CIH), and installation commander.
- d. Emergency recognition and prevention.
- e. Site topography, layout and prevailing weather conditions.
- f. Criteria and procedures for site evacuation (emergency alerting procedures/employee alarm system, emergency PPE and equipment, safe distance, place of refuge (assembly area), evacuation routes, site security and control).
- g. Specific procedures for decontamination and medical treatment of injured personnel.
- h. Route maps to nearest pre-notified medical facility.
- i. Criteria for initiating community alert program, contacts and responsibilities.
- j. Critique of emergency responses and follow-up.
- k. Material Safety Data Sheets (MSDS) for each hazardous substance anticipated to be encountered on site would be made accessible to site personnel at all times.

15.4 Sampling – sampling will be conducted in accordance with established protocols and methodologies. Site-specific sampling requirements will be presented in the project-specific Work Plans and/or in other project-specific documents such as Field Sampling and Analysis Plans and Quality Assurance Plans.

Prior to initiating any sampling activities, an UXO-qualified technician will screen sites potentially contaminated with UXO/CWM. A magnetometer will be used to screen entry into a suspect area as in paragraph 15.2 above. Lanes will be marked and suspect items and subsurface anomalies will be identified and avoided. The immediate sampling area will be surface-screened prior to the introduction of the sampling team into the area.

Prior to any subsurface intrusive sampling, another check with a magnetometer needs to be accomplished. The GA-52Cx Magnetic Locator (magnetometer) can be used for collecting

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subsurface samples not greater than 0.5 feet. If excavation of a borehole or hand auguring hole is to exceed this depth, a MG-220 Magnetic Gradiometer (down hole magnetometer) shall be utilized with readings taken at two feet depth intervals.

If an anomaly is detected, the location will be marked and avoided. If appropriate and acceptable, an alternate sampling location (in a cleared area) will be designated. If the sampling location cannot be relocated then the UXO-qualified technician will hand excavate down to the anomaly to determine if it is hazardous. If it is not hazardous, the object will be set aside and the sampling event will continue. If the object has been determined to be hazardous or suspect, the sampling team will move out of the area and the emergency procedures listed in paragraph 11.0 will be implemented.

15.5 Monitoring Well Installation – the area within a 50-foot radius of the borehole and the off- road access path will be screened with the GA-52Cx magnetometer and be cleared of all metal objects. Once this is accomplished, the areas around borehole sites will be marked using colored marking tape and/or pin flags. Heavy equipment such as front-end loaders, backhoes, and bulldozers will not be used to develop or establish drill sites. The following action will be followed:

- a. The GA-52Cx magnetometer will be used directly over the borehole site to check for buried items down to 0.5 feet. After a surface check, the UXO-qualified technician will hand auger down to a depth of two feet and check down the hole using the MG-220 magnetometer.
- b. Once the hand-auguring hole has been cleared, the drill rig will be positioned over the proposed borehole. Drilling will commence to a depth of four feet, the drill auger will be removed from the borehole, the drill crew chief and UXO personnel will make observations of the soil from the core barrel and the soil removed from the hole by hand auger (if needed). The drilling log and lithologic log will be maintained in accordance with standard practices, noting any metal objects that may be found.
- c. The drilling derrick will be secured and drill rig moved to a position at least 20 feet from the borehole.
- d. The borehole will be checked again with the MG-220 magnetometer.
- e. If UXO or magnetic anomaly is present, the borehole will be abandoned and another location selected. The new borehole should be at least six feet from the original borehole. If a UXO or anomaly is not detected and the clearance is given, the drill rig shall be positioned back over the borehole, and drilling will proceed to the next depth (6 feet).
- f. Repeat above steps at intervals of 2 feet, until a depth of ten feet is reached. At the ten-foot interval, a magnetometer reading shall be taken with the MG-220 set on the maximum sensitivity. The instrument will detect larger objects (approaching 100 lbs.) that could be expected to penetrate to depths of 10 feet or more.
- g. After reaching the depth of ten feet, the above steps will be repeated at intervals of 4 feet, until the desired depth is reached.

15.6 Exploratory Trenching and Excavation – at times, exploratory trenching may be required to determine the lateral extent of a landfill, burial pit, or subsurface geophysical anomaly. Trenching and excavation to uncover a subsurface area will be conducted using a backhoe, an excavator, or sometimes a front-end loader. **Any trenching or excavation activities (regardless of depth) must be done in accordance with OSHA 29 Subpart P requirements, which must be considered and addressed in the project-specific Health and Safety Plan.**

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On project sites where excavation activities are within the scope of work and a UXO/CWM concern exists, the following additional procedures will be utilized to conduct these operations:

- a. The surface of the area to be trenched or excavated will first be swept with the GA-52Cx magnetometer. Anomalies will be hand excavated to determine if hazardous.
- b. No more than 0.5 feet of surface soil will then be gingerly removed (scraped) from the area of concern.
- c. The heavy equipment will be removed at least 20 feet away from the area, and the area will be checked with the MG-220 magnetometer. If the area is a trench, the entire length of the trench will be checked with the MG-220 and the excavation can continue two feet at a time. If the area is a wide-open area, it can once again be checked with the GA-52Cx, but only 0.5 feet of soil removal can be excavated at a time.
- d. Anomalies will continue to be uncovered by hand excavation until the desired results are obtained and the trench/area is abandoned and refilled.
- e. Excavation will continue another 2 feet if using the MG220 or 0.5 feet if using the GA-52Cx magnetometer. Once again after the proper depth of soil is excavated, the heavy equipment is removed from the area (>20 feet) and the area is rechecked with the magnetometer. If excavation depths reach 4 feet, suitable means of access/egress must be provided (e.g., ladders) and atmospheric monitoring must be performed prior to any entries.
- f. The above procedures are followed until the desired depth is reached and/or the desired results are obtained.

Once the area or trench has been cleared, excavation can continue to the proper depth before the equipment is again moved away (at least 20 feet) and the area/trench.

- 15.7 Geophysical Surveys – there are several instruments that can be used to conduct geophysical surveys. The GA-52Cx (Schonstedt) and the MG-220 are magnetometers and are passive instruments. The Geonics Terrain Conductivity Meter (EM-31) is an active instrument and is commonly used to measure subsurface terrain conductivity. This information can be used geophysical surveys, as well as for locating voids, discontinuities in soil structures such as boundaries of disposal pits and buried conducting objects. An Ordnance Safety Analysis of the Geonics Model EM-61 Non-Contacting Terrain Conductivity Meter was conducted by the Naval Surface Warfare Center at the request of TtNUS in April 1993. The analysis concluded, in summary, that the “Geonics EM-61 poses no ordnance safety hazard when operated in the normal survey mode, where the device is held at hip height.” However, the Geonics EM-61 should not be used with the boom on the ground if ordnance is present or suspected.

When using the magnetometer or the EM-61, a UXO-qualified technician will conduct a surface sweep of the area to be surveyed to ensure that no surface ordnance or other hazards exist. The magnetometer is a passive instrument; therefore, no special ordnance safety precautions are required.

Manufacture recommended procedures for the EM-61 must be followed to ensure safe operation during the geophysical survey. Standard survey protocols and quality assurance methods will also be required during survey operations.

- 15.8 Miscellaneous Operations – due to the potential of UXO/CWM materials being encountered during field activities, UXO support will be provided at all site locations. UXO support will be

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provided for any and all field activities that are in areas suspected to contain UXO and/or CWM. These areas also include those areas covered with water and creeks, canals, etc.

Operations that involve the inspection, hazard classification, segregation, and final disposal of UXO and UXO-related scrap will not be covered in this SOP. The demilitarization of UXO and UXO-related scrap is not authorized unless specific work plans, SOPs, health and safety plans and other established procedures are written and approved addressing these operations.

16.0 HAZARD CONTROL BRIEF

A Health and Safety Hazard Control Briefing (i.e., tailgate meetings) will be conducted daily prior to the start of onsite activities. The briefing will be detailed and will cover the information in the Safe Work Permits for the anticipated tasks for the day, as well as applicable portions of this SOP. Additional briefings will be conducted as necessary for tasks that become necessary during the course of a workday, if they were not covered in the morning briefing. These briefings are in addition to (not in place of) the site-specific health and safety training that is required for all onsite personnel prior to their participation in any onsite, intrusive activities.

The following information will be given during the daily briefings:

- a. Overview of task(s) to be performed and review of appropriate Safe Work Permits with task participants.
- b. Overview of the day's objectives, as well as general site hazards
 - Unexploded Ordnance Hazards
 - Chemical Warfare Agents and Materials
 - Physical Hazards
- c. Overview of Standard Work Practices pertinent to the day's planned activities
- d. Review of any worker incidents or near-miss events, including a review of corrective/preventive measures to prevent recurrence
- e. Overview of Emergency Response Actions, evacuation routes and assembly points

17.0 SECURITY

Field activities under various TtNUS contracts are typically unclassified and normal security measures apply in accordance with above references (paragraph 9.1 above). TtNUS personnel and their subcontractors will check in with the appropriate client/installation's security office and may be issued security badges for entry into certain work areas. This SOP will not cover special security requirements for projects involving UXO/CWM as most installations have established policies and procedures on reporting and securing recovered items that are UXO and/or CWM. The TtNUS Project Manager will incorporate all security procedures required by the installation into the site work plan.

ATTACHMENT III

MEDICAL DATA SHEET

MEDICAL DATA SHEET

This Medical Data Sheet must be completed by site personnel and kept in the command post during the conduct of site operations. This data sheet will accompany any personnel when medical assistance is needed or if transport to hospital facilities is required.

Project _____

Name _____ Home Telephone _____

Address _____

Age _____ Height _____ Weight _____

Person to notify in the event of an emergency: Name: _____

Phone: _____

Drug or other Allergies: _____

Particular Sensitivities : _____

Do You Wear Contacts? _____

What medications are you presently using? _____

Name, Address, and Phone Number of personal physician: _____

Note: Health Insurance Portability and Accountability Act (HIPAA) Requirements

HIPAA took effect April 14, 2003. Loosely interpreted, HIPAA regulates the disclosure of Protected Health Information (PHI) by the entity collecting that information. PHI is any information about health status (such as that you may report on this Medical Data Sheet), provision of health care, or other information. HIPAA also requires Tetra Tech to ensure the confidentiality of PHI. This Act can affect the ability of the Medical Data Sheet to contain and convey information you would want a Doctor to know if you were incapacitated. So before you complete the Medical Data Sheet understand that this form will not be maintained in a secure location. It will be maintained in a file box or binder accessible to other members of the field crew so that they can accompany an injured party to the hospital.

DO NOT include information that you do not wish others to know, only information that may be pertinent in an emergency situation or treatment.

Name (Print clearly)

Signature

Date

ATTACHMENT IV

INCIDENT REPORT FORM

Report Date		Report Prepared By		Incident Report Number	
INSTRUCTIONS:					
All incidents (including those involving subcontractors under direct supervision of Tetra Tech personnel) must be documented on the IR Form.					
Complete any additional parts to this form as indicated below for the type of incident selected.					
TYPE OF INCIDENT (Check all that apply)			Additional Form(s) Required for this type of incident		
Near Miss (No losses, but could have resulted in injury, illness, or damage)			<input type="checkbox"/>	Complete IR Form Only	
Injury or Illness			<input type="checkbox"/>	Complete Form IR-A; Injury or Illness	
Property or Equipment Damage, Fire, Spill or Release			<input type="checkbox"/>	Complete Form IR-B; Damage, Fire, Spill or Release	
Motor Vehicle			<input type="checkbox"/>	Complete Form IR-C; Motor Vehicle	
INFORMATION ABOUT THE INCIDENT					
Description of Incident					
<hr/> <hr/> <hr/>					
Date of Incident			Time of Incident		
			_____ AM <input type="checkbox"/> PM <input type="checkbox"/> OR Cannot be determined <input type="checkbox"/>		
Weather conditions at the time of the incident			Was there adequate lighting?		
			_____ Yes <input type="checkbox"/> No <input type="checkbox"/>		
Location of Incident					
_____ Was location of incident within the employer's work environment? Yes <input type="checkbox"/> No <input type="checkbox"/>					
Street Address			City, State, Zip Code and Country		
Project Name			Client:		
Tt Supervisor or Project Manager			Was supervisor on the scene?		
			Yes <input type="checkbox"/> No <input type="checkbox"/>		
WITNESS INFORMATION (attach additional sheets if necessary)					
Name			Company		
Street Address			City, State and Zip Code		
Telephone Number(s)					

CORRECTIVE ACTIONS

Corrective action(s) immediately taken by unit reporting the incident:

Corrective action(s) still to be taken (by whom and when):

ROOT CAUSE ANALYSIS LEVEL REQUIRED

Root Cause Analysis Level Required: Level - 1 Level - 2 None

Root Cause Analysis Level Definitions

Level - 1	<p>Definition: A Level 1 RCA is conducted by an individual(s) with experience or training in root cause analysis techniques and will conduct or direct documentation reviews, site investigation, witness and affected employee interviews, and identify corrective actions. Activating a Level 1 RCA and identifying RCA team members will be at the discretion of the Corporate Administration office.</p> <p>The following events may trigger a Level 1 RCA:</p> <ul style="list-style-type: none"> ▪ Work related fatality ▪ Hospitalization of one or more employee where injuries result in total or partial permanent disability ▪ Property damage in excess of \$75,000 ▪ When requested by senior management
Level - 2	<p>Definition: A Level 2 RCA is self performed within the operating unit by supervisory personnel with assistance of the operating unit HSR. Level 2 RCA will utilize the 5 Why RCA methodology and document the findings on the tools provided.</p> <p>The following events will require a Level 2 RCA:</p> <ul style="list-style-type: none"> ▪ OSHA recordable lost time incident ▪ Near miss incident that could have triggered a Level 1 RCA ▪ When requested by senior management

Complete the Root Cause Analysis Worksheet and Corrective Action form. Identify a corrective action(s) for each root cause identified within each area of inquiry.

NOTIFICATIONS

Title	Printed Name	Signature	Telephone Number	Date
Project Manager or Supervisor				
Site Safety Coordinator or Office H & S Representative				
Operating Unit H&S Representative				
Other: _____				

The signatures provided above indicate that appropriate personnel have been notified of the incident.

INSTRUCTIONS:

Complete all sections below for incidents involving injury or illness.
Do NOT leave any blanks.
Attach this form to the IR FORM completed for this incident.

Incident Report Number: (From the IR Form)

EMPLOYEE INFORMATION

Company Affiliation

Tetra Tech Employee?

TetraTech subcontractor employee (directly supervised by Tt personnel)?

Full Name

Company (if not Tt employee)

Street Address, City, State and Zip Code

Address Type

Home address (for Tt employees)

Business address (for subcontractors)

Telephone Numbers

Work: _____

Home: _____

Cell: _____

Occupation (regular job title)

Department

Was the individual performing regular job duties?

Yes No

Time individual began work

_____ AM PM OR Cannot be determined

Safety equipment

Provided? Yes No

Used? Yes No If no, explain why

- Type(s) provided:
- Hard hat
 - Protective clothing
 - Gloves
 - High visibility vest
 - Eye protection
 - Fall protection
 - Safety shoes
 - Machine guarding
 - Respirator
 - Other (list)

NOTIFICATIONS

Name of Tt employee to whom the injury or illness was first reported

Was H&S notified within one hour of injury or illness?

Yes No

Date of report

H&S Personnel Notified

Time of report

Time of Report

If subcontractor injury, did subcontractor's firm perform their own incident investigation?

Yes No If yes, request a copy of their completed investigation form/report and attach it to this report.

INJURY / ILLNESS DETAILS

What was the individual doing just before the incident occurred? Describe the activity as well as the tools, equipment, or material the individual was using. Be specific. Examples: "Climbing a ladder while carrying roofing materials"; "Spraying chlorine from a hand sprayer"; "Daily computer key-entry"

What Happened? Describe how the injury occurred. Examples: "When ladder slipped on wet floor and worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time"

Describe the object or substance that directly harmed the individual: Examples: "Concrete floor"; "Chlorine"; "Radial Arm Saw". If this question does not apply to the incident, write "Not Applicable".

MEDICAL CARE PROVIDED

Was first aid provided at the site: Yes No If yes, describe the type of first aid administered and by whom?

Was treatment provided away from the site: Yes No If yes, provide the information below.

Name of physician or health care professional	Facility Name
Street Address, City State and Zip Code	Type of Care?
	Was individual treated in emergency room? Yes <input type="checkbox"/> No <input type="checkbox"/>
	Was individual hospitalized overnight as an in-patient? Yes <input type="checkbox"/> No <input type="checkbox"/>
Telephone Number	Did the individual die? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, date: _____
	Will a worker's compensation claim be filed? Yes <input type="checkbox"/> No <input type="checkbox"/>

NOTE: Attach any police reports or related diagrams to this report.

SIGNATURES

I have reviewed this report and agree that all the supplied information is accurate

Affected individual (print)	Affected individual (signature)	Telephone Number	Date

This form contains information relating to employee health and must be used in a manner that protects the confidentiality of the employee to the extent possible while the information is being used for occupational safety and health purposes.

INSTRUCTIONS:

Complete all sections below for incidents involving property/equipment damage, fire, spill or release.
Do NOT leave any blanks.
Attach this form to the IR FORM completed for this incident.

Incident Report Number: (From the IR Form)

TYPE OF INCIDENT (Check all that apply)

Property Damage <input type="checkbox"/>	Equipment Damage <input type="checkbox"/>	Fire or Explosion <input type="checkbox"/>	Spill or Release <input type="checkbox"/>
--	---	--	---

INCIDENT DETAILS

Results of Incident: Fully describe damages, losses, etc.

Response Actions Taken:

Responding Agency(s) (i.e. police, fire department, etc.)

Agency(s) Contact Name(s)

DAMAGED ITEMS (List all damaged items, extent of damage and estimated repair cost)

Item:	Extent of damage:	Estimated repair cost

SPILLS / RELEASES (Provide information for spilled/released materials)

Substance	Estimated quantity and duration	Specify Reportable Quantity (RQ)
		_____ Exceeded? Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>

FIRES / EXPLOSIONS (Provide information related to fires/explosions)

Fire fighting equipment used? Yes No If yes, type of equipment: _____

NOTIFICATIONS

Required notifications	Name of person notified	By whom	Date / Time
Client: _____ Yes <input type="checkbox"/> No <input type="checkbox"/>			
Agency: _____ Yes <input type="checkbox"/> No <input type="checkbox"/>			
Other: _____ Yes <input type="checkbox"/> No <input type="checkbox"/>			

Who is responsible for reporting incident to outside agency(s)? To Client Other Name: _____

Was an additional written report on this incident generated? Yes No If yes, place in project file.

INSTRUCTIONS:

Complete all sections below for incidents involving motor vehicle accidents. Do NOT leave any blanks.
Attach this form to the IR FORM completed for this incident.

Incident Report Number: (From the IR Form)							
INCIDENT DETAILS							
Name of road, street, highway or location where accident occurred				Name of intersecting road, street or highway if applicable			
County			City			State	
Did police respond to the accident?				Did ambulance respond to the accident?			
Yes <input type="checkbox"/> No <input type="checkbox"/>				Yes <input type="checkbox"/> No <input type="checkbox"/>			
Name and location of responding police department				Ambulance company name and location			
Officer's name/badge #							
Did police complete an incident report? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, police report number: _____ Request a copy of completed investigation report and attach to this form.							
VEHICLE INFORMATION							
How many vehicles were involved in the accident? _____ (Attach additional sheets as applicable for accidents involving more than 2 vehicles.)							
Vehicle Number 1 – Tetra Tech Vehicle				Vehicle Number 2 – Other Vehicle			
Vehicle Owner / Contact Information				Vehicle Owner / Contact Information			
Color				Color			
Make				Make			
Model				Model			
Year				Year			
License Plate #				License Plate #			
Identification #				Identification #			
Describe damage to vehicle number 1				Describe damage to vehicle number 2			
Insurance Company Name and Address				Insurance Company Name and Address			
Agent Name				Agent Name			
Agent Phone No.				Agent Phone No.			
Policy Number				Policy Number			

DRIVER INFORMATION

Vehicle Number 1 – Tetra Tech Vehicle		Vehicle Number 2 – Other Vehicle	
Driver's Name		Driver's Name	
Driver's Address		Driver's Address	
Phone Number		Phone Number	
Date of Birth		Date of Birth	
Driver's License #		Driver's License #	
Licensing State		Licensing State	
Gender	Male <input type="checkbox"/> Female <input type="checkbox"/>	Gender	Male <input type="checkbox"/> Female <input type="checkbox"/>
Was traffic citation issued to Tetra Tech driver? Yes <input type="checkbox"/> No <input type="checkbox"/>		Was traffic citation issued to driver of other vehicle? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Citation #		Citation #	
Citation Description		Citation Description	

PASSENGERS IN VEHICLES (NON-INJURED)

List all non-injured passengers (excluding driver) in each vehicle.
 Driver information is captured in the preceding section.
 Information related to persons injured in the accident (non-Tt employees) is captured in the section below on this form.
 Injured Tt employee information is captured on FORM IR-A

Vehicle Number 1 – Tetra Tech Vehicle		Vehicle Number 2 – Other Vehicle	
How many passengers (excluding driver) in the vehicle? ____		How many passengers (excluding driver) in the vehicle? ____	
Non-Injured Passenger Name and Address		Non-Injured Passenger Name and Address	
Non-Injured Passenger Name and Address		Non-Injured Passenger Name and Address	
Non-Injured Passenger Name and Address		Non-Injured Passenger Name and Address	

INJURIES TO NON-TETRATECH EMPLOYEES

Name of injured person 1				Address of injured person 1		
Age	Gender	Car No.	Location in Car	Seat Belt Used?	Ejected from car?	Injury or Fatality?
	Male <input type="checkbox"/> Female <input type="checkbox"/>			Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Injured <input type="checkbox"/> Died <input type="checkbox"/>
Name of injured person 2				Address of injured person 2		
Age	Gender	Car No.	Location in Car	Seat Belt Used?	Ejected from car?	Injury or Fatality?
	Male <input type="checkbox"/> Female <input type="checkbox"/>			Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Injured <input type="checkbox"/> Died <input type="checkbox"/>

OTHER PROPERTY DAMAGE

Describe damage to property other than motor vehicles	
Property Owner's Name	Property Owner's Address

COMPLETE AND SUBMIT DIAGRAM DEPICTING WHAT HAPPENED

A large, empty rectangular box with a thin black border, intended for drawing a diagram. The box occupies most of the page below the header.

ATTACHMENT V

**TABLE 4-1 OF THE DEPARTMENT OF DEFENSE EXPLOSIVES SAFETY
BOARD TECHNICAL PAPER #18**

Table 4-1. Minimum Qualification Standards

Position Description	Training Required (Notes 1, 2, & 3)	Minimum Years of EOD/UXO Experience (Note 4)	Special Requirements (Note 5)
Senior UXO Supervisor	1, 2, or 3	10 years	Significant experience in all aspects of munitions response actions or range clearance activities, as appropriate for the contracted operation. Five years experience in supervisory positions.
UXO Safety Officer	1, 2, or 3	8 years	Experience in all phases of munitions response actions or range clearance activities, as appropriate for the contracted operation, and applicable safety standards.
UXO Quality Control Specialist	1, 2,3	8 years	Experience in all phases of munitions response actions or range clearance activities, as appropriate for the contracted operation, and the transportation, handling and storage of munitions and commercial explosives.
UXO Technician III	1, 2 or 3	8 years	Prior military EOD and/or commercial UXO experience in munitions response actions or range clearance activities, as appropriate for the contracted operation.
UXO Technician II	1 or 2 -----or----- 3	N/A -----or----- 3 years	Prior military EOD experience -----or----- Experience in response munitions response actions or range clearance activities, as appropriate for the contracted operation, plus specific project/explosives safety training.
UXO Technician I	3	0	Successfully completed formal course of instruction appropriate to this skill level
UXO-Sweep Personnel	Equipment and site specific training	N/A	Safety Equipment and site specific training. (Experience at this position is not required for UXO Technician I certification.)

ATTACHMENT VI

OSHA POSTER

Job Safety and Health

It's the law!

OSHA

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

EMPLOYEES:

- You have the right to notify your employer or OSHA about workplace hazards. You may ask OSHA to keep your name confidential.
- You have the right to request an OSHA inspection if you believe that there are unsafe and unhealthful conditions in your workplace. You or your representative may participate in that inspection.
- You can file a complaint with OSHA within 30 days of retaliation or discrimination by your employer for making safety and health complaints or for exercising your rights under the *OSH Act*.
- You have the right to see OSHA citations issued to your employer. Your employer must post the citations at or near the place of the alleged violations.
- Your employer must correct workplace hazards by the date indicated on the citation and must certify that these hazards have been reduced or eliminated.
- You have the right to copies of your medical records and records of your exposures to toxic and harmful substances or conditions.
- Your employer must post this notice in your workplace.
- You must comply with all occupational safety and health standards issued under the *OSH Act* that apply to your own actions and conduct on the job.

EMPLOYERS:

- You must furnish your employees a place of employment free from recognized hazards.
- You must comply with the occupational safety and health standards issued under the *OSH Act*.

This free poster available from OSHA –
The Best Resource for Safety and Health



Free assistance in identifying and correcting hazards or complying with standards is available to employers, without citation or penalty, through OSHA-supported consultation programs in each state.

1-800-321-OSHA
www.osha.gov

OSHA 3165-12-06R