Comprehensive Long-term Environmental Action Navy

CONTRACT NUMBER N62467-04-D-0055

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NSWC CRANE
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Health and Safety Plan

for

Unexploded Ordnance (UXO) Sites 5 and 7

Naval Surface Warfare Center (NSWC) Crane
Crane, Indiana

Contract Task Order 0034

September 2007

NAVFAC
Naval Facilities Engineering Command
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PITT-10-7-017

October 4, 2007

Project No. 112G00447

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Reference: CLEAN Contract No. N62467-04-D-0055
Contract Task Order (CTO) No. 0034

Subject: Final Health and Safety Plan for UXO 5 (Building 2044 Drop Tower/Test Rail Site) and UXO 7 (Ranges) Field Work

Dear Mr. Hickey:

Enclosed is the subject Health and Safety Plan.

Please contact Matt Soltis at (412) 921-8912 (e-mail Matt.Soltis@tetratech.com) or myself at (412) 921-8308 (e-mail Ralph.Basinski@tetratech.com) regarding any questions or comments.

Sincerely,

Ralph R. Basinski
Project Manager

RRB/mlg
Enclosure

cc: Mr. Tom Brent, NSWC Crane (letter and enclosure)
Ms. Lee Anne Rapp, NAVFAC Atlantic (PDF copy of letter via e-mail)
Ms. Bonnie Capito, NAVFAC Atlantic (PDF copy of letter via e-mail)
Mr. John Trepanowski, Tetra Tech (letter and enclosure)
Mr. Garth Glenn, Tetra Tech (letter only)
Project File – CTO 0034 (Midwest)

HEALTH AND SAFETY PLAN

FOR

UNEXPLODED ORDNANCE (UXO) SITES 5 AND 7

NAVAL SURFACE WARFARE CENTER (NSWC) CRANE
CRANE, INDIANA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Southeast
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29406

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CONTRACT NUMBER N62467-04-D-0055
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SEPTEMBER 2007

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1.0 INTRODUCTION

The objective of this Health and Safety Plan (HASP) is to provide the safety and health requirements, restrictions, practices and procedures for Tetra Tech NUS, Inc. (TtNUS) personnel participating in onsite activities associated with investigating surface and near-surface soils at UXO Site 5 (Building 2044, or B-2044) Drop Tower/Test Rail Site) and USXO Site 7 (a sub-site of Solid Waste Management Unit 7, or SWMU & - Old Rifle Range).

In addition to this HASP, a copy of the Tetra Tech NUS, Inc. (TtNUS) Health and Safety Guidance Manual (HSGM) must be maintained on site during the performance of the specified activities listed in Section 4.0 of this HASP. This guidance manual contains many specific safety and health program elements, various TtNUS standard operating procedures (SOPs), as well as safe work practices. Both documents must be present at the site to comply with the requirements stipulated in the Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120.

This HASP has been developed using the latest available information regarding known or suspected chemical contaminants and potential physical hazards associated with the proposed work and site activities. This HASP will be modified if:

- New information becomes available
- Changes in the scope of work

The necessity to change the HASP will be determined by the TtNUS Health and Safety Manager (HSM). It is the responsibility of the Project Manager (PM) to notify affected personnel of changes to this HASP.

1.1 AUTHORITY

This work is authorized under the Comprehensive Long - Term Environmental Action Navy (CLEAN) contract, administered through the U.S. Navy Southeast Naval Facilities Engineering Command, as defined under Contract No. N62467-04-D-0055; Contract Task Order (CTO) Number 0034.

1.2 KEY PROJECT PERSONNEL AND ORGANIZATION

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

- The TtNUS Project Manager is responsible for the overall direction of health and safety for this project.

- The Project Health and Safety Officer (PHSO) is responsible for developing the HASP in accordance with applicable OSHA regulations. Specific responsibilities include:

  i. Providing information regarding site contaminants and physical hazards associated with the site.
  ii. Establishing air monitoring and decontamination procedures.
  iii. Assigning personal protective equipment (PPE).
  iv. Determining emergency response procedures.
  v. Stipulating training and appropriate training and medical surveillance requirements for TtNUS and other personnel.
  vi. Identifying relevant standard work practices to minimize potential injuries and exposures associated with the project scope of work.

- The TtNUS Field Operations Leader (FOL) is responsible for implementation of the HASP with the assistance of an appointed Site Safety Officer (SSO). The FOL manages field activities, executes the work plan, and enforces safety procedures as applicable to the work plan.

- The SSO supports site activities by advising the FOL on the aspects of health and safety on-site. These duties may include:

  i. Coordinating health and safety activities with the FOL.
  ii. Selecting, applying, inspecting, and maintenance of personal protective equipment.
  iii. Establishing work zones and control points in areas of operation.
  iv. Implementing air monitoring program for on-site activities.
  v. Verifying training and medical clearance of on-site personnel status in relation to site activities.
  vi. Implementing Hazard Communication and other associated health and safety programs, as they may apply to site activities.
  vii. Coordinating emergency services.
  viii. Providing site-specific training for on-site personnel.
  ix. Investigating accidents and injuries (see Attachment I - Tetra Tech Inc. Incident Report Form).
  x. Providing input to the PHSO regarding the need to modify this HASP, or applicable health and safety associated documents.

- Compliance with the requirements stipulated in this HASP is monitored by the SSO and coordinated through the CLEAN Health and Safety Manager.

- A UXO Technician Level III will be a key member of the field team for all activities performed at UXO Site 5. The principle duties of this team member will be to implement the aspects of the UXO SOP (Attachment IV) to assure effective UXO clearance and avoidance practices to protect personnel from encountering items of ordnance, MEC at Site 5 (Note: as UXO Site 7 involved only a small arms range, no UXO concerns are anticipated, and therefore no UXO site clearance or avoidance measures will be necessary).

  The UXO Technician will also be responsible to assure that UXO Escort/Avoidance activities are observed/provided areas of intrusive operation and that these intended work areas are free of anomalies and Munitions and Explosives of Concern (MEC). The UXO Technician will conduct UXO Escort for all non-UXO personnel as needed to prevent accidental exposure to potential hazardous ordnance items. Other responsibilities of the UXO Technician include:

  - Be present during field activities at UXO 5;
  - Ensure that MEC Safety Awareness information is incorporated as appropriate into daily tailgate briefings;
  - Ensure visitor MEC safety awareness briefing is conducted and documented prior to allowing visitors on site;
  - Stop work if unacceptable health and safety conditions exist or unsafe acts are observed;

Note: In some cases one person may be designated responsibilities for more than one position. For example, at NSWC Crane, the FOL may also be responsible for the SSO duties. This will be performed only as credentials, experience, and availability permits.

1.3 SITE INFORMATION AND PERSONNEL ASSIGNMENTS

Site Name: NSWC Crane
Address: Crane, Indiana

Client Contact: Mr. Thomas Brent
Phone Number: (812) 854-6160
Alternate Contact: Ms. Chris Freeman
Phone Number: (812) 854-4423

Purpose of Site Visit: Hand augering at UXO Sites 5 and 7 to characterize surface and near-surface conditions for metals and/or explosives contamination

Proposed Dates of Work: October 2007

Project Team:

TtNUS Personnel:	Discipline/Tasks Assigned:	Contact Information:
Ralph Basinski	PM	(412) 921-8308
Matthew M. Soltis, CIH, CSP	HSM	(412) 921-8912
Tom Dickson, CSP	PHSO	(412) 921-8457
Jim Goerdt	FOL/SSO	(412) 921-8425
Frank Montes	UXO Technician Level III	(770) 413-0965

Non-TtNUS Personnel:	Discipline/Tasks Assigned:	Contact Information:
None anticipated	Not Applicable	Not Applicable

Hazard Assessments and selected control measures for the preparation of this HASP were conducted by:

M. Soltis, CIH, CSP

2.0 EMERGENCY ACTION PLAN

2.1 INTRODUCTION

This section has been developed as part of a pre-planning effort to guide and direct field personnel in the event of an incident/emergency. In the event of on-site incident, TtNUS will expend available onsite emergency resources in an initial response measure to control initial stage incidents including

- Incipient stage fire fighting support and prevention
- Removal of personnel from emergency situations
- Provision of initial medical support for injuries or illnesses requiring only first-aid level support
- Provision of site control and security measures as necessary

Once initial response measures have been expended site personnel will be evacuated to a safe place of refuge and the appropriate emergency response agencies will be notified and emergency services will be notified.

Life threatening injuries, imminent hazards (struck by equipment; excavation collapse trapping a member of the field crew) are considered emergencies and will require an immediate notification of Emergency Services listed within this HASP.

This emergency action plan conforms to the requirements of OSHA 29 CFR 1910.38(a), as allowed in OSHA 29 CFR 1910.120(l)(1)(ii).

2.2 EMERGENCY PLANNING/RECOGNITION/PREVENTION

Through the initial hazard/risk assessment effort the following are considered conditions or situations or scenarios associated with this cope that are or could result in an emergency:

- Struck by equipment (See Section 5.2)
- Excavation collapse (See Section 5.3)
- Natural hazards –
  - Inclement weather (tornados, electrical storms).
  - Venomous snake bite or other life threatening health occurrence (heart attack, stroke, etc.)

To minimize and eliminate these potential emergency situations, emergency planning activities associated with this project include the following. The FOL/SSO will:

- Coordinate with NSWC Crane Emergency Services personnel to ensure that TtNUS emergency action activities are compatible with existing facility emergency response procedures. As part of this effort the SSO will evaluate the distance, and the primary and secondary routes, from the intended work locations to the emergency service facilities. It has been determined that the time necessary for emergency services to be on-scene to help an injured/ill employee will take longer than 4 minutes. Therefore, it will be necessary for at least one person on the field team to possess current First-Aid/CPR/Bloodborne pathogen training.

- The Base Contact will provide to the TtNUS crew the location of on-Base emergency shelters in the event of a significant storm event during operation hours or an event that has occurred on Base.

- Establishing and maintaining information at the project staging area (support zone) for easy access in the event of an emergency. This information will include the following:

  - Chemical Inventory (used on-site), with Material Safety Data Sheets (MSDSs).
  - On-site personnel medical records (medical data sheets).
  - A logbook identifying personnel on site each day.
  - Emergency notification phone numbers in site vehicles or an area that is immediately accessible to all personnel.

- Identifying a chain of command for emergency action. For this field effort, the FOL/SSO shall serve as Incident Coordinator in the event of an incident. Incident Command responsibilities will be then passed to the responding emergency services agency.

- Informing site workers of the hazards and control measures associated with planned activities at the site, and providing early recognition and prevention, where possible. This will be accomplished through

  - Site-specific training of this HASP
  - Pre-task briefing
  - Through the use of task-specific Safe Work Permits
  - Through an initial and ongoing assessment of the work area during sample collection.

- Identify, remove (where possible), and/or barricade/demarcate physical hazards within the estimated work area. Ensure that approach paths and access and control points into the work area have been established to ensure the safety of on-site personnel and resources.

- Provide the necessary equipment to control potential emergencies [i.e., safety cans for flammable liquid storage, spill containment equipment, PPE, and emergency equipment such as portable fire extinguishers and first-aid kits]. Ensure emergency equipment and resources are at the ready, should they be needed for emergency response measures.

It is understood that the use of two-way communication devices (cellular phones and radios) must be approved by the NSWC Crane Safety Office if operating power is greater than 5 watts and such equipment will only be used with official permission.

However, TtNUS is authorized to utilize two-way radio assigned by the Environmental Department. This radio is to be used only in the event of an emergency.

2.4 SAFE DISTANCES AND PLACES OF REFUGE

The FOL/SSO shall identify a safe place of refuge (in the event of an emergency). This location will be selected and conveyed to the Field Crew as part of issuing daily safety briefing. Selection will be based on the following considerations:

- A location adjacent to the site from which providing telephone communications and/or shelter.

- A location from which the field crews can provide site security restricting access to the emergency area, however, a point from which the field crew may direct emergency response personnel (i.e., intersection or gate, etc.).

This location should be positioned a sufficient (safe) distance from the operation that will not be impacted by the emergency.

Tentative location: Building 106

2.5 DECONTAMINATION PROCEDURES / EMERGENCY MEDICAL TREATMENT

The primary site contaminants that may be encountered in the planned work include metals, polyaromatic hydrocarbons (PAHs), and trace constituents associated with munitions (referred to as Munitions Constituents or MCs). Contact with appreciable concentrations of these substances is not anticipated in the planned scope of work presented in this HASP.

Therefore, decontamination procedures will be to remove any PPE the injured person is wearing, stabilize, and ship/transport for medical treatment.

2.5.1 Emergency Medical Treatment

Personnel providing medical assistance are required to be trained in First-Aid/CPR and in the requirements of OSHA's Bloodborne Pathogen Standard (29 CFR 1910.1030). Given the remote locations of the sites First-Aid/CPR trained personnel will be incorporated into the field crew.

TtNUS personnel are only permitted to provide treatment to the level of their training. It should also be noted that first-aid shall be administered voluntarily with the exception of those persons trained and designated to provide this service.

Emergency medical treatment will be initiated under the following guarded restrictions:

- Call (812) 854-3300 or (812) 854-1333.
- Take the necessary precautions to prevent direct contact with the injured person's body fluids. This may be accomplished through the employment of the following measures:
  - Use sterile gloves when handling cuts, abrasions, bites, punctures, etc. or any part of the injured person. The use of safety glasses and surgeons masks maybe necessary if there is the potential for uncontrolled spread of body fluids. The PHSO will be immediately notified in event that personnel providing emergency first-aid come into contact with body fluids or other potentially infectious tissues. Measures described here are Universal precautions and Body Substance Isolation discussed in the Tetra Tech NUS, Inc. Bloodborne Pathogen Program. You can only use these devices if you have them ready and stocked in your First-Aid Kit.
  - Assess **A**irway (is it open), **B**reathing (are they breathing) and **C**irculation [No pulse – Begin CPR; Bleeding – type (arterial, venous, or capillary)]
    - To stabilize the injured person. Initiate control measures to open airway, provide rescue breathing, provide CPR or control bleeding through applying direct pressure to the injury.

If the emergency involves personnel exposures to chemicals, follow the steps provided in Figure 2-3, Potential Exposure Protocol.

In order to engage these protective measures, the FOL shall ensure that these items are part of their first-aid kit.

2.6 EMERGENCY ALERTING AND ACTION/RESPONSE PROCEDURES

Radio communication in addition to hand signals and voice commands will comprise the mechanisms to alert site personnel of an emergency.

If an incident occurs, site personnel will initiate the following procedures:

- Initiate incipient response measures.
- The FOL/SSO will determine if the field crew can control the incident. If not emergency notification procedures will be initiated.
- Evacuate non-essential personnel

In the event that site personnel cannot control the incident through offensive and/or defensive measures, the FOL and the SSO will enact the emergency notification procedure to secure additional outside assistance in the following manner:

Call (812) 854-3300 or (812) 854-1333 and report the emergency. Give the emergency operator the location of the emergency and a brief description of what has occurred

- Stay on the phone and follow the instructions given by the operator.
- The appropriate agency will be notified and dispatched.

If an accident occurs at NWSC Crane outside of the designated operating areas impacting field personnel, the following procedures are to be initiated:

- Initiate an evacuation
- Direct field personnel to proceed to the appropriate assembly points (as directed by NWSC Crane Emergency Services or by our NSWC POC) Designated Emergency Shelter.

2.7 EMERGENCY CONTACTS

Prior to performing work at the site, personnel will be thoroughly briefed on the emergency procedures to be followed in the event of an incident. A cellular phone or designated land-line phone shall be identified and made available during on-site operations for the purpose of emergency notification. If a cell phone is used it will be tested to insure an adequate signal can be obtained from SWMU 8. Table 2-1 provides a list of emergency contacts and their corresponding telephone numbers. This table must be posted on-site, where it is readily available to site personnel.

TABLE 2-1
EMERGENCY REFERENCE
NSWC CRANE, INDIANA

AGENCY	TELEPHONE
Base Emergency Number (Fire Department, Base Security, Ambulance)	(812) 854-3300 or (812) 854-1333
Base Environmental Office	(812) 854-3114
Bedford Ambulance	(812) 279-6545
Bloomington Hospital (Bloomington, IN)	(812) 336-9515
Hospital, Bedford Medical Center (Bedford, IN)	(812) 275-1200
Poison Control Center	1-800-222-1222
National Response Center	1-800-424-8802
Base Contact, Thomas Brent	(812) 854-6160
Contract Project Manager, Ralph Basinski	(412) 921-8308
TtNUS Crane Field Office Building 3245	(812) 854-0280
CLEAN Health and Safety Manager, Matthew M. Soltis, CIH, CSP	(412) 921-8912
Project Health and Safety Officer, Tom Dickson, CSP	(412) 921-8457

Note: Most phones require the number to be preceded by 991 (i.e., 991-812-854-0280) or by "99" (if 812 is left off) (i.e., 99-854-0280)

2.8 EMERGENCY ROUTE TO HOSPITAL

Directions to Bedford Regional Medical Center* See Figure 2-1 Hospital Route Map (Bedford Gate)

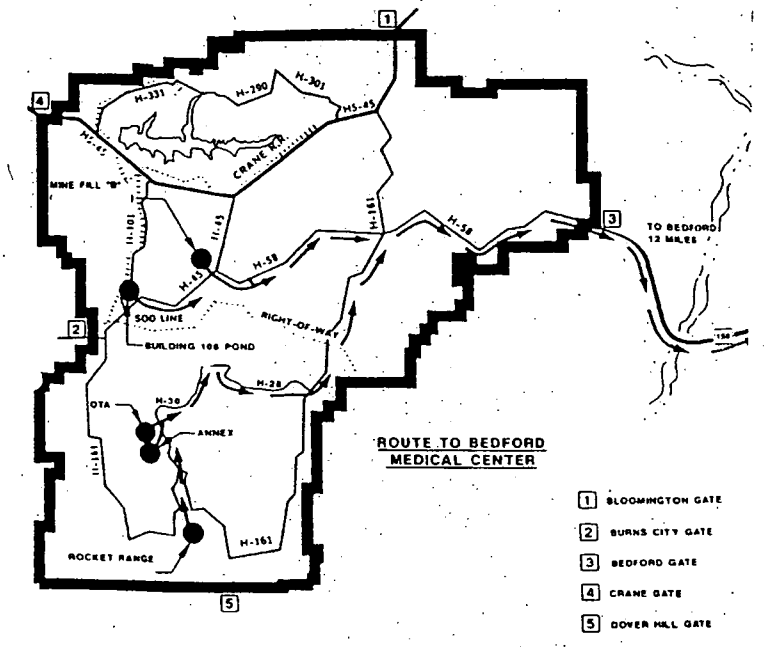
Exit the base on H-58, through the Bedford Gate. Head West on State Highway 158. State Highway 158 becomes 16th Street upon entering the City of Bedford. The medical center is on the right shortly after Plaza Drive (2900 16th Street).

Directions to the Bloomington Hospital** See Figure 2-2 Hospital Route Map (Bloomington Gate)

Exit NSWC Crane on H-45 through the Bloomington gate. Follow Highway 45 North to Bloomington at Highway 45 and Highway 37. Continue going straight over the overpass (Bloomfield Road). Follow Bloomfield Road North; this road turns into 2nd Street. Follow 2nd Street, hospital will be on the right (601 West 2nd Street).

Figure 2-1
Hospital Route Map (Bedford Gate)

***Note: The Bedford Gate is open only from 0600 - 0830 and 1500 - 1800 hours.**



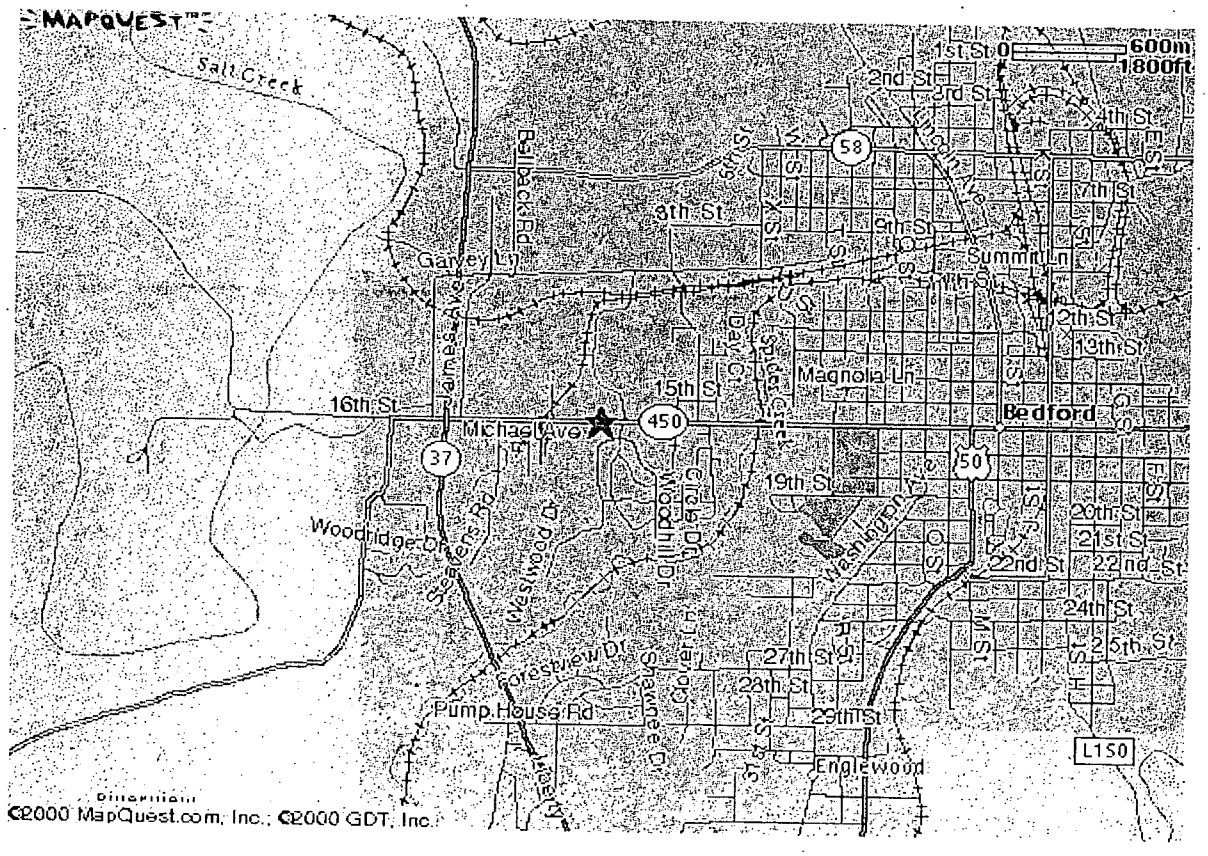
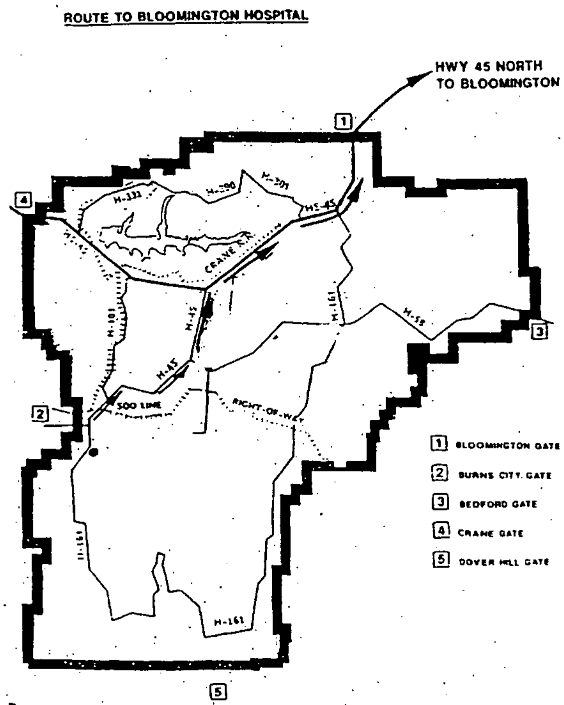
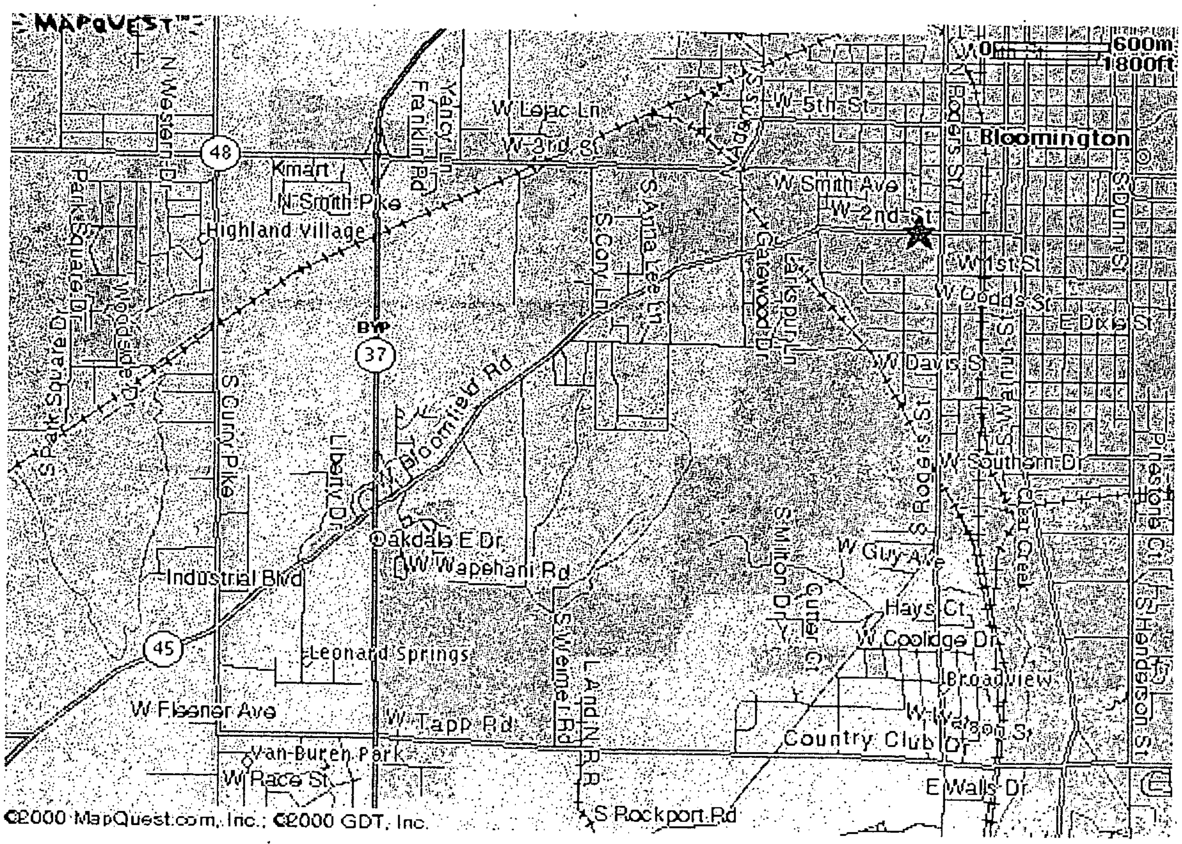


Figure 2-2
Hospital Route Map (Bloomington Gate)

****Note: The Bloomington Gate is open 24 hours.**





2.9 PPE AND EMERGENCY EQUIPMENT

First aid kit(s) and fire extinguishers are recognized as the primary emergency equipment that will be required and maintained based on the scope of work. These items will be readily accessible location. Based on the anticipated hazards, these emergency equipment items may be maintained near the work areas (i.e., the exclusion zones) of on-going operations.

- First-Aid Kit [OSHA/ANSI Approved (ANSI Z308.1) for industrial applications – (It will be on the label) Additional items to be stocked in the first aid kit includes
  - Emergency phone numbers and map to the hospital
  - General First Aid guidance
  - Medical Data Sheets (completed)
  - PPE including surgeons gloves (nitrile), safety glasses, surgeons or dust masks, Microshield CPR masks, etc. to provide barriers against bodily fluids. The SSO will determine the number of kits necessary based on the physical separation of tasks being conducted.
- Fire Extinguishers – Portable fire extinguisher(s) will be maintained on the job site. The requirements are as follows:
  - General Activities – 2A:B:C
  - Activities involved in the storage and dispensing of flammable liquids at least a 10B extinguisher for each 5-gallons. Call the PHSO for fire extinguisher selections for quantities of flammable liquids over 5-gallons. All Portable Fire Extinguishers will be inspected certifying that
    - The extinguisher is fully charged
    - The tamper devices have not been broken and/or removed.
    - There are no signs of obvious physical damage.
    - The placement is fully accessible at all times.
    - The FOL/SSO shall insure all persons who will potentially employ a Fire Extinguisher has been adequately trained in its operation. **P**ull the pin; **A**im at the base of the fire exercising care not to disperse the fire through over pressurization; **S**queeze the lever in short bursts; **S**weep side to side – **P.A.S.S**
    - Document all inspections within the logbook including date of inspection and the extinguisher number. Remember for long term jobs, this inspection must be completed monthly.

2.10 INJURY/ILLNESS REPORTING

If any TtNUS personnel are injured or develop an illness as a result of working on site, the Tetra Tech "Incident Report Form" (Attachment I) must be followed. Also, as soon as possible the Base Contact must be informed of any incident or accident that requires medical attention.

Any pertinent information regarding allergies to medications or other special conditions will be provided to medical service personnel. This information is listed on Medical Data Sheets (see Attachment II) which are to be completed for each worker and filed on-site. If an exposure to hazardous materials has occurred, provide information on the chemical, physical, and toxicological properties of the subject chemical(s) to medical service personnel, and follow the protocol specified in Figure 2-3.

FIGURE 2-3
POTENTIAL EXPOSURE PROTOCOL

The purpose of this protocol is to provide guidance for the medical management during injury situations.

In the event of a personnel injury or accident:

- Rescue, when necessary, employing proper equipment and methods.
- Give attention to emergency health problems -- breathing, cardiac function, bleeding, and shock.
- Transfer the victim to the medical facility designated in this HASP by suitable and appropriate conveyance (i.e., ambulance for serious events).
- Obtain as much exposure history as possible (a Potential Exposure report is attached).
- If the injured person is a TtNUS employee, call the medical facility and advise them that the patient(s) is/are being sent and that they can anticipate a call from the WorkCare physician. WorkCare will contact the medical facility and request specific testing which may be appropriate. WorkCare physicians will monitor the care of the victim. Site officers and personnel should not attempt to get this information, as this activity leads to confusion and misunderstanding.
- Call WorkCare at 1-800-455-6155 and enter Extension 109, or follow the voice prompt after hours and on weekends and be prepared to provide:
  - Any known information about the nature of the injury.
  - As much of the exposure history as was feasible to determine in the time allowed.
  - Name and phone number of the medical facility to which the victim(s) has/have been taken.
  - Name(s) of the involved TtNUS employee(s).
  - Name and phone number of an informed site officer who will be responsible for further investigations.
  - Fax appropriate information to WorkCare at (714) 456-2154.
- Contact Corporate Health and Safety Department (Matt Soltis) and Human Resources (Marilyn Duffy) at 1-800-245-2730. This number will only be accessible from 0800 through 1700 hours Monday through Friday.

As data is gathered and the scenario becomes more clearly defined, this information should be forwarded to WorkCare. WorkCare will compile the results of the data and provide a summary report of the incident. A copy of this report will be placed in each injured person's medical file in addition to being distributed to appropriately designated company officials. Each involved worker will receive a letter describing the incident but deleting any personal or individual comments. A personalized letter describing the individual findings/results will accompany this generalized summary. A copy of the personal letter will be filed in the continuing medical file maintained by WorkCare.

FIGURE 2-3 (continued)

WORKCARE

POTENTIAL EXPOSURE REPORT

Name: _____ Date of Exposure: _____

Social Security No.: _____ Age: _____ Sex: _____

Client Contact: _____ Phone No.: _____

Company Name: _____

I. Exposing Agent

Name of Product or Chemicals (if known): _____

_____

Characteristics (if the name is not known)

Solid Liquid Gas Fume Mist Vapor

II. Dose Determinants

What was individual doing? _____

How long did individual work in area before signs/symptoms developed? _____

Was protective gear being used? If yes, what was the PPE? _____

Was their skin contact? _____

Was the exposing agent inhaled? _____

Were other persons exposed? If yes, did they experience symptoms? _____

III. Signs and Symptoms (check off appropriate symptoms)

Immediately With Exposure:

Burning of eyes, nose, or throat
Tearing
Headache
Cough
Shortness of Breath
Chest Tightness / Pressure
Nausea / Vomiting
Dizziness
Weakness

Delayed Symptoms:

Weakness
Nausea / Vomiting
Shortness of Breath
Cough
Loss of Appetite
Abdominal Pain
Headache
Numbness / Tingling

IV. Present Status of Symptoms (check off appropriate symptoms)

Burning of eyes, nose, or throat
Tearing
Headache
Cough
Shortness of Breath
Chest Tightness / Pressure
Cyanosis
Nausea / Vomiting
Dizziness
Weakness
Loss of Appetite
Abdominal Pain
Numbness / Tingling

Have symptoms: (please check off appropriate response and give duration of symptoms)

Improved: _____ Worsened: _____ Remained Unchanged: _____

V. Treatment of Symptoms (check off appropriate response)

None: _____ Self-Medicated: _____ Physician Treated: _____

3.0 SITE BACKGROUND

This section provides a brief summary of the general history of NSWC Crane, and of the two specific areas of this facility where the work addressed in this HASP will be performed. Figure 3-1 presents a General Location Map depicting the site.

3.1 SITE HISTORY

NSWC Crane is located in Crane, Indiana approximately 75 miles southwest of Indianapolis and 71 miles northwest of Louisville, Kentucky. The facility encompasses more than 100 square miles (64,463 acres) in Daviess, Greene, Lawrence, and Martin Counties. It is located in a rural, sparsely populated area. The acreage surrounding the base is either wooded or farmed land. The facility, originally called Naval Ammunition Depot (NAD), Burns City, was opened in 1941 to serve as an inland ammunition production and storage center. The Depot's name was changed to NAD, Crane in 1943. In 1975, the name was changed to Naval Weapons Support Center Crane and in 1992 the name was again changed to Naval Surface Warfare Center Crane. Today NSWC Crane's mission is to "provide quality and responsive engineering, technical and material support to the Fleet for combat subsystems, equipment and components, microelectronic technology, microwave components, electronic warfare, acoustic sensors tests, engineering pyrotechnics, small arms, electronic module test and system command." Under the Single Service Management Program, a segment of the Center's mission is to provide support (including environmental protection) to the Crane Army Ammunition Activity (CAAA). The Army is tasked with the production and renovation of conventional ammunition and related items, the performance of manufacturing, engineering, and product quality assurance to support production; and the storage, shipment, demilitarization, and disposal of conventional ammunition and related components. Because of the nature of the Army's operations, CAAA contributes significant financial support for the environmental program through an Inter-service Support Agreement.

3.2 SPECIFIC SITES TO BE INVESTIGATED

3.2.1 UXO 5: Building 2044 (B-2044) Drop Tower/Test Rail Site

UXO 5 is located adjacent to Highway 304 and consists of two areas, the drop tower and the test rail. The test area is located east of B-2044, in an area that is maintained by periodic mowing. UXO5 is bordered to the north, south, and east by woods and to the west by Highway 45. The actual test site currently consists of a drop tower approximately 100 feet tall with an 8 ft. X 8 ft. concrete pad on the southwestern side of the base of the tower. Periodically, 20-mm cartridges were dropped form the top of the tower onto the concrete pad to verify that cartridges would not detonate if mishandled. Therefore, it is assumed that a relatively small proportion (i.e., fewer than 1 percent) of these cartridges would have actually deteonated

during these past tests. Approximately 75 feet southeast of the drop tower is a test rail approximately 97 feet in length form east and west. The test rail was used to test cartridge-actuated devices (CADs) and propellant actuated devices (PADs) in ejection seats. The site was used from January 1951 through December 1983, with average actual site usage reported to be approximately 9 days per month.

A Munitions Response Program (MRP) preliminary assessment (PA) has been conducted, and no evidence was observed indicating MEC on the ground surface at this site. During the testing periods, it was Navy policy to remove all retrievable MEC after testing. Subsurface MEC and surface/subsurface MEC have not been investigated prior to this current investigation covered by this HASP. However, based on the operations conducted at the site, no surface or subsurface ordnance is expected to be encountered. Munitions Constituents (MCs) that may be present would consist of trace explosives and metals near the drop tower, test rail, and possibly in the nearby grassy drainageway. Based on the known testing operations conducted at the site, MCs at this site (if any) would be most likely present in the surface soil.

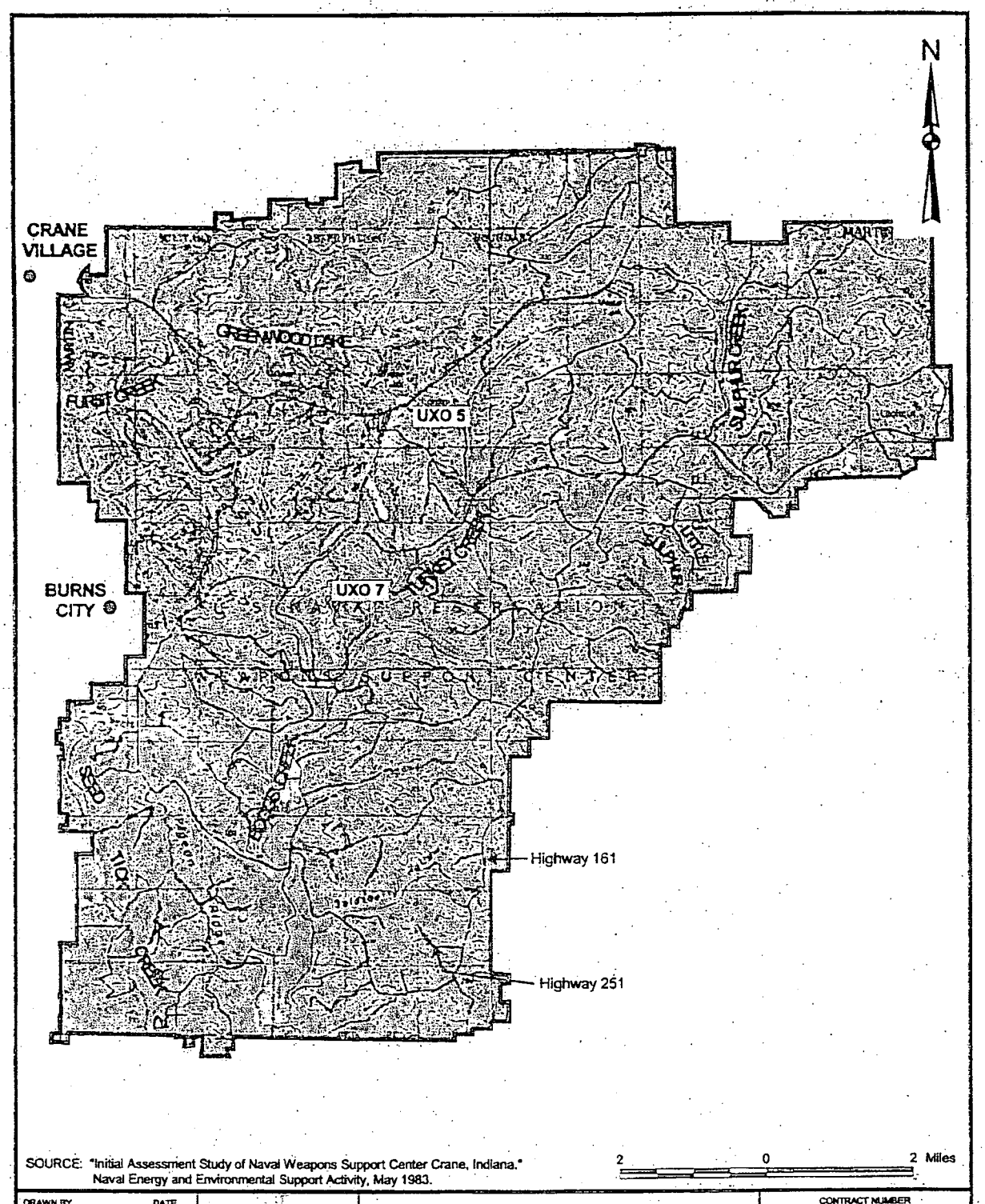
3.2.2 UXO 7: West Trap Range, East Trap Range, South Pistol Range

UXO 7 is located within the boundaries of the Old Rifle Range (ORR) which occupies approximately 20 acres and is part of a larger unit designated as Solid Waste Management Unit (SWMU) 7. UXO 7 is immediately west of NSWC Crane Highway 8 in the flat-lying floodplain of Turkey Creek. The site consists of a flat, grass-covered area bisected from north to south by an unnamed but maintained gravel road. This road provides access to various groundwater monitoring wells located within SWMU 7 and to a powder burning area that is a RCRA-permitted open burning (OB) facility. Currently, only the area of the ORR consisting of the OB facility is active. The other areas used for rifle and pistol target practice are inactive. During previous RCRA Facility Investigation (RFI) activities conducted at SWMU 7, three new ranges were identified, which collectively make up UXO 7. These include: (1) the West Trap Range; (2) the East Trap Range, and; (3) the South Pistol Range. Munitions handled at these three locations consisted of small arms.

During a preliminary visit, no MECs were observed at these three locations, and are not suspected of being present at these sites. However, MCs that might be present would consist of lead shot fired from the weapons. Contamination would be located primarily in the surface soils including the drainage areas to the east of the site because lead mobility in soil is low.

FIGURE 3-1

GENERAL SITE LOCATION MAP



SOURCE: "Initial Assessment Study of Naval Weapons Support Center Crane, Indiana." Naval Energy and Environmental Support Activity, May 1983.

DRAWN BY J. LAMEY DATE 8/27/01		UXO 5 AND UXO 7 LOCATIONS	CONTRACT NUMBER CTO 0034
CHECKED BY J. GOERDT DATE 1/12/07		UXO 5/7 QAPP ADDENDUM NO. 2	APPROVED BY — DATE —
COST/SCHEDULE-AREA		NSWC CRANE	APPROVED BY — DATE —
SCALE AS NOTED	NAVFAC	CRANE, INDIANA	DRAWING NO. FIGURE 1 - 2 REV 0

P:\GIS\CRANE_NSWC\MAPDOCS\APR\SURFICIAL_APR UXO LOCATION LAYOUT 1/12/07 SS

4.0 SCOPE OF WORK

The planned activities addressed in this HASP include the following:

- Mobilization/Demobilization
- Hand augering and surface shallow subsurface soil characterization
- UXO Screening (at UXO 5 only)
- Decontamination of hand tools and sampling equipment.
- Investigative derived waste (IDW) management

No other activities are anticipated to be necessary. If it becomes apparent that additional or modified tasks must be performed beyond those listed above, the work is not to proceed until the FOL or SSO notifies the Project Manager and the HSM, so that any appropriate modifications to this HASP can first be developed and communicated to the intended task participants.

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 Safe Work Permits (SWPs), which are to be reviewed in the field by the SSO with all 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 it 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

In addition to the task-specific work practices and restrictions identified in the SWPs attached to this HASP, the following general safe work practices are to be followed when conducting work on-site.

- Eating, drinking, chewing gum or tobacco, taking medication, or smoking in contaminated or potentially contaminated areas or where the possibility for the transfer of contamination exists is prohibited.

- Wash hands and face thoroughly upon leaving a contaminated or suspected contaminated area. If a source of potable water is not available at the work site that can be used for hands-washing, the use of waterless hands cleaning products will be used, followed by actual hands-washing as soon as practicable upon exiting the site.

- Avoid contact with potentially contaminated substances including puddles, pools, mud, or other such areas. Avoid, kneeling on the ground or leaning or sitting on equipment. Keep monitoring equipment away from potentially contaminated surfaces.

- Plan and mark entrance, exit, and emergency evacuation routes.

- Rehearse unfamiliar operations prior to implementation.

- Buddies should maintain visual contact with each other and with other on-site team members by remaining in close proximity to assist each other in case of emergency.

- Establish appropriate safety zones including support, contamination reduction, and exclusion zones.
- Minimize the number of personnel and equipment in contaminated areas (such as the exclusion zone). Non-essential vehicles and equipment should remain within the support zone.
- Establish appropriate decontamination procedures for leaving the site.
- Immediately report all injuries, illnesses, and unsafe conditions, practices, and equipment to the SSO.
- Observe co-workers for signs of toxic exposure and heat or cold stress.
- Inform co-workers of potential symptoms of illness, such as headaches, dizziness, nausea, or blurred vision.

5.2 NATURAL HAZARDS

Insect/animal bites and stings, poisonous plants, and inclement weather are natural hazards that may be present given the location of activities to be conducted. As previously discussed, some portions of the site include vegetated areas which increases the potential for field crews to encounter ticks, bees, mosquitoes/insects, and to a lesser extent snakes, and poisonous vegetation.

5.2.1 Insect Bites and Stings

Insect/animal bites and stings are difficult to control given the climate and environmental setting of NSWC Crane. However, in an effort to minimize this hazard the following control measures will be implemented where possible.

- Commercially available bug sprays and repellents will be used whenever possible. Insect repellants should contain at least 10% DEET for protection against biting insects. Stronger repellants (such as those containing Permethrin) may be designed to be applied only to clothing, and not directly onto the skin. ***Always follow the manufacturer's label instructions*** for the proper application processes and re-application frequencies for all products.
- Where possible, loose-fitting and light-colored clothing with long sleeves should be worn. This will aid in insect control by providing a barrier between the field person and the insects and to provide easy recognition of crawling insects against the lighter background. Pants legs should be taped to the work-boots (using duct tape) to prevent access by ticks.

- Clothing/limited body checks for ticks and other crawling insects should be conducted upon exiting heavily vegetated areas. Workers should perform a more detailed check of themselves when showering in the evening. Ticks prefer moist areas of the body (arm-pits, genitals, etc.) and will migrate to those locations.

- The FOL/SSO must determine if site personnel (through completion of Medical Data Sheets), suffer allergic reactions to bee and other insect stings and bites. Field crew members that are allergic to bites should have their emergency kit containing antihistamine and a preloaded syringe of epinephrine readily available.

Any allergies (insect bites, bee stings, etc.) must be reported on the Medical Data Sheet and to the SSO.

Ticks and mosquitoes are a problem at NSWC Crane however one of the more predominant pests are Chiggers. These larval mites feed on skin cells not blood of animals and humans. They are difficult to see but resemble a bright red speck on the skin. After crawling onto their host from tall weeds and bushes they inject digestive enzymes into the skin that break down skin cells. They do not actually "bite," but instead form a hole from which they suck the decomposing skin. These digestive enzymes cause severe irritation and swelling. The severe itching is accompanied by red water filled blisters.

Chiggers can't be easily seen and the itching usually begins once the chigger has fallen off. Chiggers are not vectors spreading infectious disease from host to host.

Tick and Mosquito Transmitted Illnesses and Diseases

Ticks and mosquitoes have been identified in the transmission of diseases including Lyme's disease and malaria. Warm months (Spring through early Fall) are the most predominant time for this hazard. Information concerning Lyme's Disease including recognition, evaluation, tick removal, and control is provided in Section 4.0 of the Health and Safety Guidance Manual.

Malaria may occur when a mosquito or other infected insect sucks blood from an infected person, and the insect becomes the carrier to infect other hosts. The parasite reproduces within the mosquito, and is then passed on to another person through the biting action. Acute symptoms include chills accompanied by fever and general flu like symptoms. This generally terminates in a sweating stage. These symptoms may recur every 48 to 72 hours.

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. There is no specific therapy or vaccine against West Nile encephalitis.

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 percent DEET (N,N-diethyl-meta-toluamide). Avoid products containing more than 30 percent DEET.
- Spray clothing with repellents containing permethrin or DEET, mosquitoes may bite through thin clothing.

See Section 4.0 of the HSGM for additional information.

5.2.2 Snakes

Indigenous animals including snakes (poisonous and non-poisonous varieties), raccoons, and other animals native to the region may be present at the site. These animals may be encountered if work locations encroach on nesting or territories claimed by these animals.

To avoid the obvious hazards conveyed as part of a direct encounter, the following actions will be taken to minimize impact on the field crews and/or operations. The FOL/SSO will preview access routes and work locations for nesting areas or signs of animal activities (tracks, foraging areas, etc.). Identified suspect areas will be communicated to the field crews.

Venomous Snakes of Indiana

There are only four reported venomous snake in Indiana. These include:

- Northern Copperhead
- Timber Rattle Snake
- Massasauga Rattle Snake
- Water Mocassin or cotton mouth in the very southern areas of the state.

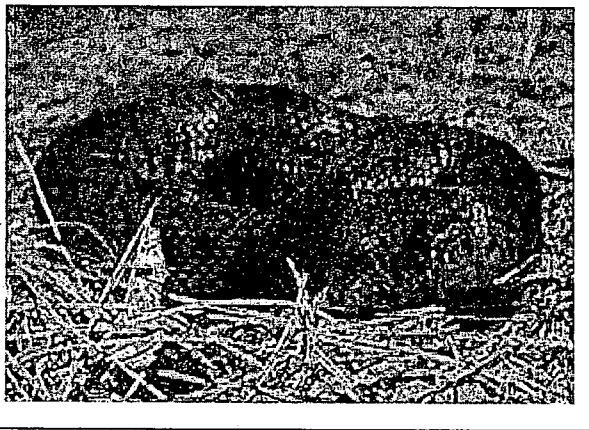
These poisonous snakes are very heavy-bodied – they look "fat." They also have broad, spade-shaped heads that are distinctly wider than their narrow necks. Eyes are mounted on the sides so if you were to look down on them from above the eyes would not be readily visible (don't get that close). The heads of non-venomous snakes are typically about the same width as their bodies. Such distinctions are not completely reliable, as some species such as water snakes can be rather stout, and many species of snakes will flatten their heads when bluffing, giving the head a spade-like shape as well. The pupils of the venomous snakes of Indiana are vertical slits rather than round. This distinction may not hold elsewhere, but works in this state.

Do not attempt to handle or kill a snake that you believe may be venomous. Simply keep at a safe distance and move on your way. Snakes do not actively seek out people and bite them. Given the chance, snakes will almost always try to escape an encounter unless they feel threatened or trapped. If you leave them alone, they will make every effort to leave you alone as well. Be very careful to avoid the head when handling dead snakes. A snake's reflexes can remain functional hours after death, and supposedly "dead" snakes have bitten people.

It is unlikely that during the excavation, trucking and all of the other activities being conducted that these snake would be encountered.

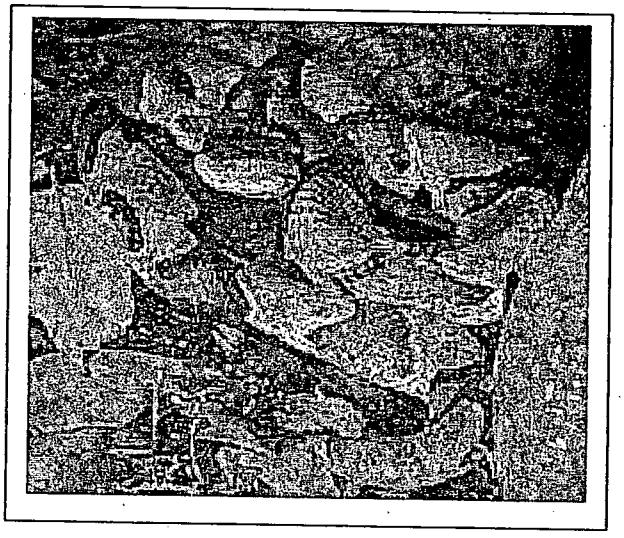
Cotton Mouth or Water Moccasin

The water moccasin is a pit viper. It has a hollow, or pit, in the side of its head, between and slightly below the eye and nostril. Several harmless water snakes have a broad head like the moccasin, but they lack the pit. Adult water moccasins are about 3 ½ feet long, though some grow to more than 5 feet long. They usually have broad dark bands across their bodies. Water moccasins feed on a wide variety of animals, including frogs, fish, small mammals, and birds. Water moccasins are most often seen in watery places, in the swampy backwaters of rivers and streams, and on marshy lakeshores. The bite of the water moccasin is highly dangerous and may be fatal. This snake is also called a cottonmouth because when threatened it throws back its head and flashes its white-lined mouth as a warning signal.



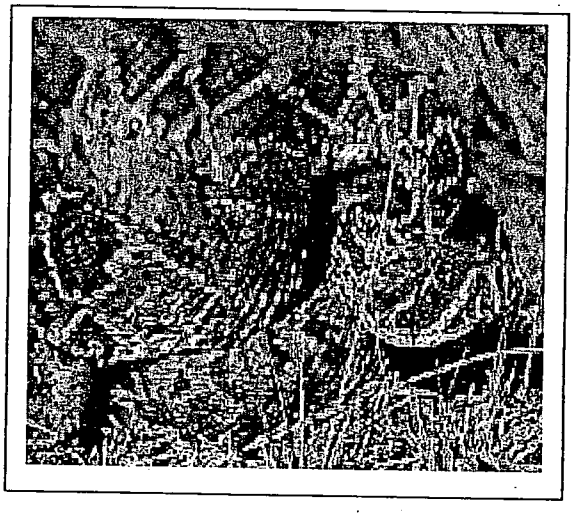
Copperhead

Copperhead is also a poisonous pit vipers. Its body has broad chestnut-red bands. Most copperheads are about 2 ½ feet long while the largest grow to about 4 feet. The copperhead bites people more often than most rattlesnakes, partly because it is silent and smaller, and is not so quickly noticed. The bite is seldom fatal to adults. This reptile usually eats rodents and other small mammals by killing them with their poison and swallowing them whole. Sometimes the snake eats insects and frogs. The copperhead can be identified by the presence of a pit in front of and below each nostril.



Rattlesnake

The rattlesnake is a pit viper with a rattle on the end of its tail. The rattle is used to warn enemies to stay away. However, sometimes they give no warning before they bite. The rattlesnake always lifts its tail when it sounds where as harmless snakes that mimic the rattlesnake move their tail back and forth on top of dry leaves or grass. The diamondback rattler is the heaviest of the poisonous snakes, though not the longest. It gets its name because diamond-shaped blotches edged with yellow cover its body. Diamondbacks grow 3-6 feet long.



Snake Bites

Initial efforts will be directed to avoid, where possible, nesting and territorial areas. However, should field personnel come in contact with these animals and receive a bite, the following actions are necessary.

1. 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, as necessary.

2. Immobilize the bite victim to the extent possible. Physical exertion will mobilize the toxins (if poisonous varieties) from the bite point systemically through the body.

3. Apply a pressure wrap (for extremities), just above and over the bite area. With a couple wraps of the pressure wrap in place over the bite area, apply a splint, and continue the application of the pressure wrap. The purpose for the splint is to restrict the movement of the extremity, this along with the pressure wrap will aid in restricting the toxins from leaving the site of the bite.

4. Seek medical attention immediately.

5.2.3 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, tornados, hailstorms, etc.), the FOL and/or the SSO will be responsible for temporarily suspending or terminating activities until hazardous conditions no longer exist. Personnel will move to shelters or vehicles. Tornados in this area are somewhat common. The NSWC Crane POC will identify potential shelters to be used if an alarm is sounded.

During electrical storms use the 30/30 Rule:

If there is less than 30 seconds between thunder and lightning go inside for at least 30 minutes from when you hear that last thunder.

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, POTENTIAL ROUTES OF EXPOSURE, AND CONTROLS

Inhalation: Previous analytical data determined the presence of MECs and MCs, metals, and PAHs. Based on available information and on the properties of these substances, encountering significant concentrations that could represent an exposure concern is considered unlikely, These substances are not anticipated to represent an inhalation concern because they are not readily volatile at standard temperature and pressure conditions, and it is unlikely that airborne respirable particulates will be generated in any significant quantities based on the nature of the planned activities. Therefore, inhalation exposure is not a concern and respiratory protection will not be required.

Ingestion and Skin Contact: Potential exposure concerns to PCE may also occur through ingesting or coming into direct skin contact with contaminated soils. The likelihood of worker exposure concerns through these two routes are also considered very unlikely, provided that workers follow good personal hygiene and standard good sample collection/sample handling practices, and wear appropriate PPE as specified in this HASP. Examples onsite practices that are to be observed that will protect workers from exposure via ingestion or skin contact include the following:

- No hand-to-mouth activities on site (eating, drinking, smoking, etc.)
- Washing hands upon leaving the work area and prior to performing any hand to mouth activities
- Wearing surgeon's-style gloves whenever handling potentially-contaminated media, including soils, hand tools, and sample containers.

6.2 MEC/MC RELATED ITEMS

One of the obvious hazards associated with this activity is the potential for encountering MC at either UXO 5 or 7. At UXO 5, there is an additional concern for contact with MEC which presents obvious consequences for the unintended detonation of an ordnance-related item resulting in injury or possibly death. At UXO 7, prevention and control of personnel exposure to MC substances will be consistent with standard contaminant avoidance practices at any hazardous waste-related site. At UXO 7, additional precautions will be warranted recognizing that some potential for encountering actual MEC may exist. These additional precautions for UXO 7 are as follows:

- Facility EOD Safety Officer and Tetra Tech NUS, Inc. Unexploded (UXO) Technician Level III (the UXO Tech) will perform a visual survey of all the areas of UXO 7 that the Site Inspection Team intends to access.
- The Team will follow instructions and directions provided by the UXO Tech. The Team will restrict themselves to accessing ONLY the areas cleared by the UXO Tech.
- The Team will be directed not to pick up, kick, or otherwise harass articles laying on the ground. At no time will the Team be permitted to engage in intrusive activities such as digging or unearthing items.
- Personnel will be assigned in such a manner to permit the monitoring of one another as well as provide emergency assistance should it be required.
- Personnel will notify the UXO Tech should they encounter articles or unidentified items.
- There shall be no smoking in areas where explosives are of a concern.
- No matches, lighters, or other fire-, flame-, or spark-producing devices shall be taken into areas where explosives are a concern
- Personnel should shut off cell phones, limit articles (e.g., keys, jewelry, knives, or coins) they carry into the site inspection area.

6.3 OTHER 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.

- Injury due to overexertion from operating the hand auger
- Slip, trips, and falls
- Contact with underground (electric lines, gas lines, water lines, etc.)
- Strain/muscle pulls from heavy lifting
- Pinch/compression points
- Vehicular and equipment traffic

These hazards are discussed further below, and are presented relative to each task in the task-specific Safe Work Permits.

6.3.1 Injury due to Hand Augering

Operating a hand auger can be physically demanding depending on factors such as the conditions of the soil, the conditions of the auger tooling, and the physical capabilities of the operator(s). Potential injuries such as muscle strains, tendon or ligament sprains, or back or other soft-tissue injuries, as well as bruises, abrasions or cuts from handling or operating the hand auger tooling.

Other potential injuries that could be presented from physical threats during this task include foot injuries, eye injuries, and injury from unintentional contact with underground utilities.

As part of the site-specific training, site personnel shall be advised of the hazards associated with working this equipment. Prior to beginning any soil-disturbance activities, the FOL/SSO shall be responsible for assuring that the intended location is clear of any underground utilities by following the TtNUS Utility Locating And Excavation Clearance SOP attached to this HASP (Attachment V).

Additional safety measures used to prevent injury during this task include: assuring that only persons who are confident that they can physically perform this activity without injuring themselves participate in operating a hand auger, performing simple stretches prior to beginning the task, ensuring that the hand auger tooling is maintained in effective working order, avoiding injury by stopping if strong resistance is encountered (such as if impassable rocky conditions are encountered), getting assistance if needed, and wearing appropriate PPE (work gloves, steel toe shoes, and safety impact eye protection.

6.3.2 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 (restrict access, guardrails, life lines and/or safety harnesses) and other means suitable for the task at hand. Site activities will be performed using the buddy system.

6.3.3 Contact with Underground Utilities

Underground utilities such as pressurized lines, water lines, telephone lines, buried utility lines, and high voltage power lines are known to be present throughout the facility. Clearance of underground utilities for each hand auger location will be coordinated Sunshine State One Call of Florida. The TtNUS and Excavation Clearance SOP is attached to this HASP (Attachment V).

6.3.4 Strain/Muscle Pulls from Heavy Lifting

During execution of planned activities there is some potential for strains, sprains, and/or muscle pulls due to the physical demands and nature of this site work. To avoid injury during lifting tasks personnel are to lift with the force of the load carried by their legs and not their backs. When lifting or handling heavy material or equipment use an appropriate number of personnel. Keep the work area free from ground clutter to avoid unnecessary twisting or sudden movements while handling loads.

6.3.5 Pinch/Compression Points

Handling of tools, machinery, and other equipment on site 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.

7.0 AIR MONITORING

The use of direct reading air monitoring instruments will not be required on this project for the scope of work presented in this HASP. This is based on recognizing that available data, historical site information, and the chemical and physical properties of substances that might be present on UXO Sites 5 and 7, it is unlikely that workers will encounter any contaminants in airborne concentrations that would represent an inhalation exposure hazard.

8.0 TRAINING/MEDICAL SURVEILLANCE REQUIREMENTS

8.1 INTRODUCTORY/REFRESHER/SUPERVISORY/FIRST AID TRAINING

This section specifies health and safety training and medical surveillance requirements for TtNUS personnel participating in on-site activities. TtNUS personnel who will engage in field associated activities as described in this HASP must have:

- Completed 40 hours of introductory hazardous waste site training or equivalent work experience as defined in OSHA 29 CFR 1910.120(e).
- Completed 8-Hour Refresher Training, if the identified persons had introductory training more than 12 months, prior to this site work.
- Completed 8-hour Supervisory training in accordance with OSHA 29 CFR 1910.120(e) (4), if their assigned function will involve the supervision of subordinate personnel.

Documentation of introductory training or equivalent work experience, supervisory, and refresher training, as well as, site-specific training will be maintained at the site. Copies of certificates or other official documentation will be used to fulfill this requirement and to track site personnel's training status. The SSO shall be responsible for insuring training qualifications through review of training documentation and for monitoring the status of on-site personnel to insure during the course of this project site personnel do not cycle outside of their training compliance status. The documentation supporting training compliance and status shall be maintained at the project site and be made available, upon request.

First-Aid/CPR (American Red Cross or Equivalent)

As the nearest emergency medical facility is more than 5 minutes travel time from the intended work areas, at least one member of the field team will hold current training in First Aid and Cardiopulmonary Resuscitation (CPR).

8.2 SITE-SPECIFIC TRAINING

TtNUS SSO will provide site-specific training to TtNUS employees who will perform work on this project.

Figure 8-1 will be used to document 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 will be employed to identify personnel who through record review and attendance

of the site-specific training are cleared for participation in site activities. This document shall be posted to maintain an active list of cleared site personnel.

TtNUS will conduct a pre-activities training session prior to initiating site work. Additionally, a brief meeting may be held daily to discuss operations planned for that day as well as, a short meeting may be held at the end of the day to discuss the operations completed and any problems encountered. This activity will be supported through the use of a Safe Work Permit System (see Section 9.4 and Attachment III) and/or documented in the Project Logbook.

8.3 MEDICAL SURVEILLANCE

TtNUS personnel participating in project field activities will have had a physical examination. Physical examinations shall meet the minimum requirements of paragraph (f) of OSHA 29 CFR 1910.120. The physical examinations will be performed to ensure that personnel are medically qualified to perform hazardous waste site work using respiratory protection.

Documentation for medical clearances will be maintained at the job site and made available, as necessary. A letter from an officer of the company or a medical clearance authorized by the physician can be used as documentation. Documentation must indicate that clearance provided is in accordance with medical surveillance as determined by OSHA 29 CFR 1910.120 (f).

The SSO shall be responsible for ensuring that personnel participating in this project provide documentation regarding their medical qualifications. Personnel associated with this project will maintain a current status regarding medical surveillance as determined by OSHA 29 CFR 1910.120 (f) or the prescribed interval as determined by the Licensed Occupational Health Care Provider. Documentation supporting medical surveillance compliance and status shall be made available, upon request.

8.3.1 Medical Data Sheet

Each field team member, including any visitors, entering the exclusion zone(s) shall be required to complete and submit a copy of the Medical Data Sheet (see Attachment II). This shall be filled out and collected, reviewed and maintained by the SSO. 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 should this person become incapacitated.

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

HIPAA took effect 1996 and was amended in April 14, 2003. Basically, 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 TtNUS 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 the 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.

FIGURE 8-1

SITE-SPECIFIC TRAINING DOCUMENTATION

My signature below indicates that I am aware of the potential hazardous nature of performing investigation activities at NSWC Crane, and that I have received site-specific training that included the elements presented below:

- Names of personnel and alternates responsible for site safety and health
- Safety, health and other hazards present on site
- Use of personal protective equipment
- Work practices to minimize risks from hazards
- Safe use of engineering controls and equipment
- Medical surveillance requirements
- Signs and symptoms of overexposure
- The contents of the health and safety plan
- Emergency response procedures (evacuation and assembly points)
- Review contents of relevant Material Safety Data Sheets
- Review of Safe Work Permits
- UXO avoidance techniques/measures (for any work associated with UXO 5)

I have been given the opportunity to ask questions and that my questions have been answered to my satisfaction. The dates of my training and my medical surveillance requirements are accurate and correct to the best of my knowledge.

Name (Printed and Signature)	Site-Specific Training Date	40-Hour Training (Date)	8-Hour Refresher Training (Date)	8-Hour Supervisory Training (Date)	Medical Exam

Instructor(s): _____

_____

9.0 SITE CONTROL

This section outlines the means by which TtNUS 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 three-zone approach will be used during work at this site. This approach will be comprised of an exclusion zone, a contamination reduction 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.

9.1 EXCLUSION ZONE

The exclusion zone will be considered the areas of the site of known or suspected contamination. It is anticipated that the areas around the exhaust vents will have the potential for contaminants brought to the surface. These areas will be marked and personnel will maintain safe distances. Once intrusive activities have been completed and surface contamination has been removed, the potential for exposure is again diminished and the area can then be reclassified as part of the contamination reduction zone. Therefore, the exclusion zones for this project will be limited to those areas of the site where active work (hand augering and sample collection) is being performed plus a designated area of at least 15 feet surrounding the work area. Exclusion zones will be delineated as deemed appropriate by the FOL, through means such as erecting visibility fencing, barrier tape, cones, and/or postings to inform and direct personnel.

9.1.1 Exclusion Zone Clearance

A pre-startup site visit will be conducted by members of the identified field team in an effort to identify proposed subsurface investigation locations, conduct utility clearances, and provide upfront notices concerning scheduled activities within the facility.

Subsurface activities will proceed only when utility clearance has been obtained. In the event that a utility is struck during a subsurface investigative activity, the emergency numbers provided in Section 2.0, Table 2-1, will be notified.

In the case of UXO 5, UXO clearance by the UXO Tech will also be required prior to accessing any of the intended work areas.

9.2 CONTAMINATION REDUCTION ZONE

The contamination reduction zone (CRZ) will be a buffer area between the exclusion zone and any area of the site where contamination is not suspected. This area will also serve as a focal point in supporting exclusion zone activities. This area will be delineated using barrier tape, cones, and postings to inform and direct facility personnel. Decontamination will be conducted at a central location. Equipment potentially contaminated will be bagged and taken to that location for decontamination.

9.3 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 where away from potential exposure to site contaminants during normal working conditions or foreseeable emergencies.

9.4 SAFE WORK PERMITS

Exclusion Zone work conducted in support of this project will be performed using Safe Work Permits (SWPs) to guide and direct field crews on a task by task basis. An example of the SWP to be used is provided in Figure 9-1. Partially completed SWPs for the work to be performed are attached to this HASP (Attachment III). These permits were completed to the extent possible as part of the development of this HASP. It is the SSO's responsibility to finalize and complete all blank portions of the SWPs based on current, existing conditions the day the task is to be performed, and then review that completed permit with all task participants as part of a pre-task tail gate briefing session. This will ensure that site-specific considerations and changing conditions are appropriately incorporated into the SWP, provide the SSO with a structured format for conducting the tail gate sessions, as well will also give personnel an opportunity to ask questions and make suggestions. All SWPs require the signature of the FOL or SSO.

9.5 SITE VISITORS

Site visitors for the purpose of this document are identified as representing the following groups of individuals:

- Personnel invited to observe or participate in operations by TtNUS
- Regulatory personnel (i.e., DOD, EPA, OSHA)
- Property Owners
- Authorized Navy Personnel
- Other authorized visitors

Non-DOD personnel working on this project are required to gain initial access to the base by coordinating with the TtNUS FOL or designee and following established base access procedures.

Once access to the base is obtained, personnel who require site access into areas of ongoing operations will be required to obtain permission from the TOM. Upon gaining access to the site, site visitors wishing to observe operations in progress will be escorted by a TtNUS representative and shall be required to meet the minimum requirements discussed below:

- Site visitors will be directed to the FOL/SSO, who will sign them into the field logbook. Information to be recorded in the logbook will include the individual's name (proper identification required), the entity which they represent, and the purpose of the visit.

- Site visitors wishing to enter the exclusion zone will be required to produce the necessary information supporting clearance to the site. This shall include information attesting to applicable training and medical surveillance as stipulated in Section 8.0 of this document. In addition, to enter the site operational zones during planned activities, visitors will be required to first go through site-specific training covering the topics stipulated in Section 8.2 of this HASP.

Once the site visitors have completed the above items, they will be permitted to enter the operational zone. Visitors are required to observe the protective equipment and site restrictions in effect at the site at the time of their visit. Visitors entering the exclusion zones during ongoing operations will be accompanied by a TtNUS representative. Visitors not meeting the requirements, as stipulated in this plan, for site clearance will not be permitted to enter the site operational zones during planned activities. Any incidence of unauthorized site visitation will cause the termination of on site activities until the unauthorized visitor is removed from the premises. Removal of unauthorized visitors will be accomplished with support from local law enforcement personnel.

FIGURE 9-1

SAFE WORK PERMIT

Permit No. _____ Date: _____ Time: From _____ to _____

SECTION I: General Job Scope

I. **Work limited to the following (description, area, equipment used):** _____

II. **Primary Hazards:** _____

III. **Field Crew:** _____

IV. **On-site Inspection conducted** ☐ Yes ☐ No Initials of Inspector _____TtNUS
Equipment Inspection required ☐ Yes ☐ No Initials of Inspector _____TtNUS

SECTION II: General Safety Requirements (To be filled in by permit issuer)

V. **Protective equipment required**
Level D ☐ Level B ☐
Level C ☐ Level A ☐

Respiratory equipment required
Yes ☐ Specify on the reverse
No ☐

Modifications/Exceptions: _____

VI.

Chemicals of Concern	Hazard Monitoring	Action Level(s)	Response Measures

Primary Route of Exposure/Hazard: _____

(Note to FOL and/or SSO: Each item in Sections VII, VIII, and IX must be checked Yes, No, or NA)

VII. **Additional Safety Equipment/Procedures**

Hard-hat	☐ Yes	☐ No	Hearing Protection (Plugs/Muffs)	☐ Yes	☐ No
Safety Glasses	☐ Yes	☐ No	Safety belt/harness	☐ Yes	☐ No
Chemical/splash goggles	☐ Yes	☐ No	Radio/Cellular Phone	☐ Yes	☐ No
Splash Shield	☐ Yes	☐ No	Barricades	☐ Yes	☐ No
Splash suits/coveralls	☐ Yes	☐ No	Gloves (Type –_____)	☐ Yes	☐ No
Impermeable apron	☐ Yes	☐ No	Work/rest regimen	☐ Yes	☐ No
Steel toe Work shoes or boots	☐ Yes	☐ No	Chemical Resistant Boot Covers	☐ Yes	☐ No
High Visibility vest	☐ Yes	☐ No	Tape up/use insect repellent	☐ Yes	☐ No
First Aid Kit	☐ Yes	☐ No	Fire Extinguisher	☐ Yes	☐ No
Safety Shower/Eyewash	☐ Yes	☐ No	Other	☐ Yes	☐ No

Modifications/Exceptions: _____

VIII. **Site Preparation**

	Yes	No	NA
Utility Locating and Excavation Clearance completed	☐	☐	☐
Vehicle and Foot Traffic Routes Established/Traffic Control Barricades/Signs in Place	☐	☐	☐
Physical Hazards Identified and Isolated (Splash and containment barriers)	☐	☐	☐
Emergency Equipment Staged (Spill control, fire extinguishers, first aid kits, etc).	☐	☐	☐

IX. **Additional Permits required** (Hot work, confined space entry, excavation etc.) ☐ Yes ☐ No
If yes, SSO to complete or contact Health Sciences, Pittsburgh Office (412)921-7090

X. **Special instructions, precautions:** _____

Permit Issued by: _____ Permit Accepted by: _____

9.6 SITE SECURITY

Site security will be accomplished using TtNUS field personnel. TtNUS will retain complete control over active operational areas. As this activity takes place at a 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.

9.7 SITE MAP

Once the areas of contamination, 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 collection of contaminants and adjustment of zones and access points.

9.8 BUDDY SYSTEM

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

9.9 MSDS REQUIREMENTS

TtNUS personnel will be required to collect MSDSs for chemicals brought on site. The contents of these documents will be reviewed by the SSO with the user(s) of the chemical substances prior to any actual use or application of the substances on site. A chemical inventory of the chemicals used on site will be developed using the Health and Safety Guidance Manual (See Section 5.0). The MSDSs will then be maintained in a central location (i.e., temporary office) and will be available for anyone to review upon request.

9.10 COMMUNICATION

Based on the defined scope of work it is anticipated that personnel will be working in proximity to one another during field activities, a supported means of communication between field crew members such as hand held radios, will not be necessary. External communication will be accomplished by using the telephones at predetermined and approved locations or through cellular phones.

10.0 SPILL CONTAINMENT PROGRAM

Based on the limited potential for spills and releases associated with this operation including resource requirements and IDW a spill containment program will not be required.

11.0 CONFINED SPACE ENTRY

Personnel under the provisions of this HASP are not allowed, under any circumstances, to enter confined spaces.

A **Confined Space** is defined as a space that:

- 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, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry).
- Is not designed for continuous employee occupancy.

A **Permit Required Confined Space** is a confined space that has one or more of the following characteristics:

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

While entering the excavation will meet the above conditions, hazard assessment and control will be facilitated through the Excavation Safety measures employed.

For further information on confined space consult the Health and Safety Guidance Manual or call the Manager, Health Sciences. If confined space operations are to be performed as part of the scope of work, detailed procedures and training requirements will be addressed in an addendum or the site specific health and safety plan.

12.0 MATERIALS AND DOCUMENTS

The TtNUS FOL shall ensure the following materials/documents are taken to the project site and used when required.

- A completed copy of this HASP (Signed)
- Tetra Tech NUS, Inc. Health and Safety Guidance Manual
- Medical Data Sheets
- MSDSs for chemicals brought on site, including decontamination solutions, fuels, sample preservatives, etc.
- A full-size OSHA Job Safety and Health Poster (posted in the site trailers)
- Tetra Tech NUS, Inc. Health and Safety Policy
- Training/Medical Surveillance Documentation Form (Blank)
- Emergency Reference Information (Section 2.0, extra copy for posting)

12.1 MATERIALS TO BE POSTED OR MAINTAINED 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.

Chemical Inventory Listing (posted) - This list represents chemicals brought on-site, including decontamination solutions, sample preservations, fuel, etc. This list should be posted in a central area.

MSDS (maintained) - The MSDSs should also be in a central area accessible to site personnel. These documents should match the listings on the chemical inventory list for substances used on-site. It is acceptable to have these documents within a central folder and the chemical inventory as the table of contents.

The OSHA Job Safety and Health Protection Poster (posted) - this poster, as directed by OSHA 29 CFR 1903.2 (a)(1), should be conspicuously posted in places where notices to employees are normally posted. Each FOL shall ensure that this poster is not defaces, altered, or covered by other material.

Emergency Phone Numbers and Directions to the Hospital(s) (posted) - This list of numbers and directions will be maintained at phone communications points and in each site vehicle.

Medical Data Sheets (maintained) - Medical Data Sheets will be filled out by on-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 personnel to be carried on their person.

13.0 GLOSSARY

CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CLEAN	Comprehensive Long-Term Environmental Action Navy
CSP	Certified Safety Professional
CTO	Contract Task Order
DEET	N,N-diethyl-meta-toluomide
EMAC	Environmental Multiple Award Contract
FOL	Field Operations Leader
HSGM	Health and Safety Guidance Manual
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSM	Health and Safety Manager
IDW	Investigative Derived Waste
MSDS	Material Safety Data Sheet
N/A	Not Available or Not Applicable
NSWC	Naval Surface Warfare Center
OPR	Old Pistol Range
ORR	Old Rifle Range
OSHA	Occupational Safety and Health Administration
PHSO	Project Health and Safety Manager
PM	Project Manager
PPE	Personal Protective Equipment
SSO	Site Safety Officer
SWMU	Solid Waste Management Unit
TBD	To Be Determined
TNT	Trinitrotoluene
WP	Work Plan

ATTACHMENT I

INCIDENT REPORT FORM

TETRA TECH, INC.
Safety Excellence

TETRA TECH, INC.
INCIDENT REPORT

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)	☐ Complete IR Form Only
Injury or Illness	☐ Complete Form IR-A; Injury or Illness
Property or Equipment Damage, Fire, Spill or Release	☐ Complete Form IR-B; Damage, Fire, Spill or Release
Motor Vehicle	☐ Complete Form IR-C; Motor Vehicle

INFORMATION ABOUT THE INCIDENT

Description of Incident

_____

_____

_____

_____

Date of Incident	Time of Incident
	_____ AM ☐ PM ☐ *OR* Cannot be determined ☐
Weather conditions at the time of the incident	**Was there adequate lighting?**
	_____ Yes ☐ No ☐

Location of Incident

_____ Was location of incident within the employer's work environment? Yes ☐ No ☐

Street Address	City, State, Zip Code and Country
Project Name	**Client:**
Tt Supervisor or Project Manager	**Was supervisor on the scene?**
	Yes ☐ No ☐

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	**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. The following events may trigger a Level 1 RCA: ▪ 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	**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. The following events will require a Level 2 RCA: ▪ 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?	Time individual began work
Yes ☐ No ☐	_____ AM ☐ PM ☐ *OR* Cannot be determined ☐

Safety equipment

Provided? Yes ☐ No ☐

Used? Yes ☐ No ☐ If no, explain why

_____

_____

_____

Type(s) provided:
- ☐ Hard hat
- ☐ Gloves
- ☐ Eye protection
- ☐ Safety shoes
- ☐ Respirator
- ☐ Protective clothing
- ☐ High visibility vest
- ☐ Fall protection
- ☐ Machine guarding
- ☐ 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 ☐ No ☐
_____	Was individual hospitalized overnight as an in-patient? Yes ☐ No ☐
Telephone Number	Did the individual die? Yes ☐ No ☐ If yes, date: _____
	Will a worker's compensation claim be filed? Yes ☐ No ☐

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 ☐ Equipment Damage ☐ Fire or Explosion ☐ Spill or Release ☐

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 ☐ No ☐ NA ☐

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 ☐ No ☐			
Agency: _____ Yes ☐ No ☐			
Other: _____ Yes ☐ No ☐			

Who is responsible for reporting incident to outside agency(s)? Tt ☐ 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 ☐ No ☐	Yes ☐ No ☐
Name and location of responding police department	Ambulance company name and location
Officer's name/badge #	

Did police complete an incident report? Yes ☐ No ☐ 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 ☐ Female ☐	Gender	Male ☐ Female ☐
Was traffic citation issued to Tetra Tech driver? Yes ☐ No ☐		Was traffic citation issued to driver of other vehicle? Yes ☐ No ☐	
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 ☐ Female ☐			Yes ☐ No ☐	Yes ☐ No ☐	Injured ☐ Died ☐
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 ☐ Female ☐			Yes ☐ No ☐	Yes ☐ No ☐	Injured ☐ Died ☐

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

COMPLETE AND SUBMIT DIAGRAM DEPICTING WHAT HAPPENED

ATTACHMENT II

MEDICAL DATA SHEET

MEDICAL DATA SHEET

This Medical Data Sheet must be completed by on-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:_____ Work#: _____ Cell#:_____

Address _____

Age: _____ Height: _____ Weight:_____

Occupation/Trade:_____

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

Home Telephone:_____ Work#: _____ Cell#:_____

Drug or other Allergies: _____

Particular Sensitivities : _____

Do You Wear Contacts?_____

What medications are you presently using? _____

_____

Existing medical conditions that could be aggravated:_____

_____

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

_____

_____

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

HIPAA took effect in 1996 and was amended in 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 TtNUS 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 the 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 III

SAFE WORK PERMITS

SAFE WORK PERMIT
MOBILIZATION/DEMOBILIZATION ACTIVITIES
NSWC CRANE UXO 5 AND UXO 7
CRANE, INDIANA

Permit No. _____ Date: _____ Time: From _____ to _____

SECTION I: General Job Scope

I. **Work limited to the following (description, area, equipment used):** Mobilization and demobilization activities.

II. **Primary Hazards:** Lifting, pinches and compressions; slips, trips and falls; vehicle and foot traffic; ambient temperature extremes and inclement weather; insect and animal bites

III. **Field Crew:** _____

IV. **On-site Inspection conducted** ☐ Yes ☐ No Initials of Inspector _____ TtNUS
Equipment Inspection required ☐ Yes ☐ No Initials of Inspector _____ TtNUS

SECTION II: General Safety Requirements (To be filled in by permit issuer)

V. **Protective equipment required**
Level D ☒ Level B ☐
Level C ☐ Level A ☐

Respiratory equipment required
Yes ☐ See Reverse
No ☒

Modifications/Exceptions: None anticipated

VI.

Chemicals of Concern	Hazard Monitoring	Action Level(s)	Response Measures
None anticipated	NA	NA	NA

Primary Route of Exposure/Hazard: None

(Note to FOL and/or SSO: Each item in Sections VII, VIII, and IX must be checked Yes or No)

VII. **Additional Safety Equipment/Procedures**

Hard-hat	☐ Yes	☐ No	Hearing Protection (Plugs/Muffs)	☐ Yes	☐ No
Safety Glasses	☐ Yes	☐ No	Safety belt/harness	☐ Yes	☒ No
Chemical/splash goggles	☐ Yes	☒ No	Radio/Cellular Phone	☐ Yes	☐ No
Splash Shield	☐ Yes	☒ No	Barricades	☐ Yes	☐ No
Splash suits/coveralls	☐ Yes	☒ No	Gloves (Type – Leather/Cotton)	☒ Yes	☐ No
Impermeable apron	☐ Yes	☒ No	Work/rest regimen	☐ Yes	☒ No
Steel toe work shoes or boots	☒ Yes	☐ No	Chemical Resistant Boot Covers	☐ Yes	☒ No
High Visibility vest	☐ Yes	☒ No	Tape up/use insect repellent	☒ Yes	☐ No
First Aid Kit	☒ Yes	☐ No	Fire Extinguisher	☒ Yes	☐ No
Safety Shower/Eyewash	☐ Yes	☐ No	Other	☐ Yes	☐ No

Modifications/Exceptions: If overhead hazards or bump hazards exist hard hats and safety glasses will be required. Use insect repellant and tape up to protect against insects and insect bites in areas of heavy brush and wooded areas. Wear hearing protection when working near operating equipment. Remember the General Rule of Thumb: If you have to raise your voice to be heard by someone within 2-feet of where you are standing excessive noise levels are being approached and you should wear hearing protection. Work gloves required when handling sharp or rough objects/tools.

VIII. **Site Preparation**

	Yes	No	NA
Utility Locating and Excavation Clearance completed	☐	☐	☐
Vehicle and Foot Traffic Routes Established/Traffic Control Barricades/Signs in Place	☐	☐	☐
Physical Hazards Identified and Isolated	☐	☐	☐
Emergency Equipment Staged (Spill control, fire extinguishers, first aid kits, etc)	☐	☐	☐

IX. **Additional Permits required** (Hot work, confined space entry, excavation etc.) ☐ Yes ☒ No
If yes, SSO to complete or contact Health Sciences, Pittsburgh Office (412)921-7090

X. **Special instructions, precautions:** Suspend site activities in the event of inclement weather. Employ proper lifting techniques as described in the HSGM Section 4.4. Cuts/Lacerations are also a potential hazard associated with this task. Use safe cutting procedures specified in Section 4.13 of the HSGM. UXO Tech must clear all areas associated with UXO 5 before any work at that area begins.

Permit Issued by: _____ Permit Accepted by: _____

SAFE WORK PERMIT
HAND AUGERING AND SOIL SAMPLING
NSWC CRANE UXO 5 AND UXO 7
CRANE, INDIANA

Permit No. _____ Date: _____ Time: From _____ to _____

SECTION I: General Job Scope

I. **Work limited to the following (description, area, equipment used):** Hand augering and shallow surface soil sampling.

II. **Primary Hazards:** At UXO5: MEC and MC associated with ordnance. At UXO7: MC associated with small arms fire use history, transfer of contamination, lifting, slips, trips, and falls; vehicle and foot traffic; and inclement weather.

III. **Field Crew:** _____

IV. **On-site Inspection conducted** ☐ Yes ☐ No Inspector Initials _____ TtNUS

Equipment Inspection required ☒ Yes ☐ No Inspector Initials _____ TtNUS

SECTION II: General Safety Requirements (To be filled in by permit issuer)

V. **Protective equipment required**

Level D ☒ Level B ☐
Level C ☐ Level A ☐

Respiratory equipment required

Yes ☐ See Reverse
No ☒

Modifications/Exceptions: None anticipated

VI. **Chemicals of Concern**

Chemicals of Concern	Hazard Monitoring	Action Level(s)	Response Measures
UXO5: MEC/MC	Visual observations	Visible dust	Avoid or wet area
UXO7: MC	Visual observations	Visible dust)	Avoid or wet area

Primary Route of Exposure/Hazard: Inhalation of airborne particulates, incidental ingestion of contaminated media, Wear PPE, follow good personal hygiene and decontamination practices, and good site work practices (e.g., no hand-to-mouth actions on site, etc.) to control ingestion and skin contact routes of entry. It is not anticipated that significant concentrations will be encountered.

(Note to FOL and/or SSO: Each item in Sections VII, VIII, and IX must be checked Yes or No)

VII. **Additional Safety Equipment/Procedures**

Hard-hat	☐ Yes	☐ No	Hearing Protection (Plugs/Muffs)	☐ Yes	☒ No
Safety Glasses	☒ Yes	☐ No	Safety belt/harness	☐ Yes	☒ No
Chemical/splash goggles	☐ Yes	☒ No	Radio/Cellular Phone	☐ Yes	☐ No
Splash Shield	☐ Yes	☒ No	Barricades	☐ Yes	☐ No
Splash suits/coveralls	☐ Yes	☐ No	Gloves (Type – Cotton/leather/surgeons)	☒ Yes	☐ No
Impermeable apron	☐ Yes	☒ No	Work/rest regimen	☐ Yes	☒ No
Steel toe work shoes or boots	☒ Yes	☐ No	Chemical Resistant Boot Covers	☒ Yes	☐ No
High Visibility vest	☒ Yes	☐ No	Tape up/use insect repellent	☒ Yes	☐ No
First Aid Kit	☒ Yes	☐ No	Fire Extinguisher	☒ Yes	☐ No
Safety Shower/Eyewash	☐ Yes	☒ No	Other	☐ Yes	☐ No

Modifications/Exceptions: Disposable coveralls at SSO's discretion.

VIII. **Site Preparation**

	Yes	No	NA
Utility Locating and Excavation Clearance completed	☐	☐	☐
Vehicle and Foot Traffic Routes Cleared and Established	☐	☐	☐
Physical Hazards Barricaded and Isolated	☐	☐	☐
Emergency Equipment Staged	☐	☐	☐

IX. **Additional Permits required** ☐ Yes ☒ No

If yes, SSO complete permit or contact Health Sciences, Pittsburgh Office (412) 921-7090

X. **Special instructions, precautions:** Personnel will bag contaminated PPE and reusable sampling tools. Minimize contact with potentially contaminated media. Tape up and use insect repellants (follow manufacturer's label instructions for proper application and re-application). UXO Tech must clear all areas associated with UXO 5 before any work at that area begins. Suspend site activities in the event of inclement weather (Use the 30/30 Rule). Employ proper lifting techniques as described in Section 4.4 of the HSGM.

Permit Issued by: _____ Permit Accepted by: _____

SAFE WORK PERMIT
EXCAVATION ENTRY – SOIL SAMPLING ACTIVITIES
NSWC CRANE UXO 5 AND UXO 7
CRANE, INDIANA

Permit No. _____ Date: _____ Time: From _____ to _____

SECTION I: General Job Scope

I. **Work limited to the following (description, area, equipment used):** Visual inspection and area walk-overs by UXO Technician to clear intended walking/working areas of UXO and MECs.

II. **Primary Hazards:** MECs and MCs, insect/animal bites, contact with poisonous plants, inclement weather.

IV. **Field Crew:** _____

IV. **On-site Inspection conducted** ☐ Yes ☐ No Initials of Inspector _____ TtNUS

Equipment Inspection required ☐ Yes ☒ No Initials of Inspector _____ TtNUS

SECTION II: General Safety Requirements (To be filled in by permit issuer)

V. **Protective equipment required**

Level D ☒ Level B ☐
Level C ☐ Level A ☐

Respiratory equipment required

Yes ☐ See Reverse
No ☒

Modifications/Exceptions: None anticipated

VI. **Chemicals of Concern**

Chemicals of Concern	Hazard Monitoring	Action Level(s)	Response Measures
MECs/MCs	NA	NA	NA

Primary Route of Exposure/Hazard: Not Applicable for this surficial, non-intrusive task.

(Note to FOL and/or SSO: Each item in Sections VII, VIII, and IX must be checked Yes or No)

VII. **Additional Safety Equipment/Procedures**

Hard-hat	☐ Yes	☐ No	Hearing Protection (Plugs/Muffs)	☐ Yes	☒ No
Safety Glasses	☐ Yes	☐ No	Safety belt/harness	☐ Yes	☒ No
Chemical/splash goggles	☐ Yes	☒ No	Radio/Cellular Phone	☐ Yes	☐ No
Splash Shield	☐ Yes	☒ No	Barricades	☐ Yes	☒ No
Splash suits/coveralls	☐ Yes	☒ No	Gloves (Type – Leather/Cotton)	☐ Yes	☒ No
Impermeable apron	☐ Yes	☒ No	Work/rest regimen	☐ Yes	☒ No
Steel toe work shoes or boots	☐ Yes	☒ No	Chemical Resistant Boot Covers	☐ Yes	☒ No
High Visibility vest	☐ Yes	☒ No	Tape up/use insect repellent	☒ Yes	☐ No
First Aid Kit	☒ Yes	☐ No	Fire Extinguisher	☐ Yes	☐ No
Safety Shower/Eyewash	☐ Yes	☒ No	Other	☐ Yes	☐ No

Modifications/Exceptions: If intended areas include high grass or heavy brush, wear snake chaps, and tape up and use insect repellants. If wooded or thicket areas involved, wear hard hats and safety impact eye protection. No personnel are permitted to access any areas of UXO5 until/unless the area has first been cleared by the UXO Tech. Suspend activities in the event of inclement weather (follow 30/30 rule)

VIII. **Site Preparation**

	Yes	No	NA
Utility Locating and Excavation Clearance completed	☐	☐	☒
Vehicle and Foot Traffic Routes Established/Traffic Control Barricades/Signs in Place	☐	☐	☒
Physical Hazards Identified and Isolated	☐	☐	☐
Emergency Equipment Staged (Spill control, fire extinguishers, first aid kits, etc)	☐	☐	☐

IX. **Additional Permits required** (Hot work, confined space entry, excavation etc.). ☐ Yes ☒ No

If yes, SSO to complete or contact Health Sciences, Pittsburgh Office (412)921-7090

X. **Special instructions, precautions:** Tape up and use insect repellants (follow manufacturer's label instructions for proper application and re-application).

Permit Issued by: _____ Permit Accepted by: _____

SAFE WORK PERMIT
IDW MANAGEMENT
NSWC CRANE UXO 5 AND UXO 7
CRANE, INDIANA

Permit No. _____ Date: _____ Time: From _____ to _____

SECTION I: General Job Scope

I. **Work limited to the following (description, area, equipment used):** IDW management activities includes containerization, staging, monitoring for leaks of IDW accumulated wastes. Waste types include hand auger cuttings, disposable PPE, and decontamination wash waters.

II. **Primary Hazards:** Potential hazards associated with this task are primarily physical in nature including lifting, pinches and compressions; slips, trips, and falls.

Field Crew: _____

IV. **On-site Inspection conducted** ☐ Yes ☐ No Initials of Inspector _____ TtNUS

Equipment Inspection required ☐ Yes ☒ No Initials of Inspector _____ TtNUS

SECTION II: General Safety Requirements (To be filled in by permit issuer)

V. **Protective equipment required**

Level D ☒ Level B ☐

Level C ☐ Level A ☐

Respiratory equipment required

Yes ☐ See Reverse

No ☒

Modifications/Exceptions: None anticipated

VI. Chemicals of Concern	Hazard Monitoring	Action Level(s)	Response Measures
MC	None required	NA	NA

Primary Route of Exposure/Hazard: None

(Note to FOL and/or SHSO: Each item in Sections VII, VIII, and IX must be checked Yes or No)

VII. **Additional Safety Equipment/Procedures**

Hard-hat	☐ Yes	☐ No	Hearing Protection (Plugs/Muffs)	☐ Yes	☒ No
Safety Glasses	☐ Yes	☐ No	Safety belt/harness	☐ Yes	☒ No
Chemical/splash goggles	☐ Yes	☐ No	Radio/Cellular Phone	☐ Yes	☐ No
Splash Shield	☐ Yes	☒ No	Barricades	☐ Yes	☐ No
Splash suits/coveralls	☐ Yes	☒ No	Gloves (Type – Leather/Cotton)	☒ Yes	☐ No
Impermeable apron	☐ Yes	☒ No	Work/rest regimen	☐ Yes	☒ No
Steel toe Work shoes or boots	☒ Yes	☐ No	Chemical Resistant Boot Covers	☐ Yes	☒ No
High Visibility vest	☐ Yes	☒ No	Tape up/use insect repellent	☐ Yes	☐ No
First Aid Kit	☒ Yes	☐ No	Fire Extinguisher	☐ Yes	☐ No
Safety Shower/Eyewash	☐ Yes	☒ No	Other	☐ Yes	☐ No

Modifications/Exceptions: If you are using pneumatic/electric power to open drums – Safety glasses are required; If power equipment is employed to move drums or you are working near operating equipment hard hats will be employed.

VIII. **Site Preparation**

	Yes	No	NA
Utility Locating and Excavation Clearance completed	☐	☐	☒
Vehicle and Foot Traffic Routes Established/Traffic Control Barricades/Signs in Place	☐	☐	☐
Physical Hazards Identified and Isolated	☐	☐	☐
Emergency Equipment Staged (Spill control, fire extinguishers, first aid kits, etc)	☐	☐	☐

IX. **Additional Permits required** (Hot work, confined space entry, excavation etc.). ☐ Yes ☒ No

If yes, SHSO to complete or contact Health Sciences, Pittsburgh Office (412)921-7090

X. **Special instructions, precautions:** Suspend site activities in the event of inclement weather. Employ proper lifting techniques. When/where possible use heavy equipment to move and place containers. When placing drums – Place the label and retention ring nut on the outside where it is readily visible. Place 4-drums to a pallet. Maintain a minimum distance of 4-feet between pallet rows.

Permit Issued by: _____ Permit Accepted by: _____

SAFE WORK PERMIT
DECONTAMINATION ACTIVITIES
NSWC CRANE UXO 5 AND UXO 7
CRANE, INDIANA

Permit No. _____ Date: _____ Time: From _____ to _____

SECTION I: General Job Scope

I. **Work limited to the following (description, area, equipment used):** Decontamination of sampling equipment using buckets, brushes and spray bottles at the work site or designated location. This task will include removing visible dirt from hand auger tooling and sampling equipment through wash and rinse and disposal as general refuse.

II. **Primary Hazards:** Contaminants (residual levels); decontamination fluids; lifting (strain/muscle pulls) slips, trips, and falls, inclement weather. Vehicular and foot traffic.

III. **Field Crew:** _____

IV. **On-site Inspection conducted** ☐ Yes ☐ No Initials of Inspector _____ TtNUS
Equipment Inspection required ☒ Yes ☐ No Initials of Inspector _____ TtNUS

SECTION II: General Safety Requirements (To be filled in by permit issuer)

V. **Protective equipment required**
Level D ☒ Level B ☐
Level C ☐ Level A ☐

Respiratory equipment required
Yes ☐ Specify on the reverse
No ☒

Modifications/Exceptions: None anticipated

VI. **Chemicals of Concern**: Liquinox (soap)
Hazard Monitoring: None Required
Action Level(s): None
Response Measures: Eye irritant/flush with clean water

Primary Route of Exposure/Hazard: Soap – Contact - Eye irritant; ingestion - nausea possible vomiting, diarrhea; Exposure to residual site contaminants during this activity is considered negligible.

(Note to FOL and/or SSO: Each item in Sections VII, VIII, and IX must be checked Yes or No)

VII. **Additional Safety Equipment/Procedures**

Hard-hat	☐ Yes	☒ No	Hearing Protection (Plugs/Muffs)	☐ Yes	☒ No
Safety Glasses	☒ Yes	☐ No	Safety belt/harness	☐ Yes	☒ No
Chemical/splash goggles	☐ Yes	☒ No	Radio/Cellular Phone	☐ Yes	☒ No
Splash Shield	☒ Yes	☐ No	Barricades	☐ Yes	☒ No
Splash suits/coveralls	☐ Yes	☐ No	Gloves (Type – Nitrile)	☒ Yes	☐ No
Impermeable apron	☐ Yes	☐ No	Work/rest regimen	☐ Yes	☒ No
Steel toe work shoes or boots	☒ Yes	☐ No	Chemical Resistant Boot Covers	☐ Yes	☐ No
High Visibility vest	☐ Yes	☒ No	Tape up/use insect repellent	☒ Yes	☐ No
First Aid Kit	☒ Yes	☐ No	Fire Extinguisher	☒ Yes	☐ No
Safety Shower/Eyewash	☐ Yes	☐ No	Other	☐ Yes	☐ No

Modifications/Exceptions: Gloves – Nitrile (surgeons style) for cleaning hand tools. Disposable coveralls or impermeable aprons and boot covers at SSO's discretion if substantial overspray anticipated.

VIII. **Site Preparation**

	Yes	No	NA
Utility Locating and Excavation Clearance completed	☐	☐	☒
Vehicle and Foot Traffic Routes Established/Traffic Control Barricades/Signs in Place	☐	☐	☐
Physical Hazards Identified and Isolated (Splash and containment barriers)	☐	☐	☐
Emergency Equipment Staged (Spill control, fire extinguishers, first aid kits, etc)	☐	☐	☐

IX. **Additional Permits required** (Hot work, confined space entry, excavation etc.) ☐ Yes ☒ No
If yes, SSO to complete or contact Health Sciences, Pittsburgh Office (412)921-7090

X. **Special instructions, precautions:** Suspend site activities in the event of inclement weather. Use the 30/30 Rule. Follow MSDS for any decontamination solutions/solvents used. Tape up and use insect repellants (follow manufacturer's label instructions for proper application and re-application). UXO Tech must clear all areas associated with UXO 5 before any work at that area begins.

Permit Issued by: _____ Permit Accepted by: _____

ATTACHMENT IV

UNEXPLODED ORDNANCE AND CHEMICAL WARFARE AGENTS ACTIVITIES

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1.0 GENERAL

This Standard Operating Procedure (SOP) was prepared in accordance with applicable U.S. Army Corps of Engineers, and NAVSEA OP5 (Ammunition and Explosive Safety Ashore) procedures and policies governing field activities where Munitions and Explosives of Concern (MEC), and/or Material Potentially Presenting an Explosive Hazard (MPPEH) could be encountered. All personnel conducting operations under this SOP must read and understand applicable parts of references listed in Section 9.1 below prior to commencing any work described within this SOP. Other documents supporting this SOP may include project-specific Work Plan (WP) and Site Health and Safety Plan (HASP) when prepared for the purpose of accomplishing work that contain a Munitions and Explosives of Concern (MEC), [MEC includes Unexploded Ordnance (UXO), Discarded Military Munitions (DMM) and Munitions Constituents (MC)].

2.0 PURPOSE

This SOP applies to all operations involving MEC support during field operations at Naval Surface Warfare Center (NSWC), Crane, IN where Tetra Tech NUS (TtNUS) personnel are present. It provides procedural requirements for any activity involving MEC, as well as detailed procedures for the location, identification, documentation, and emergency response actions pertaining to MEC activities.

3.0 APPLICABILITY

This SOP applies to persons who may participate in planned activities to be conducted at NSWC Crane where TtNUS is performing work that involve some MEC component. Compliance with the content of this SOP is mandatory for all Tetra Tech personnel, subcontractors, and visitors to NSWC Crane, IN where MEC activities are in progress.

3.1 UXO Information

The munitions response site (MRSs) that is subject to this SOP is UXO Site 5. It is a landholding of NSWC Crane, and is considered to be an area that potentially contains munitions and explosives of concern (MEC). The Navy therefore requires that all areas of intrusive activity in this MRS to be screened and cleared for potential presence of MEC.

4.0 RESPONSIBILITIES

Project Manager (PM)

Effective implementation of this SOP at the project level will be the ultimate responsibility of the assigned Tetra Tech Project Manager (PM). The PM 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 PM 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 MEC, this will involve ensuring that a suitably qualified and experienced UXO Technician and a Site Health and Safety Officer 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 PM 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 Manager

The TtNUS UXO Manager will ensure all UXO issues are addressed and resolved to include equipment, staffing and administrative requirements. The UXO Manager will provide technical expertise and input into project planning activities and documents such as the project-specific Work Plan and Site Health and Safety Plan. The UXO Manager will provide support off-site throughout the project duration unless requested on site by the PM.

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 PM on all MEC matters, including 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 review documents such as the project-specific Work Plan and Site Health and Safety Plan
- Assessing and clearing worksite areas for MEC concerns prior to the initiation of any other onsite activities
- Participating in the development and conductance of site specific training sessions and daily tailgate meetings to communicate MEC 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 MEC matters

Field Manager

The TtNUS FOL is responsible for coordinating all on-site personnel and for providing technical assistance, when required. The FOL has authority to complete the field work in the most efficient manner while adhering to the requirements of the QAPP Addendum No. 2 and the HASP. The TtNUS FOL will ensure the availability and maintenance of all sampling materials and equipment pertinent to his/her function. The TtNUS FOL is responsible for completing all sampling, field, and chain-of-custody documentation, will assume custody of all samples sent to the confirmation sampling laboratory, and will ensure the proper handling and shipping of samples. The TtNUS FOL will report directly to the TtNUS PM but will have authority to guide field operations to efficiently conclude the scheduled work. Specific TtNUS FOL responsibilities include the following:

- Ensuring that all health and safety requirements unique to the RFA and Phase I RFI are implemented.
- Functioning as the on-site communications link between field staff members, the Site Safety Officer (SSO), NSWC Crane ESM, and TtNUS PM.
- Overseeing the mobilization and demobilization of all field equipment and subcontractors.
- Coordinating and managing the field technical staff.
- Adhering to the work schedules provided by the TtNUS PM.
- Ensuring the proper maintenance of site logbooks, field logbooks, and field recordkeeping.
- Initiating field task modification requests (field change orders) when necessary.
- Identifying and resolving problems in the field, resolving difficulties via consultation with the NSWC Crane ESM, implementing and documenting corrective action procedures, and providing communication between the field team and project management.

See the Site Specific Work Plan/HASP for other duties and responsibilities.

Site Health and Safety Officer (SHSO)

A suitably qualified and experienced health and safety professional will be assigned to 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 activities.
- Conduct initial site-specific health and safety training for all personnel participating in onsite 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 MEC, and minimal health concerns or requirements (e.g., chemical exposures or monitoring) exist.

The duties of the designated TtNUS SSO are detailed in the TtNUS HASP. The SSO has stop-work authority, which can be executed upon the determination of an imminent safety hazard.

CLEAN Health and Safety Manager (HSM)

Provide program oversight including:

- Perform periodic project audits and evaluations to determine the ongoing effectiveness of this SOP to address MEC concerns, and review and evaluate this SOP to determine any revisions that are appropriate.
- Develop and implement appropriate programs to provide processes and procedures for achieving protection of employees' health and safety, and for achieving compliance with the requirements with company policies and programs, and applicable regulatory and contractual requirements.

The HSM will also provide technical program support at the project level through coordination with the SHSO and onsite UXO Technician.

5.0 LOCATION OF OPERATIONS

The NSWC Crane is located in Martin County in south-central Indiana. NSWC Crane is the third largest naval installation in the world encompassing 100 square miles and employing approximately 3,400 Naval employees and 550 Army employees. The installation was originally built to prepare, load, renovate, receive, store, and issue all ammunition, including pyrotechnics and illuminating projectiles, and to act as a principal source of supply at a most critical time - the early days of World War II; however, due to its expertise in engineering and electronics, NSWC Crane today is a multi-mission, multi-service product center with both fleet support and industrial base missions.

NSWC Crane covers roughly the northern third of Martin County with a small overlap into Greene County to the north and an even smaller overlap into Lawrence County on the east. The approximately 63,000-acre base is approximately 37 miles southwest of Bloomington, Indiana, and approximately 70 miles southwest of Indianapolis, Indiana.

Background Information

NSWC Crane began in 1941 as the Naval Ammunition Depot. Since its inception, NSWC Crane has been under four different commands. The Ammunition Quality Evaluation Unit was added in 1947, which led NSWC Crane into expanded activities, capabilities, and expertise. In 1975, the installation name changed to Naval Weapons Support Center, Crane to reflect its true function of weapons support. The Crane Army

Ammunition Activity (CAAA) was established in 1977 to assume the loading, assembly and storage of ammunition at the installation. After merging with the Naval Ordnance Station at Louisville, Kentucky (KY), in 1992, the installation received its current name: Crane Division, Naval Surface Warfare Center, and continues to be a recognized leader in highly technical product lines servicing the Navy.

UXO Site 5 (Building 2044 (B-2044) Drop Tower/Test Rail Site) Description

UXO Site 5 is located adjacent to Highway 304 and consists of two areas, the drop tower and test rail. The test area is located east of Building 2044 and is located in an area that is maintained by periodic mowing. UXO 5 is bordered to the north, south, and east by woods and to the west by Highway 45. The actual test site currently consists of a drop tower approximately 100 feet tall with an 8- by 8-foot concrete pad on the southwestern side of the base of the tower. Periodically, 20-mm cartridges were dropped from the top of the tower onto the concrete pad to verify that cartridges would not detonate if mishandled. Therefore it is assumed that a relatively small proportion (i.e., fewer than 1 percent) of the 20-mm cartridges would have actually detonated. Approximately 75 feet southeast of the drop tower is a test rail approximately 97 feet in length from east and west. The test rail was used to test cartridge actuated devices (CADs) and propellant actuated devices (PADs) in ejection seats. CADs and PADs are items which release precise explosive or propellant energy to perform controlled work functions in a variety of applications. The site was used from January 1951 through December 1983, with average actual site usage reported to be approximately 9 days per month.

An MRP preliminary assessment (PA) has been conducted, and no evidence was observed indicating munitions and explosives of concern (MEC) on the ground surface at this site. During the testing periods, it was Navy policy to remove all retrievable MEC after testing. Subsurface MEC and surface/subsurface MEC have not been investigated; however, based on the operations conducted at the site, no surface or subsurface MEC is expected. Munitions constituents (MCs) that may be present would consist of trace explosives and metals near the drop tower, test rail, and possibly in the nearby grassy drainage-way. Based on the known testing operations conducted at the site, the MCs, if present would be primarily in the surface soil.

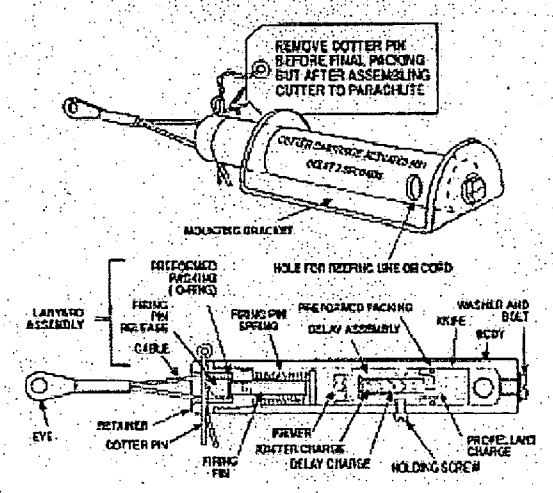
The Final Preliminary Assessment indicates that black powder and black powder plus carboxy terminated polybutadiene (CTPB), N-53 were the primary MC of CADs and PADs tested at UXO 5 (Malcolm Pirnie, Inc, 2005). Though not explicitly identified as such, the CTPB appears to have been a binder that was added to the mixture to slow the combustion for a controlled burning of the MC. In this capacity its purpose would also have been to provide a uniform matrix throughout which the black powder was dispersed. A CAD such as the M21 reefing line cutter is a cartridge actuated, one shot, disposable mechanical unit with the cartridge sealed internally. Major components consist of a case, firing pin assembly, lanyard, knife assembly, delay assembly and cotter pin. A PAD is used to provide stabilization and improve trajectories of the seat escape system. Airborne testing of PADs and CADs was conducted on the rail.

A 20mm cartridge is an assembly of cartridge case, primer, a quantity of propellant within the cartridge case, and a bullet or projectile. The fragmentation zone has a radius of 163-meters, for a 20mm cartridge containing less than one gram of explosives. The fragmentation radius is based on the minimal fragmentation distance for up to a half pound of explosives. MEC and MC are not expected in the fragmentation radius. The fragmentation radius is indicated on Map 5.2-2.

Based on known frequency of usage, types of items, and likely volume of items tested, heavy deposition of MC contamination is not expected. Actual concentrations (if any) of MC remaining at the site are unknown.

Ordnance Technical Data Sheet
M21, Cartridge Actuated Cutter

CUTTER, CARTRIDGE ACTUATED: M21 (M500)



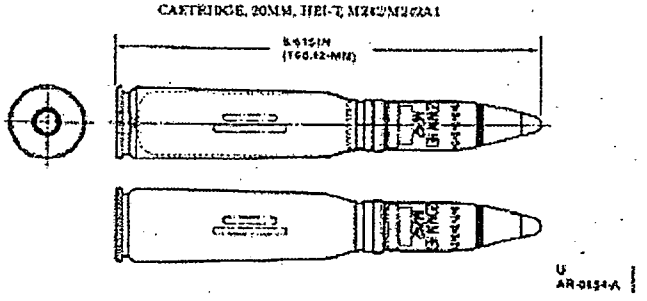
Nomenclature:	M21, Cartridge Actuated Cutter
Ordnance Family:	Cartridge Actuated Device (CAD)
DODIC:	M500
Filler:	Bullseye black powder
Filler weight:	0.0040 lb (28 grains)
Item weight:	.7 lb
Diameter:	0.75 in. (1.905 cm)
Length:	6.0 in. (15.24 cm)
Fuze:	Percussion

Usage: The M21 reefing line cutter is a cartridge actuated, one shot, disposable mechanical unit with the cartridge sealed internally. Major components consist of case, firing pin assembly, lanyard, knife assembly delay assembly and cotter pin.

Description: The M21 reefing line cutter is a cartridge actuated, one shot, disposable mechanical unit with the cartridge sealed internally. Major components consist of case, firing pin assembly, lanyard, knife assembly, delay assembly and cotter pin.

Reference: TM 43-0001-39, TECHNICAL MANUAL ARMY DATA SHEETS FOR CARTRIDGES, CARTRIDGE ACTUATED DEVICES AND PROPELLANT ACTUATED DEVICES (FSC 1377), December 1991

Ordnance Technical Data Sheet
20 mm Cartridge



Nomenclature: Cartridge, 20 MM, HEI-T
Ordnance Family: Pyrotechnic/Smoke
DODIC: 1305-A659
Filler: Red phosphorus composition
Filler weight:
Item weight: 5.806 kg (12.8 Lbs)
Diameter: 124.5 mm (4.9in)
Length: 6.615 in.
Fuze: Saltwater activated battery

Usage: Mark 58 is designed for use in air/sea rescue operations, as a target marker, and as a surface wind indicator. It features day or night operation, and can be launched by hand or from aircraft.

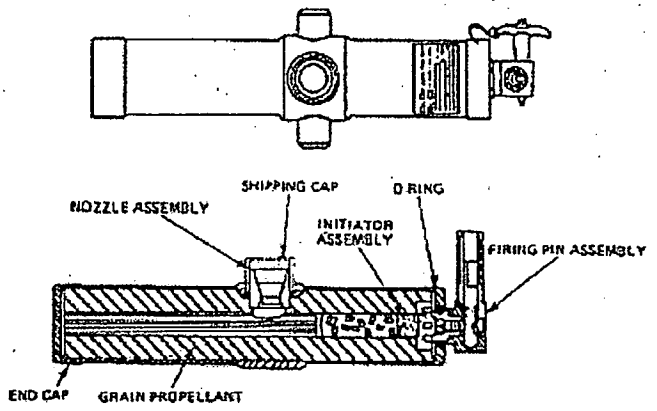
Description: Consists of a cylindrical tin can approximately 21.78 inches long and 5.03 inches in diameter. The can contains two pyrotechnic candles of a red phosphorus composition. The ignition end of the marker has three holes-two for smoke and flame emission and one for water to enter the Mk 72 Mod 1 seawater-activated battery. Adhesive foil disks hermetically seal the two emission holes. A reinforced adhesive foil strip with a rectangular pull ring hermetically seals the battery cavity hole

Reference: ORDATA Online, NAVSEA SW0050-AB-MMA-010, NAVAIR 11-15-7

Ordnance Technical Data Sheet

Rocket Motor

ROCKET MOTOR: (M447)

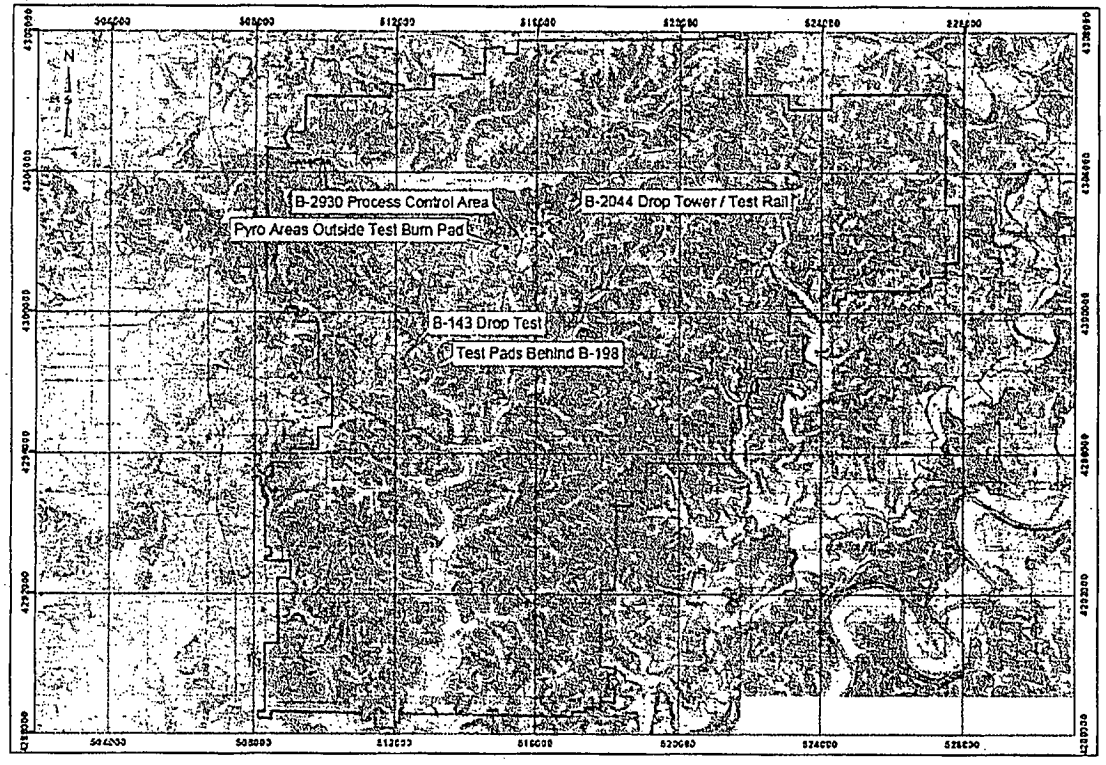


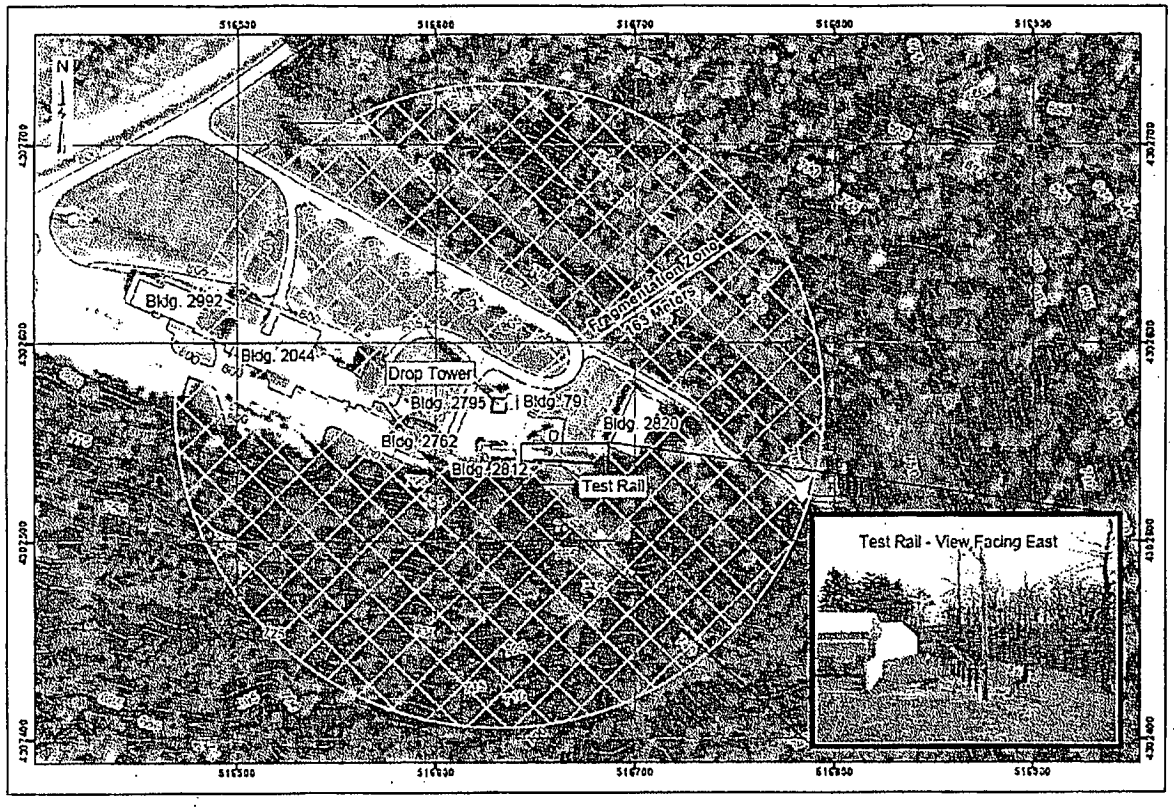
Nomenclature:	Rocket Motor
Ordnance Family:	Propellant Actuated Device (PAD)
DODIC:	M447
Filler:	High-density carboxy terminated polybutadiene, N-53
Filler weight:	2.56 lb (17920 grains)
Item weight:	6.36 lb (2.9 kg)
Diameter:	4.202 in. (10.67 cm)
Length:	13.3 in. (33.78 cm)
Fuze:	

Usage: To provide stabilization and improved trajectories of the seat escape system.

Description: The M119 tip-off compensation rocket motor is designed for use in the Grumman OV-1 Mohawk airplane on the MD-S5 seat system. The unit provides sufficient energy to stabilize the ejection seat in the correct attitude to insure drogue chute deployment in the optimum direction.

Reference: TM 43-0001-39, TECHNICAL MANUAL ARMY DATA SHEETS FOR CARTRIDGES, CARTRIDGE ACTUATED DEVICES AND PROPELLANT ACTUATED DEVICES (FSC 1377), December 1991


B-2930 Process Control Area
B-2044 Drop Tower / Test Rail
Pyro Areas Outside Test Burn Pad
B-143 Drop Test
Test Pads Behind B-198
N
Preliminary Assessment
NSWC Crane, Indiana
MALCOLM PIRNIE
Map 2.1-1
Area Location Map
Legend
Installation Boundary
Ranges
1,500 0 1,500 3,000 4,500 Meters
Data Source: USGS, 7.5 Minute Series
Topographic Survey Map
Owensburg, IN, 1976
Indian Springs, IN, 1979
Scotland, IN, 1979
Williams, IN, 1979
Koleen, IN, 1979
Loogootee, IN, 1976
Odon, IN, 1976
Cornelia, IN, 1963
Coordinate System: UTM Zone 16N
Datum: NAD83
Units: Meters
Contract: N62472-02-D-1300
Edition: Final Preliminary Assessment
Date: April 2005
NSWC Crane



Preliminary Assessment
NSWC Crane, Indiana

MALCOLM PIRNIE

Map 5.2-2
Range/Site Details
B-2044 Drop Tower/Test Rail

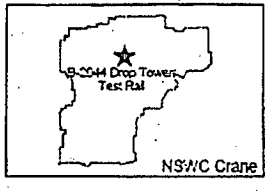
Legend

- Installation Boundary
- Structures
- Roads
- Contours
- Fragmentation Zone
- B-2044 Drop Tower/Test Rail

Data Source: NSWC Crane, Orthophoto, 1995
NSWC Crane, CADD Data, 2003

Coordinate System: UTM Zone 16N
Datum: NAD 83
Units: Meters

Contract: N62472-02-D-1300
Section: Final Preliminary Assessment
Date: April 2005



6.0 UXO TECHNICIAN PERSONNEL QUALIFICATIONS AND REQUIREMENTS

6.1 Personnel Qualifications: Qualifications of those personnel actively involved in MEC operations shall meet or exceed the minimum qualification standards as stated in Table 4-1, DDESB TP 18 dated 20 December 2004.

a. UXO personnel shall be graduates of a military EOD School of the United States, Canada, Great Britain, Germany, or Australia. They may also be graduates of a formal training course of instruction as stated in chapter 3, DDESB TP-18 or EOD assistant courses

b. The UXO Technician for this operation will be a Tech II or higher. The UXO Technician II will have prior military EOD experience or 3 years UXO/EOD experience after formal training.

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 MEC 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 MEC.

b. One UXO-qualified technician will be present at the site during all activities to provide MEC support in the event their services are required.

7.0 OTHER PERSONNEL QUALIFICATIONS AND REQUIREMENTS

The activities to be conducted under this contract have the following training and medical surveillance requirements

- All personnel will be trained in accordance with the provisions of 29 CFR 1910.120 (e).
- All personnel will be medically qualified to perform identified duties in accordance with 29 CFR 1910.120 (f).
- Equipment operators will be knowledgeable and proficient in the equipment they will operate. Documentation of such experience or the SHSO assessment will be used to validate competency.
- Work will not be permitted unless at least two personnel are present in the work area.

See the site HASP for additional information concerning training and medical qualifications and requirements.

8.0 HAZARD COMMUNICATION

The properties and configurations of specific explosive materials are not addressed in this SOP. This SOP must be maintained onsite along with these project-specific documents to aid in appropriate communication and implementation activities. Materials 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 Tetra Tech Command Post for any chemical substances brought to the project site by Tetra Tech and Tetra Tech subcontractor personnel. 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. The requirements for the completion and implementation of the Site Specific Hazard Communication Program is provided in greater detail in Section 5.0 of the TtNUS Health and Safety Guidance Manual.

9.0 SAFETY REQUIREMENTS

9.1 Referenced Safety Requirements: The safety requirements that apply to the MEC operations covered under this SOP are derived from:

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

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.* Available online at: http://www.usace.army.mil/inet/usace-docs/eng-regs/er385-1-92/entire.pdf

c. US Army Corps of Engineers Engineering Pamphlet (EP) 385-1-95a, *Basic Safety Concepts and Consideration for OE Operations.* Available online at: http://www.usace.army.mil/inet/usace-docs/eng-pamphlets/ep385-1-95a/entire.pdf

d. US Army Corps of Engineers Engineering Manual (EM) 385-1-1, *Safety and Health Requirements.* Available on line at: http://www.usace.army.mil/publications/eng-manuals/em385-1-1/toc.htm.

e. Department of Defense Explosive Safety Board (DDESB) TP 18, Minimum Qualifications for Unexploded Ordnance (UXO) Technicians and Personnel. Available on line at: http://www.ddesb.pentagon.mil/documents.html

f. US Army Corps of Engineers Engineering Pamphlet (EP) 1110-1-18, *Ordnance and Explosive (OE) Response.* Available on line at: http://www.usace.army.mil/inet/usace-docs/eng-pamphlets/ep1110-1-18/entire.pdf

g. US Army Corps of Engineers Engineering Pamphlet (EP) 75-1-2, *Unexploded Ordnance Support for Hazardous, Toxic and Radioactive Waste and Construction Activities.* Available on line at: http://www.usace.army.mil/inet/usace-docs/eng-pamphlets/ep75-1-2/entire.pdf

h. US Army Corps of Engineers Engineering Pamphlet (EP) 75-1-3, *Recovered Chemical Warfare Material (RCWM) Response Process.* Available on line at: http://www.usace.army.mil/usace-docs/eng-pamphlets/ep75-1-3/entire.pdf

i. US Navy NAVSEA OP-5, *Ammunition and Explosive Safety Ashore.*

j. Technical Manual 60A-1-1-31, *Explosive Ordnance Disposal Procedures, General Information on EOD Disposal Procedures.*

k. Tetra Tech NUS, Inc. Health and Safety Program elements.

9.2 Site-Specific Safety Requirements:

a. All site operations will be suspended if any site worker encounters an item of suspected MEC. Site work will remain suspended until the item is inspected and cleared or marked for avoidance 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. Buddy System –
Escort/Avoidance - A minimum of two personnel, at least one a UXO-qualified technician will be present at all sites where MEC is suspected or present.

d. Standard work practices as outlined in Site-specific Health and Safety Plan and/or Work Plan will be observed.

9.3 Inherent MEC Hazards:

MEC 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 MEC 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 inherent hazards to consider are:

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

10.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Task-specific PPE will be identified in site HASP. Typical PPE for project sites where the principle concern is for MEC will include the items listed below. Items marked with an asterisk (*) will be available and will be used as specified in the site HASP and/or as determined by the Tetra Tech 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/Standard Field Attire; (protective coveralls*, if the work site requires to protect clothing or if contamination is discovered on site during the excavation)

d. Gloves (type to be specified for each project task in the site HASP and/or by the site Health and Safety Officer)

e. Respiratory protection equipment* (29CFR1910.134) – Not anticipated

f. Hearing protection* - Plugs or muffs are recommended in the site HASP activities within 25-feet of heavy equipment operation. Hearing protection employed will have a minimum Noise Reduction Rating of 25 dBA.

g. Hard hats*

11.0 EMERGENCY RESPONSE AND CONTINGENCY PLANS

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 Site Health and Safety Plan and will be in accordance with either 29 CFR 1910.38(a) or 1910.120(l). Tetra Tech will utilize the Installations Base Fire Protection and Emergency Services in emergencies or potential emergencies.

11.1 Emergency Contacts: The identification of (and means to communicate with) 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 their locations/driving directions/phone numbers.

At a minimum, the names and means of communication (phone number, radio frequency, etc.) of the following parties must be included:

EMERGENCY REFERENCE
NSWC CRANE, INDIANA

AGENCY	TELEPHONE
Base Emergency Number (Fire Department, Base Security, Ambulance)	854-3300 or 854-1333
Base Environmental Office	(812) 854-3114
Bedford Ambulance	(812) 279-6545
Bloomington Hospital (Bloomington, IN)	(812) 336-9515
Hospital, Bedford Medical Center (Bedford, IN)	(812) 275-1200
Poison Control Center	1-800-222-1222
National Response Center	1-800-424-8802
Base Contact, Thomas Brent	(812) 854-6160
Project Manager, Ralph Basinski	(412) 921-8308
UXO Manager, Ralph Brooks	(770) 413-0965 ext 231
TtNUS Crane Field Office Building 3245	(812) 854-0280
Field Operations Leader, James Goerdt On-Site Off-Site	 (412) 443-0244 (412) 921-8425
TtNUS Office, Pittsburgh	(412) 921-7090
CLEAN Health and Safety Manager, Matthew M. Soltis, CIH, CSP	(412) 921-8912
Project Health and Safety Officer, Eric Samuels	(770) 413-0965 ext 232

Note: Most phones require the number to be preceded by 991 (i.e., 991-812-854-0280) or by "99" (if 812 is left off) (i.e., 99-854-0280)

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

a. Pre-Planning – Upon arrival at the site/installation, the Tetra Tech Field Manager and/or the SHSO 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 precede 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 expected to be small enough that accounting for personnel will not be effectively accomplished and maintained via visual head counting. If there is a larger field team, 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 – Tetra Tech 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 at least one 5 pound Class ABC fire extinguisher.

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 Tetra Tech managing employee onsite (PM, Site Manager, Site Supervisor, Field Manager). 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 site HASP.

(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 Plan and Health and Safety Plan. The site HASP will specify actions that are to be taken in the event that monitoring instrument readings indicate that detected concentrations may represent a health threat to onsite workers.

g. Liquid Release Monitoring – As part of this field effort the equipment and sampling tools will require decontamination. Decontamination fluids will be generated and accumulated. All field team members will be responsible for observing and reporting any liquid chemical releases or conditions that could lead to a release as part of the spill containment program (See Section 11.11 of the site HASP). 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 earthen 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 Tetra Tech Field Manager and/or the SSC 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 affect 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 CLIENT/FACILITY SAFETY POINTS OF CONTACT

The following contacts will be the safety POCs for this MEC project. Communication and coordination with these positions will be implemented and maintained throughout the project activities (from pre-field operations planning through to project close-out).

Base Environmental Office for NSWC Crane .....(812) 845-3114

13.0 TOOLS AND EQUIPMENT

Tools and equipment necessary to safely and effectively accomplish the objectives of this project which are required for MEC operations are presented below:

13.1 Personal Protective Equipment

See Section 10.0

13.2 UXO Support Equipment

a. Schonstedt Magnetic Locators (GA-52Cx or equivalent passive instrument) will be used for anomaly detection MEC activities. The GA-52Cx detects the magnetic field of any ferromagnetic object. The instrument responds to the difference in the magnetic field between two sensors. The locator provides an audio signal only. The magnetic locator does not need to be calibrated. To ensure it is operating properly, the operator turns on the instrument and slowly moves the locator towards ferrous metal. As the probe advances toward the target, the audio signal will increase. Normal setting is 2, setting the instrument to 3 or 4 will make it more sensitive, setting the instrument to 1 will make it less sensitive. The instrument can be used in shallow water. The instrument will not detect copper, brass or aluminum munitions (See Operating Manual for additional information).

b. Schonstedt MG-230 Magnetic Gradiometer (Down-Hole Magnetometer or equivalent) will be used to conduct down hole anomaly checks. The MG-230 detects the magnetic field of any ferromagnetic object as it is lowered into a borehole. The instrument responds to the difference in the magnetic field between two sensors. The response consists of a change in the idling frequency of the signal from the speaker, and a change on the digital readout. The MG-230 does not need to be calibrated. To ensure it is operating properly, the operator turns on the instrument and slowly moves the probe towards ferrous metal. As the probe advances toward the target, the audio signal will increase and the milligauss display will also increase. Normal setting is 200 on the Range Selector Switch. The instrument can be used in up to 50 feet of water. The instrument will not detect copper, brass or aluminum munitions. The instrument can be used for down-hole monitoring during drilling or Geo-Probe operations, underwater location and/or recovery operations, and excavation or trenching operations. A lead weight may be attached to the probe when lowering the detector into water. Do not use ferrous metal objects. If there is a threat of the

bore hole caving-in, use 2 inch or larger PVC pipe in the hole prior to lower in the probe. This will insure the probe does not become buried, which would require hand excavation to remove the probe (See Operating Manual for additional information).

c. Survey Equipment (transit, tripod, level, etc.) as required

d. Marking tape, pin flags, stakes, utility spray paints, etc.

13.3 Decontamination Equipment

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

13.4 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 type of waste to be generated, the environmental concerns, and the handling and disposition are summarized below:

Personal Protective Equipment (PPE) will be rinsed of visible soils, bagged and disposed of as general refuse in a dumpster identified by the facility contact.

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

15.0 MEC 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. Surface and subsurface sampling

c. Other miscellaneous operations

15.2 Initial Entry

Initial entry into suspect areas requires a UXO-qualified technician with a magnetometer (GA-52Cx or equivalent) 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 MEC contamination prior to any work commencing. All personnel will stay within the cleared areas and not venture out into areas not screened. No intrusive work will occur during initial entry activities. If a proposed boring or sample location is found to have magnetic anomalies, the UXO-qualified technician will step out from the originally proposed location until a clear area is located. If appropriate and acceptable, the alternate boring/sampling location will be designated.

15.3 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 MEC. 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. A magnetometer can be used for clearing subsurface samples location not greater than 2 foot. In areas with anomaly interference nearby, the UXO technician may reduce this to a 1 foot clearance. If excavation of a borehole or hand auguring hole is to exceed this depth, a MG-230 Magnetic Gradiometer (down hole magnetometer) shall be utilized with readings taken at two foot 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.

15.4 Miscellaneous Operations – A UXO Technician will be present for any and all field activities that are in areas suspected to contain MEC. These activities include, but are not limited to survey operations, staking of sample locations, and laying out of grids. The MEC 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, DMM, MC and related scrap will not be covered in this SOP. Demilitarization is not authorized as part of this WP and/or the site HASP.

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 Activity Hazard Analysis 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 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
- 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 Tetra Tech contracts are typically unclassified and normal security measures apply in accordance with above references (See Section 9.1 above). Tetra Tech 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 MEC as most installations have established policies and procedures on reporting and securing recovered items that are MEC.

Tetra Tech will maintain security for all operational areas. The Tetra Tech PM will insure that all appropriate security procedures required by the installation are incorporated into the site work plan and/or the HASP where and as applicable.

ATTACHMENT V

UTILITY LOCATING AND EXCAVATION CLEARANCE STANDARD OPERATING PROCEDURE

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1.0 PURPOSE

Utilities such as electric service lines, natural or propane gas lines, water and sewage lines, telecommunications, and steam lines are very often in the immediate vicinity of work locations. Contact with underground or overhead utilities can have serious consequences including employee injury/fatality, property and equipment damage, substantial financial impacts, and loss of utility service to users.

The purpose of this procedure is to provide minimum requirements and technical guidelines regarding the appropriate procedures to be followed when performing subsurface and overhead utility locating services. It is the policy of Tetra Tech NUS, Inc. (TtNUS) to provide a safe and healthful work environment for the protection of our employees. The purpose of this Standard Operating Procedure (SOP) is to aid in achieving the objectives of this policy, to present the acceptable procedures pertaining to utility locating and excavation clearance activities, and to present requirements and restrictions relevant to these types of activities. This SOP must be reviewed by any employee potentially involved with underground or overhead utility locating and avoidance activities.

2.0 SCOPE

This procedure applies to all TtNUS field activities where there may be potential contact with underground or overhead utilities. This procedure provides a description of the principles of operation, instrumentation, applicability, and implementability of typical methods used to determine the presence and avoidance of contact with utility services. This procedure is intended to assist with work planning and scheduling, resource planning, field implementation, and subcontractor procurement. Utility locating and excavation clearance requires site-specific information prior to the initiation of any such activities on a specific project. This SOP is not intended to provide a detailed description of methodology and instrument operation. Specialized expertise during both planning and execution of several of the methods presented may also be required.

3.0 GLOSSARY

Electromagnetic Induction (EMI) Survey - A geophysical exploration method whereby electromagnetic fields are induced in the ground and the resultant secondary electromagnetic fields are detected as a measure of ground conductivity.

Magnetometer – A device used for precise and sensitive measurements of magnetic fields.

Magnetic Survey – A geophysical survey method that depends on detection of magnetic anomalies caused by the presence of buried ferromagnetic objects.

Metal Detection – A geophysical survey method that is based on electromagnetic coupling caused by underground conductive objects.

Vertical Gradiometer – A magnetometer equipped with two sensors that are vertically separated by a fixed distance. It is best suited to map near surface features and is less susceptible to deep geologic features.

Ground Penetrating Radar – Ground Penetrating Radar (GPR) involves specialized radar equipment whereby a signal is sent into the ground via a transmitter. Some portion of the signal will be reflected from the subsurface material, which is then recorded with a receiver and electronically converted into a graphic picture.

4.0 RESPONSIBILITIES

Project Manager (PM)/Task Order Manager (TOM) - Responsible for ensuring that all field activities are conducted in accordance with this procedure.

Site Manager (SM)/Field Operations Leader (FOL) - Responsible for the onsite verification that all field activities are performed in compliance with approved SOPs or as otherwise directed by the approved project plan(s).

Site Health & Safety Officer (SHSO) – Responsible to provide technical assistance and verify full compliance with this SOP. The SHSO is also responsible for reporting any deficiencies to the Corporate Health and Safety Manager (HSM) and to the PM/TOM.

Health & Safety Manager (HSM) – Responsible for preparing, implementing, and modifying corporate health and safety policy and this SOP.

Site Personnel – Responsible for performing their work activities in accordance with this SOP and the TtNUS Health and Safety Policy.

5.0 PROCEDURES

This procedure addresses the requirements and technical procedures that must be performed to minimize the potential for contact with underground and overhead utility services. These procedures are addressed individually from a buried and overhead standpoint.

5.1 Buried Utilities

Buried utilities present a heightened concern because their location is not typically obvious by visual observation, and it is common that their presence and/or location is unknown or incorrectly known on client properties. This procedure must be followed prior to beginning any subsurface probing or excavation that might potentially be in the vicinity of underground utility services. In addition, the Utility Clearance Form (Attachment 3) must be completed for every location or cluster of locations where intrusive activities will occur.

Where the positive identification and de-energizing of underground utilities cannot be obtained and confirmed using the following steps, the PM/TOM is responsible for arranging for the procurement of a qualified, experienced, utility locating subcontractor who will accomplish the utility location and demarcation duties specified herein.

1. A comprehensive review must be made of any available property maps, blue lines, or as-builts prior to site activities. Interviews with local personnel familiar with the area should be performed to provide additional information concerning the location of potential underground utilities. Information regarding utility locations shall be added to project maps upon completion of this exercise.

2. A visual site inspection must be performed to compare the site plan information to actual field conditions. Any findings must be documented and the site plan/maps revised. The area(s) of proposed excavation or other subsurface activities must be marked at the site in white paint or pin flags to identify those locations of the proposed intrusive activities. The site inspection should focus on locating surface indications of potential underground utilities. Items of interest include the presence of nearby area lights, telephone service, drainage grates, fire hydrants, electrical service vaults/panels, asphalt/concrete scares and patches, and topographical depressions. Note the location of any emergency shut off switches. Any additional information regarding utility

locations shall be added to project maps upon completion of this exercise and returned to the PM/TOM.

3. If the planned work is to be conducted on private property (e.g., military installations, manufacturing facilities, etc.) the FOL must identify and contact appropriate facility personnel (e.g., public works or facility engineering) before any intrusive work begins to inquire about (and comply with) property owner requirements. It is important to note that private property owners may require several days to several weeks advance notice prior to locating utilities.

4. If the work location is on public property, the state agency that performs utility clearances must be notified (see Attachment 1). State "one-call" services must be notified prior to commencing fieldwork per their requirements. Most one-call services require, by law, 48- to 72-hour advance notice prior to beginning any excavation. Such services typically assign a "ticket" number to the particular site. This ticket number must be recorded for future reference and is valid for a specific period of time, but may be extended by contacting the service again. The utility service will notify utility representatives who then mark their respective lines within the specified time frame. It should be noted that most military installations own their own utilities but may lease service and maintenance from area providers. Given this situation, "one call" systems may still be required to provide location services on military installations.

5. Utilities must be identified and their locations plainly marked using pin flags, spray paint, or other accepted means. The location of all utilities must be noted on a field sketch for future inclusion on project maps. Utility locations are to be identified using the following industry-standard color code scheme, unless the property owner or utility locator service uses a different color code:

white	excavation/subsurface investigation location
red	electrical
yellow	gas, oil, steam
orange	telephone, communications
blue	water, irrigation, slurry
green	sewer, drain

6. Where utility locations are not confirmed with a high degree of confidence through drawings, schematics, location services, etc., the work area must be thoroughly investigated prior to beginning the excavation. In these situations, utilities must be identified using safe and effective methods such as passive and intrusive surveys, or the use of non-conductive hand tools. Also, in situations where such hand tools are used, they should always be used in conjunction with suitable detection equipment, such as the items described in Section 6.0 of this SOP. Each method has advantages and disadvantages including complexity, applicability, and price. It also should be noted that in some states, initial excavation is required by hand to a specified depth.

7. At each location where trenching or excavating will occur using a backhoe or other heavy equipment, and where utility identifications and locations cannot be confirmed prior to groundbreaking, the soil must be probed using a device such as a tile probe which is made of non-conductive material such as fiberglass. If these efforts are not successful in clearing the excavation area of suspect utilities, hand shoveling must be performed for the perimeter of the intended excavation.

8. All utilities uncovered or undermined during excavation must be structurally supported to prevent potential damage. Unless necessary as an emergency corrective measure, TtNUS shall not make any repairs or modifications to existing utility lines without prior permission of the utility owner, property owner, and Corporate HSM. All repairs require that the line be locked-out/tagged-out prior to work.

5.2 Overhead Power Lines

If it is necessary to work within the minimum clearance distance of an overhead power line, the overhead line must be de-energized and grounded, or re-routed by the utility company or a registered electrician. If protective measures such as guarding, isolating, or insulating are provided, these precautions must be adequate to prevent employees from contacting such lines directly with any part of their body or indirectly though conductive materials, tools, or equipment.

The following table provides the required minimum clearances for working in proximity to overhead power lines.

Nominal Voltage	Minimum Clearance
0 -50 kV	10 feet, or one mast length; whichever is greater
50+ kV	10 feet plus 4 inches for every 10 kV over 50 kV or 1.5 mast lengths; whichever is greater

6.0 UNDERGROUND LOCATING TECHNIQUES

A variety of supplemental utility locating approaches are available and can be applied when additional assurance is needed. The selection of the appropriate method(s) to employ is site-specific and should be tailored to the anticipated conditions, site and project constraints, and personnel capabilities.

6.1 Geophysical Methods

Geophysical methods include electromagnetic induction, magnetics, and ground penetrating radar. Additional details concerning the design and implementation of electromagnetic induction, magnetics, and ground penetrating radar surveys can be found in one or more of the TtNUS SOPs included in the References (Section 8.0).

Electromagnetic Induction

Electromagnetic Induction (EMI) line locators operate either by locating a background signal or by locating a signal introduced into the utility line using a transmitter. A utility line acts like a radio antenna, producing electrons, which can be picked up with a radiofrequency receiver. Electrical current carrying conductors have a 60HZ signal associated with them. This signal occurs in all power lines regardless of voltage. Utilities in close proximity to power lines or used as grounds may also have a 60HZ signal, which can be picked up with an EM receiver. A typical example of this type of geophysical equipment is an EM-61.

EMI locators specifically designed for utility locating use a special signal that is either indirectly induced onto a utility line by placing the transmitter above the line or directly induced using an induction clamp. The clamp induces a signal on the specific utility and is the preferred method of tracing since there is little chance of the resulting signals being interfered with. A good example of this type of equipment is the Schonstedt® MAC-51B locator. The MAC-51B performs inductively traced surveys, simple magnetic locating, and traced nonmetallic surveys.

When access can be gained inside a conduit to be traced, a flexible insulated trace wire can be used. This is very useful for non-metallic conduits but is limited by the availability of gaining access inside the pipe.

Magnetics

Magnetic locators operate by detecting the relative amounts of buried ferrous metal. They are incapable of locating or identifying nonferrous utility lines but can be very useful for locating underground storage tanks (UST's), steel utility lines, and buried electrical lines. A typical example of this type of equipment is the Schonstedt® GA-52Cx locator. The GA-52Cx is capable of locating 4-inch steel pipe up to 8 feet deep.

Non-ferrous lines are often located by using a typical plumbing tool (snake) fed through the line. A signal is then introduced to the snake that is then traced.

Ground Penetrating Radar

Ground Penetrating Radar (GPR) involves specialized radar equipment whereby a signal is sent into the ground via a transmitter. Some portion of the signal will be reflected from the subsurface material, which is then recorded with a receiver and electronically converted into a graphic picture. In general, an object which is harder than the surrounding soil will reflect a stronger signal. Utilities, tunnels, UST's, and footings will reflect a stronger signal than the surrounding soil. Although this surface detection method may determine the location of a utility, this method does not specifically identify utilities (i.e., water vs. gas, electrical vs. telephone); hence, verification may be necessary using other methods. This method is somewhat limited when used in areas with clay soil types or with a high water table.

6.2 Passive Detection Surveys

Acoustic Surveys

Acoustic location methods are generally most applicable to waterlines or gas lines. A highly sensitive Acoustic Receiver listens for background sounds of water flowing (at joints, leaks, etc.) or to sounds introduced into the water main using a transducer. Acoustics may also be applicable to determine the location of plastic gas lines.

Thermal Imaging

Thermal (i.e., infrared) imaging is a passive method for detecting the heat emitted by an object. Electronics in the infrared camera convert subtle heat differentials into a visual image on the viewfinder or a monitor. The operator does not look for an exact temperature; rather they look for heat anomalies (either elevated or suppressed temperatures) characteristic of a potential utility line.

The thermal fingerprint of underground utilities results from differences in temperature between the atmosphere and the fluid present in a pipe or the heat generated by electrical resistance. In addition, infrared scanners may be capable of detecting differences in the compaction, temperature and moisture content of underground utility trenches. High-performance thermal imagery can detect temperature differences to hundredths of a degree.

6.3 Intrusive Detection Surveys

Vacuum Excavation

Vacuum excavation is used to physically expose utility services. The process involves removing the surface material over approximately a 1' x 1' area at the site location. The air-vacuum process proceeds with the simultaneous action of compressed air-jets to loosen soil and vacuum extraction of the resulting

debris. This process ensures the integrity of the utility line during the excavation process, as no hammers, blades, or heavy mechanical equipment comes into contact with the utility line, eliminating the risk of damage to utilities. The process continues until the utility is uncovered. Vacuum excavation can be used at the proposed site location to excavate below the "utility window" which is usually 8 feet.

Hand Excavation

When the identification and location of underground utilities cannot be positively confirmed through document reviews and/or other methods, borings and excavations may be cleared via the use of non-conductive hand tools. This should always be done in conjunction with the use of detection equipment. This would be required for all locations where there is a potential to impact buried utilities. The minimum hand-excavation depth that must be reached is to be determined considering the geographical location of the work site. This approach recognizes that the placement of buried utilities is influenced by frost line depths that vary by geographical region. Attachment 2 presents frost line depths for the regions of the contiguous United States. At a minimum, hand excavation depths must be at least to the frost line depth (see Attachment 2) plus two (2) feet, but never less than 4 feet below ground surface (bgs). For hand excavation, the hole created must be reamed large enough to be at least the diameter of the drill rig auger or bit prior to drilling. For soil gas surveys, the survey probe shall be placed as close as possible to the cleared hand excavation. It is important to note that a post-hole digger must not be used in this type of hand excavation activity.

Tile Probe Surveys

For some soil types, site conditions, and excavation requirements, non-conductive tile probes may be used. A tile probe is a "T"-handled rod of varying lengths that can be pushed into the soil to determine if any obstructions exist at that location. Tile probes constructed of fiberglass or other nonconductive material are readily-available from numerous vendors. Tile probes must be performed to the same depth requirements as previously specified. As with other types of hand excavating activities, the use of a non-conductive tile probe, should always be in conjunction with suitable utility locating detection equipment.

7.0 INTRUSIVE ACTIVITIES SUMMARY

The following list summarizes the activities that must be performed prior to beginning subsurface activities:

1. Map and mark all subsurface locations and excavation boundaries using white paint or markers specified by the client or property owner.

2. Notify the property owner and/or client that the locations are marked. At this point, drawings of locations or excavation boundaries shall be provided to the property owner and/or client so they may initiate (if applicable) utility clearance.

   Note: Drawings with confirmed locations should be provided to the property owner and/or client as soon as possible to reduce potential time delays.

3. Notify "One Call" service. If possible, arrange for an appointment to show the One Call representative the surface locations or excavation boundaries in person. This will provide a better location designation to the utilities they represent. You should have additional drawings should you need to provide plot plans to the One Call service.

4. Implement supplemental utility detection techniques as necessary and appropriate to conform utility locations or the absence thereof.

5. Complete Attachment 3, Utility Clearance Form. This form should be completed for each excavation location. In situations where multiple subsurface locations exist within the close proximity of one another, one form may be used for multiple locations provided those locations are noted on the Utility Clearance Form. Upon completion, the Utility Clearance Form and revised/annotated utility location map becomes part of the project file.

8.0 REFERENCES

OSHA Letter of Interpretation, Mr. Joseph Caldwell, Attachment 4
OSHA 29 CFR 1926(b)(2)
OSHA 29 CFR 1926(b)(3)
TtNUS Utility Locating and Clearance Policy
TtNUS SOP GH-3.1; Resistivity and Electromagnetic Induction
TtNUS SOP GH-3.2; Magnetic and Metal Detection Surveys
TtNUS SOP GH-3.4; Ground-penetrating Radar Surveys

ATTACHMENT 1
LISTING OF UNDERGROUND UTILITY CLEARANCE RESOURCES

American Public Works Association
2345 Grand Boulevard, Suite 500, Kansas City, MO 64108-2625
Phone (816) 472-6100 • Fax (816) 472-1610
Web www.apwa.net • E-mail apwa@apwa.net

ONE-CALL SYSTEMS INTERNATIONAL CONDENSED DIRECTORY

Alabama
Alabama One-Call
1-800-292-8525

Alaska
Locate Call Center of Alaska, Inc.
1-800-478-3121

Arizona
Arizona Blue Stake
1-800-782-5348

Arkansas
Arkansas One Call System, Inc.
1-800-482-8998

California
Underground Service Alert North
1-800-227-2600
Underground Service Alert of Southern California
1-800-227-2600

Colorado
Utility Notification Center of Colorado
1-800-922-1987

Connecticut
Call Before You Dig
1-800-922-4455

Delaware
Miss Utility of Delmarva
1-800-282-8555

Florida
Sunshine State One-Call of Florida, Inc.
1-800-432-4770

Georgia
Underground Protection Center, Inc.
1-800-282-7411

Hawaii
Underground Service Alert North
1-800-227-2600

Idaho
Dig Line Inc.
1-800-342-1585
Kootenai County One-Call
1-800-428-4950
Shoshone - Benewah One-Call
1-800-398-3285

Illinois
JULIE, Inc.
1-800-892-0123
Digger (Chicago Utility Alert Network)
312-744-7000

Indiana
Indiana Underground Plant Protection Service
1-800-382-5544

Iowa
Iowa One-Call
1-800-292-8989

Kansas
Kansas One-Call System, Inc.
1-800-344-7233

Kentucky
Kentucky Underground Protection Inc.
1-800-752-6007

Louisiana
Louisiana One Call System, Inc.
1-800-272-3020

Maine
Dig Safe System, Inc.
1-888-344-7233

Maryland
Miss Utility
1-800-257-7777
Miss Utility of Delmarva
1-800-282-8555

Massachusetts
Dig Safe System, Inc.
1-888-344-7233

Michigan
Miss Dig System, Inc.
1-800-482-7171

Minnesota
Gopher State One Call
1-800-252-1166

Mississippi
Mississippi One-Call System, Inc
1-800-227-6477

Missouri
Missouri One-Call System, Inc.
1-800-344-7483

Montana
Utilities Underground Protection Center
1-800-424-5555
Montana One Call Center
1-800-551-8344

Nebraska
Diggers Hotline of Nebraska
1-800-331-5666

Nevada
Underground Service Alert North
1-800-227-2600

New Hampshire
Dig Safe System, Inc.
1-888-344-7233

New Jersey
New Jersey One Call
1-800-272-1000

New Mexico
New Mexico One Call System, Inc.
1-800-321-2537
Las Cruces- Dona Ana Blue Stakes
1-888-526-0400

New York
Dig Safely New York
1-800-962-7962
New York City- Long Island One Call Center
1-800-272-4480

North Carolina
The North Carolina One-Call Center, Inc.
1-800-632-4949

North Dakota
North Dakota One-Call
1-800-795-0555

Ohio
Ohio Utilities Protection Service
1-800-362-2764
Oil & Gas Producers Underground Protect'n Svc
1-800-925-0988

Oklahoma
Call Okie
1-800-522-6543

Oregon
Oregon Utility Notification Center/One Call Concepts
1-800-332-2344

Pennsylvania
Pennsylvania One Call System, Inc.
1-800-242-1776

Rhode Island
Dig Safe System, Inc.
1-888-344-7233

South Carolina
Palmetto Utility Protection Service Inc.
1-888-721-7877

South Dakota
South Dakota One Call
1-800-781-7474

Tennessee
Tennessee One-Call System, Inc.
1-800-351-1111

ATTACHMENT 1 (Continued)

Texas
Texas One Call System
1-800-245-4545
Texas Excavation Safety System, Inc.
1-800-344-8377
Lone Star Notification Center
1-800-669-8344

Utah
Blue Stakes of Utah
1-800-662-4111

Vermont
Dig Safe System, Inc.
1-888-344-7233

Virginia
Miss Utility of Virginia
1-800-552-7001
Miss Utility (Northern Virginia)
1-800-257-7777

Washington
Utilities Underground Location Center
1-800-424-5555
Northwest Utility Notification Center
1-800-553-4344
Inland Empire Utility Coordinating Council
509-456-8000

West Virginia
Miss Utility of West Virginia, Inc.
1-800-245-4848

Wisconsin
Diggers Hotline, Inc.
1-800-242-8511

Wyoming
Wyoming One-Call System, Inc.
1-800-348-1030
Call Before You Dig of Wyoming
1-800-849-2476

District of Columbia
Miss Utility
1-800-257-7777

Alberta
Alberta One-Call Corporation
1-800-242-3447

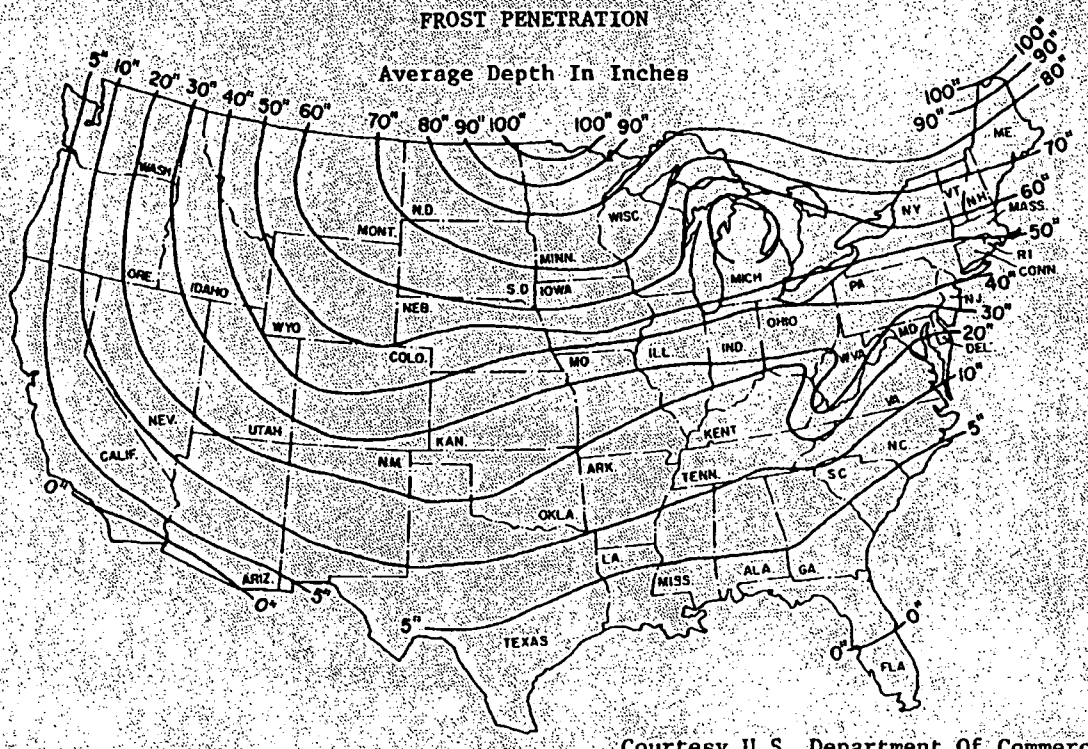
British Columbia
BC One Call
1-800-474-6886

Ontario
Ontario One-Call System
1-800-400-2255

Quebec
Info-Excavation
1-800-663-9228

ATTACHMENT 2

FROST LINE PENETRATION DEPTHS BY GEOGRAPHIC LOCATION



Courtesy U.S. Department Of Commerce

ATTACHMENT 3
UTILITY CLEARANCE FORM

Client: _____ Project Name: _____

Project No.: _____ Completed By: _____

Location Name: _____ Work Date: _____

Excavation Method/Overhead Equipment: _____

1. Underground Utilities — Circle One

a) Review of existing maps? yes no N/A

b) Interview local personnel? yes no N/A

c) Site visit and inspection? yes no N/A

d) Excavation areas marked in the field? yes no N/A

e) Utilities located in the field? yes no N/A

f) Located utilities marked/added to site maps? yes no N/A

g) Client contact notified yes no N/A
Name _____ Telephone: _____ Date: _____

g) State One-Call agency called? yes no N/A
Caller: _____
Ticket Number: _____ Date: _____

h) Geophysical survey performed? yes no N/A
Survey performed by: _____
Method: _____ Date: _____

i) Hand excavation performed (with concurrent use of utility detection device)? yes no N/A
Completed by: _____
Total depth: _____ feet Date: _____

j) Trench/excavation probed? yes no N/A
Probing completed by: _____
Depth/frequency: _____ Date: _____

2. Overhead Utilities — Present Absent

a) Determination of nominal voltage yes no N/A

b) Marked on site maps yes no N/A

c) Necessary to lockout/insulate/re-route yes no N/A

d) Document procedures used to lockout/insulate/re-route yes no N/A

e) Minimum acceptable clearance (SOP Section 5.2): _____

3. Notes:

_____

_____

_____

Approval:

_____ _____
Site Manager/Field Operations Leader Date

c: PM/Project File
Program File

ATTACHMENT 4
OSHA LETTER OF INTERPRETATION

Mr. Joseph Caldwell
Consultant
Governmental Liaison
Pipeline Safety Regulations
211 Wilson Boulevard
Suite 700
Arlington, Virginia 22201

Re: Use of hydro-vacuum or non-conductive hand tools to locate underground utilities.

Dear Mr. Caldwell:

In a letter dated July 7, 2003, we responded to your inquiry of September 18, 2002, regarding the use of hydro-vacuum equipment to locate underground utilities by excavation. After our letter to you was posted on the OSHA website, we received numerous inquiries that make it apparent that aspects of our July 7 letter are being misunderstood. In addition, a number of industry stakeholders, including the National Utility Contractors Association (NUCA), have provided new information regarding equipment that is available for this work.

To clarify these issues, we are withdrawing our July 7 letter and issuing this replacement response to your inquiry.

Question: Section 1926.651 contains several requirements that relate to the safety of employees engaged in excavation work. Specifically, paragraphs (b)(2) and (b)(3) relate in part to the safety of the means used to locate underground utility installations that, if damaged during an uncovering operation, could pose serious hazards to employees.

Under these provisions, what constitutes an acceptable method of uncovering underground utility lines, and further, would the use of hydro-vacuum excavation be acceptable under the standard?

Answer

Background

Two sections of 29 CFR 1926 Subpart P (Excavations), 1926.651(Specific excavation requirements), govern methods for uncovering underground utility installations. Specifically, paragraph (b)(2) states:

> When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours * * * or cannot establish the exact location of these installations, the employer may proceed, provided the employer does so with caution, and provided detection equipment or other acceptable means to locate utility installations are used. (emphasis added).

Paragraph (b)(3) provides:

ATTACHMENT 4 (Continued)

> When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means. (emphasis added).

Therefore, "acceptable means" must be used where the location of the underground utilities have not been identified by the utility companies and detection equipment is not used.

Subpart P does not contain a definition of either "other acceptable means" or "safe and acceptable means." The preambles to both the proposed rule and the final rule discussed the rationale behind the wording at issue. For example, the preamble to the proposed rule, 52 Fed. Reg. 12301 (April 15, 1987), noted that a 1972 version of this standard contained language that specified "careful probing or hand digging" as the means to uncover utilities. The preamble then noted that an amendment to the 1972 standard later deleted that language "to allow other, *equally effective means* of locating such installations." The preamble continued that in the 1987 proposed rule, OSHA again proposed using language in section (b)(3) that would provide another example of an acceptable method of uncovering utilities that could be used *where the utilities have not been marked and detection equipment is not being used* – "probing with hand-held tools." This method was rejected in the final version of 29 CFR 1926. As OSHA explained in the preamble to the final rule, 54 Fed. Reg. 45916 (October 31, 1989):

> OSHA received two comments * * * and input from ACCSH [OSHA's Advisory Committee on Construction Safety and Health] * * * on this provision. All commenters recommended dropping 'such as probing with hand-held tools' from the proposed provision, because this could create a hazard to employees by damaging the installation or its insulation.

In other words, the commenters objected to the use of hand tools being used unless detection equipment was used in conjunction with them. OSHA then concluded its discussion relative to this provision by agreeing with the commentators and ultimately not including any examples of "acceptable means" in the final provision.

Non-conductive hand tools are permitted

This raises the question of whether the standard permits the use of hand tools alone -- without also using detection equipment. NUCA and other industry stakeholders have recently informed us that non-conductive hand tools that are appropriate to be used to locate underground utilities are now commonly available.

Such tools, such as a "shooter" (which has a non-conductive handle and a snub nose) and non-conductive or insulated probes were not discussed in the rulemaking. Since they were not considered at that time, they were not part of the class of equipment that was thought to be unsafe for this purpose. Therefore, we conclude that the use of these types of hand tools, when used with appropriate caution, is an "acceptable means" for locating underground utilities.

ATTACHMENT 4 (Continued)

Hydro-vacuum excavation

It is our understanding that some hydro-vacuum excavation equipment can be adjusted to use a minimum amount of water and suction pressure. When appropriately adjusted so that the equipment will not damage underground utilities (especially utilities that are particularly vulnerable to damage, such as electrical lines), use of such equipment would be considered a "acceptable means" of locating underground utilities. However, if the equipment cannot be sufficiently adjusted, then this method would not be acceptable under the standard.

Other technologies

We are not suggesting that these are the only devices that would be "acceptable means" under the standard. Industry stakeholders have informed us that there are other types of special excavation equipment designed for safely locating utilities as well.

We apologize for any confusion our July 7 letter may have caused. If you have further concerns or questions, please feel free to contact us again by fax at: U.S. Department of Labor, OSHA, Directorate of Construction, Office of Construction Standards and Compliance Assistance, fax # 202-693-1689. You can also contact us by mail at the above office, Room N3468, 200 Constitution Avenue, N.W., Washington, D.C. 20210, although there will be a delay in our receiving correspondence by mail.

Sincerely,

Russell B. Swanson, Director
Directorate of Construction

NOTE: OSHA requirements are set by statute, standards and regulations. Our interpretation letters explain these requirements and how they apply to particular circumstances, but they cannot create additional employer obligations. This letter constitutes OSHA=s interpretation of the requirements discussed. Note that our enforcement guidance may be affected by changes to OSHA rules. Also, from time to time we update our guidance in response to new information. To keep apprised of such developments, you can consult OSHA's website at http://www.osha.gov.