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HEALTH AND SAFETY PLAN FOR TREATABILITY STUDY FOR OPERABLE UNIT 9 (OU 9)  
SITE 59 NAS CECIL FIELD FL  
6/1/2005  
TETRA TECH NUS INC

**Health and Safety Plan  
For  
Site 59 - Treatability Study  
at**

**Naval Air Station Cecil Field  
Jacksonville, Florida**



**Southern Division  
Naval Facilities Engineering Command  
Contract No. N62467-94-D-0888  
Contract Task Order 0078**

June 2005

**HEALTH AND SAFETY PLAN  
FOR  
SITE 59 – TREATABILITY STUDY  
AT  
NAVAL AIR STATION CECIL FIELD  
JACKSONVILLE, FLORIDA**

**COMPREHENSIVE LONG-TERM  
ENVIRONMENTAL ACTION NAVY CONTRACT**

**Submitted to:  
Southern Division  
Naval Facilities Engineering Command  
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North Charleston, South Carolina 29406**

**Submitted by:  
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**CONTRACT NO. N62467-94-D-0888  
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**June 2005**

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## 1.0 INTRODUCTION

This Health and Safety Plan (HASP) has been developed to provide practices and procedures for Tetra Tech NUS, INC. (TtNUS) and subcontractor personnel engaged in investigation activities at Site 59 of the Naval Air Station (NAS) Cecil Field, in Jacksonville, Florida as part of Contract Task Order (CTO) 0078. The CTO directing this investigation is part of an overall effort conducted under the Comprehensive Long-Term Environmental Action Navy (CLEAN III) administered through the U.S. Navy Southern Division Naval Facilities Engineering Command (NAVFAC) as defined under Contract Number N62467-94-D-0888. Treatability Study site activities will include a bench scale test; installation of injection/monitoring wells; treatment of groundwater through injection of lactate, HRC, and sodium barcarbonate; multi-media sampling, and related site activities. This HASP must be used in conjunction with the TtNUS Health and Safety Guidance Manual. Both of these documents must be present at the site during the performance of site activities. The Guidance Manual provides detailed information pertaining to the HASP as well as applicable TtNUS Standard Operating Procedures (SOPs). This HASP and the contents of the Guidance Manual were developed to comply with the requirements stipulated in 29 CFR 1910.120 (OSHA's Hazardous Waste Operations and Emergency Response Standard).

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. The HASP will be modified if new information becomes available. Changes to the HASP will be made with the approval of the TtNUS Task Order Manager (TOM). The TOM will notify affected personnel of changes. A Site Safety Follow-up Report must be completed to document changes to the HASP.

### 1.1 KEY PROJECT PERSONNEL AND ORGANIZATION

This section defines responsibility for site safety and health for TtNUS employees and subcontractor personnel engaged in onsite activities. These persons will be the primary point of contact for questions regarding safety and health procedures and the selected control measures addressed in this HASP.

- The TtNUS TOM is responsible for the overall direction and implementation of this HASP.
- The FOL manages field activities, executes the work plan, and enforces safety procedures as applicable to the work plan.
- The Project Health and Safety Officer (PHSO) is responsible for developing this HASP in accordance with applicable OSHA regulations. Specific responsibilities include:

- Providing information regarding site contaminants and physical hazards.
  - Establishing air monitoring and decontamination procedures.
  - Assigning personal protective equipment based on task and potential hazards.
  - Determining emergency response procedures and emergency contacts.
  - Stipulating training requirements and reviewing appropriate training and medical surveillance certificates.
  - Providing standard work practices to minimize potential injuries and exposures associated with hazardous waste site work.
  - Modify this HASP when necessary.
- The Site Safety Officer (SSO) supports site activities by advising the TOM on the aspects of health and safety on site. These duties may include the following:
    - Coordinate health and safety activities with the FOL.
    - Select, inspect, implement, and maintain personal protective equipment.
    - Establish work zones and control points.
    - Implements air-monitoring program for onsite activities.
    - Verify training and medical status of onsite personnel status in relation to site activities.
    - Implements hazard communication, respiratory protection, and other associated safety and health programs as necessary
    - Coordinates emergency services.
    - Provides site specific training for onsite personnel.
    - Investigates accidents and injuries (see Attachment I Illness/Injury Procedure and Report Form)
    - Provides input to the PHSO regarding the need to modify, this HASP, or other applicable health and safety associated documents as per site-specific requirements.
  - Compliance with the requirements of this HASP are monitored by the SSO and coordinated through the TtNUS CLEAN Health and Safety Manager (HSM).

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

**1.2 SITE INFORMATION AND PERSONNEL ASSIGNMENTS**

**Site Name:** Naval Air Station - Cecil Field (NASCF) **Address:** Jacksonville, Florida

**U.S. Navy Remedial Project Manager (RPM):** Mr. Mark Davidson **Phone Number:** (803) 820-5526

**NASCF Site Contact:**

Jacksonville Airport Authority Portion  
Rusty Chandler - Cecil Field Manager (904) 573-1613  
[RusselC@jaa.aero](mailto:RusselC@jaa.aero)

Diana Stone – NAS Cecil Field Facilities Manager (904) 573-1604  
(904)759-1213 (cell)  
(904)771-9186 (fax)  
[dianast@jaxairports.org](mailto:dianast@jaxairports.org)

City of Jacksonville (EDC)  
Andy Echardt (904) 573-1604  
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**Tetra Tech NUS, Inc. Project Team:**

<b>TtNUS Management Personnel:</b>	<b>Discipline/Tasks Assigned:</b>	<b>Telephone</b>
<u>Mark P. Speranza, P.E.</u>	<u>Task Order Manager (TOM)</u>	<u>(850) 385-9899</u>
<u>Matthew M. Soltis, CIH, CSP</u>	<u>CLEAN Health and Safety Manager</u>	<u>(412) 921-8912</u>
<u>_____</u>	<u>Field Operations Leader (FOL)</u>	<u>_____</u>
<u>TBD</u>	<u>Site Safety Officer (SSO)</u>	<u>_____</u>
<u>Donald J. Westerhoff, CSP</u>	<u>Project Health and Safety Officer (PHSO)</u>	<u>(412) 921-7281</u>
<u>Thomas Patton</u>	<u>Equipment Manager</u>	<u>(412) 859-4670</u>

<b>Non-TtNUS Personnel</b>	<b>Affiliation/Discipline/Tasks Assigned</b>	<b>Telephone</b>
<u>_____</u>	<u>Direct Push Technology Subcontractor</u>	<u>_____</u>
<u>_____</u>	<u>_____</u>	<u>_____</u>
<u>_____</u>	<u>_____</u>	<u>_____</u>

Hazard Assessment (for purposes of 29 CFR 1910.132) for HASP preparation has been conducted by:

**Prepared by:** Donald J. Westerhoff, CSP

## 2.0 EMERGENCY ACTION PLAN

### 2.1 INTRODUCTION

This section of the HASP is part of a preplanning effort to direct and guide field personnel in the event of an emergency. The first measure in accomplishing this objective is to define what is considered an emergency.

**An emergency as defined in 1910.120 is:**

*An occurrence or condition that can or has resulted in an uncontrolled release of a hazardous substance or potential safety hazard (i.e., fire, explosion, and chemical exposure) associated with that release.*

**Incidental releases are not emergencies.** An incidental release as defined in 1910.120 is:

*The releases of a hazardous substance that can be absorbed, neutralized, or otherwise controlled and will not result in potential safety hazard (i.e., fire, explosion, chemical exposure) are not considered emergency responses.*

Based on the above definitions, TtNUS will, through necessary services, provide initial response measures for incidents such as:

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

Incidents and conditions above this level of participation are and will be considered emergencies. These events are considered beyond the capabilities of field personnel and available resources to provide emergency response safely. Therefore, the emergency response agencies listed in this plan are capable of providing the most effective response and will be designated as the primary responders in the event of an emergency. These agencies are located within a reasonable distance (within 5 minutes) from the area of site operations, which ensures adequate emergency response time.

This Emergency Action Plan conforms to the requirements of 29 Code of Federal Regulations (CFR) 1910.38(a), as allowed in 29 CFR 1910.120(l)(1)(ii). The FOL and/or the SHSO shall serve as the

Emergency Action Plan Administrators. All inquiries regarding the implementation of this Emergency Action Plan should be directed to them.

## **2.2 EMERGENCY PLANNING – RECOGNITION/PREVENTION**

As part of the pre-planning effort, an initial hazard/risk assessment was conducted to identify potential emergency scenarios/conditions associated with planned site activities. Based on this hazard/risk assessment the conclusion was that there is very minor potential for injury or illnesses resulting from exposure to chemical, physical, or other hazards, and subsequently little likelihood of emergency situations.

It is recognized that during subsurface investigative measures that the following conditions could result in an emergency situation:

**Potential Emergency:** Damaging an underground utility.

**Planned Control Measure:** Utility location and clearance in accordance with facility and TtNUS Utility Locating and Excavation Clearance procedures. See also Potential emergencies Physical hazards associated with drilling provided below.

**Potential Emergency:** Physical hazards associated with tenant and Flight line operations.

**Planned Control Measure:** The FOL and/or the SHSO shall ensure all personnel are familiar with the boundaries of the TtNUS work zones, approach pathways, and areas where the Tenant has requested restrictions (i.e., near aircraft, hangar doors, within vehicles approach routes, etc.). In addition, all personnel within these areas will have attended Ramp School and will understand operational protocol for these areas.

**Potential Emergency:** Physical Hazards associated with drilling operations including

- Struck by – Movement in and around operating equipment
- Entanglement into rotating equipment
- Energized systems

### **Planned Control Measure - Site Surveys**

As part of early recognition the FOL and/or the SHSO will conduct the following activities

- An initial site walk through will be conducted prior to the commitment of personnel or equipment. The purpose of this walk through will be to
  - Examine the site for conditions that may predispose field personnel to potential hazards including

- The existence of overhead power sources near where the drill rig will operate
  - Surface monuments indicating underground utilities in the area (manhole covers, valve boxes, etc.)
  - Areas that may require alterations of traffic patterns or scheduling when the work will be conducted.
  - Physical hazards within the work area.
- Periodic operations surveys – The FOL and/or the SHSO will conduct these surveys for the purpose of
    - Ensuring field personnel are following protective measures specified within the HASP (specifically Table 5-1 and the Safe Work Permit).
    - Review the initial hazard assessments to insure they reflect the hazards as it may pertain to site specific conditions.
    - Prepare for Emergencies. This includes staging emergency equipment, adequate site control measures, identifying site personnel who will engage incidental response measures and reviewing what measures will be taken and when prior to declaring an emergency.

These surveys should be documented within the project logbook. The results of these surveys are not to be disciplinary in nature however identify areas of need improvement, where applicable. The results of these surveys are to be discussed with the field personnel. Results should also be forwarded to the PHSO with any recommendations from the field.

For additional control measures regarding these physical hazards, see Section 6.2 Physical Hazards, Table 5-1 Monitoring Well Installation, and Section 9.0 Site Control for identified control measures to minimize or eliminate these hazards.

In a general approach to further minimize or eliminate potential emergency situations, pre-emergency planning activities associated with this project shall be implemented. The FOL and/or the SHSO are responsible for:

- Coordinating response actions with City of Jacksonville (“Land Side”) and Jacksonville Port Authority (JPA) (“Air Side”) Emergency Services personnel to ensure that TtNUS emergency action activities are compatible with existing facility emergency response procedures.
- Identifying a chain of command for emergency action. It is currently anticipated that the FOL and/or the SHSO shall serve as the Incident Coordinator(s) in/during initial response measures.
- Preview all work locations to remove and/or barricade to restrict access to potential physical hazards.

- Educating site workers to the hazards and control measures associated with planned activities at the site, and providing early recognition and prevention, where possible. This process will take place during as part of site-specific training, the Safe Work Permit issuance for activities to be conducted, as well as, during the daily safety/operation briefing.

### **2.3 SAFE PLACES OF REFUGE/EVACUATION ROUTES/CRITICAL OPERATIONS**

In the event incidental measures are unsuccessful containing an incident, emergency services will be contacted and the site will be evacuated. All personnel will immediately stop activities and report to a pre-determined safe place of refuge. The safe places of refuge selected are as follows:

These locations have been selected because they serve as a location from which approaching Emergency Services may be directed to the incident location. See Figure 2-1 Site Plan for these locations.

These locations will be conveyed to personnel as part pre-site training. There are no critical operations associated with this scope of work that would be required to be manned during an emergency. Therefore, all will report to the refuge location during an emergency evacuation. Personnel will remain there until directed otherwise by the TtNUS FOL and/or the SHSO. The FOL and/or the SHSO will take a head count at this location to confirm the presence of all site personnel. Emergency response agencies will be notified of any unaccountedfor personnel and their last known or suspected location.

### **2.4 EMERGENCY ALERTING AND ACTION/RESPONSE PROCEDURES**

Emergency Action Notification Procedures:

#### **Utility Contact or Damage**

Electrical – If contact is made, it is important not to contact the ground surface and the drill rig at the same time. Cease all operations, notify the area contact or authority, provide security surrounding the rig until the power source can be de-energized.

Gas – Immediately shut down all operations; eliminate all ignition sources; Contact 911 and the area contact or authority; move to designated assembly point; conduct a head count.

Plumbing (water/sanitary/storm); communication - Immediately shut down all operations; Contact the area contact or authority; provide perimeter security until the authorities arrive; move to designated assembly point; conduct a head count.

### **Fire and/or spill**

If a fire/spill situation is judged to be greater than just incidental:

- Do not attempt any response other than immediate evacuation/notification of proper response authorities

Incidental fires or spills (<55 gallons) that can be extinguished or cleaned up with one portable fire extinguisher or site spill equipment for incidental fires/spills, the following procedures are authorized:

- Engage defensive measures, employ fire extinguishers or spill containment, as appropriate to control the release and/or fire.
- Notify the FOL and/or the SHSO by verbal or radio communication regarding any incident or near incident.
- Using members of the field crew, establish site security measures to restrict access to the area.
- If the situation is controlled, the FOL and/or the SHSO will begin the Incident Investigation to determine cause and effect. All information will be gathered and incorporated on The Incident Report Form (Section 1.0 of the Health and Safety Guidance Manual) and provided to the HSM, TOM, and the PHSO.

### **Injury**

Follow provisions specified in Section 2.8 of this HASP.

If the injury requires more than basic first aid response, the FOL and/or SHSO will enact emergency notification procedures to secure additional assistance in the following manner:

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

Note: **All** incidents and near incidents are to be reported to the PHSO and the HSM.

## 2.5 EMERGENCY CONTACTS

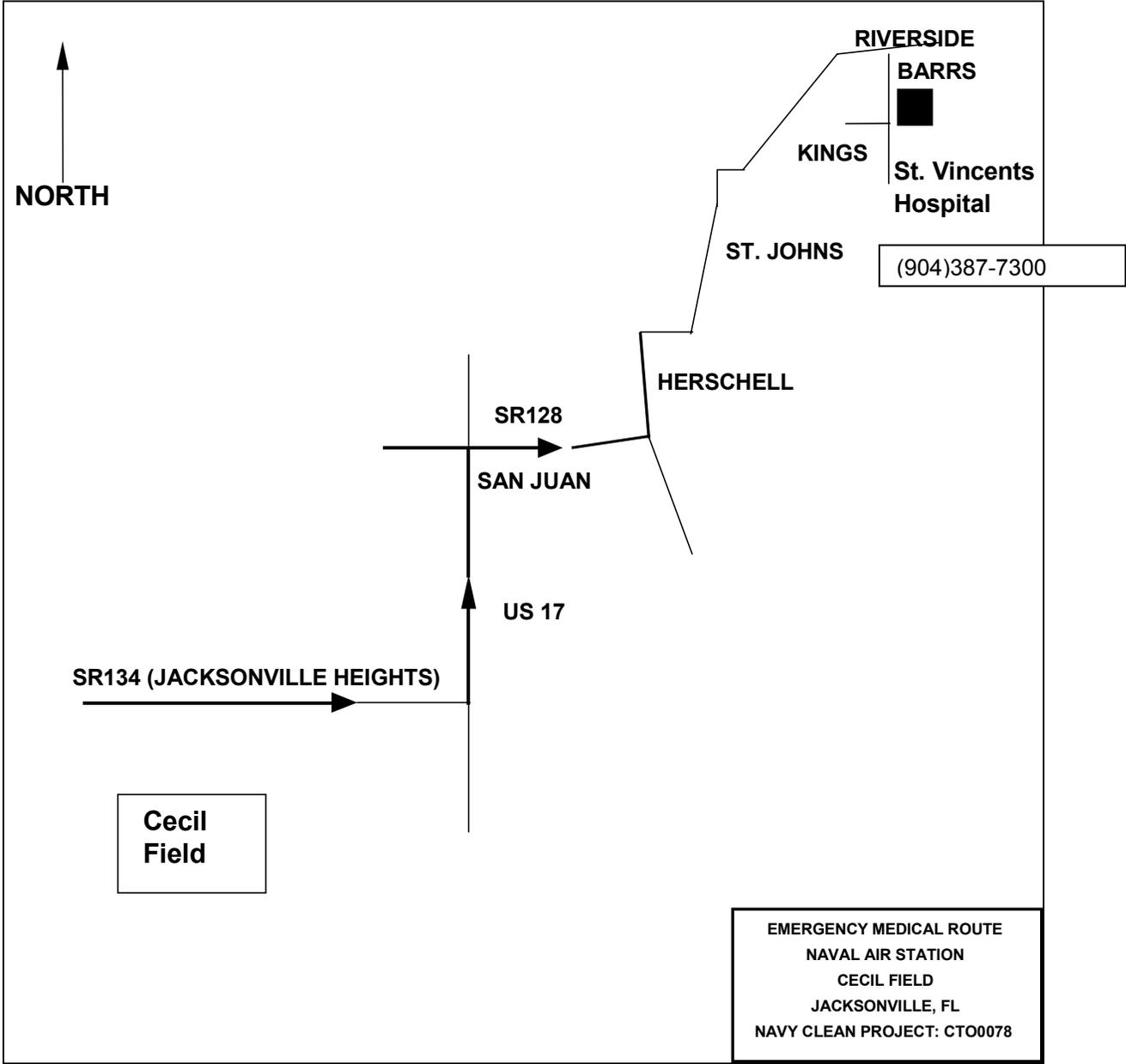
Prior to performing work at the site, all personnel will be thoroughly briefed on the emergency procedures to be followed in the event of an incident. As indicated earlier, Table 2-1 provides a list of emergency contacts and their corresponding telephone numbers. This table along with maps to the hospital will be made readily available to all site personnel.



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

CONTACT	PHONE NUMBER
EMERGENCY (Police, Fire, Ambulance Service)	<b>911</b>
City of Jacksonville Sheriff's Office (non-emergency)	(904) 630-7600
Primary Hospital - St. Vincent Hospital	(904)387-7300
Florida Poison Information Center - Jacksonville	(904) 549-4480
Chemtrec	(800) 424-9300
National Response Center	(800) 424-8802
NAS - Cecil Field (Point-of-Contact) Ralph Hogan	(904) 771-6397
NAS-Flight Line Area Contact Diane Stone	(904) 573-1604
TtNUS, Pittsburgh Office	(412) 921-7090
TtNUS, Cecil Field Site Office	(904) 317-9199
Task Order Manager Mark Speranza, P.E.	(412) 921-8916
Health and Safety Manager Matthew M. Soltis, CIH, CSP	(412) 921-8912
Project Health and Safety Officer Donald J. Westerhoff, CSP	(412) 921-7281
Public Works (utilities, gas, water, sewage, telephone, fiber optics)  Jacksonville Airport Authority Portion Rusty Chandler - Cecil Field Manager  Diana Stone - Cecil Field Facilities Manager  City of Jacksonville (EDC) Andy Echardt Ralph Hogan	<p>(904) 573-1613 <a href="mailto:RusselC@jaa.aero">RusselC@jaa.aero</a></p> <p>(904) 573-1604 904-759-1213 (cell) 904-771-9186 (fax) <a href="mailto:dianast@jaxairports.org">dianast@jaxairports.org</a></p> <p>(904) 630-1223 (904) 771-6397</p>

Figure 2-1  
Route to Hospital



**2.6 EMERGENCY ROUTE TO HOSPITAL**

1. Take SR 134 (Jacksonville Heights) approximately 8 miles to US 17, **Turn left (North) on U.S. 17**
2. Take US 17 approximately 2.5 miles to SR 128 (San Juan Ave.), **Turn right on San Juan**
3. Go east on San Juan approximately 1/4 mile to Herschell, **Turn left onto Herschell**
4. Herschell will then turn into St. Johns Ave., then St. Johns Ave. which will turn into Riverside. Take Riverside approximately 1 mile to King St., **Turn right on King Street**. The hospital will be on the corner of King Street and Barrs.

## **2.7 DECONTAMINATION PROCEDURES/EMERGENCY MEDICAL TREATMENT**

Chemical hazards or emergencies associated with exposure to chemical hazards are not anticipated. During any site evacuation, decontamination procedures will be performed only if doing so does not further jeopardize the welfare of site workers. Decontamination will not be performed if the incident warrants immediate evacuation.

### **2.7.1 Medical Data Sheet**

In support of medical treatment, all personnel will be required to complete a Medical Data Sheet. Information to be contained on this Medical Data Sheet shall include any pertinent information regarding allergies to medications, current medications or restrictions, or other special conditions. The intent of this sheet is to provide information to medical services personnel in the event the employee is incapacitated. This information will permit medical services personnel to render more timely and effective treatment. A copy of the Medical Data Sheet can be found in Attachment V.

### **2.7.2 Non-Life Threatening Medical Incident (Bruises, Cuts, Scrapes, Etc.)**

Employ general first aid measures concurrent with your level of training. If it is determined that medical assistance (medical facility or personnel capable of providing medical assistance) is greater than 15-minutes (for non-life threatening injuries) then at least two persons must be trained and on-site to the First Aid/CPR Level.

### **2.7.3 Life Threatening Injuries**

If it is determined that medical assistance (medical facility or personnel capable of providing medical assistance) is greater than 3 to 4-minutes (for life threatening injuries) then at least two persons must be trained and on-site to provide First Aid and CPR.

First Aid Procedures:

- Engage Emergency Notification Sequence, Notify off-site response agencies.
- If it will not endanger the injured individual (i.e., spinal cord injury, etc.) remove any outer PPE. Removal may require the use of bandage scissors to remove the outer garments. If this type of injury is suspected do not move injured person, notify emergencies services.
- Begin life saving techniques as appropriate [first aid, Cardio Pulmonary Resuscitation (CPR), cooling or warming regimens, etc.].
- Wrap the injured in a blanket for transport to the hospital.
- Follow instructions provided in Section 1.9.1 of the Health and Safety Guidance Manual.

**Note:** One person from the field team will accompany the injured to the hospital with his/her medical data sheet, appropriate MSDSs (if applicable), a copy of this HASP, and the incident forms. This person will collect as much information, as possible, and transfer that information to the HSM, TOM, and Work Care as per the Incident Response Protocol provided in Section 1.9.1 and Section 1.9.2 of the Health and Safety Guidance Manual. All other personnel will engage site control/site security measures.

#### **2.7.4      Emergency Medical Treatment Protective Measures**

TtNUS and subcontractor personnel are only permitted to provide treatment to the level of their First-Aid Training. It should also be noted that all first aid shall be administered voluntarily. All First-Aid provided will incorporate the following protective measures:

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

- 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 surgeons 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 has come into contact with body fluids or other potentially infectious tissues.
  - Should CPR be required, use a CPR Micro-Shield mouthpiece or a resuscitation bag when administering CPR to prevent contact with the injured person's body fluids.

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

### **2.8            PPE AND EMERGENCY EQUIPMENT**

**First-Aid Kit** – The SHSO will determine the minimum number of units necessary to insure the units are immediately available for all personnel. The first aid kits will meet the requirements of ANSI 308 for a standard Industrial First Aid Kit (it will indicate it meets this requirement on the kit).

**Eye Wash Units** (or bottles of disposable eyewash solution) – Will be readily (immediately) available to personnel handling sample containers with preservative, containers of natural attenuation reagents, and during well construction activities.

**Fire Extinguisher** - Fire extinguishers ABC Combination units will be maintained during any refueling operation or handling of flammable liquids, and hot work operations. The units must be readily available for use in the event of an emergency.

## **2.9 INJURY/ILLNESS REPORTING**

If any TtNUS personnel are injured or develop an illness as a result of working on site, the TtNUS "Injury/Illness Procedure" (Attachment I) and Figure 2-2 Emergency Response Protocol must be followed. Following this procedure is necessary for documenting all of the information obtained at the time of the incident.

Any pertinent information regarding allergies to medications or other special conditions will be provided to medical services personnel. This information is listed on Medical Data Sheets filed onsite (Attachment V). 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.

## **FIGURE 2-2 EMERGENCY RESPONSE PROTOCOL**

The purpose of this protocol is to provide guidance for the medical management of 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 Tetra Tech NUS 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, being 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 Tetra Tech NUS, Inc. 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) at 1-800-245-2730.
- Contact the Human Resources Manager, (Marilyn Duffy) at 1-800-245-2730.

As data is gathered and the scenario becomes more clearly defined, this information should be forwarded to WorkCare.

WorkCare will compile the results of all data and provide a summary report of the incident. A copy of this report will be placed in each victim'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 2-2 (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          Chest Tightness / Pressure  
Tearing          Nausea / Vomiting  
Headache          Dizziness  
Cough          Weakness  
Shortness of Breath

**Delayed Symptoms:**

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

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

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

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

### 3.1 SITE HISTORY

NAS Cecil Field is located in western Duval County, Florida, within the limits of the City of Jacksonville. In 1989, NAS Cecil Field was placed on the United States Environmental Protection Agency's (EPA's) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) National Priorities List (NPL) as a result of pollution resulting from past waste disposal practices that predate CERCLA. In 1990, The United States Department of the Navy entered into a Federal Facilities Agreement (FFA) with EPA to define the overall extent of contamination. NAS Cecil Field has approximately 35 individual sites where hazardous wastes may have been handled, spilled, or buried. As a result, work at the various sites has been organized into nine Operable Units (OUs), as well as more than 100 other areas undergoing evaluation in the BRAC and Underground Storage Tank programs.

### 3.2 CURRENT STATUS

NAS - Cecil Field is closed. While the Jacksonville Port Authority is planning on maintaining the air field (airside), the City of Jacksonville is currently re-developing the landside.

### 3.3 SITE DESCRIPTIONS

#### 3.3.1 Site 59 –Bldgs. 324/1845 areas

Groundwater sampling conducted in this area under the Base Realignment and Closure (BRAC) program identified trichloroethene (TCE) contamination, and the area was designated Site 59 under Operable Unit (OU) 9 to be investigated under the Installation Restoration (IR) program as governed by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

##### 3.3.1.1 Building 324

Building 324 was built in 1989 and used as the Engine Maintenance Shack primarily by a naval subcontractor. Past investigations at this site revealed no evidence of contamination. A recent due diligence investigation though revealed evidence of TCE.

##### 3.3.1.2 Building 1845

Building 1845 is not considered to be part of the source contamination. However, during the due diligence investigation the plume was identified at various depths extending past Building 1845 and therefore defining the boundaries of Site 59.

## 4.0 SCOPE OF WORK

This section of the HASP addresses the proposed site activities that are to be conducted as part of the Treatability Study at Site 59 of NAS Cecil Field under CTO 0078. Site activities are separated into two primary field events: 1) the Bench Scale Test, and 2) the Treatability Study.

### 4.1 BENCH SCALE TEST

During the Bench Scale Test, soils cores containing soil and groundwater will be separated into individual containers (five individual 5 – gallon buckets) and solutions of sodium bicarbonate ( $\text{NaHCO}_3$ ) will be added to evaluate the quantity of  $\text{NaHCO}_3$  that is necessary to achieve a pH of 7.0. A portable pH meter will be used to measure the pH of the soils in each bucket. Soil core collection activities involved in this task will be performed using a Rotosonic drill rig and will take place prior to conducting the Bench Scale Test. The activities related to the operation and use of the Rotosonic drill rig are addressed under a separate HASP and are not included in this HASP. Only specific tasks involved with conducting the Bench Scale Test are addressed within this HASP for Site 59.

### 4.2 TREATABILITY STUDY

- Mobilization/demobilization activities
- Installation of Injection/Monitoring Wells using Direct Push Technology (DPT)
- Injection of Lactate, Hydrogen Releasing Compounds (HRC), and  $\text{NaHCO}_3$
- Groundwater monitoring and related tasks (water level measurements, monitoring well development and purging, etc.)
- Decontamination of heavy equipment and sampling devices
- IDW Management

For more detailed description of the planned tasks, refer to the Project Work Plan (WP). Any tasks to be conducted outside of the elements listed here will be considered a change in scope requiring modification of this document. All requested modifications to this document will be submitted to the HSM by the TOM or a designated representative.

## 5.0 TASKS/HAZARDS/ASSOCIATED CONTROL MEASURES SUMMARY

This section of the HASP is intended to provide hazard assessment and hazard control information for each of the site tasks that are to be performed.

Table 5-1 is intended to provide a one page/task summary to permit quick referencing of information as it pertains to the task-specific hazards and identified control measures.

Safe Work Permits will be issued for all exclusion zone activities (See Section 9.10). Table 5-1 will be employed as the Safe Work Permit's primary reference. The FOL and/or the SHSO completing the Safe Work Permit will add additional site-specific information.

The following information represents the hazard assessment (identifying the potential hazard) of the tasks to be conducted as part of this field effort. See Table 5-1 for the recommended control measures as they may pertain to these hazards.

### 5.1 MOBILIZATION/DEMobilIZATION

This task includes, but not limited to, the following:

- The procurement and shipping/unpacking of equipment, and materials for the field investigation.
- Review of planning documents (i.e., HASP, Sampling and Analysis Plan, Work Plan, Quality Assurance Plan, etc.)
- Site Reconnaissance to include site characterization, site preparation, layout of sampling locations and identification of utilities and physical hazards
- Secure, construct, or equip decontamination facilities to support the field activities.
- Secure, construct, or equip IDW storage facilities to support the field activities.

**Physical Hazards** – The hazard types associated with this task are considered primarily to be Physical hazards – Lifting, strains/sprains, lacerations achieved during unpacking of equipment and during site preparation (i.e., cutting open boxes, lifting equipment, locating sample points).

**Chemical Hazards** - It is not anticipated that personnel will be exposed to chemical contamination as part of this task. However, certain chemicals will be brought on-site to support field activities. These hazards will be addressed through the implementation of a Site-specific Hazard Communication Program (See Section 5.0 of the HSGM).

**Natural Hazards** – These hazards are considered low to moderate as the areas of investigation are considered light industrial areas that are regularly maintained (grass cut, regular traffic, paved/concrete areas, etc.) as indicated by the FOL.

## **5.2 INJECTION/MONITORING WELL INSTALLATION/SOIL BORINGS – USING DPT METHODS**

DPT units are hydraulically powered, percussion/probing machines designed to drive small diameter sampling tools directly into the subsurface without the production of significant quantities of Investigation-Derived Wastes (IDW). The tools are advanced by static hydraulic force coupled with a percussion hammer.

**Physical Hazards with DPT Operations** – Contact with moving equipment; pinches and compressions; buried utilities; heavy lifting / repetitive motions; elevated noise levels.

- Contact with moving equipment control measures include:
  - If equipped with emergency stop devices, these devices will be tested daily. This will be accomplished using the equipment inspection form (Attachment III) and during daily inspections.
  - One person on the drill crew will be designated as the Emergency Stop Device Operator (usually the Driller).
  - Prior to the start of the rig, the driller will announce they are about to start and will insure all personnel are away from advancing apparatus.
  - The SHSO shall insure that all personnel have
    - Secured/removed all loose clothing and/or PPE articles
    - Removed all jewelry or other articles that could snag on rotating/advancing parts.
    - During the inspection the SHSO shall insure that the drill stems do not have obvious snag points. It should be noted that the core drill stems are not as hazardous as other drilling applications such as hollow-stem augering since these devices are assembled through flush threaded joints which presents fewer snag points.
  
- Pinches/compression control measures include:
  - During DPT boring, hydraulic components (shoe, sampling tooling, mast, etc) are moved to position the rig and to initiate the boring. The potential exists for workers to pinch their fingers, hands, or other body parts in these areas. Prior to use, all site equipment will be inspected to ensure that all guards are properly positioned.

- Drill stems/rods are to be removed/placed on/from the rack evenly to prevent collapse
- Personnel will not place their hands near any pinch points during DPT operation.
- Energized Systems – Overhead and underground. See Attachment II regarding Utility Locating and Excavation Clearance for minimal clearance distances.
- Lifting Hazards – DPT rods and bags of Portland Cement (>90 lbs). This is a very common hazard within the drilling industry that requires the use of safe lifting procedures and assistance from others.
- Pressurized systems – This hazard occurs when workers are in the proximity of unguarded pressurized systems. An incident of this nature (high pressure line came loose and struck the driller) occurred within the last couple of years resulting in a near fatality. Therefore, efforts will be employed to insure fittings and connections are secure. Those fittings and connections near the operator or driller's helper that are not guarded will be secured by whatever means are necessary (i.e., pressurized line restraints). Pressurized hazards are also recognized while performing support functions such as decontamination. Pressurized water/heated pressurized water has accounted for burns and water lacerations.

Due to the severity and frequency [incident (injury/illness) analysis] it is recommended that supervisory personnel (FOL and SHSO) should focus their attention conditions that could predispose personnel to these hazards.

- Traffic hazards – These sites are located within active industrial areas and within the safety corridor of active runways. Field crews will have facility, pedestrian, vehicle, and possibly aircraft traffic to contend with during field activities. Measures such as constructing and isolating work zones, controlling facility traffic patterns away from the work zone, and project scheduling to coordinate efforts with the facility operations will be used to minimize this hazard.
- Noise – The operating level of DPT drill rigs vary depending on the type of rig and the density/composition of the soil or the ground surface. Typically noise levels above 85 dBA can be expected. In addition, use of pressure washer/steam cleaners during decontamination produce excessive noise levels. These items typically operate at 94-97 dBA when engaged. It is anticipated that this hazard will be made worse due to contributory noise levels associated with flight line operations. Use of hearing protection (ear plugs or ear muffs) will be required when working with operating equipment or whenever excessive noise levels are present.

### **Chemical hazards associated with DPT operations -**

- Groundwater contamination – Analytical data obtained during previous site investigations has indicated that trichloroethene (TCE) is present in groundwater at Site 59.
- Well injection activities pose a chemical hazard since contact with NaHCO<sub>3</sub>, lactate, and HRC exists. Manufacturer Material Safety Data Sheets (MSDS) for these and all substances brought on site by TtNUS and subcontractor personnel will be provided and reviewed prior to use. Information such as product use, handling, and disposal; chemical composition; PPE requirements; and symptoms of exposure are included on MSDSs.
- Exposure to chemicals associated with well construction materials are also a concern. This includes sand, grout (containing Portland Cement), Bentonite, fuels and lubricants. Hazards associated with these chemicals include irritation of the eyes, alkali/chromium burns of contact points associated with wet cement, and respiratory irritation.

## **5.3 AQUIFER DEVELOPMENT/TESTING/SAMPLING**

### **5.3.1 Monitoring Well Development**

The development of the monitoring wells is intended to remove debris associated with installation and to condition the sand pack to facilitate contact with the surrounding aquifer. Monitoring well development is accomplished using surge blocks and pumps to force water in and out of the sand pack and formation and to remove this debris from the well. 1" inch Whale Pumps with 12-volt battery will typically be employed for 2-inch wells to remove specified water volumes as well as any debris. Peristaltic pumps or wterra methods are to be employed for the pre-packed micro-wells.

See Section 5.3.3 for potential hazards.

### **5.3.2 Monitoring Well Sampling**

The monitoring wells will be sampled using low-flow purging and sampling techniques. Peristaltic pumps will be used to purge and to collect the samples. Field measurements of pH, temperature, specific conductance, and turbidity will be made during purging using a direct reading instrument. These measurements will be taken at the start of purging and every 5 to 15 minutes until the parameters have stabilized. The wells will be purged until a sufficient predetermined amount of water has been removed and the water quality measurements are acceptable and stable. All tubing used for sampling will be dedicated and disposed of after the sample has been collected.

### **5.3.3 Water Level Measurements**

Multiple rounds of water level measurements will be taken at the existing and newly installed monitoring wells during this field investigation. The water levels will be taken with an electric water level indicator using the top of the well casing as the reference point for determining water depths. Water levels will be conducted upon completion of the newly installed wells and prior to and through the course of purging, development, and sampling.

#### **Physical Hazards**

The hazard types associated with the above tasks are similar in nature and therefore presented together. Physical hazards as it pertains to development, water level measurements, and sampling are as follows:

- Lifting, strains/sprains, associated with handling purge/development waters.
- Cuts, pricks, and lacerations – This hazard is possible when cutting tubing or when opening some of the glass reagent ampoules (during natural attenuation sampling). In addition when transporting glassware for sample collection or testing may present a problem should the glassware become broken
- Traffic hazards – These sites are located within active industrial areas. Some of the investigation locations may place personnel along travel thoroughfares. Both foot and vehicular traffic hazards are considered prevalent during certain phases of executing this scope of work.
- Electrical hazards – Remote but possible when handling and using a 12-volt battery as a power source for the Whale pumps.

#### **Chemical Hazards**

Chemical exposure during this activity maybe facilitated through:

- Direct contact - Splash - Contaminant exposure based on direct interaction with contaminated media through possible splash.
- Inhalation – Some wells due to biological degradation may build off-gases. When a field crew member opens the well they maybe exposed to vapors/gases coming out of the well. This of course is based on the proximity of the field technician to the well head and the amount of time they remain at this potential source.

- Ingestion – Due to handling of equipment, sample media, and improper work hygiene could result in the ingestion of identified site contaminants or reagents employed in the site investigation.
- Sample preservatives/natural attenuation reagents/decontamination solutions – Certain chemicals will be brought on-site in support of this field investigation effort. These chemical hazard classes include corrosives, flammable, and oxidizers.

See Table 5-2 for potential health effect information due to chemical exposure. See also the Site Specific Hazard Communications Program for controlling hazards as it pertains to chemical substances brought on-site.

**Natural Hazards:**

- Spiders/bees/nests are sometimes encountered in the protective casings of monitoring wells. When opening the casing or attempting to open the well may bring personnel within close proximity to these insects and spiders.

**5.6 DECONTAMINATION**

The equipment involved in the field activities for well installation and sampling will be decontaminated prior to, during and after the completion of on-site activities.

**5.6.1 Heavy Equipment**

Heavy equipment decontamination will be accomplished using a pressure washer and/or steam cleaner within an established temporary decontamination pad. Procedural steps include:

1. Remove gross (visible) materials using scrapers, shovels as necessary (soils, etc.)
2. Use the pressure washer/steam cleaner remove remaining visible debris.
3. As necessary, follow up with scrub brushes with Alconox or Liquinox detergent wash.
4. Potable water rinse using pressure washer/steam cleaner as necessary
5. Air dry
6. Visual examination to insure cleanliness.

**5.6.2 Sampling Equipment**

All non-dedicated sampling equipment (i.e. stainless-steel hand augers, trowels, bowls, split spoons, etc.) will be decontaminated prior to the initiation of field sampling, between sample locations, and at the completion of the field activities. The following decontamination steps will be taken:

1. Remove heavy materials (soils, etc.)
2. Alconox or Liquinox detergent wash
3. Potable water rinse
4. Solvent rinse (Isopropanol)
5. DI water rinse
6. Air dry
7. Scan/screen articles using the PID to insure the removal of site contaminants as well as decontamination solvents.

All dedicated sampling and PPE equipment will be rinse to remove gross contamination and then disposed of as general refuse.

**Physical Hazards associated with this activity include:**

- Water cuts/lacerations/burns – This is the primary and most severe hazard associated with this activity. Pressure washers operating at 3000 psi are sufficient to cause water lacerations of unprotected skin. Steam cleaners operating at much lower temperatures, not only has the capabilities of causing water lacerations but also burns due to the high water temperatures. Two years ago an individual using a steam cleaner place the tip of the cleaning wand on the top of his boot and accidentally engaged the trigger. The elevated temperatures in conjunction with the operating water pressure cut through the top of the individuals work boot resulting in severe burns. This single split second action cut through a leather work boot.
- Noise – Operating level of the pressure washer/steam cleaners typically operate at 94-97 dBA when engaged.

**Chemical Hazards** associated with this activity include:

- Exposure to contaminated media
- Exposure to decontamination solvents

**Natural hazards** associated with this activity:

None anticipated.

## 5.7 WASTE MANAGEMENT

This task includes the containerization, labeling, staging, monitoring, and final deposition of investigative derived wastes. These are as follows:

Containerization – Materials generated including soils, purge and development waters, decontamination fluids shall be collected and containerized in 55-gallon drums and staged in a centralized location at the trailer yard.

Labeling – All containers will be labeled as to their contents. The labels will include the following information

Site

Job Number

Location (SWMU)

Date – To be completed once filling the container begins

Drum # - Assign an inventory number to be added to a comprehensive log

Contents – Description

Volume – Final volume

Contact – This person should be available on base. To this end an up-dated inventory should be provided at the close of each shift to this person.

Emergency Number – Contact person provided above

Staging – All drums will be staged on pallets (4 to a pallet) with lid retention ring bolt accessible on the outside as well as the label. Pallet rows will maintain a minimum of 4 feet between rows for access and monitoring for leaks. Containers will be separated according to media and site.

Monitoring – During staging site personnel will examine containers to ensure they are not leaking.

Final Deposition – Waste materials will be separated as determined through sampling and disposed of through pre-determined routes.

**Physical Hazards** associated with this Waste Management activity include:

- Caught between pinches and compressions. This occurs primarily when moving containers to transport vehicles and when staging the drums on pallets. The prevalent hazard is recognized when moving the drums and hands get caught between drums.

- Lifting – Drums of water can weigh upwards of 475 lbs. Drums of wet soil can weigh up to 750 lbs.

**Chemical Hazards** associated with this activity are considered negligible unless there is a spill from these closed containers.

**Natural hazards** associated with this activity:

None anticipated.

For more detailed description of the associated tasks, refer to the Work Plan (WP) and/or the Quality Assurance Plan (QAP). The above listing represents a summarization of the tasks as they apply to the scope and application of this HASP.

## **5.8 GENERAL SAFE WORK PRACTICES**

In addition to the task-specific safe work practices identified in Table 5-1 to be employed to minimize task specific hazards, the following general safe work practices will be employed. These safe work practices establish a pattern of general precautions and measures for reducing risks associated with hazardous site operations.

- Refrain from 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.
- Wash hands and face thoroughly upon leaving a contaminated or suspected contaminated area. This is especially critical between breaks and prior to lunch and associated hand to mouth activities.
- Avoid contact with potentially contaminated substances by walking around puddles, pools, mud, or other such areas. Avoid, whenever possible, kneeling on the ground or leaning or sitting on equipment. Do not place monitoring equipment on potentially contaminated surfaces.
- Be familiar with and adhere to all instructions provided within this site-specific HASP.
- Be aware of the location of the nearest telephone and all emergency telephone numbers. See Section 2.0, Table 2-1.
- Attend briefings on anticipated hazards, equipment requirements, Safe Work Permits, emergency procedures, and communication methods before going on site.

- Plan and mark entrance, exit, and emergency escape routes. See Section 2.0.
- Rehearse unfamiliar operations prior to implementation.
- Use the “buddy system”.
- Maintain visual contact with each other and with other on-site team members by remaining in close proximity in order 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 Site Health and Safety Officer (SHSO).
- Observe coworkers 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.

## **5.9 DRILLING/SOIL BORING SAFE WORK PRACTICES**

The following Safe Work Practices are to be followed when working in or around the DPT/Drilling Operations.

### **5.9.1 Before Drilling/Soil Boring**

- Identify all underground utilities and buried structures before drilling. This service is provided by Sunshine State One-Call of Florida, Inc. 1(800) 432-4770. In addition, Tetra Tech NUS, Inc. personnel will use the Utility Locating and Excavation Clearance Standard Operating Procedure provided in Attachment II. The typical sequence of events are as follows:

1. A request is submitted for clearance of a location(s). Often times intersections, building numbers, or other location identifiers are provided. It is best to provide as much assistance as possible. Ensure that marks are on the ground using white paint or flagging. Sunshine One Call systems then notifies members within this cooperative. Not all utilities are required to be members. Provisions to accommodate this shortfall are provided in the Tetra Tech NUS, Inc. Utility Locating and Excavation Clearance Standard Operating Procedure provided in Attachment II.
  2. Typical timeline for marking and providing clearances for commercial one call is 48-hrs. A ticket or ticket number will be provided referring to your clearance. This will have a timeline, generally 14-days. Again problems sometime arise here because site personnel allow their tickets to expire, then accidentally encounter a utility. Tickets must be maintained valid by asking for a re-issue or extension, when necessary, prior to expiration.
  3. Utility locations marked on the ground may not remain visible. The FOL is responsible for ensuring that utility locations/marks on the ground are maintained so they remain visible (repaint, pin flags, etc.), and to annotate maps with these locations so they may be incorporated into the EGIS system.
  4. Once marks are placed on the ground and have been cleared, there is only a limited leeway (2-foot) exists to stray from the planned and approved intrusive locations.
- All DPT/drill rigs will be inspected by the SHSO or designee, prior to the acceptance of the equipment at the site and prior to the use of the equipment. All repairs or deficiencies identified will be corrected prior to use. The inspection will be accomplished using the Equipment Inspection Checklist provided in Attachment III. Inspection frequencies will be once every 10-day shift or following repairs.
  - Check operation of the Kill Switch (initially, then periodically thereafter). See Section 5.2 concerning these testing of the emergency stop devices and the other required precautions.
  - Ensure that all machine guarding is in place and properly adjusted.
  - Block the DPT/drill rig and use levelers to prevent movement of the equipment.
  - The work area around the point of operation will be graded to the extent possible to remove any trip hazards near or surrounding operating equipment.

- The driller's helper will establish an equipment staging and laydown plan. The purpose of this is to keep the work area clear of clutter and slips, trips, and fall hazards.

### **5.9.2 During Drilling/Soil Boring**

- Minimize contact to the extent possible with contaminated tooling and environmental media. All potentially contaminated tooling will be placed on polyethylene sheeting for storage and wrapped for transport to the centrally located equipment decontamination area
- An individual must be designated with the primary responsibility of operating the kill switch mechanism. Also, the DPT/drill rig operator must verbally announce to all surrounding persons each time that he/she is about to activate the drilling mechanism.
- Support functions (sampling and screening stations) will be maintained a minimum distance equal to the height of the mast plus five feet or 25-feet for DPT rigs. These distances have been determined to restrict activities from within suspected physical hazard boundaries. Because work will be performed in areas accessible to the general facility population, these boundaries must be strictly enforced by site personnel.
- Only qualified operators and knowledgeable ground crew personnel will participate in the operation of the DPT/drill rig.
- During maintenance, use only manufacturer provided/approved equipment
- In order to minimize contact with potentially contaminated tooling and media and to minimize lifting hazards, multiple personnel should be used to move heavy tooling.
- Only personnel absolutely essential to the work activity will be allowed in the exclusion zone. Site visitors will be escorted at all times.

### **5.9.3 After Drilling/Soil Boring**

- All equipment used within the exclusion zone will undergo a complete decontamination and evaluation by the FOL and/or the SHSO to determine cleanliness prior to moving to the next location, exiting the site, or prior to down time for maintenance.
- **All** motorized equipment will be fueled prior to the commencement of the day's activities. During fueling operations all equipment will be shutdown and bonded to the fuel source.

- When not in use all DPT/drill rigs will be shutdown, and emergency brakes set and wheels will be chocked to prevent movement.
- **All** areas subjected to subsurface investigative methods will be restored to equal or better condition than original to remove any contamination brought to the surface and to remove any physical hazards. In situations where these hazards cannot be removed these areas will be barricaded to minimize the impact on field crews working in the area and the general population who may have access to these areas.

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**TABLE 5-1  
TASKS/HAZARDS/CONTROL MEASURES  
NAS CECIL FIELD, JACKSONVILLE, FLORIDA**

Task/Operation/Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring - Types and Action Levels	Personal Protective Equipment <i>(Items in italics are deemed optional as conditions or the FOL or SSO require)</i>	Decontamination Procedures
<p>Mobilization/ Demobilization</p> <p>This activity includes, but not limited to:</p> <ul style="list-style-type: none"> <li>- Equipment Preparation and Inspection</li> <li>- Resource acquisition and unpacking of supplies</li> <li>- Site clearance and preparation – Utility clearances, etc.</li> <li>- Construct decontamination and IDW operation and storage facilities, as applicable.</li> </ul>	<p><b>Chemical hazards:</b></p> <p>1) Exposure to potential site contaminants is not anticipated during these activities. Site contaminants are not anticipated to be encountered during mobilization/demobilization activities. However, contact with chemicals brought on-site (fuels, preservatives, etc.) will be considered.</p> <p><b>Physical hazards:</b></p> <p>2) Lifting (strain/muscle pulls)</p> <p>3) Pinches and compressions</p> <p>4) Slips, trips, and falls</p> <p>5) Vehicular and foot traffic</p> <p><b>Natural hazards:</b></p> <p>6) Ambient temperature extremes (heat/cold stress)</p> <p>7) Insect and animal bites</p> <p>8) Inclement weather</p>	<p>1) The on-site Hazard Communication Program (Section 5.0 TiNUS Health and Safety Guidance Manual) will be followed. All chemicals brought onto the site by Tetra Tech NUS and subcontractor personnel will be inventoried with each applicable chemical having an MSDS on site, on file. This effort shall include:</p> <ul style="list-style-type: none"> <li>- A Chemical Inventory list is generated for chemicals brought on site (Complete Section 5.0 of the Tetra Tech NUS Health &amp; Safety Guidance Manual)</li> <li>- MSDS's must be available for chemicals brought on site.</li> <li>- Materials are stored in accordance with recommended practices and according to compatibility (See MSDS for storage and compatibility recommendations). The FOL and/or the SSO will preview work locations in an effort to identify, barricade and/or remove physical and biological hazards prior to the commitment of any personnel, equipment or other resources.</li> </ul> <p>2) Use machinery or multiple personnel for heavy lifts, where possible.</p> <ul style="list-style-type: none"> <li>- Use proper lifting techniques</li> <li>- Lift with your legs, not your back, bend your knees move as close to the load as possible, and ensure good hand holds are obtainable.</li> <li>- Minimize the horizontal distance to the center of the lift to your center of gravity.</li> <li>- Minimize turning and twisting when lifting as the lower back is especially vulnerable at this time.</li> <li>- Break lifts into steps if the vertical distance (from the start point to the placement of the lift) is excessive.</li> <li>- Plan your lifts – Place heavy items on shelves between the waist and chest; lighter items on higher shelves.</li> <li>- Periods of high frequency lifts or extended duration lifts should provide sufficient breaks to guard against fatigue and injury.</li> <li>- Area available to maneuver the lift.</li> <li>- Area of the lift – Work place clutter, slippery surfaces</li> </ul> <p>3) Only modify tools according to manufacturer's instruction.</p> <ul style="list-style-type: none"> <li>- Keep any machine guarding in place, avoid moving parts.</li> <li>- Use tools or equipment where necessary to avoid placing hands in areas vulnerable to pinch points.</li> <li>- Adjust machine guarding as necessary to minimize access into the machine.</li> <li>- When staging equipment, insure all stacked loads, shelving, are adequately secure to avoid creating a hazard from falling objects.</li> </ul> <p>4) Preview work locations for unstable/uneven terrain.</p> <ul style="list-style-type: none"> <li>- Cover, guard and barricade all open pits, ditches, and floor opening as necessary.</li> <li>- Ruts, roots, tools, and other tripping hazards should be eliminated to minimize trips and falls.</li> <li>- Maintain a clutter free work area.</li> <li>- As part of site control efforts construct fences or other means of demarcation (i.e. signs and postings) to control and isolate traffic in the work area. Means of demarcation shall also be constructed isolating resource and/or staging areas.</li> </ul> <p>5) Establish safe zones of approach (i.e. Boom or mast + 5 feet). See Table 5-1 for Soil boring/Monitoring Well Installation for recommended distances.</p> <ul style="list-style-type: none"> <li>- The mast will be lowered when moving the rig.</li> <li>- Foot and vehicular traffic routes shall be well defined.</li> <li>- Heavy equipment patterns shall be isolated using fences or other suitable barricades from pedestrian pathways.</li> <li>- Bumpers or other suitable traffic stops shall be placed in areas where it is desired that traffic approaching an drop offs or unprotected banks.</li> <li>- All self-propelled equipment with restricted vision moving backwards shall be equipped with back up warning systems.</li> <li>- The FOL and/or the SSO as a precautionary measure to remove or demarcate physical hazards shall preview traffic routes (foot and vehicular) before the commitment of personnel and resources.</li> </ul> <p>6) Wear appropriate clothing for weather conditions. Provide acceptable shelter and liquids for field crews. Additional information regarding heat and cold stress is provided in Section 4.0 of the TiNUS Health and Safety Guidance Manual.</p> <p>7) This is not considered a predominant hazard as these activities are to be conducted in a well maintained area. To combat the potential impact of natural hazards, the following actions are recommended:</p> <ul style="list-style-type: none"> <li>- Wear light color clothes and, if necessary, tape pant legs to work boots to block direct access.</li> <li>- Use repellents – Permethrin should be applied liberally to the clothing, but not the skin as it may cause irritation. Follow manufacturer's recommendations for use.</li> </ul> <p>8) Suspend or terminate operations until directed otherwise by SSO. See Section 4.0 of the TiNUS Health and Safety Guidance Manual for additional information concerning natural hazards.</p>	<p>Visual observation of work practices by the FOL and/or the SSO to minimize potential physical hazards (i.e., improper lifting, unsecured loads, cutting practices, etc.).</p> <p>Monitoring for chemical hazards is not required during this activity.</p>	<p>Level D - (Minimum Requirements)</p> <ul style="list-style-type: none"> <li>- Standard field attire (Sleeved shirt; long pants)</li> <li>- Safety shoes (Steel toe/shank)</li> <li>- <i>Safety glasses</i></li> <li>- <i>Hardhat (when overhead hazards exists, or identified as a operation requirement)</i></li> <li>- <i>Reflective vest for high traffic areas</i></li> <li>- <i>Hearing protection for high noise areas (At the direction of the FOL and/or the SSO).</i></li> </ul> <p>As site conditions may change, the following equipment will be maintained during all on-site activities as prescribed in Section 2.0 of this HASP</p> <ul style="list-style-type: none"> <li>- Fire Extinguishers</li> <li>- First-aid kit</li> </ul> <p><b>Note:</b> The FOL and/or the SSO will determine the number of fire extinguishers and first-aid kits to be made available based on the number of operations to be conducted at any given time.</p>	<p>Not required.</p> <p>Good personal hygiene practices should be employed prior to breaks lunch or other period when hand to mouth contact occurs. This will minimize potential ingestion exposures.</p> <p>Personnel should inspect themselves and one another for the presence of ticks when exiting wooded areas, grassy fields, etc. This action will be employed to assist in stopping the transfer of these insects into vehicles, homes, and offices.</p> <p>In a review of a number of tick bites reported over the past few years, the ticks that went undetected were located on the back and in the shoulder areas. Have your buddy examine this area carefully.</p>

**TABLE 5-1  
TASKS/HAZARDS/CONTROL MEASURES  
NAS CECIL FIELD, JACKSONVILLE, FLORIDA**

Task/Operation/Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring - Type and Action Levels	Personal Protective Equipment <i>(Items in italics are deemed optional as conditions or the FOL or SSO require)</i>	Decontamination Procedures
<p>Bench Scale Test</p> <p>Two soil slug samples will be separated into five 5-gallon buckets and will be analyzed for their buffering capacity by adding varying quantities of NaHCO<sub>3</sub> (baking soda) and checking the pH.</p>	<p><b>Chemical hazards:</b></p> <p>1) Previous analytical data identified TCE as the primary contaminants of concern. Based on predictive modeling, TCE is not anticipated to be present at concentrations that are likely to present an occupation exposure concern to site workers. Additional information on TCE is provided in Section 6.1 and Table 6-1. This activity will also require the use of 0.01 molar solutions of NaHCO<sub>3</sub> which are unlikely to present an occupational exposure concern.</p> <p><b>Physical hazards:</b></p> <p>2) Strain/muscle pulls from manual lifting</p>	<p>1) Avoid contact with contaminated media (groundwater) through safe work practices, PPE, and decontamination. Use monitoring instruments to identify airborne concentrations of TCE – though based on available analytical data hazardous concentrations in worker breathing zones are unlikely. Good work and personal hygiene measures will be used to control potential exposures through incidental ingestion. Avoid hand to mouth contact, wash hands and face or use hygienic wipes to remove potential contaminants prior to breaks or lunch or other hand to mouth activities.</p> <p>2) Buckets containing soil may present a lifting/muscle strain concern. Use proper lifting techniques (See Lifting Mobilization/Demobilization of this table).</p>	<p>No air monitoring is required for this site activity. Site contaminants are unlikely to be present at concentrations that pose an inhalation hazard to site personnel.</p> <p>As a precautionary measure, a direct reading instrument such as PID or FID may be used to detect volatile organic compounds (VOCs).</p> <p>Any sustained readings greater than 50 ppm in a worker's breathing zone, or observations of symptoms of exposure, will require that site activities be suspended until the readings subside to background levels or the source is determined.</p>	<p>Level D protection constitutes the following for sampling activities</p> <p>Standard field dress (long pants, Sleeved shirts) <i>Nitrile surgeon style inner gloves</i> Steel toe safety shoes or work boots <i>Safety glasses</i></p> <p><b>Note:</b> The Safe Work Permit(s) for this task (See Attachment IV) will be issued at the beginning of each day to address the tasks planned for that day. As part of this task, additional PPE may be assigned to reflect site-specific conditions or special considerations or conditions associated with any identified task.</p>	<p><b>Personnel Decontamination</b></p> <p>Upon completion of the sampling</p> <ul style="list-style-type: none"> <li>- Dedicated equipment will be rinsed and bagged for disposal.</li> <li>- Handi-Wipes or similar product will be used to clean hands, prior to moving to the next location.</li> </ul> <p><b>Equipment Decontamination</b></p> <p>Decontamination of equipment (sampling and hand tools) will proceed as indicated in Table 5-1 of this HASP and/or the Work Plan.</p>

**TABLE 5-1  
TASKS/HAZARDS/CONTROL MEASURES  
NAS CECIL FIELD, JACKSONVILLE, FLORIDA**

Task/Operation/Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring - Type and Action Levels	Personal Protective Equipment <i>(Items in italics are deemed optional as conditions or the FOL or SSO require )</i>	Decontamination Procedures
<p>Monitoring/Injection Well Installation - using DPT methods.</p> <p>This task also includes the injection of lactate, HRC, and NaHCO<sub>3</sub> into injection wells using a DPT rig.</p>	<p><b>Chemical hazards:</b></p> <p>1) Previous analytical data identified TCE as the primary contaminants of concern. Based on predictive modeling, TCE is not anticipated to be present at concentrations that are likely to present an occupation exposure concern to site workers. Additional information on TCE is provided in Section 6.1 and Table 6-1.</p> <p>Injection of lactate, HRC, and NaHCO<sub>3</sub> presents limited exposure concern based on the nature and constituents of these compounds.</p> <p>2) Transfer of contamination into clean areas or onto persons</p> <p><b>Physical hazards:</b></p> <p>3) Heavy equipment hazards (pinch/compressions points, rotating equipment, hydraulic lines, etc.)</p> <p>4) Noise in excess of 85 dBA</p> <p>5) Energized systems (contact with underground or overhead utilities)</p> <p>6) Lifting (strain/muscle pulls)</p> <p>7) Slips, trips, and falls</p> <p>8) Cuts and lacerations</p> <p>9) Vehicular and foot traffic</p> <p><b>Natural hazards:</b></p> <p>10) Inclement weather</p> <p>11) Insect bites</p>	<p>1) Avoid contact with contaminated media (groundwater) through safe work practices, PPE, and decontamination. Use monitoring instruments to identify airborne concentrations of TCE – though based on available analytical data hazardous concentrations in worker breathing zones are unlikely. Good work and personal hygiene measures will be used to control potential exposures through incidental ingestion. Avoid hand to mouth contact, wash hands and face or use hygienic wipes to remove potential contaminants prior to breaks or lunch or other hand to mouth activities. Refer to manufacturer MSDS for lactate, HRC, and NaHCO<sub>3</sub> and to determine potential hazards and appropriate control measures. Avoid contact with injection materials especially if heated to facilitate pumping/injection.</p> <p>2) Restrict the cross use of equipment and supplies between locations and activities without first going through a suitable decontamination. Work practices including establishing a rigid decontamination procedure will be employed for all equipment between locations and between clean and potentially dirty work. This provision along with dedicated sampling equipment will insure materials are not carried and deposited in unaffected areas.</p> <p>3) All equipment will be:</p> <ul style="list-style-type: none"> <li>- Inspected in accordance with Federal safety and transportation guidelines, OSHA (1926.600.601.602), and manufacturer's design, as applicable. All inspections will be documented using the Equipment Inspection - Checklist found in Attachment III of this HASP.</li> <li>- Operated and supported by knowledgeable operators and ground crew.</li> <li>- Personnel not directly supporting this operation will remain at least 25 feet from the point of operation or the height of the mast plus 5-feet, whichever is greater.</li> <li>- All personnel will be instructed in the location and operations of the emergency shut-off device(s). This device will be tested initially (and then daily) to ensure its operational status.</li> <li>- One person will be designated as the Emergency Shut Off Device Operator.</li> </ul> <p>Prior to engaging the augers, the driller will announce, loud enough for all to hear that he is engaging the augers. He will visually confirm that all personnel are removed from the rotating equipment then engage the augers.</p> <ul style="list-style-type: none"> <li>- Areas will be inspected prior to the movement of the direct push rig and support vehicles to eliminate any physical hazards. This will be the responsibility of the FOL and/or SSO.</li> <li>- See additional safe work procedures for drilling in Section 5.2 of this HASP as well as in Section 4.0 of the Health &amp; Safety Guidance Manual.</li> </ul> <p>4) Excessive noise levels will be mitigated through the use of hearing protection. Any piece of equipment or operation that has the potential to generate excessive noise levels (i.e., you must raise your voice to speak to someone within two feet of where you are standing) will require hearing protection until sound level measurements and/or noise dosimetry may be conducted to quantify the associated noise levels.</p> <p>5) All drilling activities will proceed in accordance with the Utility Locating and Excavation Clearance SOP in Attachment II of this HASP. All utility clearances will be obtained in writing, and locations identified and marked, prior to activities.</p> <p>6) Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques as described in Table 5-1 for mobilization/demobilization. Drill stems, auger flights, and well construction supplies are some of the common material that are handled and because of their weight will present a lifting strain hazard associated with this activity.</p> <p>7) Preview work locations and site lines for uneven/unstable terrain. Clear necessary vegetation and establish temporary means for traversing hazardous terrain.</p> <p>8) Although not anticipated to be used, if soil sample cores are collected, use the knife and acetate tube retention tub recommended by Geoprobe (Geoprobe Sampling Kit) to prevent potential cuts and lacerations when accessing samples within MacroCore acetate liners.</p> <ul style="list-style-type: none"> <li>- Always cut away from yourself and others.</li> <li>- Do not place items to be cut in your hand or on your knee.</li> <li>- Maintain a sharp cutting edge.</li> <li>- Wear cut-resistant gloves (leather or heavy cotton)</li> <li>- Use traffic-warning signs, flag persons, and high visibility vests as determined by the SSO when work infringes traffic thoroughfares. Use physical barricades, when working within or altering normal traffic flow patterns/traffic lanes.</li> </ul> <p>10) Wear appropriate clothing for weather conditions. Follow the provisions as specified in Section 4.0 of the Tetra Tech NUS, Inc. Health and Safety Guidance Manual regarding the identification and evaluation of heat/cold stress related conditions.</p> <p>11) Wear appropriate clothing and PPE. Avoid potential nesting areas and suspicious vegetation. When feasible and necessary, use commercially available insect repellants. Report potential hazards to the SSO. Inspect clothing and persons for ticks and other vectors during and after work activities in wooded areas.</p>	<p>Site contaminants are unlikely to be present at concentrations that pose an inhalation hazard to site personnel.</p> <p>A direct reading instrument such as PID or FID will be used to detect volatile organic compounds (VOCs). The PID/FID will be used to screen potential source (sample locations, boreholes, etc.) areas to detect the presence of any VOCs. Positive readings at a source area will require that worker's breathing zone be monitored to determine exposure potentials.</p> <p>Any sustained readings greater than 50 ppm in a worker's breathing zone, or observations of symptoms of exposure, will require that site activities be suspended until the readings subside to background levels or the source is determined.</p> <p>Noise monitoring may be conducted at the discretion of the PHSO and/or the SSO.</p> <p>Action Level - &gt;85 dBA Participation in the Project Hearing Conservation Program. Hearing protection is required for this operation.</p>	<p>Subsurface operations are to be initiated in Level D protection. Level D protection constitutes the following minimum protection:</p> <ul style="list-style-type: none"> <li>- Standard field dress (Long pants and sleeved shirts)</li> <li>- Tyvek coveralls and disposable boot covers if the potential exists of soiling work attire.</li> <li>- Surgical style nitrile gloves</li> <li>- Steel toe shoes or work boots</li> <li>- Disposable nitrile gloves</li> <li>- Safety glasses</li> <li>- Hardhat</li> <li>- Hearing protection for high noise areas</li> <li>- <i>Reflective vest for high traffic areas</i></li> </ul> <p>Note: The Safe Work Permit for this task (see Attachment IV) will be issued at the beginning of the task to address planned activities. Additional PPE may be assigned to reflect site-specific conditions or special considerations.</p>	<p><b>Personnel Decontamination</b> -This function will take place at an area adjacent to the work operations.</p> <p>This decontamination procedure for Level D protection will consist of</p> <ul style="list-style-type: none"> <li>- Equipment drop</li> <li>- Soap/water wash and rinse of outer coveralls, gloves and boots, if applicable</li> <li>-Outer coverall and outer glove removal</li> <li>- Disposal of non-reusable PPE in doubly-lined bags/ and then into an industrial dumpster</li> <li>- Wash hands and face, leave contamination reduction zone</li> </ul> <p><b>Equipment Decontamination</b> – See Decontamination of heavy equipment. Heavy equipment decontamination will take place at a centralized decontamination pad utilizing steam or pressure washers. Heavy equipment such as drill rigs will have the wheels or tracks cleaned along with any loose debris removed, prior to transporting to the central decontamination area. All site vehicles will have restricted access to exclusion zones, and also have their wheels/tires sprayed off as not to track mud onto the roadways servicing this installation. Roadways shall be cleared of any debris resulting from the on-site activity.</p> <p>All equipment used in the exclusion zone will require a complete decontamination between locations and prior to removal from the site.</p> <p>The FOL or the SSO will be responsible for evaluating equipment arriving on site and that which is to leave the site. No equipment will be authorized access or exit without this authorization.</p>

**TABLE 5-1  
TASKS/HAZARDS/CONTROL MEASURES  
NAS CECIL FIELD, JACKSONVILLE, FLORIDA**

Task/Operation/Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring - Type and Action Levels	Personal Protective Equipment <i>(Items in italics are deemed optional as conditions or the FOL or SSO require)</i>	Decontamination Procedures
<p>Groundwater Sampling</p> <ul style="list-style-type: none"> <li>- Monitoring Well Development</li> <li>- Aquifer testing (slug testing)</li> <li>- Groundwater Sampling</li> <li>- Surface and Subsurface soil</li> </ul>	<p><b>Chemical hazards:</b></p> <p>1) Previous analytical data identified TCE as the primary contaminants of concern. Based on predictive modeling, TCE is not anticipated to be present at concentrations that are likely to present an occupation exposure concern to site workers. Additional information on TCE is provided in Section 6.1 and Table 6-1.</p> <p>2) Transfer of contamination into clean areas.</p> <p><b>Physical hazards:</b></p> <p>3) Slip, trip, and fall hazards</p> <p>4) Strain/muscle pulls from manual lifting</p> <p>5) Ambient temperature extremes (heat/cold stress)</p> <p>6) Elevated noise levels from DPT operations or aircraft operation in the area.</p> <p><b>Natural hazards:</b></p> <p>7) Animal and insect bites and encounters</p> <p>8) Inclement weather</p>	<p>1) Avoid contact with contaminated media (groundwater) through safe work practices, PPE, and decontamination. Use monitoring instruments to identify airborne concentrations of TCE – though based on available analytical data hazardous concentrations in worker breathing zones are unlikely. Good work and personal hygiene measures will be used to control potential exposures through incidental ingestion. Avoid hand to mouth contact, wash hands and face or use hygienic wipes to remove potential contaminants prior to breaks or lunch or other hand to mouth activities.</p> <p>2) Transfer of Contamination into Clean Areas - Decontaminate all equipment and supplies between sampling locations and prior to leaving the site. See decontamination of heavy and sampling equipment for direction regarding this task. In addition, the bulk of sampling equipment such as tubing are disposable therefore dedicated. This will aid in preventing cross contamination.</p> <p>3) Preview work locations and site lines for uneven/unstable terrain. Clear necessary vegetation and establish temporary means for traversing hazardous terrain.</p> <p>4) Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques (See Lifting Mobilization/Demobilization of this table).</p> <p>5) Wear appropriate clothing for weather conditions. Provide acceptable shelter and liquids for field crews. Additional information regarding heat/cold stress is provided in Section 4.0 of the Health and Safety Guidance Manual. Care should be exercised when working outdoors due to harmful effects of the sun.</p> <p>6) Excessive noise levels will be mitigated through the use of hearing protection. Any piece of equipment or operation that has the potential to generate excessive noise levels (i.e., you must raise your voice to speak to someone within two feet of where you are standing) will require hearing protection until sound level measurements and/or noise dosimetry may be conducted to quantify the associated noise levels.</p> <p>7) Wear light color clothes. - When opening existing well heads be cautious of bees and spiders as these are preferred nesting locations. - Use repellents – Permethrin should be applied liberally to the clothing, but not the skin as it may cause irritation. Concentrate on areas where ticks and other insects may access your body such as pant cuffs, shirt to pants, and collars. Products containing DEET can be applied directly to the skin. As always, follow manufacturer’s recommendations for use. See Section 4.0 of the Health and Safety Guidance Manual Section 4.0 for more information concerning these natural hazards.</p> <p>8) Suspend or terminate operations during electrical storms. Return to work when directed by the FOL and/or the SSO.</p>	<p>Site contaminants are unlikely to be present at concentrations that pose an inhalation hazard to site personnel.</p> <p>A direct reading instrument such as PID or FID will be used to detect volatile organic compounds (VOCs). The PID/FID will be used to screen potential source (sample locations, boreholes, etc.) areas to detect the presence of any VOCs. Positive readings at a source area will require that worker’s breathing zone be monitored to determine exposure potentials.</p> <p>Any sustained readings greater than 50 ppm in a worker’s breathing zone, or observations of symptoms of exposure, will require that site activities be suspended until the readings subside to background levels or the source is determined.</p> <p>Noise monitoring may be conducted at the discretion of the PHSO and/or the SSO.</p> <p>Action Level - &gt;85 dBA Participation in the Project Hearing Conservation Program. Hearing protection is required for this operation.</p>	<p>Level D protection constitutes the following for sampling activities</p> <p>Standard field dress (long pants, Sleeved shirts) Steel toe safety shoes or work boots Safety glasses Nitrile surgeon style inner gloves for sampling <i>Hard Hats</i> <i>Hearing protection</i> <i>Impermeable boot covers</i> <i>Reflective vest for traffic areas</i></p> <p>Protective Measures as specified for drilling and soil boring will be employed for all subsurface soil sampling at the drill rig.</p> <p><b>Note:</b> The Safe Work Permit(s) for this task (See Attachment IV) will be issued at the beginning of each day to address the tasks planned for that day. As part of this task, additional PPE may be assigned to reflect site-specific conditions or special considerations or conditions associated with any identified task.</p>	<p><b>Personnel Decontamination</b></p> <p>Upon completion of the sampling</p> <ul style="list-style-type: none"> <li>- Dedicated trowels, tubing, PPE will be rinsed and bagged for disposal.</li> <li>- Handi-Wipes or similar product will be used to clean hands, prior to moving to the next location.</li> </ul> <p><b>Equipment Decontamination</b></p> <p>Decontamination of equipment (sampling and hand tools) will proceed as indicated in Table 5-1 of this HASP and/or the Work Plan.</p>

**TABLE 5-1  
TASKS/HAZARDS/CONTROL MEASURES  
NAS CECIL FIELD, JACKSONVILLE, FLORIDA**

Tasks/Operation/Locations	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring - Type and Action Levels	Personal Protective Equipment <i>(Items in italics are deemed optional as conditions or the FOL or SSO require)</i>	Decontamination Procedures
<p>Decontamination of Heavy Equipment using pressure washers.</p> <p>Decontamination of sampling equipment using 5-gallon buckets/scrub brushes, etc.</p> <p>It is anticipated that this activity will take place at a temporary centralized location.</p>	<p><b>Chemical hazards:</b></p> <p>1) Previous analytical data identified TCE as the primary contaminants of concern. Based on predictive modeling, TCE is not anticipated to be present at concentrations that are likely to present an occupation exposure concern to site workers. Furthermore, TCE is not anticipated to be present at significant concentrations during decontamination efforts. Additional information on TCE is provided in Section 6.1 and Table 6-1.</p> <p>2) Decontamination fluids - Liquinox (detergent); isopropanol (decontamination solvent)</p> <p><b>Physical hazards:</b></p> <p>3) Lifting (strain/muscle pulls) 4) Noise in excess of 85 dBA 5) Flying projectiles 6) Slips, trips, and falls</p> <p><b>Natural hazards:</b></p> <p>7) Inclement weather</p>	<p>1) and 2) Employ protective equipment to minimize contact with TCE and hazardous decontamination fluids. Control potential non-occupational exposures through good work hygiene practices (i.e., avoid hand to mouth contact; wash hands and face before breaks and lunch; minimize contact with contaminated media). Obtain and familiarize yourself with manufacturer's MSDS for any decontamination fluids used on-site. Solvents may only be used in well-ventilated areas, such as outdoors. Use appropriate PPE as identified on MSDS or within this HASP. All chemicals used must be listed on the Chemical Inventory for the site, and site activities must be consistent with the Hazard Communication Program provided in Section 5.0 of the TtNUS Health and Safety Guidance Manual.</p> <p>3) Use multiple persons where necessary for lifting and handling heavy equipment for decontamination purposes. - Employ proper lifting techniques as described in Table 5-1, Mobilization/Demobilization.</p> <p>4) Wear hearing protection when operating the pressure washer and/or steam cleaner. Sound pressure levels measured during the operation of similar pieces of equipment indicate a range of 87 to 93 dBA.</p> <p>5) Use eye and face protective equipment when operating the pressure washer and/or steam cleaner, due to flying projectiles. All other personnel must be restricted from the area. In addition to minimize hazards (flying projectiles, water lacerations and burns) associated with this operation, the following controls will be implemented - A Fan Tip 25° or greater will be used on pressurized systems over 3,000 psi. This will reduce the possibility of water lacerations or punctures. - Do not point the wand at persons or place against any part of your body. - Thermostat control will be in place and operational to control the temperature levels of the water where applicable. - Visual evaluations of hoses and fittings for structural defects - Construct deflection screens as necessary to control overspray and to guard against dispersion of contaminants driven off by the spray.</p> <p>7) The decontamination pad should be constructed to contain wash waters generated during decontamination procedures. Temporary decontamination pads are usually 10-30 mil polyethylene or polyvinyl chloride tarp construction. Although these items when used as a liner offer containment, they also present a slipping hazard. When these temporary liners are employed, it is recommended that a light coating of sand be spread over the walking surface to provide traction. - In addition, adequate slope should be provided to the pad to permit drainage away from the object being cleaned. The collection point for wash waters should be of adequate distance that the decontamination workers do not have to walk through the wash waters while completing their tasks. - Hoses should be gathered when not in use to eliminate potential tripping hazards.</p> <p>8) Suspend or terminate operations until directed otherwise by SSO.</p>	<p>Use visual observation and real-time monitoring instrumentation to ensure all equipment has been properly cleaned of contamination and dried.</p>	<p><b>For Heavy Equipment</b></p> <p>This applies to pressure washing and/or steam cleaning operations and soap/water wash and rinse procedures.</p> <p>Level D Minimum requirements: - Hard hat with splash shield - Standard field attire (Long sleeve shirt; long pants) - Safety shoes (Steel toe/shank) - Chemical resistant boot covers - Nitrile outer gloves over nitrile inner gloves - Safety glasses underneath a splash shield - Hearing protection (plugs or muffs) - <i>Hooded PVC Rainsuits or PE or PVC coated Tyvek.</i> Impermeable aprons may be used instead of coveralls if they offer adequate protection against overspray and back splash.</p> <p><b>For sampling equipment</b> (trowels, split spoons, etc.), the following PPE is required</p> <p><b>Note:</b> Consult MSDS for additional PPE guidance. Otherwise, observe the following.</p> <p>Level D Minimum requirements - - Standard field attire (Long sleeve shirt; long pants) - Safety shoes (Steel toe/shank) - Nitrile outer gloves over nitrile inner gloves - Safety glasses - <i>Impermeable apron</i></p> <p><b>Note:</b> The Safe Work Permit(s) for this task (See Attachment IV) will be issued at the beginning of each day to address the tasks planned for that day. As part of this task, additional PPE may be assigned to reflect site-specific conditions or special considerations or conditions associated with any identified task.</p>	<p><b>Personnel Decontamination</b> will consist of a soap/water wash and rinse for reusable and non-reusable outer protective equipment (boots, gloves, PVC splash suits, as applicable).</p> <p>The sequential procedure is as follows: Stage 1: Equipment drop, remove outer protective wrapping; personnel will wash hand tools and pass hand equipment through as necessary. Stage 2: Soap/water wash and rinse of outer boots and gloves Stage 3: Soap/water wash and rinse of the outer splash suit or apron as applicable Stage 4: Disposable PPE will be removed and bagged. Stage 5: Wash face and hands</p> <p><b>Equipment Decontamination</b></p> <p>- Gross contamination will be removed to the extent possible at the site. Contaminated tooling then will be wrapped in polyethylene sheeting for transport to the centralized location for a full decontamination and evaluation.</p> <p>- All heavy equipment decontamination will take place at a centralized decontamination pad utilizing a steam cleaner or pressure washer.</p> <p>- Remove gross (visible) materials using scrapers, shovels as necessary (soils, etc.) - Use the pressure washer/steam cleaner remove remaining visible debris. - As necessary, follow up with scrub brushes with Alconox or Liquinox detergent wash. - Potable water rinse using pressure washer/steam cleaner as necessary - DI water rinse - Air dry</p> <p>Heavy equipment will have the wheels and tires cleaned along with any loose debris removed, prior to transporting to the central decontamination area.</p> <p><b>Sampling Equipment Decontamination</b></p> <p>- Remove heavy materials (soils, etc.) - Alconox or Liquinox detergent wash - Potable water rinse - Solvent rinse (Isopropanol) - DI water rinse - Air dry</p> <p>All equipment used in the exclusion zone will require a complete decontamination between locations and prior to removal from the site.</p> <p>The FOL or the SSO will be responsible for evaluating equipment arriving on-site, leaving the site, and between locations. No equipment will be authorized access, exit, or movement to another location without this evaluation.</p>

**TABLE 5-1  
TASKS/HAZARDS/CONTROL MEASURES  
NAS CECIL FIELD, JACKSONVILLE, FLORIDA**

Tasks/Operation/Locations	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring - Type And Action Levels	Personal Protective Equipment <i>(Items In Italics Are Deemed Optional As Conditions Or The FOL Or the SSO require)</i>	Decontamination Procedures
<p>IDW Management including storage of IDW in drums.</p>	<p><b>Chemical hazards:</b></p> <p>1) Previous analytical data TCE as the primary contaminant of concern. Based on predictive modeling, TCE is not anticipated to be present at concentrations that are likely to present an occupation exposure concern to site workers. Furthermore, TCE is not anticipated to be present at significant concentrations during IDW management activities. Additional information on TCE is provided in Section 6.1 and Table 6-1.</p> <p>Further information on the primary contaminants of concern are presented in Section 6.1, and Table 6-1.</p> <p>2) Transfer of contamination into clean areas or onto persons</p> <p><b>Physical hazards:</b></p> <p>3) Lifting (strain/muscle pulls)</p> <p>4) Heavy equipment hazards (pinch/compression points).</p> <p>5) Noise in excess of 85 dBA</p> <p>6) Slip, trip, and fall hazards (uneven or unstable terrain)</p> <p>7) Vehicular and foot traffic</p> <p>8) Ambient temperature extremes</p> <p><b>Natural hazards:</b></p> <p>9) Inclement weather</p>	<p>1) All staged IDW containers should be clearly labelled. Contact with the container's contents should be avoided whenever possible. Identify PPE to control exposures to potentially contaminated media, prior to drum movement.</p> <p>2) Decontaminate all equipment and supplies, if they have become contaminated.</p> <p>3) Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques. See Table 5-1for details.</p> <p>4) Keep hands and fingers free of drum pinch/compression points. Use tools or equipment to avoid contacting pinch points. Whenever possible, use drum dollies to transport drums. Drums shall be staged as follows: - sealed with rings, bolts, and gaskets - four drums to a pallet; labels must face outward - stationed with a minimum of 4 feet between rows - inventory must be available</p> <p>5) Excessive noise levels will be mitigated through the use of hearing protection. Any piece of equipment or operation that has the potential to generate excessive noise levels (i.e., you must raise your voice to speak to someone within 2 feet of where you are standing) will require hearing protection until sound level measurements and/or noise dosimetry may be conducted to quantify the associated noise levels.</p> <p>6) Preview work locations for uneven/unstable terrain.</p> <p>7) Traffic and equipment considerations include the following: Establishing safe zones of approach. Checking that equipment is equipped with movement warning systems. Ensuring all personnel working in high equipment traffic areas are wearing reflective vests for high visibility. Following traffic rules and requirements established by NAS Pensacola. Traffic patterns will be dictated in support of on-site activities. However, regulated patterns in and about the work zones will be established to safely control the flow patterns of mechanized vehicles and pedestrians.</p> <p>8) Wear appropriate clothing for the anticipated weather conditions while maintaining the required level of protection. Provide acceptable shelter and fluids for field crews. Refer to the TtNUS Health and Safety Guidance Manual for additional information regarding heat and cold stress.</p> <p>9) In the event of inclement weather suspend or terminate operations until directed by the SSO.</p>	<p>None Required, unless spill containment provisions are invoked. Then monitoring will proceed as described in the activity associated with the task when the materials were generated such as Soil boring or well installation.</p>	<p>Level D - (Minimum Requirements)</p> <ul style="list-style-type: none"> <li>- Standard field attire (Sleeved shirt; long pants)</li> <li>- Safety shoes (Steel toe/shank)</li> <li>- Leather or canvas work gloves</li> <li>- <i>Safety glasses (When utilizing cables or slings to move the containers)</i></li> <li>- <i>Hardhat (when overhead hazards exists, or identified as a operation requirement)</i></li> </ul> <p>PPE changes may be made with the implementation of the Spill Containment Program. This represents the only anticipated modification to this level of protection.</p>	<p><b>Personnel Decontamination</b> -This function will take place at an area adjacent to the site activities.</p> <p>This decontamination procedure for Level D protection will consist of</p> <ul style="list-style-type: none"> <li>- Equipment drop</li> <li>- Soap/water wash and rinse of outer gloves and outer boots, as applicable</li> <li>- Soap/water wash and rinse of the outer splash suit, as applicable</li> <li>- Bag disposable PPE</li> <li>- Wash hands and face, leave contamination reduction zone</li> </ul>

## 6.0 HAZARD ASSESSMENT AND CONTROLS

This section provides reference information regarding the chemical, physical, and natural hazards which may be associated with activities to be conducted as part of the scope of work. Table 6-1 provides specific information related to some of the various chemical hazards that may be present or generated at the planned project areas within NAS Cecil Field. Specifically, toxicological information, exposure limits, symptoms of exposure, physical properties, and air monitoring and sampling data are discussed in the table.

### 6.1 CHEMICAL HAZARDS

Analytical data from previous site investigations have indicated the presence of trichloroethylene (TCE) in groundwater. Short-term exposure to trichloroethylene causes irritation of the nose and throat and central nervous system (CNS) depression, with symptoms such as drowsiness, dizziness, giddiness, headache, loss of coordination. High concentrations have caused numbness and facial pain, reduced eyesight, unconsciousness, irregular heartbeat and death.

Trichloroethylene is noticeable by smell at approximately 82 parts per million (ppm) and above. In one study, exposure to 110 ppm for 8 hours produced fatigue and drowsiness. Other studies have shown no significant effects following exposure to 200 or 300 ppm for less than 4 hours. At 160-250 ppm, the odor is persistent. Lightheadedness has been reported following exposure to 350-400 ppm for 3 hours. At 1000-1200 ppm, the odor is very strong and unpleasant. Lightheadedness, reduced hand-eye coordination and dizziness have been observed after several minutes. At 2000 ppm, the odor is difficult to tolerate, irritation of the nose and throat is strong, and drowsiness, dizziness and nausea occur within 5 minutes. Very high concentrations have produced death due to CNS effects, and, in rare cases, irregular heart beat.

Effects on behavior and coordination have been observed in some studies. In one study, exposure to 110 ppm resulted in decreased performance in tests measuring reaction time, dexterity, perception, and memory. Similar effects were not observed when the study was repeated. In general, no significant effects have been observed with exposures to 100 ppm or below. Numbness and discomfort of the face and jaw weakness (trigeminal nerve effects) and serious visual disturbances, including reduced eyesight and blurred or double vision, have been reported following exposure to high concentrations. Some of the effects may persist for several months.

Sometimes, permanent nervous system damage and/or liver injury have resulted from severe overexposure to trichloroethylene. In most cases, the individuals had intentionally inhaled very high concentrations of trichloroethylene for its intoxicating effects.

See Table 6-1 for more information concerning this contaminant.

## **6.2 PHYSICAL HAZARDS**

The physical hazards that may be present during the performance of site activities are summarized below:

- Lifting
- Contact with buried or above ground utilities
- Noise in excess 85 dBA
- Flying projectiles
- Vehicular and foot traffic
- Ambient temperature extremes
- Slips, trips, and falls

These physical hazards are discussed in Table 5-1 as applicable to each site task. Further, most of these hazards are discussed in detail in Section 4.0 of the Health and Safety Guidance Manual.

## **6.3 NATURAL HAZARDS**

### **6.3.1 Insect/Snake Bites and Stings, Poisonous Plants, etc.**

As the majority of the activities will take place within a light industrial area/along the flight line predominant natural hazards of this type are considered negligible, however, are not out of the realm of possibility. Where field personnel may encounter these hazards are as follows:

- Protective casings – Preferred nesting location for bees and spiders.
- Items providing ground cover – Snakes will hide under articles providing ground cover especially in areas not disturbed (such as the maintenance storage yard). If you must pick up an article on the ground to gain access to a sample location or for whatever reason:
  - Do Not stick your hands or feet in areas where you cannot see, use a hand tool.
  - Always when picking up an article providing ground cover, always pull it towards yourself so it may serve as a shield should there be something underneath.

TABLE 6-1

## CHEMICAL/PHYSICAL/TOXICOLOGICAL PROPERTIES

Substance	CAS No.	Air Monitoring/Sampling Information	Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information	
Trichloroethylene	79-01-6	<p><b>PID:</b> I.P. 9.45 eV, 0.54 correction factor using a 10.6eV Lamp</p> <p><b>FID:</b> 70% Response with FID.</p>	<p>Air sample using charcoal tube; carbon disulfide desorption; Sampling and analytical protocol shall proceed in accordance with OSHA Method #07, or NIOSH Method #1022 or #1003.</p>	<p><b>OSHA:</b> 50 ppm 200 ppm (Ceiling)</p> <p><b>ACGIH:</b> 50 ppm 100 ppm STEL</p> <p><b>NIOSH:</b> 25 ppm</p> <p><b>IDLH:</b> 1000 ppm</p>	<p><b>Inadequate</b> - Odor threshold 82 ppm. APRs with organic vapor/acid gas cartridges may be used for escape purposes. Exceedances over the exposure limits require the use of positive pressure-demand supplied air respirator.</p> <p><b>Recommended gloves:</b> PV Alcohol unsupported &gt;16.00 hrs; Silver shield &gt;6.00 hrs; Teflon &gt;24.00 hrs; or Viton &gt;24.00 hrs; Nitrile (Useable time limit 0.5 hr, complete submersion for the nitrile selection)</p>	<p><b>Boiling Pt:</b> 188°F; 86.7°C</p> <p><b>Melting Pt:</b> -99°F; -73°C</p> <p><b>Solubility:</b> 0.1% @ 77°F; 25°C</p> <p><b>Flash Pt:</b> 90°F; 32°C</p> <p><b>LEL/LFL:</b> 8% @ 77°F; 25°C</p> <p><b>UEL/UFL:</b> 10.5 @ 77°F; 25°C</p> <p><b>Vapor Density:</b> 4.53</p> <p><b>Vapor Pressure:</b> 100 mmHg @ 90°F; 32°C</p> <p><b>Specific Gravity:</b> 1.46</p> <p><b>Incompatibilities:</b> Strong caustics and alkalis, chemically active metals (barium, lithium, sodium, magnesium, titanium, and beryllium)</p> <p><b>Appearance and Odor:</b> Colorless liquid with a chloroform type odor. Combustible liquid, however, burns with difficulty.</p>	<p>Central nervous system effects including euphoria, analgesia, anesthesia, paresthesia, headaches, tremors, vertigo, and somnolence. Damage to the liver, kidneys, heart, lungs, and skin have also been reported. Contact may result in irritation to the eyes, skin, and mucous membranes. Ingestion may result in GI disturbances including nausea, and vomiting. NIOSH lists this substance a potential human carcinogen.</p>

### **6.3.1.1 Fire Ants**

Various insects and animals may be present and should be considered. For example, fire ants present a unique situation when working outdoors in Florida. Their aggressive behavior and their ability to sting repeatedly can pose a unique health threat. The sting injects venom (formic acid) that causes an extreme burning sensation. Pustules form which can become infected if scratched. Allergic reactions of people sensitive to the venom include dizziness, swelling, shock and in extreme cases unconsciousness and death. People exhibiting such symptoms should see a physician. Fire ants can be identified by their habitat. They build mounds in open sunny areas sometimes supported by a wall or shrub. The mound has no external opening. The size of the mound can range from a few inches across to some which are in excess of two feet or more in height and diameter. When disturbed they defend it by swarming out and over the mound, even running up grass blades and sticks.

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

### **6.3.1.2 Tick Borne Illnesses**

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

Prevention is typically facilitated through taping pants to boots and using insect repellent as well as performing frequent body checks to prevent long term attachment. Site first aid kits should be equipped with medical forceps and rubbing alcohol to assist in tick removal. For information regarding tick removal procedures, and symptoms of exposure consult Section 4.0 of the HSGM.

### **6.3.1.3 Mosquito-Borne Illness**

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

Although mosquito-borne viral illnesses are rare in humans, a Kill Devil Hills, N.C., woman recently died after she came down with Eastern equine encephalitis from an infected mosquito.

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

### West Nile Virus

Encephalitis is an inflammation of the brain and can be caused by bacteria and viruses. West Nile encephalitis is caused by a virus transmitted to humans by mosquitoes. West Nile virus is commonly found in Africa, West Asia, and the Middle East. It is closely related to St. Louis encephalitis virus found in the United States. The West Nile-like virus that has been found in United States is genetically related to West Nile virus, but because of genetic differences it may be a new subtype of West Nile virus.

The mosquito becomes infected by feeding on birds infected with the West Nile virus. Infected mosquitoes then transmit the West Nile virus to humans and animals when biting (or taking a blood-meal). West Nile encephalitis is NOT transmitted from person-to-person. There is no evidence that a person can get the virus from handling live or dead infected birds. However, avoid bare-handed contact when handling any dead animals, including dead birds. Ticks have not been implicated as vectors of West Nile-like virus.

Mild infections are common and include fever, headache, and body aches, often with skin rash and swollen lymph glands. More severe infection is marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, occasional convulsions, paralysis and, rarely, and death (especially in the elderly and very young). The incubation period of West Nile encephalitis is usually 3 to 12 days.

No cases have previously been reported in the U.S. prior to September 1999 (in New York). To date seven deaths in New York have been attributed to West Nile Virus.

### Eastern Equine Encephalitis (EEE)

The Florida Department of Health and Rehabilitative Services (HRS) in 1991 confirmed five human cases of eastern equine encephalitis (EEE) in elderly residents of Bradford, Duval, and Washington counties in northern Florida. Dates of illness onset were in mid-June and early July. One patient partially recovered and has residual neurologic deficits, two patients remain comatose, and the other two patients died.

Eastern Equine Encephalitis is spread to horses and humans through the bite of an infected mosquito. The mosquito becomes infected after biting an infected bird. EEE can cause severe complications and even death. Symptoms for EEE in humans begin with high fever, chills, soar throat, nausea and vomiting. The illness can affect the central nervous system, cause sudden fever, severe headache, mental

confusion, seizures and coma. Symptoms usually appear between 5 to 15 days after exposure to infected mosquitoes. There is no cure for EEE in humans.

**Precautions include:**

- Limit outdoor activities during peak mosquito times – at dusk and dawn.
- Avoid standing water
- Wear long-sleeved shirts and long pants whenever you are outdoors.
- Apply insect repellent according to manufacturers instruction to exposed skin. An effective repellent will contain 20% to 30% DEET (N,N-diethyl-meta-toluamide). Avoid products containing more than 30% DEET.
- Spray clothing with repellents containing permethrin (such as Permanone) or DEET, mosquitoes may bite through thin clothing.

**6.3.2 Ambient Temperature Extremes (Heat Stress)**

Given the geographic location of the site and the project schedule, overexposure to high ambient temperatures (heat stress) may exist during performance of this work depending on the project schedule. Work performed when ambient temperatures exceed 70 °F may result in varying levels of heat stress (heat rash, heat cramps, heat exhaustion, and/or heat stroke) depending on variables such as wind speed, humidity, and percent sunshine, as well as physiological factors such as metabolic rate and skin moisture content. Additionally, work load and level of protective equipment will affect the degree of exposure. Site personnel **will** be encouraged to drink plenty of fluids to replace those lost through perspiration. Additional information such as Work-Rest Regimens and personnel monitoring may be found in section 4.0 of the Health & Safety Guidance Manual.

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

- Watch for signs of heat stress/exhaustion, See Heat Strain Symptoms Table below.
- Provide fluid replacement
- Provide adequate number of breaks within a cooler environment.

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

- Wear a hat that shades the face, neck, and ears.

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

**HEAT STRAIN SYMPTOMS**

**STOP WORK if any worker demonstrates any of the following**

Heart Rate	Sustained (several minutes) heart rate minus worker's age > than 180 beats per minute (bpm) measured at any time.
Body Core Temperature	> 101.3°F (38.5° C)
Recovery Heart Rate	> 110 bpm (Measured 1 minute after peak work effort)
Other symptoms	Sudden and sever fatigue, nausea, dizziness, or headache

**Individuals May Be At Greater Risk of Heat Stress If:**

Profuse sweating is sustained over hours
Weight loss over a shift is > 1.5% of beginning body weight
24-hour urinary sodium excretion is less than 50 nmoles

**6.3.3 Incllement Weather**

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

## 7.0 AIR MONITORING

A direct reading instrument such as a PID will be used at the site to detect and measure the presence and concentration of airborne site contaminants.

### 7.1 INSTRUMENTS AND USE

Instruments will be used primarily to monitor source points including boreholes, well heads, drum openings and worker breathing zone areas, while observing instrument action levels. Action levels are discussed in each Table 5-1 as they may apply to a specific task or location.

#### 7.1.1 Photoionization Detector

A Photoionization Detector (PID) with a 10.6 eV (or equivalent) lamp will be used to monitor potential sources areas and to screen collected samples and breathing zones of employees during sampling activities. All results are compared to the reference calibration standard of isobutylene. The correction factor for Trichloroethene is 0.54. So if your result is 100 ppm, multiply that result by 0.54 which gives you the actual airborne concentration of 54 ppm. The action level provided in Table 5-1 and on the Safe Work Permits have already incorporated this correction factor. Prior to the commencement of any field activities, the background level of the site must be determined and noted. Daily background readings must be taken away from areas of potential contamination to obtain accurate results. These readings, and any influencing conditions (i.e., weather, temperature, humidity) and location will also be documented in the Health and Safety Logbook as a matter of reference.

#### 7.1.2 Hazard Monitoring Frequency

Table 5-1 presents the frequencies that hazard monitoring will be performed as well as the action levels that will initiate the use of personnel retreat or the need for elevated levels of protection. The SHSO may decide to increase these frequencies based on instrument responses and site observations. The frequency at which monitoring is performed will not be reduced without the prior consent of the PHSO or HSM.

### 7.2 INSTRUMENT MAINTENANCE AND CALIBRATION

Hazard monitoring instruments will be maintained and pre-field calibrated by the TtNUS Equipment Manager. Operational checks and field calibration will be performed on all instruments each day prior to their use. Field calibration will be performed on instruments according to manufacturer's recommendations (for example, the PID must be field calibrated daily and an additional field calibration

must be performed at the end of each day to determine any significant instrument drift). These operational checks and calibration efforts will be performed in a manner that complies with the employees health and safety training, the manufacturer's recommendations, and with the applicable manufacturer standard operating procedures which are provided with each instrument. All calibration efforts must be documented. Figure 7-1 is provided for documenting these calibration efforts. This information may instead be recorded in a field operations logbook, provided that all of the information specified in Figure 7-1 is recorded. This required information includes the following:

- Date calibration was performed
- Individual calibrating the instrument
- Instrument name, model, and serial number
- Any relevant instrument settings and resultant readings (before and after) calibration
- Identification of the calibration standard (lot no., source concentration, supplier)
- Any relevant comments or remarks



## **8.0 TRAINING/MEDICAL SURVEILLANCE REQUIREMENTS**

This section is included to specify health and safety training and medical surveillance requirements for TtNUS and subcontractor personnel participating in site activities.

### **8.1 INTRODUCTORY/REFRESHER/SUPERVISORY TRAINING**

All TtNUS and subcontractor personnel must complete 40 hours of introductory hazardous waste site training prior to performing work at the NAS Cecil Field. TtNUS and subcontractor personnel who have had introductory training more than 12 months prior to site work, must have completed 8 hours of refresher training within the past 12 months before being cleared for site work. In addition, 8-hour supervisory training in accordance with 29 CFR 1910.120(e)(4) will be required for site supervisory personnel.

Documentation of TtNUS and subcontractor introductory, 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.

### **8.2 SITE-SPECIFIC TRAINING**

TtNUS will provide site-specific training to all TtNUS and subcontractor personnel who will perform work on this project. Site-specific training will include:

- Names of designated 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
- Medical surveillance requirements
- Safe use of engineering controls and equipment
- Contents of the Health and Safety Plan
- Signs and symptoms of overexposure to site contaminants
- Contents of the Health and Safety Plan
- Emergency response procedures (evacuation and assembly points)
- Spill response procedures
- Review of the contents of relevant Material Safety Data Sheets
- Emergency response procedures (evacuation and assembly points)
- Associated hazards and restricted areas within the NAS Cecil Field.

Site-specific training documentation will be established through the use of Figure 8-2.

### **8.2.1 Ramp Training (Air Side) at NASCF**

All personnel who will require access to the taxi-ways and/or runways will be required to attend a Ramp School. This training is intended to provide facility specific direction for activities within these areas. Ramp Training is provided by Mr. David Dollarhide, Jacksonville Airport Authority, Operations Technician (904) 573-1610 (Business); (904) 219-6699 (Cell). Coordination for training will be coordinated through Mr. Dollarhide. All personnel successful completing the training will be provided a card attesting to such. Copies should be provided to the FOL and/or the SHSO for retention in a central file.

### **8.3 MEDICAL SURVEILLANCE**

All TtNUS and subcontractor personnel participating in project field activities will have had a physical examination meeting the requirements of 1910.120(f). Documentation for medical clearances will be maintained at the project site.

#### **8.3.1 Requirements for All Field Personnel**

Each field team member, including subcontractors and visitors, entering the exclusion zone(s) shall be required to complete and submit a copy of the Medical Data Sheet found in Section 7.0 of the TtNUS Health and Safety Guidance Manual. See also Attachment V. This shall be completed and provided to the SHSO, prior to participating in site activities. The purpose of this document is to provide site personnel and emergency responders with any additional information you would wish them to have should you become incapacitated, but would be necessary in order to administer medical attention.



## 9.0 SITE CONTROL

This section outlines the general 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 fractured three-zone approach will be used during work at this site. This three zone approach will utilize an exclusion zone, a contamination reduction zone, and a support zone. It is also anticipated that this control measure will be used to control access to site work areas. Use of such controls will restrict the general public, minimize the potential for the spread of contaminants, and protect individuals who are not cleared to enter work areas.

### 9.1 EXCLUSION ZONE

#### 9.1.1 Exclusion Zone Dimensions/Boundaries

Exclusion Zone boundaries are as follows:

**DPT Operations** – The height of the fully extended mast plus 5 feet or 25 feet, whichever is greater. This boundary demarcation has been selected based on removal of personnel from hazards associated with this operation. In this case our primary concern is physical hazards, pressurized lines and systems and noise. By establishing the line at least at 25 feet will provide a sufficient distance for protection from flying projectiles associated with pressurized systems, as well as, providing sufficient distance thereby reducing potential for excessive noise exposure.

**Groundwater sampling/Aquifer Testing/Well Development** – 8 feet surrounding the well and discharge receptacle container.

**Soil sampling** – See DPT operations above.

**Decontamination** – Using pressure washers/steam cleaners 25 feet surrounding the point of operation or 15 feet surrounding a constructed pad.

All persons working inside these demarcated areas will adhere to the protective requirements indicated in Table 5-1, Safe Work Permits (Attachment IV) for that operation.

#### 9.1.1.1 **Flying Objects and Debris (FOD)**

FOD can best be defined as loose debris/articles that can be sucked into an aircrafts engine/turbine causing significant degree of damage, as well as, safety hazards associated with the engine

disintegrating. To control hazards associated with the potential transfer of FOD the following exclusion zone activities will be incorporated

- Equipment tires will be checked prior to entering taxiways/runways to ensure they (tires) does not track or carry in stones and associated debris.
- All equipment entering the Air Side will travel over the FOD racks to shake out any loose debris or articles.
- Non-essential equipment will be secured prior to entering areas where FOD is considered a problem.
- All equipment used in FOD sensitive areas will be accounted for.
- All exclusion zones will be closed by the FOL and/or the SHSO to ensure the area has been restored and all articles considered potential FOD has been removed.

## **9.2 CONTAMINATION REDUCTION ZONE**

The Contamination Reduction Zone will be split to represent two separate functions. The first function will be a control/supply point for supporting Exclusion Zone activities. The second function, which may take place a sufficient distance from the Exclusion Zone, is the decontamination of personnel and heavy equipment.

In order to move from the Exclusion Zone to a separate location the following activities will be used:

### **DPT Operations**

- Potentially contaminated tooling will be wrapped, when necessary, for transport to the decontamination area.
- All tooling will be pressure washed and/or steam cleaned and chemically decontaminated, per the work plan.
- All tooling will be evaluated by the FOL and/or the SHSO prior to being released for service at a new location. This evaluation will consist of
  - Visual inspection to ensure all debris (i.e., mud, dirt, any apparent sheen) has been removed through the soap and water washing process.

- Instrument scan using a PID. This will be performed to ensure removal of all contaminants of concern, as well as, identified decontamination solvent (isopropanol) used on equipment that may contact the sample media. If positive results above background are achieved, the identified pieces will require rinsing to be repeated.

### **Groundwater Sampling/Aquifer Testing/Well Development**

- As samplers move from location to location during sampling activities, dedicated sampling devices and PPE will be flushed with clean water, separated, and bagged for disposal. Personnel will use hygienic wipes, such as Handy Wipes, as necessary to clean hands and face until they can access soap and water.
- Muddy over-boots and gloves may be required to go through a gross contamination wash at the Exclusion Zone or be bagged until they can be cleaned at a central decontamination location.
- Potentially contaminated tooling will be wrapped, when necessary, for transport to the decontamination area.
- Upon completion of the assigned tasks all personnel will move through the central decontamination area to clean reusable PPE and field equipment.

### **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. In all cases, the support zones will be established at areas of the sites where exposure to site contaminants would not be expected during normal working conditions or foreseeable emergencies.

### **9.4 SAFE WORK PERMITS**

All exclusion zone work conducted in support of this project will be performed using Safe Work Permits to guide and direct field crews on a task-by-task and site-by-site basis. An example of the Safe Work Permit to be used is illustrated in Figure 9-1. Partially completed Permits for the work to be performed will be included as Attachment IV of this HASP. The daily meetings conducted at the sites will further support these work permits. This will ensure all site-specific considerations and changing conditions are incorporated into the planning effort. All permits will require the signature of the FOL and SHSO.

**FIGURE 9-1  
SAMPLE 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

Modifications/Exceptions: None anticipated

Respiratory equipment required

Yes  Specify on the reverse

No

<b>VI. Chemicals of Concern</b>	<b>Hazard Monitoring</b>	<b>Action Level(s)</b>	<b>Response Measures</b>
---------------------------------	--------------------------	------------------------	--------------------------

Primary Route of Exposure/Hazard: \_\_\_\_\_

\_\_\_\_\_

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

VII. Additional Safety Equipment/Procedures

Hard-hat.....  Yes  No

Safety Glasses .....  Yes  No

Chemical/splash goggles.....  Yes  No

Splash Shield.....  Yes  No

Splash suits/coveralls  Yes  No

Impermeable apron .....  Yes  No

Steel toe Work shoes or boots...  Yes  No

High Visibility vest.....  Yes  No

First Aid Kit.....  Yes  No

Safety Shower/Eyewash.....  Yes  No

Modifications/Exceptions: \_\_\_\_\_

Hearing Protection (Plugs/Muffs)  Yes  No

Safety belt/harness.....  Yes  No

Radio/Cellular Phone.....  Yes  No

Barricades .....  Yes  No

Gloves (Type – Nitrile).....  Yes  No

Work/rest regimen .....  Yes  No

Chemical Resistant Boot Covers  Yes  No

Tape up/use insect repellent .....  Yes  No

Fire Extinguisher.....  Yes  No

Other .....  Yes  No

VIII. Site Preparation

	Yes	No	NA
Utility Locating and Excavation Clearance completed .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Vehicle and Foot Traffic Routes Established/Traffic Control Barricades/Signs in Place .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
---	--------------------------	--------------------------	--------------------------

Physical Hazards Identified and Isolated (Splash and containment barriers) .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--	--------------------------	--------------------------	--------------------------

Emergency Equipment Staged (Spill control, fire extinguishers, first aid kits, etc).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--	--------------------------	--------------------------	--------------------------

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: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Permit Issued by: \_\_\_\_\_ Permit Accepted by: \_\_\_\_\_

Use of these permits will provide the communication line for reviewing protective measures and hazards associated with each operation. This HASP will be used as the primary reference for selecting levels of protection and control measures. The work permit will take precedence over the HASP when more conservative measures are required based on specific site conditions.

## 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., Department of Defense (DOD), Florida Department of Environmental Protection (FDEP), Environmental Protection Agency (EPA), OSHA]
- Southern Division Navy Personnel
- Other authorized visitors (City of Jacksonville, Jacksonville Port Authority)
- All 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, all personnel who require site access into areas of ongoing operations will be required to obtain permission from the FOL and the Base Contact.

Upon gaining access to the site, **all 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:

All site visitors will be routed to the FOL, 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.

All site visitors 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, all 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. All visitors are required to observe the protective equipment and site restrictions in effect at the site at the time of their visit. All visitors entering the exclusion zones during ongoing operations will be

accompanied by a TtNUS representative. Any and all 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 all on site activities until the unauthorized visitor is removed from the premises. Removal of unauthorized visitors will be accomplished with support from the Base Contact. If necessary, the Base Contact will be notified of any unauthorized visitors.

## **9.6 SITE SECURITY**

Site security at this facility will reflect four separate security contingencies. They are as follows:

### **Contingency 1**

Access to the facility is regulated and controlled by the City of Jacksonville, Florida. This is also referred to as the "Land Side". No approval is typically required to gain access to the facility, however, a Guard is posted at the Main Gate. When and if entering the facility you will need to make sure you have your

- Driver's License or some other form of Photo Identification
- Proof of Vehicle Insurance (If operating a Motor Vehicle)

City of Jacksonville Liaison: Mr. Ralph Hogan (904) 771-6397

Cecil Field Facilities Manager – Ms. Diana Stone: (904) 573-1604

### **Contingency 2**

The areas of operation identified in the scope of work approaches and encroaches on areas determined to be part of the "Air Side", which is operated under the control of the City of Jacksonville Port Authority (JPA). Access to these areas will require the following

- A one month notice is required to be provided to the JPA for activities on or near runways/taxiways.
- A 2-week notice is required to be provided to the JPA for activities on aprons or areas approaching runways/taxiways.
- Ramp training is required.

This notification is to be provided in a letter stating who?, what?, when?, where?, and how?. This letter is to be addressed to Mr. Rusty Chandler (904) 573-1613 (JPA Facility Manager). Copy Ms. Diana Stone (Cecil Field Facilities Manager) (904) 573-1604. Currently, all letters requesting access to NASCF Air Side should be process through Mr. Mervin Dale (Tetra Tech NUS, Inc. Access/Security Liaison at the Jacksonville Office (904) 636-6125.

Hours of Operation of the Tower is 8:00 a.m. through 6:00 p.m. Monday through Friday. Air Command operates the runways during the weekend. Early start or weekend work must seek prior approval through the identified notification process.

### **Contingency 3**

Within the areas controlled by the JPA is tenant property, who within some of the operational areas exercise security control. The process is as follows:

A letter to the Facility Manager (1 weeks notice is required). In addition, to the previous indicated letter content, the letter must state all personnel are US Citizens. Again the letter will be coordinated through Mr. Mervin Dale (Tetra Tech NUS, Inc. Access/Security Liaison) at the Jacksonville Office (904) 636-6125.

### **Contingency 4**

This contingency will be accomplished using TtNUS field personnel. TtNUS will retain complete control over active operational areas once access and operations are established.

## **9.7 SITE MAP**

Once the areas of contamination, access routes, topography, and dispersion routes are determined, a site map may be generated for each field event 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 all personnel involved in site operations.

## **9.9 CHEMICAL INVENTORY/MATERIAL SAFETY DATA SHEET (MSDS) REQUIREMENTS**

The FOL and/or the SHSO will develop a chemical inventory list of all chemicals used on site. A sample is provided in the HSGM. For each chemical listed on the inventory list, TtNUS and subcontractor personnel will provide MSDSs for all chemicals brought on the sites. The contents of these documents will be reviewed by the SHSO to insure these documents are complete, accurate, and current. Users of the chemical substances will be required to review the MSDSs prior to any actual use or application of the substances on site, if they are unfamiliar with the hazards of the chemical substances and/or the recommended control measures. 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**

As personnel will not always be working in proximity to one another during field activities, a supported means of communication between field crews members will be necessary. Two way radios will be used to accomplish this means of communication.

In addition, communications with the tower may be required should operations need to encroach upon taxi-ways and/or runways. Currently, the Jacksonville Office (Mervin Dale) has two radios programmed to the necessary frequency to permit communications with the tower. If required additional radios may be purchased and programmed alike.

External communication will be accomplished by using cellular phones or telephones at predetermined and approved locations.

## **9.11 SANITATION AND BREAK AREAS**

This section will address the following items:

- Toilets
- Potable water
- Showers and change rooms
- Break Areas

### **9.11.1 Toilets**

One toilet will be provided for every 20 people. All toilets will be unisex and will have locking doors. The toilet provided will either be a chemical toilet and service provider or the flush toilet readily accessible at a predetermined approved location.

### **9.11.2 Potable Water**

Potable water, as well as, electrolyte balance sports drinks such as Gatorade® will be provided to the field crews for fluid replacement, as it is necessary under conditions of ambient temperature extremes. Storage and dispensing will proceed as follows:

- All containers will be clean and replenished daily.

- All containers will clearly marked as to their contents (Potable Water – Drinking Water Only; Gatorade, etc.).
- Dispensing locations will be placed in identified break areas within the support zone. The most likely location will be a break trailer or support vehicle.
- If larger containers are used, dispensing cups will be provided.
- The coolers used for storage of potable drinks and cups will be stored in plastic bags away from potentially contaminating materials when not in use.

Fluid intake recommendations will be made based on the medical evaluations conducted at the end of the decontamination process, as necessary based on ambient conditions.

#### **9.11.3 Showers and Change Rooms**

Based on this scope and duration of this project shower facilities and locker rooms will not be provided.

#### **9.11.4 Break Areas**

Given the size of the project and nature of the tasks to be conducted structured suitable locations for work breaks and warming/cooling regimens will not be necessary. It is recommended that some means of shade be provided such as canopies or umbrellas to control direct exposure to the sun. Addition, break areas can take place at the site vehicles in the Support Zone.

## **10.0 SPILL CONTAINMENT PROGRAM**

### **10.1 SCOPE AND APPLICATION**

This program applies to the single or aggregate accumulation of bulk storage materials (over 55-gallons). As the classification of certain materials such as IDW is unknown, these materials will be treated as hazardous, pending laboratory certification to the contrary. The types of materials for which this program will apply are as follows:

- Investigative Derived Wastes (IDW) such as decontamination fluids, soil cuttings, and purge and well development waters
- Resource Storage – Limited fuel and lubricant storage

The spill containment and control will be engaged any time there is a release of the above-identified materials from a containment system or vessel. This spill containment program will be engaged in order to minimize associated hazards.

### **10.2 POTENTIAL SPILL AREAS**

Potential spill areas will be periodically monitored in an ongoing attempt to prevent and control further potential contamination of the environment. Currently, limited areas are vulnerable to this hazard including:

- Resource deployment
- Waste transfer
- Central staging

It is anticipated that the IDW generated as a result of this scope of work will be containerized, labeled, and staged to await further analyses. The results of these analyses will determine the method of disposal.

### **10.3 CONTAINMENT AREAS**

In order to facilitate leak and spill inspection and response, and to minimize potential hazards which may impact the integrity of the storage containers, the staging area for these substances will be structured as follows:

### **10.3.1 IDW**

- 55 Gallon Drums (United Nations 1A2 configurations) – 4 Drums to a Pallet; labels and the retaining ring bolt and nut on the outside of each drum to facilitate easy access; Minimum 4-feet between each row of pallets. The decision to construct a bermed and lined area will be the decision of project management. It is currently planned only to drum purge/development/decontamination generated wash waters. Soil cuttings are to be placed in roll-off containers.

The staging area will be identified as a Satellite Storage Area with proper signage, points of contact in the event of an emergency, alternate contacts, and identification of stored material (i.e., Purge or decontamination waters, soil cuttings, etc.).

An Inventory Log will be maintained by the FOL regarding types of IDW and volumes generated. An updated Inventory List will be provided by the FOL to the designated Emergency Response Agency or Facility Contact during days off and between shifts or phases of operations.

### **10.3.2 Flammable/POL Storage**

Flammable Storage [i.e., fuels, decontamination solvents (Isopropanol)] and Petroleum/oil/lubricants (POL) will require proper dispensing containers and necessary storage for cumulative volumes in excess of 25 gallons. Storage and dispensing will comply with the following requirements:

- Fuels dispensed from portable containers, will utilize safety cans.
- Portable hand held storage containers will be labeled per Hazard Communication requirements.
- Larger volumes stored for fueling equipment will be stored in approved mobile Above Ground Storage Tanks with secondary containment capable of holding the tank volume plus 10%.
- Portable flammable liquid storage tanks will be properly grounded and will have bonding capabilities for the transfer of loading and off-loading of its contents.
- Dispensing locations will be supported by a Fire Extinguisher positioned no closer than 50 feet from the storage tank, properly mounted and identified.
- The storage location will be well marked with proper signage, protective bumper poles and will have straight through access/egress for vehicles.

## **10.4 MATERIALS HANDLING**

To minimize the hazards associated with moving drums and containers (i.e, lifting, pinch and compression points) material handling will be supported in the following manner:

- A drum cart with pneumatic tires will be required, if drums are to be moved at the IDW storage area. This cart will be used to relocate drums within the staging and satellite storage location.

Other means of material handling will be evaluated by the SSO based on their ability to minimize or eliminate material handling hazards.

#### **10.5 LEAK AND SPILL DETECTION**

To establish an early detection of potential spills or leaks, a periodic walk-around by the personnel staging or disposing of drums or in the Resource Deployment area will be conducted during working hours to visually determine that storage vessels are not leaking. If a leak is detected, the FOL will be notified and the Spill Containment/Control Response Plan as specified in Section 10.8 will be engaged. Inspections will be documented in the project logbook.

#### **10.6 PERSONNEL TRAINING AND SPILL PREVENTION**

Personnel will be instructed in the procedures for incipient spill prevention, containment, and collection of hazardous materials in the site-specific training. The FOL and/or the SSO will serve as the Spill Response Coordinators for this operation, should the need arise. The FOL shall identify two members (at least two) of the project team as the Incidental Spill Response Team. Should an incidental spill occur these individuals will engage incident response measures. It shall be the responsibility of these individuals to insure they have the supplies and equipment specified in Section 10.7 to support this function. Insufficient supplies or resources should be reported to the FOL.

#### **10.7 SPILL PREVENTION AND CONTAINMENT EQUIPMENT**

The following represents the minimum equipment that will always be maintained at the staging areas the purpose of supporting this Spill Containment/Control Plan.

- Sand, clean fill, vermiculite, or other non combustible absorbent (Oil-dry)
- Extra Drums (55-gallon U.N. 1A2) should the need to transfer material from leaking containers arise.
- Pumps (Gas or Electric necessary for transferring liquids from leaking containers)/tubing
- Shovels, rakes, and brooms
- Container labels
- Personal Protective Equipment
  - Nitrile outer gloves
  - Splash Shield
  - Impermeable over-boots

- Rain suit

## **10.8 SPILL CONTAINMENT/CONTROL RESPONSE PLAN**

This section describes the procedures the Tetra Tech NUS field personnel will employ upon the detection of a spill or leak.

- Notify the SSO or FOL immediately upon detection of a leak or spill.
- Employ the personal protective equipment stored at the staging area. Initiate incidental spill response measures. Take immediate actions to stop the leak or spill by plugging or patching the container or raising the leak to the highest point in the vessel. Spread the absorbent material in the area of the spill, covering it completely.
- Transfer the material to a new vessel; collect and containerize the absorbent material. Label the new container appropriately. Await analyses for treatment and disposal options.
- Re-containerize spills, including 2-inch of top cover (if over soils) impacted by the spill. Await test results for treatment or disposal options.
- If the spill cannot be controlled or contained, initiate emergency alerting procedures for that area to remove non-essential personnel.

It is not anticipated that a spill will occur that the field crew cannot handle. Should this occur, notification of the appropriate Emergency Response agencies will be carried out by the FOL or SSO in accordance with the procedures specified in Section 2.0 of this HASP.

## 11.0 CONFINED-SPACE ENTRY

It is not anticipated, under the proposed scope of work, that confined space and permit-required confined space activities will be conducted. **Therefore, personnel under the provisions of this HASP are not allowed, under any circumstances, to enter confined spaces.**

**A confined space means a space that:**

- Is large enough and so configured that an employee can bodily enter and perform assigned work, and
- 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); and
- Is not designed for continuous employee occupancy.

**A Permit-Required Confined Space means 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 which slopes downward and tapers to a smaller cross-section; or
- Contains any other recognized, serious, safety or health hazard.

For further information on confined space, consult the Health and Safety Guidance Manual (Section 8.0) or call the PHSO. If confined space operations are to be performed as part of the scope of work, detailed procedures and training requirements will have to be addressed.

## 12.0 MATERIALS AND DOCUMENTATION

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

- A complete copy of this HASP
- Health and Safety Guidance Manual
- Incident Reports
- Medical Data Sheets
- Material Safety Data Sheets for all chemicals brought on-site, including decon solution, fuels, sample preservations, calibration gases, etc.
- A full size OSHA Job Safety and Health Poster
- Tetra Tech NUS, Inc. Health and Safety Policy
- Training/Medical Surveillance Documentation Form (blank)
- Emergency Reference Form (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 (maintained/posted)** - This list represents all chemicals brought on-site, including decontamination solutions, sample preservations, fuel, etc... This list should be posted in a central area.

**Material Safety Data Sheets (MSDS) (maintained)** - The MSDSs should also be in a central area accessible to all site personnel. These documents should match all the listings on the chemical inventory list for all substances employed 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 & Health Protection Poster (posted)** - this poster, as directed by 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 defaced, altered, or covered by other material. See Attachment II of this HASP,

**Site Clearance (maintained)** - This list is found within the training section of the HASP (See Figure 8-2). This list identifies all site personnel, dates of training (including site-specific training), and medical

surveillance. The lists indicate not only clearance but also status. If personnel do not meet these requirements, they do not enter the site while site personnel are engaged in activities.

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

**Medical Data Sheets/Cards (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 all personnel to be carried on their person.

**Hearing Conservation Standard (29 CFR 1910.95) (posted)** - this standard will be posted anytime hearing protection or other noise abatement procedures are employed.

**Personnel Monitoring (posted/maintained)** - All results generated through personnel sampling (levels of airborne toxins, noise levels, etc.) will be posted to inform individuals of the results of that effort.

**Placards and Labels (maintained)** - Where chemical inventories have been separated because of quantities and incompatibilities, these areas will be conspicuously marked using DOT placards and acceptable (Hazard Communication 29 CFR 1910.1200(f)) labels.

The purpose is to allow site personnel quick access to this information. Variations concerning location and methods of presentation are acceptable, providing the objection is accomplished.

### 13.0 ACRONYMS/ABBREVIATIONS

ACGIH	American Conference of Governmental Industrial Hygienists
CFR	Code of Federal Regulations
CNS	Central Nervous System
CRZ	Contamination Reduction Zone
DOD	Department of Defense
DOT	Department of Transportation
DPT	Direct Push Technology
EPA	Environmental Protection Agency
eV	electron Volts
FOL	Field Operations Leader
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSM	Health and Safety Manager
N/A	Not Available
NIOSH	National Institute Occupational Safety and Health
OSHA	Occupational Safety and Health Administration (U.S. Department of Labor)
PEL	Permissible Exposure Limit
PHSO	Project Health and Safety Officer
PID	Photo Ionization Detector
PPE	Personal Protective Equipment
PVC	Poly Vinyl Chloride
SAP	Sampling and Analysis Plan
SHSO	Site Health and Safety Officer
STEL	Short Term Exposure Limit
TCE	Trichloroethylene
TOM	Task Order Manager
VOCs	Volatile Organic Compounds

**ATTACHMENT I**  
**INJURY/ILLNESS PROCEDURE**  
**AND REPORT FORM**

## TETRA TECHNUS, INC.

### INJURY/ILLNESS PROCEDURE WORKER'S COMPENSATION PROGRAM

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#### WHAT YOU SHOULD DO IF YOU ARE INJURED OR DEVELOP AN ILLNESS AS A RESULT OF YOUR EMPLOYMENT:

- Stop work as needed to ensure no further harm is done.
- If injury is minor, obtain appropriate first aid treatment.
- If injury or illness is severe or life threatening, obtain professional medical treatment at the nearest hospital emergency room. Check with your office location or project health and safety plan for specific instructions.
- If incident involves an injury, illness, or chemical exposure on a project work site, follow instructions in the Health & Safety Plan.
- Immediately report any injury or illness to your supervisor or office manager. In addition, you must contact your Human Resources representative, Marilyn Duffy at (412) 921-8475, and the Corporate Health and Safety Manager, Matt Soltis at (412) 921-8912 within 24 hours of the injury. You will be required to complete an [Injury/Illness Report](#). You may also be required to participate in a more detailed investigation with the Health Sciences Department.
- In the event of a serious near-miss incident, a "Serious Near Miss Report" (Form AR-2, available online at <https://go2.tetratech.com> under "Departments", "Health and Safety", "Accident Reporting Procedures", hyperlink for "Serious Near Miss Report") must be completed and faxed to the Corporate Health and Safety Manager within 48 hours.
- If further medical treatment is needed, our insurance carrier, ACE, will provide information on the authorized providers customized to the location of the injured employee. You can find this information by accessing the website of ACE's claims handler, ESIS, at : [www.esis.com](http://www.esis.com). These providers are to be used for treatment of Worker's Compensation injuries subject to the laws of the state in which you work.

#### ADDITIONAL QUESTIONS REGARDING WORKER'S COMPENSATION:

Contact your local Human Resources representative (Marilyn Duffy), Corporate Health and Safety Manager (Matt Soltis), or Corporate Administration in Pasadena, California, at (626) 351-4664.

Worker's compensation is a state-mandated program that provides medical and disability benefits to employees who become disabled due to job related injury or illness. Tetra Tech, Inc. and its subsidiaries pay premiums on behalf of their employees. This program is based on a no-fault system, and benefits are provided for covered events as an exclusive remedy to the injured employee regardless of fault. The types of injuries or illnesses covered and the amount of

benefits paid are regulated by the state worker's compensation boards and vary from state to state. Corporate Administration in Pasadena is responsible for administering the Company's worker's compensation program. The following is a general explanation of worker's compensation provided in the event that you become injured or develop an illness as a result of your employment with Tetra Tech or any of its subsidiaries. Please be aware that the term used for worker's compensation varies from state to state.

**WHO IS COVERED:**

All employees of Tetra Tech, whether they are on a full-time, part-time or temporary status, working in an office or in the field, are entitled to worker's compensation benefits from the first day of work. All employees must follow the above injury/illness reporting procedures. If you are working out-of-state and away from your home office, you are still eligible for worker's compensation benefits.

Consultants, independent contractors, and employees of subcontractors and employees from temporary employment agencies are not covered by Tetra Tech's Worker's Compensation plan.

**WHAT IS COVERED:**

If you are injured or develop an illness caused by your employment, worker's compensation benefits are available to you subject to the laws of the state you work in. Injuries do not have to be serious; even injuries treated by first aid practices are covered and must be reported.



TETRA TECH, INC.

ACCIDENT AND ILLNESS INVESTIGATION REPORT

To: \_\_\_\_\_  
Subsidiary Health and Safety Representative

Prepared by: \_\_\_\_\_

Position: \_\_\_\_\_

cc: \_\_\_\_\_  
Workers Compensation Administrator

Office: \_\_\_\_\_

Project name: \_\_\_\_\_

Telephone number: \_\_\_\_\_

Project number: \_\_\_\_\_

Fax number: \_\_\_\_\_

**Information Regarding Injured or Ill Employee**

Name: \_\_\_\_\_

Office: \_\_\_\_\_

Home address: \_\_\_\_\_

Gender: M  F  No. of dependents: \_\_\_\_\_

\_\_\_\_\_

Marital status: \_\_\_\_\_

Home telephone number: \_\_\_\_\_

Date of birth: \_\_\_\_\_

Occupation (regular job title): \_\_\_\_\_

Social security number: \_\_\_\_\_

Department: \_\_\_\_\_

**Date of Accident:** \_\_\_\_\_

**Time of Accident:** \_\_\_\_\_ a.m.  p.m.

**Time Employee Began Work:** \_\_\_\_\_

Check if time cannot be determined

**Location of Incident**

Street address: \_\_\_\_\_

City, state, and zip code: \_\_\_\_\_

County: \_\_\_\_\_

Was place of accident or exposure on employer's premises? Yes  No

**Information About the Incident**

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

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

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.



TETRA TECH, INC.

ACCIDENT AND ILLNESS INVESTIGATION REPORT (Continued)

Information About the Incident (Continued)

What was the injury or illness? Describe the part(s) of the body affected and how it was affected. Be more specific than "hurt," "pain," or "sore." Examples "Strained back"; "Chemical burn, right hand"; "Carpal tunnel syndrome, left wrist"

Describe the Object or Substance that Directly Harmed the Employee: Examples: "Concrete floor"; "Chlorine"; "Radial arm saw." If this question does not apply to the incident, write "Not applicable."

Did the employee die? Yes [ ] No [ ] Date of death: \_\_\_\_\_

Was employee performing regular job duties? Yes [ ] No [ ]

Was safety equipment provided? Yes [ ] No [ ] Was safety equipment used? Yes [ ] No [ ]

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

Witness (Attach additional sheets for other witnesses.)

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Street address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip code: \_\_\_\_\_

Telephone number: \_\_\_\_\_

Medical Treatment Required? [ ] Yes [ ] No [ ] First aid only

Name of physician or health care professional: \_\_\_\_\_

If treatment was provided away from the work site, provide the information below.

Facility name: \_\_\_\_\_

Street address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip code: \_\_\_\_\_

Telephone number: \_\_\_\_\_

Was the employee treated in an emergency room? [ ] Yes [ ] No

Was the employee hospitalized over night as an in-patient? [ ] Yes [ ] No

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.



TETRA TECH, INC.

ACCIDENT AND ILLNESS INVESTIGATION REPORT (Continued)

**Corrective Action(s) Taken by Unit Reporting the Accident:**

**Corrective Action Still to be Taken (by whom and when):**

**Name of Tetra Tech employee the injury or illness was first reported to:** \_\_\_\_\_

**Date of Report:** \_\_\_\_\_ **Time of Report:** \_\_\_\_\_

I have reviewed this investigation report and agree, to the best of my recollection, with its contents.

\_\_\_\_\_  
Printed Name of Injured Employee

\_\_\_\_\_  
Telephone Number

\_\_\_\_\_  
Signature of Injured Employee

\_\_\_\_\_  
Date

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

Title	Printed Name	Signature	Telephone Number	Date
Office Manager				
Project Manager				
Site Safety Coordinator or Office Health and Safety Representative				

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.



TETRA TECH, INC.

ACCIDENT AND ILLNESS INVESTIGATION REPORT (Continued)

**To Be Completed by the Subsidiary Health and Safety Representative**

**Classification of Incident:**  
 Injury     Illness

**Result of Incident:**  
 First aid only  
 Days away from work  
 Remained at work but incident resulted in job transfer or work restriction  
 Incident involved days away and job transfer or work restriction  
 Medical treatment only

No. of days away from work \_\_\_\_\_  
 Date employee left work \_\_\_\_\_  
 Date employee returned to work \_\_\_\_\_  
 No. of days placed on restriction or job transfer: \_\_\_\_\_

OSHA Recordable Case Number \_\_\_\_\_

**To Be Completed by Human Resources**

Social security number: \_\_\_\_\_  
 Date of hire: \_\_\_\_\_ Hire date for current job: \_\_\_\_\_  
 Wage information: \$ \_\_\_\_\_ per  Hour  Day  Week  Month  
 Position at time of hire: \_\_\_\_\_  
 Current position: \_\_\_\_\_ Shift hours: \_\_\_\_\_  
 State in which employee was hired: \_\_\_\_\_  
 Status:  Full-time     Part-time    Hours per week: \_\_\_\_\_    Days per week: \_\_\_\_\_  
 Temporary job end date: \_\_\_\_\_

**To Be Completed during Report to Workers Compensation Carrier**

Date reported: \_\_\_\_\_ Reported by: \_\_\_\_\_  
 Confirmation number: \_\_\_\_\_  
 Name of contact: \_\_\_\_\_  
 Field office of claims adjuster: \_\_\_\_\_

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.

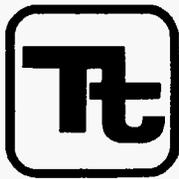
**ATTACHMENT II**

**STANDARD OPERATING PROCEDURE**

**FOR**

**UTILITY LOCATING AND EXCAVATION**

**CLEARANCE**



TETRA TECH NUS, INC.

# STANDARD OPERATING PROCEDURES

Number HS-1.0	Page 1 of 15
Effective Date 12/03	Revision 2
Applicability Tetra Tech NUS, Inc.	
Prepared Health & Safety	
Approved D. Senovich	

Subject  
UTILITY LOCATING AND EXCAVATION CLEARANCE

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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.

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#### 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 scars and patches, and topographical depressions. Note the location of any emergency shut off switches. Any additional information regarding utility

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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.

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**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 through conductive materials, tools, or equipment.

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

<u>Nominal Voltage</u>	<u>Minimum Clearance</u>
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.

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## **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

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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.

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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

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**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**

<b>Alabama</b> Alabama One-Call 1-800-292-8525	<b>Iowa</b> Iowa One-Call 1-800-292-8989	<b>New Jersey</b> New Jersey One Call 1-800-272-1000
<b>Alaska</b> Locate Call Center of Alaska, Inc. 1-800-478-3121	<b>Kansas</b> Kansas One-Call System, Inc. 1-800-344-7233	<b>New Mexico</b> New Mexico One Call System, Inc. 1-800-321-2537 Las Cruces- Dona Ana Blue Stakes 1-888-526-0400
<b>Arizona</b> Arizona Blue Stake 1-800-782-5348	<b>Kentucky</b> Kentucky Underground Protection Inc. 1-800-752-6007	<b>New York</b> Dig Safely New York 1-800-862-7962 New York City- Long Island One Call Center 1-800-272-4480
<b>Arkansas</b> Arkansas One Call System, Inc. 1-800-482-8998	<b>Louisiana</b> Louisiana One Call System, Inc. 1-800-272-3020	<b>North Carolina</b> The North Carolina One-Call Center, Inc. 1-800-632-4949
<b>California</b> Underground Service Alert North 1-800-227-2600 Underground Service Alert of Southern California 1-800-227-2600	<b>Maine</b> Dig Safe System, Inc. 1-888-344-7233	<b>North Dakota</b> North Dakota One-Call 1-800-795-0555
<b>Colorado</b> Utility Notification Center of Colorado 1-800-922-1987	<b>Maryland</b> Miss Utility 1-800-257-7777 Miss Utility of Delmarva 1-800-282-8555	<b>Ohio</b> Ohio Utilities Protection Service 1-800-362-2764 Oil & Gas Producers Underground Protect'n Svc 1-800-925-0988
<b>Connecticut</b> Call Before You Dig 1-800-922-4455	<b>Massachusetts</b> Dig Safe System, Inc. 1-888-344-7233	<b>Oklahoma</b> Call Okie 1-800-522-6543
<b>Delaware</b> Miss Utility of Delmarva 1-800-282-8555	<b>Michigan</b> Miss Dig System, Inc. 1-800-482-7171	<b>Oregon</b> Oregon Utility Notification Center/One Call Concepts 1-800-332-2344
<b>Florida</b> Sunshine State One-Call of Florida, Inc. 1-800-432-4770	<b>Minnesota</b> Gopher State One Call 1-800-252-1168	<b>Pennsylvania</b> Pennsylvania One Call System, Inc. 1-800-242-1776
<b>Georgia</b> Underground Protection Center, Inc. 1-800-282-7411	<b>Mississippi</b> Mississippi One-Call System, Inc. 1-800-227-6477	<b>Rhode Island</b> Dig Safe System, Inc. 1-888-344-7233
<b>Hawaii</b> Underground Service Alert North 1-800-227-2600	<b>Missouri</b> Missouri One-Call System, Inc. 1-800-344-7483	<b>South Carolina</b> Palmetto Utility Protection Service Inc. 1-888-721-7877
<b>Idaho</b> Dig Line Inc. 1-800-342-1585 Kootenai County One-Call 1-800-428-4950 Shoshone - Benewah One-Call 1-800-398-3285	<b>Montana</b> Utilities Underground Protection Center 1-800-424-5555 Montana One Call Center 1-800-551-8344	<b>South Dakota</b> South Dakota One Call 1-800-781-7474
<b>Illinois</b> JULIE, Inc. 1-800-892-0123 Digger (Chicago Utility Alert Network) 312-744-7000	<b>Nebraska</b> Diggers Hotline of Nebraska 1-800-331-5666	<b>Tennessee</b> Tennessee One-Call System, Inc. 1-800-351-1111
<b>Indiana</b> Indiana Underground Plant Protection Service 1-800-382-5544	<b>Nevada</b> Underground Service Alert North 1-800-227-2600	
	<b>New Hampshire</b> Dig Safe System, Inc. 1-888-344-7233	

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**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

Subject

UTILITY LOCATING AND  
EXCAVATION CLEARANCE

Number

HS-1.0

Revision

2

Page

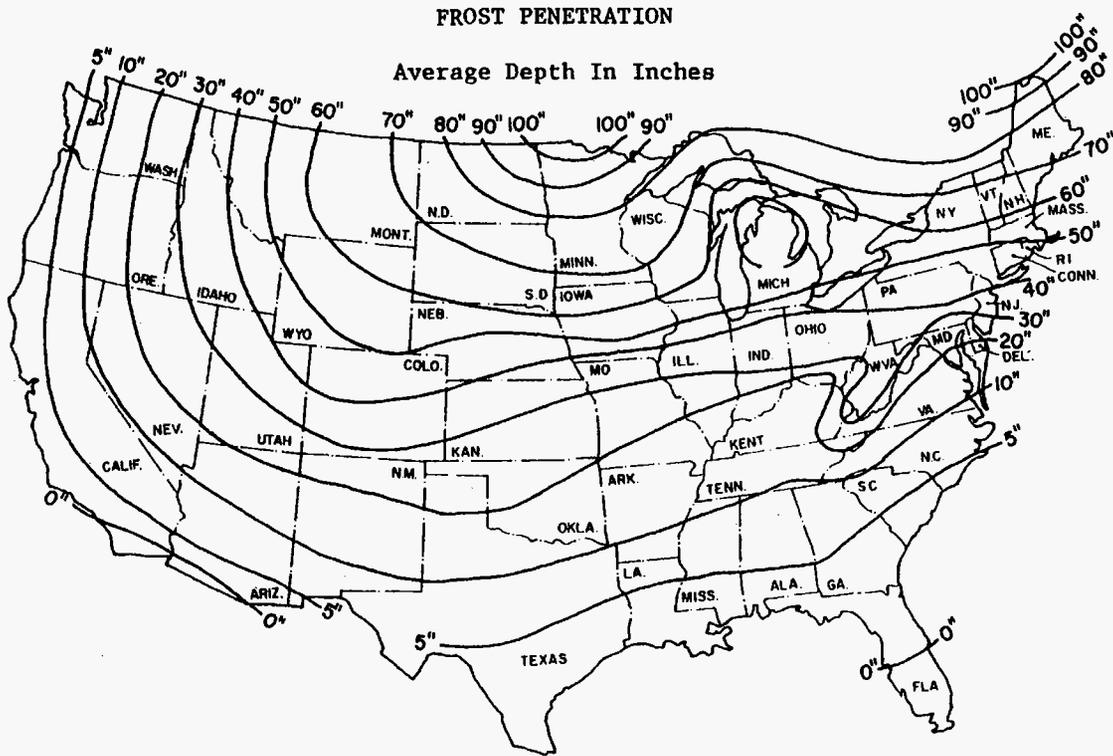
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12/03

### ATTACHMENT 2

### FROST LINE PENETRATION DEPTHS BY GEOGRAPHIC LOCATION



Courtesy U.S. Department Of Commerce

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**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

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**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:

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#### 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.

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**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>.

**ATTACHMENT III**

**EQUIPMENT INSPECTION CHECKLIST**

## EQUIPMENT INSPECTION

**COMPANY:** \_\_\_\_\_ **UNIT NO.** \_\_\_\_\_  
**FREQUENCY:** Inspect daily, document prior to use and as repairs are needed.

Inspection Date: \_\_\_\_/\_\_\_\_/\_\_\_\_ Time: \_\_\_\_\_ Equipment Type: \_\_\_\_\_  
(e.g., bulldozer)

	Good	Need Repair	N/A
Tires or tracks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hoses and belts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cab, mirrors, safety glass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Turn signals, lights, brake lights, etc. (front/rear) for equipment approved for highway use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Is the equipment equipped with audible back-up alarms and back-up lights?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Horn and gauges	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Brake condition (dynamic, park, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fire extinguisher (Type/Rating - _____)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fluid Levels:			
Engine oil	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transmission fluid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Brake fluid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cooling system fluid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Windshield wipers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hydraulic oil	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Oil leak/lube	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coupling devices and connectors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exhaust system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Blade/boom/ripper condition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Accessways: Frame, hand holds, ladders, walkways (non-slip surfaces), guardrails?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Power cable and/or hoist cable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Steering (standard and emergency)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Safety Guards:**

	Yes	No
- Around rotating apparatus (belts, pulleys, sprockets, spindles, drums, flywheels, chains) all points of operations protected from accidental contact? _____	<input type="checkbox"/>	<input type="checkbox"/>
- Hot pipes and surfaces exposed to accidental contact? _____	<input type="checkbox"/>	<input type="checkbox"/>
- Emergency shut offs switches have been identified and communicated to the field crew? _____	<input type="checkbox"/>	<input type="checkbox"/>
- Have emergency shutoff switches been field tested? _____	<input type="checkbox"/>	<input type="checkbox"/>
- Results? _____	<input type="checkbox"/>	<input type="checkbox"/>
- Are any structural members bent, rusted, or otherwise show signs of damage? _____	<input type="checkbox"/>	<input type="checkbox"/>
- Are fueling cans used with this equipment approved type safety cans? _____	<input type="checkbox"/>	<input type="checkbox"/>
- Have the attachments designed for use (as per manufacturer's recommendation) with this equipment been inspected and are considered suitable for use? _____	<input type="checkbox"/>	<input type="checkbox"/>

**Portable Power Tools:**

- Tools and Equipment in Safe Condition? _____	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>

- Saw blades, grinding wheels free from recognizable defects (grinding wheels have been sounded)? \_\_\_\_\_
- Portable electric tools properly grounded? \_\_\_\_\_
- Damage to electrical power cords? \_\_\_\_\_
- Blade guards in place? \_\_\_\_\_
- Components adjusted as per manufacturers recommendation? \_\_\_\_\_

**Cleanliness:**

- Overall condition (is the decontamination performed prior to arrival on-site considered acceptable)? \_\_\_\_\_
- Where was this equipment used prior to its arrival on site? \_\_\_\_\_
- Site Contaminants of concern at the previous site? \_\_\_\_\_
- Inside debris (coffee cups, soda cans, tools and equipment) blocking free access to foot controls? \_\_\_\_\_

**Operator Qualifications (as applicable for heavy equipment):**

- Does the operator have proper licensing where applicable, (e.g., CDL)? \_\_\_\_\_
- Does the operator, understand the equipments operating instructions? \_\_\_\_\_
- Is the operator experienced with this equipment? \_\_\_\_\_
- Does the operator have emotional and/or physical limitations which would prevent him/her from performing this task in a safe manner? \_\_\_\_\_
- Is the operator 21 years of age or more? \_\_\_\_\_

**Identification:**

- Is a tagging system available, for positive identification, for tools removed from service? \_\_\_\_\_

**Additional Inspection Required Prior to Use On-Site**

- |   | <b>Yes</b>               | <b>No</b>                |
|---|--------------------------|--------------------------|
| - Does equipment emit noise levels above 90 decibels?       | <input type="checkbox"/> | <input type="checkbox"/> |
| - If so, has an 8-hour noise dosimetry test been performed? | <input type="checkbox"/> | <input type="checkbox"/> |
| - Results of noise dosimetry: _____                         |                          |                          |
| - Defects and repairs needed: _____                         |                          |                          |
| - General Safety Condition: _____                           |                          |                          |
| - Operator or mechanic signature: _____                     |                          |                          |

Approved for Use:  Yes  No \_\_\_\_\_

Site Safety Officer Signature

**ATTACHMENT IV**

**SAFE WORK PERMITS**

**SAFE WORK PERMIT**  
**MOBILIZATION AND DEMOBILIZATION**  
**NAVAL AIR STATION CECIL FIELD,**  
**JACKSONVILLE, FLORIDA**

Permit No. \_\_\_\_\_ Date: \_\_\_\_\_ Time: From \_\_\_\_\_ to \_\_\_\_\_

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

**II. Primary Hazards:** Potential hazards associated with this task: lifting; pinches and compressions; slip, trip and falls; vehicular and foot traffic; ambient temperature extremes; insect and animal bites, and inclement weather

**III. Field Crew:** \_\_\_\_\_

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

**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
<u>None expected during this task</u>	_____	_____	_____
_____	_____	_____	_____

**Primary Route(s) of Exposure/Hazard:** NA

**(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 .....	<input type="checkbox"/> Yes <input type="checkbox"/> No	Hearing Protection (Plugs/Muffs) .....	<input type="checkbox"/> Yes <input type="checkbox"/> No
Safety Glasses .....	<input type="checkbox"/> Yes <input type="checkbox"/> No	Safety belt/harness .....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Chemical/splash goggles .....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Radio/Cellular Phone .....	<input type="checkbox"/> Yes <input type="checkbox"/> No
Splash shield .....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Barricades .....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Splash suits/coveralls .....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Gloves (Type – Work ) .....	<input type="checkbox"/> Yes <input type="checkbox"/> No
Impermeable apron .....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Work/rest regimen .....	<input type="checkbox"/> Yes <input type="checkbox"/> No
Steel toe work shoes or boots .....	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Chemical resistant boot covers .....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
High visibility vest .....	<input type="checkbox"/> Yes <input type="checkbox"/> No	Tape up/use insect repellent .....	<input type="checkbox"/> Yes <input type="checkbox"/> No
First Aid Kit .....	<input type="checkbox"/> Yes <input type="checkbox"/> No	Fire extinguisher .....	<input type="checkbox"/> Yes <input type="checkbox"/> No
Safety Shower/Eyewash .....	<input type="checkbox"/> Yes <input type="checkbox"/> No	Other .....	<input type="checkbox"/> Yes <input type="checkbox"/> No

Modifications/Exceptions: Various tasks performed as part of mobilization/demobilization require additional PPE. Tasks and site conditions will determine the need for additional PPE (hard hats, safety glasses, protective gloves, hearing protection, reflective vests, etc.).

**VIII. Site Preparation**

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

**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:** Use safe lifting/carrying techniques. Use additional PPE based on the hazards that are associated with each task. Use work gloves when cutting boxes or handling sharp tools/cutting devices. Safety glasses will be required whenever eye hazards are present. Reflective vests will be used when working near roadways or areas of operating vehicles/equipment. Identify/remove potential physical hazards and mark areas or hazards that cannot be removed. Keep work area free of ground clutter.

Permit Issued by: \_\_\_\_\_ Permit Accepted by: \_\_\_\_\_

**SAFE WORK PERMIT**  
**SOIL BORING AND MONITORING WELL INSTALLATION**  
**NAVAL AIR STATION CECIL FIELD,**  
**JACKSONVILLE, FLORIDA**

Permit No. \_\_\_\_\_ Date: \_\_\_\_\_ Time: From \_\_\_\_\_ to \_\_\_\_\_

**I. Work limited to the following (description, area, equipment used):** Soil boring and installation of monitoring/injection wells using DPT methods. Injection of lactate, HRC, and NaHCO3 is included in this task as well.

**II. Primary Hazards:** Potential hazards associated with this task: contact with site contaminants and injection materials; transfer of contamination; heavy equipment hazards; elevated noise; energized systems/utilities; heavy lifting; slip, trip and fall; cuts and lacerations; vehicular and foot traffic; ambient temperature extremes; flying projectiles; insect/animal bites and stings, poisonous plants, inclement weather

**III. Field Crew:** \_\_\_\_\_

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

**V. Protective equipment required** **Respiratory equipment required**  
 Level D  Level B  Yes  Specify on the reverse  
 Level C  Level A  No

Modifications/Exceptions: \_\_\_\_\_

VI. Chemicals of Concern	Hazard Monitoring	Action Level(s)	Response Measures
<u>TCE</u>	<u>PID or FID</u>	<u>Sustained readings in worker</u>	<u>Evacuate area until</u>
_____	_____	<u>Breathing zone greater than</u>	<u>background levels return.</u>
_____	_____	<u>50 ppm.</u>	_____

Injection materials - Refer to manufacturer MSDS for any applicable hazard monitoring and response measures.

**Primary Route(s) of Exposure/Hazard:** Elevated TCE readings in worker breathing zone are unlikely to be encountered. Incidental ingestion and contact with contaminants/injection materials will be prevented through the use of PPE and safe work practices.

**(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.....	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Hearing Protection (Plugs/Muffs) .....	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Safety Glasses .....	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Safety belt/harness .....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Chemical/splash goggles .....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Radio/Cellular Phone .....	<input type="checkbox"/> Yes <input type="checkbox"/> No
Splash shield.....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Barricades.....	<input type="checkbox"/> Yes <input type="checkbox"/> No
Splash suits/coveralls.....	<input type="checkbox"/> Yes <input type="checkbox"/> No	Gloves (Type – nitrile/work ) .....	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Impermeable apron.....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Work/rest regimen.....	<input type="checkbox"/> Yes <input type="checkbox"/> No
Steel toe work shoes or boots....	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Chemical resistant boot covers .....	<input type="checkbox"/> Yes <input type="checkbox"/> No
High visibility vest.....	<input type="checkbox"/> Yes <input type="checkbox"/> No	Tape up/use insect repellent .....	<input type="checkbox"/> Yes <input type="checkbox"/> No
First Aid Kit.....	<input type="checkbox"/> Yes <input type="checkbox"/> No	Fire extinguisher .....	<input type="checkbox"/> Yes <input type="checkbox"/> No
Safety Shower/Eyewash .....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Other.....	<input type="checkbox"/> Yes <input type="checkbox"/> No

Modifications/Exceptions: Coveralls if the potential for soiling work clothing exists. Other PPE is possible based on conditions (rain gear, rubber boots, etc.)

**VIII. Site Preparation**

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

**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:** Use safe lifting/carrying techniques. Inspect equipment prior to use. Ensure emergency stop devices are functional and test daily. Operations will be conducted in areas of an active runway – follow appropriate base procedures. Refer to manufacturer MSDS for hazards and control measures when handling injection materials. Avoid contact with potential contaminated media and injection material (particularly if they are heated to facilitate injection).

Permit Issued by: \_\_\_\_\_ Permit Accepted by: \_\_\_\_\_

**SAFE WORK PERMIT**  
**GROUNDWATER SAMPLING AND WELL DEVELOPMENT**  
**NAVAL AIR STATION CECIL FIELD,**  
**JACKSONVILLE, FLORIDA**

Permit No. \_\_\_\_\_ Date: \_\_\_\_\_ Time: From \_\_\_\_\_ to \_\_\_\_\_

- I. Work limited to the following (description, area, equipment used):** Groundwater sampling and associated activities (water level measurements, well development/purging, etc.)
- II. Primary Hazards:** Potential hazards associated with this task: contact with site contaminants; transfer of contamination; heavy lifting; slip, trip and fall; cuts and lacerations; vehicular and foot traffic; ambient temperature extremes; insect/animal bites and stings, poisonous plants, inclement weather.
- III. Field Crew:** \_\_\_\_\_
- IV. On-site Inspection conducted**  Yes  No Initials of Inspector TtNUS  
**Equipment Inspection required**  Yes  No Initials of Inspector TtNUS

**V. Protective equipment required**

Level D  Level B   
 Level C  Level A

Modifications/Exceptions: \_\_\_\_\_

**Respiratory equipment required**

Yes  Specify on the reverse  
 No

**VI. Chemicals of Concern**

TCE

**Hazard Monitoring**

PID or FID

**Action Level(s)**

Sustained readings in worker Breathing zone greater than 50 ppm.

**Response Measures**

Evacuate area until background levels return.

**Primary Route(s) of Exposure/Hazard:** Contact and incidental ingestions as a result of hand to mouth activities.

(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  
 Safety Glasses .....  Yes  No  
 Chemical/Splash Goggles .....  Yes  No  
 Splash Shield .....  Yes  No  
 Splash Suits/Coveralls .....  Yes  No  
 Impermeable Apron .....  Yes  No  
 Steel Toe Work Shoes or Boots .....  Yes  No  
 High Visibility Vest .....  Yes  No  
 First Aid Kit .....  Yes  No  
 Safety Shower/Eyewash .....  Yes  No

Hearing Protection (Plugs/Muffs) .....  Yes  No  
 Safety Belt/Harness .....  Yes  No  
 Radio/Cellular Phone .....  Yes  No  
 Barricades .....  Yes  No  
 Gloves (Type – Nitrile) .....  Yes  No  
 Work/rest regimen .....  Yes  No  
 Chemical Resistant Boot Covers ....  Yes  No  
 Tape/Insect Repellent .....  Yes  No  
 Fire Extinguisher .....  Yes  No  
 Other .....  Yes  No

Modifications/Exceptions: \_\_\_\_\_

**VIII. Site Preparation**

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

- 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:** Use safe lifting/carrying techniques. Assume media is contaminated and avoid contact through the use of safe work practices, PPE and decontamination.

Permit Issued by: \_\_\_\_\_ Permit Accepted by: \_\_\_\_\_

**SAFE WORK PERMIT**  
**DECONTAMINATION**  
**NAVAL AIR STATION CECIL FIELD,**  
**JACKSONVILLE, FLORIDA**

Permit No. \_\_\_\_\_ Date: \_\_\_\_\_ Time: From \_\_\_\_\_ to \_\_\_\_\_

- I. Work limited to the following (description, area, equipment used):** Decontamination of sampling and heavy equipment
- II. Primary Hazards:** Potential hazards associated with this task: contact with site contaminants; transfer of contamination; heavy equipment hazards; elevated noise; heavy lifting; slip, trip and fall; cuts and lacerations; vehicular and foot traffic; ambient temperature extremes; flying projectiles; insect/animal bites and stings, poisonous plants, inclement weather
- III. Field Crew:** \_\_\_\_\_
- IV. On-site Inspection conducted**  Yes  No Initials of Inspector \_\_\_\_\_ TtNUS  
**Equipment Inspection required**  Yes  No Initials of Inspector \_\_\_\_\_ TtNUS

- V. Protective equipment required**  Level D  Level B   
 Level C  Level A   
 Modifications/Exceptions: \_\_\_\_\_
- Respiratory equipment required**  
 Yes  Specify on the reverse  
 No

VI. Chemicals of Concern	Hazard Monitoring	Action Level(s)	Response Measures
<u>TCE</u>	<u>PID or FID</u>	<u>Sustained readings in worker</u>	<u>Evacuate area until</u>
_____	_____	<u>Breathing zone greater than</u>	<u>background levels return.</u>
_____	_____	<u>50 ppm.</u>	_____

**Primary Route(s) of Exposure/Hazard:** Unlikely based on concentration and physical characteristics of TCE

**(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 ..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No                      | Hearing Protection (Plugs/Muffs) ..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| Safety Glasses ..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No                | Safety Belt/Harness ..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No              |
| Chemical/Splash Goggles ..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No       | Radio/Cellular Phone ..... <input type="checkbox"/> Yes <input type="checkbox"/> No                        |
| Splash Shield ..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No                 | Barricades ..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                       |
| Splash Suits/Coveralls ..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No        | Gloves (Type – Nitrile) ..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No          |
| Impermeable apron ..... <input type="checkbox"/> Yes <input type="checkbox"/> No                        | Work/rest Regimen ..... <input type="checkbox"/> Yes <input type="checkbox"/> No                           |
| Steel Toe Work Shoes or Boots ..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Chemical Resistant Boot Covers ..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   |
| High Visibility Vest ..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No          | Tape/Insect Repellent ..... <input type="checkbox"/> Yes <input type="checkbox"/> No                       |
| First Aid Kit ..... <input type="checkbox"/> Yes <input type="checkbox"/> No                            | Fire Extinguisher ..... <input type="checkbox"/> Yes <input type="checkbox"/> No                           |
| Safety Shower/Eyewash ..... <input type="checkbox"/> Yes <input type="checkbox"/> No                    | Other ..... <input type="checkbox"/> Yes <input type="checkbox"/> No                                       |
- Modifications/Exceptions: \_\_\_\_\_

- VIII. Site Preparation**
- |   | Yes                      | No                       | NA                       |
|---|--------------------------|--------------------------|--------------------------|
| Utility Locating and Excavation Clearance completed.....                                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Vehicle and Foot Traffic Routes Established/Traffic Control Barricades/Signs in Place ..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Physical Hazards Identified and Isolated (Splash and containment barriers).....             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Emergency Equipment Staged (Spill control, fire extinguishers, first aid kits, etc.) .....  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- 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:** Review and follow the instructions on the MSDS for the decontamination fluids. Follow guidance in Table 5-1 for PPE for different decontamination tasks.

Permit Issued by: \_\_\_\_\_ Permit Accepted by: \_\_\_\_\_

**SAFE WORK PERMIT**  
**BENCH SCALE TEST**  
**NAVAL AIR STATION CECIL FIELD,**  
**JACKSONVILLE, FLORIDA**

Permit No. \_\_\_\_\_ Date: \_\_\_\_\_ Time: From \_\_\_\_\_ to \_\_\_\_\_

- I. Work limited to the following (description, area, equipment used):** Bench scale test
- II. Primary Hazards:** Potential hazards associated with this task: slip, trip and fall; vehicular and foot traffic; temperature extremes; inclement weather; insect /animal bites or stings, poisonous plants, etc.
- III. Field Crew:** \_\_\_\_\_
- IV. On-site Inspection conducted**  Yes  No Initials of Inspector TtNUS  
**Equipment Inspection required**  Yes  No Initials of Inspector TtNUS

- V. Protective equipment required**  
 Level D  Level B   
 Level C  Level A   
 Modifications/Exceptions: \_\_\_\_\_
- Respiratory equipment required**  
 Yes  Specify on the reverse  
 No

VI. Chemicals of Concern	Hazard Monitoring	Action Level(s)	Response Measures
<u>TCE</u>	<u>PID or FID</u>	<u>Sustained readings in worker Breathing zone greater than 50 ppm.</u>	<u>Evacuate area until background levels return.</u>
_____	_____	_____	_____
_____	_____	_____	_____

**Primary Route(s) 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.....                      | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Hearing Protection (Plugs/Muffs) ..... | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Safety Glasses .....               | <input type="checkbox"/> Yes <input type="checkbox"/> No            | Safety belt/harness .....              | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Chemical/splash goggles .....      | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Radio/Cellular Phone .....             | <input type="checkbox"/> Yes <input type="checkbox"/> No            |
| Splash Shield .....                | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Barricades.....                        | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Splash suits/coveralls.....        | <input type="checkbox"/> Yes <input type="checkbox"/> No            | Gloves (Type – Work ) .....            | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| Impermeable apron.....             | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Work/rest regimen.....                 | <input type="checkbox"/> Yes <input type="checkbox"/> No            |
| Steel toe work shoes or boots .... | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Chemical Resistant Boot Covers ....    | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| High Visibility vest .....         | <input type="checkbox"/> Yes <input type="checkbox"/> No            | Tape up/use insect repellent .....     | <input type="checkbox"/> Yes <input type="checkbox"/> No            |
| First Aid Kit.....                 | <input type="checkbox"/> Yes <input type="checkbox"/> No            | Fire Extinguisher .....                | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Safety Shower/Eyewash .....        | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Other.....                             | <input type="checkbox"/> Yes <input type="checkbox"/> No            |
- Modifications/Exceptions: \_\_\_\_\_

- VIII. Site Preparation**
- |   | Yes                      | No                       | NA                       |
|---|--------------------------|--------------------------|--------------------------|
| Utility Locating and Excavation Clearance completed.....                                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Vehicle and Foot Traffic Routes Established/Traffic Control Barricades/Signs in Place ..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Physical Hazards Identified and Isolated (Splash and containment barriers).....             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Emergency Equipment Staged (Spill control, fire extinguishers, first aid kits, etc) .....   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- 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: \_\_\_\_\_

**SAFE WORK PERMIT**  
**IDW MANAGEMENT**  
**NAVAL AIR STATION CECIL FIELD,**  
**JACKSONVILLE, FLORIDA**

Permit No. \_\_\_\_\_ Date: \_\_\_\_\_ Time: From \_\_\_\_\_ to \_\_\_\_\_

I. **Work limited to the following (description, area, equipment used):** IDW management, moving and storage

II. **Primary Hazards:** Potential hazards associated with this task: chemical exposure; transferring contamination; lifting; pinch and compressions; noise; slip, trip and fall, temperature extremes, and inclement weather

III. **Field Crew:** \_\_\_\_\_

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

V. **Protective equipment required**  Level D  Level B   
 Level C  Level A   
Modifications/Exceptions: \_\_\_\_\_

**Respiratory equipment required**  
Yes  Specify on the reverse  
No

<b>VI. Chemicals of Concern</b>	<b>Hazard Monitoring</b>	<b>Action Level(s)</b>	<b>Response Measures</b>
<u>TCE</u>	<u>PID or FID</u>	<u>Sustained readings in worker Breathing zone greater than 50 ppm.</u>	<u>Evacuate area until background levels return.</u>
_____	_____	_____	_____
_____	_____	_____	_____

**Primary Route(s) of Exposure/Hazard:** incidental ingestion, contact, inhalation of dusts.

(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 ..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Hearing Protection (Plugs/Muffs) ..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Safety Glasses ..... <input type="checkbox"/> Yes <input type="checkbox"/> No	Safety belt/harness ..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Chemical/splash goggles ..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Radio/Cellular Phone ..... <input type="checkbox"/> Yes <input type="checkbox"/> No
Splash Shield ..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Barricades ..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Splash suits/coveralls ..... <input type="checkbox"/> Yes <input type="checkbox"/> No	Gloves (Type – Work/nitrile ) ..... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Impermeable apron ..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Work/rest regimen ..... <input type="checkbox"/> Yes <input type="checkbox"/> No
Steel toe work shoes or boots .... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Chemical Resistant Boot Covers .... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
High Visibility vest ..... <input type="checkbox"/> Yes <input type="checkbox"/> No	Tape up/use insect repellent ..... <input type="checkbox"/> Yes <input type="checkbox"/> No
First Aid Kit ..... <input type="checkbox"/> Yes <input type="checkbox"/> No	Fire Extinguisher ..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Safety Shower/Eyewash ..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Other ..... <input type="checkbox"/> Yes <input type="checkbox"/> No

Modifications/Exceptions: \_\_\_\_\_

VIII. **Site Preparation**

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

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:** Inspect roll off boxes and drums used to store IDW prior to use. Cover IDW containers and roll offs to prevent unauthorized entry and infiltration of precipitation. Do not over load roll-offs. Disperse IDW evenly. Use proper lifting practices and obtain assistance when handling heavy drums. Use equipment whenever possible to move heavy items.

Permit Issued by: \_\_\_\_\_ Permit Accepted by: \_\_\_\_\_

**ATTACHMENT V**  
**MEDICAL DATA SHEET**

## MEDICAL DATA SHEET

This Medical Data Sheet must be completed by on-site personnel and kept in a central location during the execution of site operations. This data sheet will accompany any personnel when medical assistance is needed or if transport to hospital facilities is required.

Project **NAS - CECIL FIELD** \_\_\_\_\_

Name \_\_\_\_\_ Home Telephone \_\_\_\_\_

Address \_\_\_\_\_

Age \_\_\_\_\_ Height \_\_\_\_\_ Weight \_\_\_\_\_

Name of Next Kin \_\_\_\_\_

Drug or other Allergies \_\_\_\_\_

Particular Sensitivities \_\_\_\_\_

Do You Wear Contacts? \_\_\_\_\_

Provide a Checklist of Previous Illnesses or Exposure to Hazardous Chemicals \_\_\_\_\_

What medications are you presently using? \_\_\_\_\_

Do you have any medical restrictions? \_\_\_\_\_

Name, Address, and Phone Number of personal physician: \_\_\_\_\_

I am the individual described above. I have read and understand this HASP.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date