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FINAL HEALTH AND SAFETY PLAN FOR PRE DESIGN DATA COLLECTION AT SITES 1438
AND 1439 NAS WHITING FIELD FL
8/1/2001
TETRA TECH

Health and Safety Plan
for
Pre-Design Data Collection,
Site 1438/1439
and
Semi-Annual Monitoring,
Site 2894

Naval Air Station Whiting Field
Milton, Florida



Southern Division
Naval Facilities Engineering Command
Contract No. N62467-94-D-0888
Contract Task Order 0200

August 2001

**HEALTH AND SAFETY PLAN
FOR
PRE-DESIGN DATA COLLECTION,
SITE 1438/1439
AND
SEMI-ANNUAL MONITORING,
SITE 2894**

**NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA**

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

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

**Submitted by:
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**CONTRACT NUMBER N62467-94-D-0888
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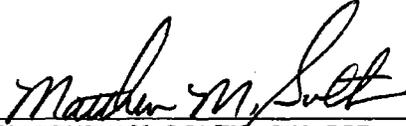
AUGUST 2001

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1.0 INTRODUCTION

Authorization: This Health and Safety Plan (HASP) and the work described within are completed under the authorization of:

Contract: Comprehensive Long-Term Environmental Action Navy (CLEAN III)
Contract Number: N62467-94-D-0888
Contract Task Order: 0200
Statement of Work Number: 0217, dated 04/17/01
Proposed Dates of Work: To be determined (TBD)

Application: This HASP has been written to encompass site activities that are to be conducted at properties associated with Naval Air Station (NAS) Whiting Field, located in Milton Florida, as part of Contract Task Order (CTO) 0200, Statement of Work (SOW) 0217. Specifically, this HASP addresses the remedial investigation activities to be conducted at the Former Underground Storage Tank Locations, Sites 1438/1439 and Site 2894. The activities to be conducted at these locations are being performed in support of

- Data acquisition in order to prepare a Remedial Action Plan (RAP) for Sites 1438/1439
- Operation, Maintenance, and Monitoring of a Barometric Pumping System at Site 2894

It is the policy of Tetra Tech NUS, Inc. (TiNUS) to provide their employees a safe and healthful work place (See Attachment I). It is the intent and purpose of this HASP to provide project organization and responsibilities, as well as, policy, procedures, safe work practices, and guidelines necessary to protect site workers, and the general population from chemical, physical, and biological hazards associated with the planned site activities. It is through the execution of the elements defined within this HASP that efforts will be directed to minimize potential incidents and associated injury and to support elements of the TiNUS Health and Safety Program.

Site activities to be conducted at NAS Whiting Field at Sites 1438/1439 and 2894 include the following (see Section 4.0 for a detailed description):

- Mobilization/demobilization
- Air Injection and Observation Monitoring Well Installation/Construction. Methods to be employed include:
 - Hollow Stem Auger (HSA)

- Direct Push Technology (DPT)
- Soil Gas Permeability Testing
- Multi-media Sampling including:
 - Subsurface soil sampling (during well installation)
 - Ground water sampling
 - Air sampling
- Equipment decontamination
- Ground water level measurements
- Investigation derived waste (IDW) handling and disposal
- Land surveying of air and observation well installation locations

Compliance: The elements of this HASP are intended to be in compliance with the requirements established by:

- Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response" (HAZWOPER)
- TtNUS Health and Safety Program
- Applicable NAS Whiting Field policies and procedures

Modifications/Changes: This HASP will be reviewed and modified (if appropriate) if any of the following conditions occur.

- The addition to or the modification of the activities specified in Section 4.0, Scope of Work.
- New information becomes available through the course of the investigation and/or from outside sources.

All changes to this HASP will be requested through the TtNUS Task Order Manager (TOM) to the TtNUS Health and Safety Manager (HSM). This can be accomplished using the TtNUS Field Task/Health & Safety Plan Modification Request Form provided as Attachment II. It is the responsibility of the TOM to notify all affected personnel of all changes to this HASP. Changes to the HASP will be documented using a Document Status Record provided in the beginning of this document.

1.1 KEY PROJECT PERSONNEL AND ORGANIZATION

This section defines responsibility for site safety and health for TtNUS and subcontractor employees engaged in on-site activities. Personnel assigned to these positions will exercise the primary responsibility for all on-site health and safety. These persons will be the points of contact for any questions regarding

the safety and health procedures and the selected control measures that are to be implemented for on-site activities.

- The TtNUS TOM is responsible for the overall direction of health and safety for this project. This includes but is not limited to, the following duties
 - i. Prepares background review - Results from past investigation activities at NAS Whiting Field, Milton, Florida
 - ii. Defines the specific scope of work to be performed
 - iii. Determines the appropriate points of contact within NAS Whiting Field
 - iv. Obtains site access, not only to the base, but also to files and records that may have some bearing or pertinence pertaining to this project
- The Project Health and Safety Officer (PHSO) is responsible for developing this HASP in accordance with internal and external requirements. Specific responsibilities include:
 - i. Providing information regarding site contaminants and physical hazards associated with the site.
 - ii. Establishing air monitoring and decontamination procedures.
 - iii. Assigning personal protective equipment based on task and potential hazards.
 - iv. Determining emergency response procedures.
 - v. Stipulate training and appropriate medical surveillance requirements for TtNUS and subcontractor personnel.
 - vi. Identifying relevant standard work practices to minimize potential injuries and exposures associated with the project scope of work.
 - vii. Modifies this HASP, as necessary.
- The TtNUS Field Operations Leader (FOL) is responsible for implementation of the HASP with the assistance of an appointed Site Health and Safety Officer (SHSO). The FOL manages field activities, executes the work plan, and enforces safety procedures as applicable to the work plan.
- The SHSO supports site activities by advising the FOL on all aspects of health and safety on-site. These duties may include:
 - i. Coordinating all health and safety activities with the FOL.
 - ii. Selecting, applying, inspecting, and maintenance of personal protective equipment.
 - iii. Establishing work zones and control points in areas of operation.
 - iv. Implementing air monitoring program for on-site activities.
 - v. Verifies training and medical clearance of on-site personnel status in relation to site activities.
 - vi. Implementing Hazard Communication and other associated health and safety programs, as they may apply to site activities.

- vii. Coordinating emergency services.
 - viii. Providing site-specific training for all on-site personnel.
 - ix. Investigating all accidents and injuries (see Attachment III - Illness/Injury Procedure and Report Form)
 - x. Providing input to the PHSO regarding the need to modify this HASP, or applicable health and safety associated documents.
- Compliance with the requirements stipulated in this HASP are monitored by the SHSO and coordinated through the TtNUS CLEAN HSM and PHSO.

NOTE: IN SOME CASES ONE PERSON MAY BE DESIGNATED RESPONSIBILITIES FOR MORE THAN ONE POSITION. FOR EXAMPLE, AT NAS WHITING FIELD, THE FOL MAY ALSO BE RESPONSIBLE FOR THE SHSO DUTIES. THIS WILL BE PERFORMED ONLY AS CREDENTIALS, EXPERIENCE, AND AVAILABILITY PERMITS.

1.2 SITE INFORMATION AND PERSONNEL ASSIGNMENTS

Site Name: NAS Whiting Field

Address: 7151 Wasp Street
Milton, Florida 32570-6159

NAS Whiting Field (POC): Mr. Jim Holland

Phone Number: (850) 623-7181 Ext. 149

Fax Number: (850) 623-

E-Mail: _____

U.S. Navy Remedial Project Manager: Ms. Beverly Washington (Code 1848)

Mr. Nick Ugolini

Address: 2155 Eagle Drive
North Charleston, South Carolina 29406

Phone Number: (843) 820-⁵⁵⁹⁶5581~~2~~

Fax Number: (843) 820-7465

E-mail: washingtonb@efdsouth.navfac.navy.mil
UgoliniN

Base Pass and Security: _____

Phone Number: _____

Note: See Section 9.5.1 for Base Access Information.

Purpose of Site Visit: This field investigation will entail multiple tasks and activities (see Section 4.0), including air injection and observation well installation using Hollow Stem Auger and Mud Rotary drilling applications. In addition, multi-media sampling including air, subsurface soils and groundwater sampling will be conducted, as well as, other related activities.

Proposed Dates of Work: July 2001 until completed

Project Team:

Tetra Tech NUS Personnel:

Discipline/Tasks Assigned:

Phone/Fax/E-mail No.

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TBD

Field Operations Leader (FOL)

Fax: _____

TBD

Site Health and Safety Officer (SHSO)

Fax: _____

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 constitutes 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, chemical exposure) associated with that release.

An incidental release (which is not an "emergency") is defined in 1910.120 as:

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, include 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. The emergency response agencies listed in this plan are capable of providing the most effective response and therefore will be designated as the primary responders in the event of an emergency. These agencies are located within a reasonable distance from the area of site operations, which ensures adequate emergency response time.

NAS Whiting Field Emergency Dispatch will be notified anytime outside response agencies are contacted. This Emergency Action Plan conforms to the requirements of 29 Code of Federal Regulations (CFR) 910.38(a), as allowed in 29 CFR 1910.120(l)(1)(ii).

2.2 PRE-EMERGENCY PLANNING

Through the initial hazard/risk assessment effort, injury or illness resulting from exposure to chemical, physical hazards, or fire are the most probable emergencies that could potentially be encountered during site activities. To minimize and eliminate these potential emergency situations, the SHSO and/or the FOL are responsible for pre-emergency planning activities, which include the following.:

- Coordinating response actions with NAS Whiting Field Emergency Services personnel to ensure that TtNUS emergency action activities are compatible with existing facility emergency response procedures. This will require the FOL and/or the SHSO to review these emergency actions with the appointed Emergency Response Providers, prior to the commencement of on-site activities.
- Establishing and maintaining information at the project staging area (Support Zone) for easy access in the event of an emergency. This information includes the following:
 - Chemical Inventory (for substances used on-site), with Material Safety Data Sheets (MSDS).
 - On-site personnel medical records (medical data sheets).
 - A logbook identifying personnel on-site each day.
 - Emergency notification phone numbers in all site vehicles
- Identifying a chain of command for emergency action. For this field effort, the FOL and/or the SHSO shall serve as Incident Coordinators in the event of an incident. In the event the release can not be controlled, Incident Command will be passed to the responding emergency services agency.
- Informing site workers of the hazards and control measures associated with planned activities at the site, and providing early recognition and prevention, where possible. This will be accomplished through site-specific training of this emergency action plan, HASP, and through daily briefings and through the use of task-specific Safe Work Permits (SWP).

2.3 EMERGENCY RECOGNITION AND PREVENTION

The primary focus of this section is the ability to recognize and control factors that could contribute to an emergency situation/condition. The FOL and/or the SHSO will preview all site work locations prior to committing personnel or resources. Their actions will be as follows:

- Identify, remove, and/or barricade physical hazards within the estimated work area. Ensure that approach paths and access and control points into the work area have been established to ensure that pedestrian and vehicle traffic and other installation activities are not impacted by site operations.
- Provide the necessary equipment to control potential emergencies (i.e., safety cans for flammable liquid storage, spill containment equipment, Personal Protective Equipment (PPE), and emergency equipment such as portable fire extinguishers and first-aid kits). Ensure emergency equipment and resources are ready, should they be needed for incidental response measures.
- Evaluate operations to ensure that necessary measures are taken to control and/or minimize the impact of emergency situations/conditions. This includes actions such as, but not limited to,
 - Securing the necessary permits and clearances such as Utility and Excavation Clearances provided by the Base Public Works (Note: Mr. Holland will serve as the liaison between the Base and Sunshine (the Florida One-Call System for Utility Locating and Clearance). When utility clearances are obtained you will need to secure paper copies, ticket numbers, etc. All utility clearances are good for 14 days from the date of issue. If the work will not be completed in that time frame, extensions may be requested. All Utility Location and Excavation Clearances will be conducted in accordance with Attachment IV of this HASP.
 - Ensure all personnel are adequately trained in the provisions of this HASP and this Emergency Action Plan.
- Complete site characterization for all predetermined work in contaminated areas to quantify and qualify the hazards associated with those areas. Areas will be demarcated and restricted to only authorized personnel, based on the results from this site characterization.

Field Crew shall:

- At the FOL and/or the SHSO's direction, remove or barricade physical hazards within the estimated work area identified by the FOL and/or the SHSO.
- Follow the direction provided in the HASP and Safe Work Permits issued.
- Follow the guidelines for control of emergency conditions.
- Report any potential emergency situation to the FOL and/or the SHSO.

2.3.1 Drilling Activities

The potential emergencies that could result during this activity are primarily physical in nature. They include being struck by the equipment, entanglement into rotating machinery, striking an underground utility, exposure to excessive noise levels, and associated traffic hazards. The control measures to be put in place to minimize hazards of this nature are presented in Sections 6.2.3., 6.2.4 and 6.2.5.

2.3.2 Fire

There is limited potential for fire during this operation, predominantly with regard to fueling equipment and the use of decontamination solvents. Fire protection and prevention methods will be followed as specified in Section 2.9.2.

Another less likely fire potential is associated with the soil gas permeability test. This test is designed to drive off volatile emissions, and if exceptionally high concentrations are generated, some fire potential would exist. It is not anticipated that airborne concentrations in an outdoor environment during this testing will accumulate to concentrations that would present an exposure and/or potential fire hazard. As a precaution, the practices specified in Section 6.2.7 will be followed to further minimize and control fire hazards. As a further precaution, a Combustible Gas Indicator/Oxygen Meter will be used as specified in Table 5-1 for Soil Permeability Testing. Action levels specified in that table and in Table 7-1 will be followed to monitor for flammable atmospheres and to recognize if/when any control measures are appropriate.

2.3.3 Chemical Exposure

Given the reported chemical concentrations of site contaminants and the proposed work activities associated with the scope of work, emergency situations involving potential exposures to chemical contaminants are unlikely to occur. Additionally, use of required control measures (such as air monitoring, personal protective equipment usage and decontamination efforts) will further reduce the potential for exposures to site contaminants. However, as indicated before, when systems are pressurized, this will increase contaminant levels in accumulation areas including well heads. To avoid potential exposure in this situation, the release valve will be engaged from an up wind position and the well head will be allowed to evacuate to atmospheric pressure. Personnel will remove themselves from the well head during the pressure release.

As indicated previously, in support of fire prevention efforts, once the well heads have reached atmospheric pressure, monitoring of potential accumulation points down wind of the release point in the area will be evaluated using a Combustible Gas/Oxygen Meter. Vapors associated with AV Gas (vapor

density = 4.0) and JP-5 (vapor density = 5.0) will sink and collect in low lying areas and subsurface structures such as storm tunnels. These types of structures (if they exist in the near proximity of site activities) should be evaluated for the potential accumulation of flammable atmospheres.

2.4 SAFE DISTANCES AND PLACES OF REFUGE

2.4.1 Safe Place of Refuge Selection

The FOL and/or the SHSO shall identify a safe place of refuge (in the event of an emergency) on the Safe Work Permit (See Attachment VI). This location will be selected and conveyed to the Field Crew as part of issuing the Safe Work Permit at the beginning of each field task and at each location. Selection will be based on the following considerations:

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

In all cases this location should be positioned a sufficient (safe) distance from the operation that will not be impacted by the emergency. This distance is impacted by a number of conditions (i.e., tasks being conducted; chemical, physical, and toxicological properties; potential for fire and explosion; meteorological conditions; terrain). Based on the level of reported contaminants and the low risk of encountering any significant emergency situations, it is not anticipated that emergency assembly points will need to be located significantly away from the planned work areas.

2.4.2 Critical Operations

There are no operations being conducted under this scope of work that are considered critical and would require an individual or individuals to man during an emergency. Therefore in the event of an emergency all personnel will cease all operations and report to the safe place of refuge.

2.5 DECONTAMINATION PROCEDURES/EMERGENCY MEDICAL TREATMENT

During an evacuation, decontamination procedures will be performed only if they are not anticipated to jeopardize the welfare of site workers. However, it is unlikely that an emergency would occur which would require workers to evacuate the site without first performing decontamination procedures. Decontamination of medical emergencies will proceed in the following manner.

2.5.1 Non-Life Threatening Medical Incident (Bruises, Cuts, Scrapes, Etc.)

The area of clothing or suit penetration will be isolated from the decontamination procedure by removing the protective garments or clothing surrounding the area of the injury and applying a light gauze wrap and plastic cover. Decontamination for unaffected areas will proceed as per Table 5-1 of this HASP.

2.5.2 Life Threatening

- 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.
- Begin life saving techniques as appropriate (Cardio Pulmonary Resuscitation (CPR), cooling or warming regimens, etc.).
- Wrap the injured in a blanket for transport to the hospital.
- Engage Emergency Notification Sequence
- Follow instructions provided in Figure 2-1.

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 and to WorkCare (see the Incident Response Protocol provided in Figure 2-1). All other personnel will follow site control/site security measures.

The SHSO will lead the investigation of the incident to gather as much information as possible. Attachment III, TtNUS Injury/Illness Procedure will be used as part of this task. This information must be communicated to the HSM within 24 hours of any injury or illness incident.

2.5.3 Emergency Medical Treatment

TtNUS and subcontractor personnel are only permitted to provide treatment to the level of their training. It should also be noted all first-aid shall be administered voluntarily.

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

- The FOL and/or the SHSO have been notified of the incident.
- 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 may be necessary if there is the potential for uncontrolled spread of body fluids. The PHSO will be immediately notified in event that personnel providing emergency first-aid come into contact with body fluids or other potentially infectious tissues.

- Should CPR be required, use a CPR Micro-Shield mouthpiece or resuscitation bag when administering CPR to prevent contact with the injured person's body fluids.

In order to engage these protective measures, the FOL shall ensure that these items are part of their first-aid kit. In addition, general first-aid instruction shall be provided for all first-aid kits in the form of a poster provided as Attachment VII.

2.6 EMERGENCY ALERTING AND ACTION/RESPONSE PROCEDURES

Since TtNUS personnel will not always be working in close proximity with each other, hand signals, voice commands, air horns, and/or two-way radios may be needed to alert site personnel of an emergency.

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

- Initiate incident alerting procedures (if needed) verbally, by air horn, or using two-way radios.
- Evacuate non-essential personnel.
- Initiate initial response procedures.
- Describe to the FOL (who will serve as the Incident Coordinator) what has occurred in as much detail as possible.

In the event that site personnel cannot control the incident through offensive and/or defensive measures, the FOL and/or the SHSO will undertake emergency notification procedure to secure additional outside assistance. Depending on the nature of the emergency, this may include in the following:

- Call 911, Santa Rosa County Dispatch request emergency assistance at your location at NAS Whiting Field. They will notify the Main Gate of emergency services in route. Position someone at the Safe Place of Refuge Location to direct Emergency Services to the location of the emergency (See Table 2-1).

Note: All cellular phone calls are routed through one of two communications towers, either Santa Rosa Emergency Dispatch or Escambia County Emergency Dispatch. Request the Santa Rosa Emergency Dispatch. It will be necessary to inform the dispatch that you are at the NAS Whiting Field Facility.

- Give the emergency operator the location of the emergency and a brief description of what has occurred.
- Stay on the phone and follow the instructions given by the operator.
- The appropriate agency will be notified and dispatched.

If an “external” incident occurs (that is, one not initiated by field activities) the FOL shall:

- Initiate an evacuation (if needed) by voice commands, hand signals, air horns, or two-way radio.
- Call Navy On-Site Representative [Mr. Jim Holland at (850) 623-7181 Ext. 149.]
- Direct field personnel to proceed to the appropriate assembly points (as directed by NAS Whiting Field Emergency Services or other designated Navy personnel).

2.7 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. A cellular phone or designated land-line phone shall be identified and made available during all on-site operations for the purpose of emergency notification. Table 2-1 provides a list of emergency contacts and their corresponding telephone numbers. This table must be posted on-site, where it is readily available to all site personnel. If field personnel are operating at a number of isolated locations, addition copies should be made and handed out to the field crew.

**TABLE 2-1
EMERGENCY REFERENCE
NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA**

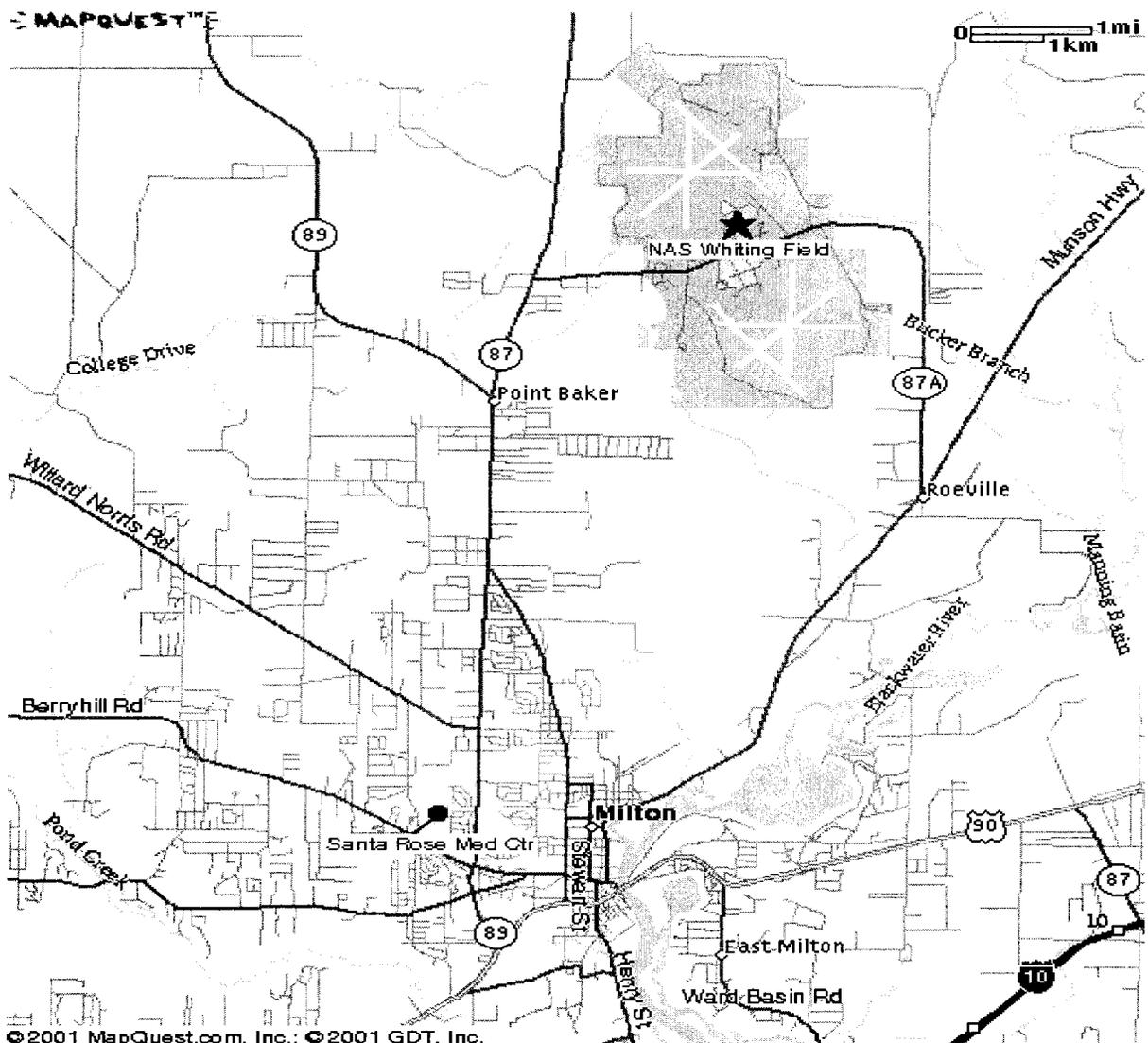
CONTACT	PHONE NUMBER
EMERGENCY (Milton Police, Fire, and Ambulance Services)	911
Santa Rose Medical Center (Primary Hospital)	(850) 626-7762
West Florida Regional Medical Center (Alternate Hospital)	(850) 478-4460
Santa Rosa County Emergency Management	911 (850) 983-5360
Task Order Manager Paul Calligan, P.G.	(850) 385-9899
Navy On-site Representative at NAS Whiting Field Jim Holland	(850) 623-7181 ext. 149
Utilities Jim Holland	(850) 623-7181 ext. 149
NAS Whiting Field Security	
NAS Whiting Field Fire Department	
Chemtrec National Response Center	(800) 424-9300 (800) 424-8802
TtNUS Tallahassee Office	(850) 385-9899
TtNUS, Pittsburgh Office	(412) 921-7090
Health and Safety Manager Matthew M. Soltis, CIH, CSP	(412) 921-8912
Project Health and Safety Officer Thomas Dickson, CSP	(412) 921-8457
InfoTRAC (Information Clearinghouse for Hazardous Materials TtNUS Ships)	1 (800) 535-5053

For all Emergency situations call 911. Attend to the injured person first.

* - Cellular communications will be routed through either Santa Rosa or Escambia County Dispatch. If Escambia County Dispatch receives your cell phone request for emergency services ask to be patched into Santa Rosa County Emergency Management Dispatch. It is imperative that you inform them that you are calling from the NAS Whiting Field facility. They will notify the Base that an ambulance is in route and be permitted access. 911 will work from any Base extension.

2.8 ROUTE TO HOSPITALS

Directions to Santa Rose Medical Center



© 2001 MapQuest.com, Inc.; © 2001 GDT, Inc.
Directions to Santa Rosa Medical Center (Primary Hospital)

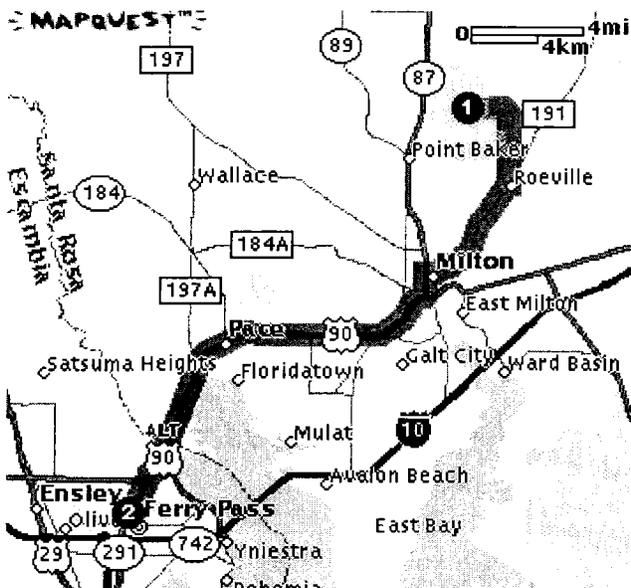
Phone Number (850) 626-7762

Directions Miles

- | | | |
|----|---|-----|
| 1. | Travel 1 mile west of the base on Highway 87A , turn left. | 1.0 |
| 2. | Drive 5.5 miles south on Highway 87/89 to Berry Hill Road , turn right. | 5.5 |
| 3. | Travel 1.7 miles and the hospital is on the right. | 1.7 |

This hospital has been selected as the primary location due to its proximity to NAS Whiting Field and services offered.

Directions to West Florida Regional Medical Center (Alternate Hospital)



©2000 MapQuest.com, Inc.; ©2000 Navigation Technologies
 Phone Number (850) 494-3737



©2000 MapQuest.com, Inc.; ©2000 GDT, Inc.

Directions Miles

- | | | |
|----|--|------|
| 1. | Start out going South on E GATE RD towards MUNSON HWY. | 3.1 |
| 2. | Turn SLIGHT RIGHT onto MUNSON HWY. | 3.6 |
| 3. | MUNSON HWY becomes BROAD ST. | 0.5 |
| 4. | Turn SLIGHT RIGHT onto OLIVER ST. | 0.3 |
| 5. | Turn LEFT onto FL-87 S. | 0.8 |
| 6. | Turn SLIGHT RIGHT onto US-90 W/FL-10 W/FL-89 N. | 0.6 |
| 7. | US-90 W/FL-10 W/FL-89 N becomes US-90 W/FL-10 W. | 11.6 |
| 8. | Stay straight to go onto US-90 ALT W/FL-10 W. | 0.7 |
| 9. | Turn SLIGHT LEFT onto FL-291 S. | 1.5 |

When using any driving directions or map, it's a good idea to do a reality check and make sure the route all exists, watch out for construction, and follow all traffic safety precautions. This is only for general use and not for planning.

Any pertinent information regarding allergies to medications or other special conditions will be provided to medical service personnel. This information is listed on Medical Data Sheets filed on-site. If an exposure to hazardous materials has occurred, provide hazard information from Table 6-1 to medical service personnel.

Note: Based on the nature and extent of the injury received, the ambulance service may opt to transport injured persons to the hospital identified as the alternate (West Florida Regional Medical Center). This is based on the capabilities of the identified trauma units. Either selection based on their direction would be considered acceptable.

2.9 PPE AND EMERGENCY EQUIPMENT

A first aid kit, eye wash units (as necessary), and fire extinguishers will be maintained on-site at an easily accessible location and shall be immediately available for use in the event of an emergency. Based on the anticipated hazards, these emergency equipment items may be maintained near the work areas (i.e., the Exclusion Zones) of on-going operations. This will be at the discretion of the SHSO.

The FOL and/or the SHSO should ensure the First-Aid Kits are stocked with the necessary equipment. All first-aid kits purchased for the job-site shall be American National Standards Institute (ANSI) Z308.1 approved for industrial applications. The SHSO will determine the number of kits necessary based on the number of personnel and the number of remote operations being conducted under the scope of work at the same time.

PPE to be used in an emergency will be the same as that specified for the task that was involved in the injury. The anticipated levels of PPE are indicated below.

2.9.1 PPE Requirements - Incidental Spill of Investigative Derived Wastes

- Polyvinyl chloride (PVC) Rain-Suits or Tyvek based on the potential for soiling work clothes during clean-up
- PVC or Neoprene Over-boots (Pant legs on the outside of the over-boots)
- Nitrile inner surgeons gloves with Nitrile outer gloves over top
- Hard hat as conditions or overhead hazards exist
- Safety Glasses
- Splash Shields as necessary

Spill equipment (identified in Section 10.0) will be maintained in the IDW storage and/or the resource deployment area to support rapid response.

2.9.2 Fire Fighting

Standard field attire will be used to combat incipient stage fires from a sufficient distance as not to endanger field personnel. Fire extinguishers will be maintained at the following locations:

- Support trailer (As applicable)
- On each piece of equipment in excess of 1 ton rating (i.e., trucks, excavator, drill rig, etc.)
- At all locations which store, dispense or otherwise handle flammable or combustible liquids.

It will be the responsibility of the SHSO to ensure that enough fire extinguishers are available to support on-site operations in the vulnerable locations stated above.

All personnel will be trained in the proper selection and use of the provided portable fire extinguishers in their work areas. The training information to be provided during site-specific training may be found in Attachment VIII of this document.

2.10 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 III) must be followed. Following this procedure is necessary for documenting all of the information obtained at the time of the incident. Also, as soon as possible the Base Contact must be informed of any incident or accident that requires medical attention.

Any pertinent information regarding allergies to medications or other special conditions will be provided to medical service personnel. This information is listed on Medical Data Sheets (see Attachment IX) which are to be completed for each worker and filed on-site. If an exposure to hazardous materials has occurred, provide information on the chemical, physical, and toxicological properties of the subject chemical(s) to medical service personnel, and follow the protocol specified in Figure 2-1.

FIGURE 2-1 EMERGENCY RESPONSE PROTOCOL

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

In the event of a personnel injury or accident:

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

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

WorkCare will compile the results of all data and provide a summary report of the incident. A copy of this report will be placed in each injured person's medical file in addition to being distributed to appropriately designated company officials.

Each involved worker will receive a letter describing the incident but deleting any personal or individual comments. A personalized letter describing the individual findings/results will accompany this generalized summary. A copy of the personal letter will be filed in the continuing medical file maintained by WorkCare.

**FIGURE 2-1 (continued)
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 there 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-Medicating: _____ Physician Treated: _____

3.0 SITE BACKGROUND AND DESCRIPTION

3.1 SITE INFORMATION

NAS Whiting Field is located in Santa Rosa County, approximately 20 miles northeast of Pensacola, in Milton, Florida. The Air Station, which is divided into two areas, provides support and facilities for flight and academic training. The North Field is used for fixed wing training, while the South Field is used for helicopter flight instruction.

3.2 SITE HISTORY AND CURRENT OPERATIONS

The air station was commissioned in 1943 as a training facility and has since generated waste streams associated with the operation and maintenance of aircraft, pilot scenario training exercises, and facility maintenance activities. Prior to the establishment of hazardous waste management and recycling plans, most of these materials were disposed of on-site. Wastes were either placed in on-site disposal pits or in waste oil bowzers, which were often used for fire fighting training.

The industrial operations at NAS Whiting Field include the North Field, South Field, and Mid Field areas. The North Field of NAS Whiting provided Primary flight training until 1949. Jet training was then introduced and several types of fixed wing aircraft were used until 1983. Maintenance and repair of these aircraft included stripping, painting, washing, and engine upkeep. These activities generated wastes such as stripping compounds, cleaning solvents, paint wastes, alkaline cleaners, detergents, oil, and hydraulic fluids. In the 1970's, NAS Whiting Field began to perform general aircraft maintenance duties for Air Wing Five, a unit stationed at NAS Whiting. The types of waste generated include waste oil, mineral spirits, methyl ethyl ketone (MEK), isopropyl alcohol, mixed paint thinners, and aircraft cleaning solution.

Line maintenance on transient aircraft and the daily upkeep and maintenance of several assigned aircraft has been performed at the Mid-Field Hanger since the 1940's. Operation and maintenance activities performed and the wastes generated at the Mid Field are similar to those generated at the North Field.

The South Field of NAS Whiting, provided aircraft flight training until the early 1970's. In 1972, fixed wing aircraft training was moved from the South Field to the North Field and helicopter training was initiated. Operation and maintenance activities performed on the helicopters were similar to those performed on fixed wing aircraft at the North Field. Wastes generated at the South Field were similar to those generated at the North Field.

In 1985, an initial site assessment was performed which indicated that thousands of gallons of waste including paints, paint thinners, solvents, waste oils, gasoline, hydraulic fluids, aviation gasoline (AVGAS), tank bottom sludges, transformer fluids containing polychlorinated biphenyls (PCBs), and paint stripping wastewater, were potentially dumped into on-site disposal areas. Additional wastes were reportedly released as a result of accidents or equipment failure. The assessment identified 16 disposal and/or spill areas located on the facility property.

3.3 INVESTIGATION AREAS

The sites to be investigated as identified in this HASP include:

- Former Underground Storage Tanks Site 1438/1439
- Former Underground Storage Tank 2498

3.3.1 Sites 1438/1439

Tanks 1438 and 1439 were installed in 1943. Each tank was of concrete construction and had the capacity to hold 218,384 gallons of AVGAS. The tanks were decommissioned in 1980, at which time they were filled with water. In 1985, Tank 1438, and the pumphouse were demolished and removed from the site; however, Tank 1439 was collapsed and abandoned in place. During demolition, free product was discovered in the excavation pit. The fuel transmission pipelines running to both the north and south airfields were reportedly abandoned in place and filled with concrete.

A Site Assessment was performed and a Site Assessment Report (SAR) was submitted in August 1999. A Supplemental Assessment Report was submitted in December 2000. Preparation of a RAP was recommended to address soil contamination above leachability levels.

3.3.2 Site 2894

It was reported that an accidental release of JP-5 occurred in 1991 during routine refueling operations at Tank 2894. A Site Assessment was conducted and a SAR was submitted in October 1993. The site investigation revealed that an extensive JP-5 plume was present beneath the site. Excessively contaminated soil was identified to a depth of approximately 85 feet below land surface (bls), over an area approximately 170 by 200 feet. No significant groundwater contamination is known to exist, related to those releases. Three zones of contamination were identified at the site. The shallow zone extends from the surface to 15 feet bls. The intermediate zone extends from 15 to 25 feet bls. The deep zone extends from 25 to 85 feet bls.

A RAP was submitted in October 1995. The RAP recommended the installation of a bioventing system to address the shallow zone and a barometric pumping system to address the deep zone. System installation activities began in September 1996 and the system was started in November 1997.

Concentrations of contaminants of concern in the shallow zone have reached site rehabilitation levels. The Florida Department of Environmental Protection (FDEP) granted a request to discontinue operation of the bioventing system in December 1999 and remedial activities were subsequently discontinued in the shallow zone.

4.0 SCOPE OF WORK

Site activities to be conducted at NAS Whiting Field at Sites 1438/1439 and 2894 include the following:

**TABLE 4-1
SITE ACTIVITY SUMMARY**

Activity	Site 1438/1439	Site 2894
Mobilization/Demobilization	X	X
Soil Boring/Air injection and Observation well Installation using HAS or possibly Direct Push Application	2 air injection at 15 and 40-foot depths; 6 observation wells, 3 at 15 and 3 at 40-foot depths at 15, 30, and 60-feet from the air injection well location.	NA
Soil Gas Permeability Testing	X	NA
Monitoring Well Purging and Development	X	X
Groundwater Sampling (Semi-annual event)	NA	Collect samples from MW-2, 3, 5, and 7
Soil Gas Sampling (Semi-annual event)	NA	Collect soil gas samples from BPW-8, 11, and 13. FID readings from BPW-7, 8, 9, 11, 13, and 14
Subsurface Soil Sampling	Approximately 6 samples for bacterial enumeration	NA
Air Sampling	12 Air samples (pre-test and post-test) Off-site analysis – DO, CO ₂ , and TPH	See soil gas sampling
Decontamination of Sampling and Heavy Equipment	X	X
IDW Management	Approximately 20 drums of soils during Air Injection/Observation Well Installation	Approximately 4 drums of purge waters during semi-annual monitoring events.

X – To be conducted, as defined within the scope of work.

NA – Not applicable for this site and/or location.

A detailed description of these tasks/activities are provided in the remainder of Section 4.0.

4.1 MOBILIZATION/DEMobilIZATION

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

- The procurement and shipping of equipment, and materials for the field investigation.
- The review of planning documents (i.e., HASP, Sampling and Analysis Plan, Work Plan, Quality Assurance Plan, Applicable Standard Operating Procedures (SOPs), etc.).

- Site Reconnaissance to include site characterization, site preparation, the layout of sampling locations and to secure the necessary utility clearances and isolate physical hazards, where applicable. All utility clearances shall proceed in accordance with Attachment IV, TtNUS Utility Locating and Excavation Clearance Procedures. Utility clearances for NAS Whiting Field will require 10 day advance notification. Utility clearances are also required to be supported using Sunshine (Florida One-Call Utility Locating Service 1(800) 432-4770. This service will be coordinated through Jim Holland at NAS Whiting Field. Sunshine requires a 2 working day advance notification. Once obtained the Utility Clearance ticket is good for a period of 14 days.
- Secure, construct, or equip decontamination facilities to support the field activities.
- Secure, construct, or equip IDW storage facilities to support the field activities.

4.2 PERMANENT MONITORING WELL INSTALLATION

The TtNUS geologist will oversee the drilling, construction, and development of all air injection and observation groundwater monitoring wells. Groundwater well installation and development procedures will be performed in accordance with TtNUS SOP GH-1.3 and GH-2.8. Two air injection wells will be installed at depths of 15 and 40 feet. In addition, six observation wells will be installed, 3 at a depth of 15 and 3 at a depth of 40 feet. Each of the observation wells will be installed at a distance of 15, 30, and 60 feet away from the air injection wells.

4.2.1 Hollow Stem Auger Drilling

This method of drilling consists of rotating augers with a hollow stem into the ground. Cuttings are brought to the surface by the rotating action of the auger. Advantages of this type of drilling include:

- Samples can be obtained while augers remain in the ground. Sampling requires the use of split-barrel or thin-wall tube samplers advanced through the hollow core of the auger.
- No drilling fluids are required.
- Once the well has been drilled to the desired depth as directed by the TtNUS Geologist, a well can be assembled and installed inside the auger stem.

4.2.2 Air/Injection Well Installation

Once the well annulus is drilled to the desired depth (as determined by the TtNUS Geologist), the well screen and riser are assembled and lowered into the temporary casing created by the hollow stem or mud rotary augers. Sometimes centering rings are used to ensure that the well is placed within the center of the temporary casing. Once the well is positioned, sand is poured around the well screen and riser, either directly or through a tremie pipe. A weighted tape measure is used to measure the sand pack during installation. As the sand pack is installed, the temporary casing created by the hollow auger flights is extracted while holding the well in the desired position. Extraction is usually performed using a hoist and cable inserted through a shackle attached to the auger pin opening of the auger flight. This allows extraction and maintenance of the well in its desired position. After the sand pack is installed to at least one foot above the screen interval a betonite pellet seal or equivalent is applied in the same manner as the sand pack. The betonite seal is applied from 1 to 3 feet in thickness. A cement-betonite grout is applied to the annulus as the remaining augers are extracted.

For each air injection well installed, three observation wells are installed in increasing distance (15, 30, and 60 feet respectively) from the air injection well.

4.2.3 Direct Push Technology

Shallow Air Injection/Observation Monitoring wells can be installed using DPT applications. The method selected in support of this activity is the Dual Tube method. This method employs a 48 inch inner tube affixed with a core catcher/retainer tube advanced through the 3.25 inch x 48 inch outer tube. The procedure is as follows:

1. The outer tube (3.0 inch x 48 inch tube with a 3.25 inch Outside Diameter (OD) cutting shoe) is advanced to the desired depth.
2. The inner window sheath tube is advanced inside the outer tube. The application utilizes the outer tube in the same manner as a hollow stem auger by maintaining the integrity of the borehole.
3. This procedure is repeated adding sections and advancing the outer tube to the desired depth. Upon, completion of soil collection, the inner tube collection system may be replaced with a small diameter air injection/observation wells that are placed inside the outer tube and then the outer tube is extracted. Selection of a system such as this would be based on historical difficulties in maintaining borehole structures while placing wells at the desired depths. This system also permits the borehole to

collapse around and surrounding the well as the outer tubes are extracted. This prevents smearing of screens and other down hole apparatus that may hinder air flow at the observation well.

4. Samples acquisition will occur at a depth determined to be appropriate by the site geologist based on visual observations and with the aid of a photo-ionization detector (PID). The sample depth exhibiting the highest potential for contamination will be sampled. Exhibition of the highest potential for contamination will be based on elevated PID readings, visual and olfactory detection (staining and odors), and possibly the existing of confining units. If the field screening fails to produce a preferential contaminant zone, the sample will be collected from the soil just above the saturated zone.
5. All monitoring wells will be constructed of a 1.0 inch x 2.5 inch OD Pre-packed Screened Monitoring Well. 1.0 inch PVC materials including flush-joint riser pipe, flush-joint factory slotted PVC screen, and a flush-joint end cap.
6. Placement and length of the well screened interval will be determined for each site. Generally, the top of the well screened interval will be positioned approximately 1 foot above the stabilized water level. Well screen lengths will be provided in 5 foot lengths and will have a screen slot size of 0.010 inches. After the borings are pushed to the desired depth, the well will be installed through the outer tubes. The wells to be used are already equipped with silica sand packs. The tubes will be withdrawn from the boring allowing the nature soils to collapse surrounding the screen.

4.2.4 Permanent Monitoring Well Development

The purpose of well development is to stabilize and increase the permeability of the sand pack around the well screen and to restore permeability of the formation that has been reduced by the installation of the well.

The steps to develop monitoring wells are as follows:

- The depth to water and total depth of the well are measured using an M-scope or similar water level indicator.
- A surge block or submersible pump will be lowered into the screened section of the well. The surge block or pump will be rapidly lowered and raised in the well causing groundwater to flow in and out of the well screen, flushing fine sediment out of the sand-pack.
- A submersible pump or airlift hose will be lowered into the well. The monitoring wells will be pumped using a submersible pump, or by airlift.

- Field measurements consisting of pH, temperature, specific conductance, and turbidity will be performed utilizing a Horiba U10 or U-22 Water Quality Meter during the evacuation of water, at 3 to 5 minute intervals.
- Parameters will be considered stable when variations in values are within 10 percent of each other and pH \pm 0.2 units, for three consecutive readings taken at 3 to 5 minute intervals. Additionally, the well will be developed until the turbidity is below 10 NTUs.
- The parameters will be recorded on Monitoring Well Development Record sheets.

Monitoring well development is typically used for newly installed wells and for those that have remained stagnant for an extended period of time. Well development should take place for the newly installed air injection/observation wells because of the benefits achieved by restoring the permeability surrounding the newly installed wells. There was no indication as to whether the wells at Site 2894 will be re-developed leading into this semi-annual monitoring event.

4.3 SOIL GAS PERMEABILITY TESTING

The soil gas permeability testing will include pressurizing the air injection wells to a maximum operating pressure of 50 pounds per square inch (psi). Subsequent pressure measurements shall be recorded at the observation wells installed at that compatible depth. Pressure responses shall be recorded at specified time intervals until a steady state condition is achieved. This test will be used to determine the soil gas permeability, as well as, the radius of influence accomplished through the air injection. As part of this effort air samples will be extracted. See air sampling, Section 4.4.2.

4.4 MULTI-MEDIA SAMPLING

Analytical samples will be collected from representative media including subsurface soils, groundwater, and air in order to quantify potential environmental contamination.

4.4.1 Subsurface Soil Sampling

Subsurface soil samples will be collected during air injection/observation well installation. Approximately six subsurface soil samples will be collected for bacterial enumeration (one set of three from each of the represented lithological layers). Subsurface soil sample acquisition from mechanized equipment will use split spoon by inserting them into either the borehole or annulus to extract a sample from a desired depth. The sample is removed from the device, scanned with the direct reading instrumentation, then transferred into the appropriate sample container. Samples obtained from DPT will use a MacroCore Sampler, which

is a hollow stainless steel tube with an acetate liner. The sampler is advanced using hydraulic force or hydraulic force and percussion. Once the sampler is advanced the desired depth, the sampler is extracted and the acetate liner is removed, cut open to permit scanning with direct reading instruments and sample selection and collection. **If this method of sampling is used, a GeoProbe Sampling Kit (or equivalent must be used to prevent hand-cutting injuries.**

4.4.1.1 Hand Augers

The hand auguring of borings will be conducted in support of the air injection/observation well installation. Hand auguring will be conducted to verify the absence/presence of utilities in the area selected for subsurface evaluation. Hand auger boreholes will proceed a minimum depth of 4 feet and possibly deeper based on as-built drawings concerning the depth of area utilities and transmission lines (see TtNUS SOP "Utility Locating and Excavation Clearance, Attachment IV). Hand auguring will proceed to the prescribed depth as indicated above, using multiple borings adjacent to one another to ensure that the diameter of the auger flights are cleared for subsurface advancement.

4.4.2 Air Sampling

Approximately 12 air samples will be collected from the six (pre-test and post-test) observation wells at Site 1438/1439. In addition, 3 air samples will be collected during each of the two semi-annual monitoring events at Site 2894. The method of collection will be attaching an air pump to an air release outlet/port on the air cap. A Tedlar Bag will be attached to the air pump and the pump will be engaged. The pump will be engaged until the sample bag is filled to capacity.

4.4.3 Water Level Measurements

Water level measurements will be collected from the newly installed and existing wells. The water level measurements 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 level measurements will be conducted upon completion of the newly installed wells. All wells will be allowed to set for 24 hours after installation prior to development and 24 hours after that prior to the one round of water level measurements. The water level measurements will be conducted within the same time interval (same day) to ensure minimal fluctuation.

4.4.4 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. These measurements will be taken at the start of purging and every 3 to 5 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. All tubing used for sampling will be dedicated and disposed of after the sample has been collected.

4.5 INVESTIGATION DERIVED WASTE MANAGEMENT

It is estimated that approximately 20 drums of IDW will be generated at Site 1438/1439 and approximately 4 drums of liquid during each semi-annual monitoring event during the investigation. In order to profile the accumulated waste to determine disposal methods and options the following activities will be conducted:

- Characterization will be accomplished using the associated sample profiles.
- Drums will remain on-site until the results of the chemical analysis are completed.
- QA/QC samples of the IDW are not required.
- The Navy will sign all waste manifests and Bills of Lading.

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

- Site
- Job Number
- Location Solid Waste Management Unit (SWMU)
- Date – To be completed upon filling the container or when no more material is to be added
- 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. An up-dated inventory should be provided at the close of each shift to this person.
- Emergency Number – Contact person provided above

All Satellite Storage locations will be structured as follows:

Investigative Derived Waste Storage

- 55 Gallon Drums (United Nations 1A2 configurations) – No more than 4 drums to a pallet. Labels and retaining ring bolt and nut assemblies affixed on the outside of each drum to facilitate easy access. A minimum of 4 feet must be maintained between each row of pallets. The decision to construct a bermed and lined area will be at the discretion of project management.

These Satellite Storage Areas must be identified by proper signage, which specifies points of contact in the event of an emergency, alternate contacts, and the identification of the stored material (i.e., purge or decontamination waters, soil cuttings, etc.).

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

4.6 DECONTAMINATION

The equipment involved in the field activities for this investigation will be decontaminated prior to, during and after the sampling activities.

4.6.1 Sampling Equipment

All non-dedicated sampling equipment (i.e. stainless-steel hand augers, trowels, bowls, 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.

- Potable water rinse
- Alconox or Liquinox detergent wash
- Deionized (DI) water rinse
- Solvent rinse (Isopropanol)
- DI water rinse
- Air dry

All dedicated sampling and PPE equipment will be rinse to remove gross contamination. Then pending the sampling results be disposed of accordingly.

4.6.2 Heavy Equipment

All non-dedicated heavy equipment (i.e. auger flights, split spoons, drive rods, etc.) will be decontaminated prior to use, between sample locations, and at the completion of the field activities. The following decontamination steps will be taken.

- Potable water rinse
- Alconox or Liquinox detergent wash
- Pressure Washer
- DI water rinse

- Solvent rinse (Isopropanol)
- DI water rinse
- Air dry
- Instrument scan – This will be performed after air drying to ensure all chemical solvents have been effectively removed. Positive results require re-rinsing and re-scan to ensure removal of the applicable chemical solvents.

The above listing represents an overview of the tasks associated with the scope of work and the application of this HASP. For more detailed description of the associated tasks, refer to the SAP. Any tasks to be conducted outside of the elements listed here will be considered a change in scope requiring modification of this document. The TOM or a designated representative will submit all requested modifications to this document to the HSM.

5.0 TASK-SPECIFIC SUMMARY OF HAZARDS AND ASSOCIATED CONTROL MEASURES

Table 5-1 of this section serves as the primary portion of this HASP and identifies the potential hazards, evaluation methods, and control measures for each planned tasks that will be performed as part of the scope of work. This table will be reviewed and (possibly) revised if new or modified tasks are identified. The anticipated hazards, recommended control measures, air-monitoring recommendations, required PPE, and decontamination measures for each site task are discussed in Table 5-1.

The FOL/SHSO will use this table as the primary reference for supporting the task-specific Safe Work Permits. Safe Work Permits are the primary tool for accomplishing safety and health reviews (task-specific tailgate safety sessions) with field personnel prior to the initiation of any tasks. These permits are to be completed by the FOL/SHSO and reviewed with all field personnel at the beginning of each day's activities.

5.1 GENERAL SAFE WORK PRACTICES

In addition to the task-specific work practices identified on Table 5-1, the following general safe work practices are to be observed when conducting work on-site. These practices establish a pattern of general precautions and measures for reducing risks associated with hazardous site operations.

- Do not eat, drink, chew gum or tobacco, take medication, and/or smoke 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. A thorough shower and washing must be conducted as soon as possible, if excessive skin contamination occurs.
- Avoid contact with potentially contaminated substances. Do not walk through 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 in the 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, SWPs, emergency procedures, and communication methods before going on site.
- Plan and delineate entrance, exit, and emergency escape routes. See Section 2.0.
- Rehearse unfamiliar operations, prior to implementation.

- Use the “buddy system”. Buddies should maintain visual contact with each other and with other on-site team members by remaining in close proximity to assist each other in case of emergency.
- Establish appropriate Safety Zones including Support, Contamination Reduction, and Exclusion Zones.
- Minimize the number of personnel and equipment in contaminated areas (such as the Exclusion Zone). Non-essential vehicles and equipment should remain within the Support Zone.
- Establish appropriate decontamination procedures for leaving the site.
- Immediately report all injuries, illnesses, and unsafe conditions, practices, and equipment to the SHSO.
- Matches and lighters are restricted from entering in the Exclusion Zone or Contamination Reduction Zone.
- Observe co-workers for signs of toxic exposure and heat or cold stress.
- Inform co-workers of potential symptoms of illness, such as headaches, dizziness, nausea, or blurred vision.

5.2 HOLLOW STEM AUGER/DIRECT PUSH DRILLING SAFE WORK PRACTICES

The following Safe Work Practices are to be followed when working in or around Hollow Stem Auger/DPT Drill Rig Operations.

5.2.1 Before Drilling

- Identify all underground utilities and buried structures before drilling. Use the Utility Locating and Excavation Clearance Standard Operating Procedure provided in Attachment IV.
- All drill rigs will be inspected by a Competent Person (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 V. Inspection frequencies will be initially (prior to being put into use at the site), followed by once every 10 day shift or following repairs.
- The work area around the point of operation will be graded to the extent possible to remove any trip hazards near or surrounding rotating equipment.
- The Driller’s helper will establish an equipment staging and lay-down plan. The purpose of this is to keep the work area clear of clutter and slips, trips, and fall hazards. Mechanisms to secure heavy objects such as auger flights, and drive rods will be provided to avoid the collapse stacked equipment.

- All potentially contaminated tooling will be wrapped in polyethylene sheeting for storage and transport to the centrally located decontamination unit.

5.2.2 During Drilling

- Secure frayed or loose clothing, hair, and jewelry when working with rotating equipment.
- Personnel will minimize contact to the extent possible with contaminated tooling and environmental media.
- Support functions (sampling and screening stations) will be maintained a minimum distance from the drill rig. This distance is typically the height of the mast plus 5 feet or a minimum of 25 feet, whichever is greater, to remove personnel involved in these activities from within physical hazard boundaries.
- Only qualified operators and knowledgeable ground crew personnel will participate in the operation of the drill rig.
- In order to minimize contact with potentially contaminated tooling and media and to minimize lifting hazards, multiple personnel should move heavy tooling, as applicable and necessary.
- Only personnel absolutely essential to the work activity will be allowed in the Exclusion Zone. Site visitors will be escorted at all times.

5.2.3 After Drilling

- All equipment used within the Exclusion Zone will undergo a complete decontamination and evaluation by the SHSO to determined 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 provider, where applicable.
- When not in use all drill rigs will be shutdown, emergency brakes set, and wheels chocked (All vehicles over one ton rated capacity).
- 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.

**TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES
NAS WHITING FIELD, MILTON, FLORIDA**

Task/Operation/Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring - Types and Action Levels	Personal Protective Equipment (Items in <i>italics</i> are deemed optional as conditions of the FOL or SHSO dictate.)	Decontamination Procedures
<p>Mobilization/Demobilization</p> <p>This activity includes, but not limited to:</p> <ul style="list-style-type: none"> - Equipment Preparation and Evaluation - Resource acquisition and unpacking of supplies - Site clearance and preparation - Utility clearances, etc. - Establish and construct access routes to sample/work locations - Construct decontamination and IDW operation and storage facilities, as applicable. 	<p>Chemical hazards:</p> <p>1) Chemical hazards associated with chemicals brought on-site.</p> <p>Physical hazards:</p> <p>2) Lifting (strain/muscle pulls) 3) Cuts and lacerations 4) Pinches and compressions/Struck by 5) Slips, trips, and falls 6) Heavy equipment hazards (swinging booms, hydraulic lines, etc.) 7) Vehicular and foot traffic</p> <p>Natural hazards:</p> <p>8) Ambient temperature extremes (heat stress) 9) Insect and animal bites and poisonous plants 10) Inclement weather</p>	<p>Chemical hazards:</p> <p>1) The on-site Hazard Communication Program (Section 5.0 TINUS Health and Safety Guidance Manual) will be followed. This effort shall include</p> <ul style="list-style-type: none"> - Accurate Chemical Inventory List (Entries will match chemicals brought on-site, as the names appear on the MSDS and the label) This list will also contain quantities and storage locations. - MSDS's will be maintained in a central location available to all personnel. - All containers will have labels specifying the following information: <ul style="list-style-type: none"> a) Chemical Identity (As it appears on the label, MSDS, and Chemical Inventory List) b) Appropriate Warning (i.e., Eye and skin irritation, flammable, etc.) c) Manufacturer's Name Address and Phone Number <p>It will be the FOL and/or the SSO's responsibility to insure this is completed. All personnel will be required to review the appropriate MSDS's, prior to the use of a specified chemical substance. This direction should also be communicated on the Safe Work Permit completed for this task. Any specific provisions recommended by the MSDS shall be in place (i.e., eye wash, fire extinguisher, specified PPE, etc.) prior to using the chemical substance.</p> <p>Physical hazards:</p> <p>2) Lifting Hazards - During mobilization/demobilization personnel are required to handle equipment, supplies, and resources in preparation for site activities. This hazard becomes more predominant in the early morning hours (prior to muscles becoming limber) and later in the day (as a result of fatigue). The following provisions shall be instituted in order to minimize hazards of this nature:</p> <ul style="list-style-type: none"> - Use machinery or multiple personnel for heavy lifts. - 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. - Minimize the horizontal distance to the center of the lift to your center of gravity. - Minimize turning and twisting when lifting as the lower back is especially vulnerable at this time. Ensure there is adequate room to lift and maneuver the load. Ensure the area of the lift is free of work place clutter, slippery surfaces, etc. - Break lifts into steps if the vertical distance (from the start point to the placement of the lift) is excessive. - Plan your lifts - Place heavy items on shelves between the waist and chest; lighter items on higher shelves. - Periods of high frequency lifts or extended duration lifts should provide sufficient breaks to guard against fatigue and injury. <p>3) Cuts and lacerations - To prevent cuts and lacerations associated with unpacking or packing equipment and supplies, during site preparation (clearing access routes), the following provisions are required:</p> <ul style="list-style-type: none"> - Always cut away from yourself and others, then, if a knife slips, you will not impale yourself or others. - Do not place items to be cut in your hand or on your knee. - Change out blades as necessary to maintain a sharp cutting edge. Many accidents result from struggling with dull cutting attachments. <p>If hand tools (brush hooks, machetes, etc.) are used to gain access to sample locations, the following precautions are recommended:</p> <ul style="list-style-type: none"> - Insure handles are of good construction (no cracks, splinters, loose heads/cutting apparatus). - Insure all cutting tools are maintained. Blades shall be sharp without nicks and gouges in the blade. - All hand tools (brush hooks, machetes, etc.) with cutting blades shall be provided with a sheath to protect individuals when not in use and when carrying these items over rough or slippery terrain. <p>4) Pinches/Compressions/Struck By - Do not modify tooling without manufacturer's expressed permission.</p> <ul style="list-style-type: none"> - Keep any machine guarding in place, avoid moving parts. - Use tools or equipment where necessary to avoid placing hands in areas vulnerable to pinch points. - Adjust machine guarding as necessary to minimize distance between guards and point of operation. - When staging equipment, insure all stacked loads, shelving, are adequately secure to avoid creating a hazard from falling objects. <p>5) Slips, trips, and falls - Preview work locations for unstable/uneven terrain.</p> <ul style="list-style-type: none"> - Cover, guard and barricade all open pits, ditches, and openings to subsurface structures, as necessary. - The FOL and the SHSO during site surveys and site preparation should identify these potential hazards. - All activities conducted greater than 6-feet above ground surface shall employ acceptable engineered fall protection (i.e. handrails and platforms) or accepted fall protection harnesses. <p>6) Heavy Equipment Hazards - All equipment will be</p> <ul style="list-style-type: none"> - Inspected in accordance with OSHA and manufacturer's design. - All equipment inspection will be documented on a Equipment Inspection Checklist as provided in provided in Attachment V. - Operated by knowledgeable operators and ground crew. <p>7) Vehicular and Foot Traffic Hazards - As part of site preparation activities and zone construction, when preparing traffic and equipment considerations are to include the following:</p> <ul style="list-style-type: none"> - All self-propelled equipment shall be equipped with movement warning systems. - The FOL and/or the SHSO as a precautionary measure to remove or demarcate physical hazards shall preview traffic routes (foot and vehicular) and work areas before the commitment of personnel and resources. <p>Natural hazards:</p> <p>8) Ambient Temperature Extremes - Wear appropriate clothing for weather conditions. Additional information regarding heat and cold stress is provided in Section 4.0 of the TINUS Health and Safety Guidance Manual and Section 6.2.6 of this HASP.</p> <p>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</p> <ul style="list-style-type: none"> - Wear a hat that shades the face, neck, and ears. - Apply sunscreen with an 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 alot. - 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. - Wear wrap-around sunglasses to protect the eyes and delicate skin around them. <p>9) Insect/Animal Bites and Stings and Poisonous Plants - To combat the potential impact of natural hazards, the following actions are recommended</p> <ul style="list-style-type: none"> - Avoid nesting areas - Activities are to take place within light industrial areas. Therefore, this hazard is not considered significant. However, mosquitoes, ticks, and fire ants are still anticipated to be problematic. See Section 6.3 of this HASP as well as Section 4.0 of the Health and Safety Guidance Manual. - Wear light color clothes. This will allow easier detection of ticks and insects crawling on your body. It will also assist in heat stress control. - Tape pant legs to work boots to block direct access. - Use repellents - Permanone 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. <p>10) Inclement Weather - In the event of electrical storms, high winds or other inclement weather, suspend or terminate operations until directed otherwise by SHSO.</p>	<p>Visual observation of work practices by the FOL and/or the SHSO to minimize potential physical hazards (i.e., improper lifting, unsecured loads, cutting practices, etc.).</p>	<p>Level D - (Minimum Requirements)</p> <ul style="list-style-type: none"> - Standard field attire (Sleeved shirt; long pants) - Safety shoes (Steel toe/shank) - <i>Safety glasses (when potential eye hazards exist)</i> - <i>Hardhat (when overhead hazards exists, or identified as a operation requirement)</i> - <i>Reflective vest for high traffic areas</i> - <i>Hearing protection for high noise areas (As directed on an operation by operation scenario or at the direction of the FOL and/or the SHSO).</i> <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"> - Fire Extinguishers - First-aid kit <p><i>Note: The FOL and/or the SHSO shall determine the number of fire extinguishers and first-aid kits to be made available based on the number of remote or separated operations to be conducted at any given time.</i></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>

**TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES
NAS WHITING FIELD, MILTON, FLORIDA**

Task/Operation/ Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring - Type and Action Levels	Personal Protective Equipment (Items in italics are deemed optional as conditions of the FOL or SSO dictate.)	Decontamination Procedures
<p>Air Injection/ Observation Monitoring Well Installation (and soil borings) using</p> <ul style="list-style-type: none"> - Hollow Stem Augers - DPT <p>At Sites 1438/1439</p> <p>1 Air injection well installed to 15- feet total depth; 3 observation wells installed at 15- feet in total depth spatially arranged at 15, 30, and 60- feet from the air injection well.</p> <p>1 Air injection well installed to 40- feet total depth; 3 observation wells installed at 40- feet in total depth spatially arranged at 15, 30, and 60- feet from the air injection well.</p>	<p>Chemical hazards: 1) Historical information indicates the following compounds of concern</p> <p>Sites 1438/1439 – AVGas (Aviation Gasoline)</p> <p>Previous analytical data identified the following components of this contaminant of concern within the soils:</p> <ul style="list-style-type: none"> - Benzene 0.13 ppm - Toluene 10.0 ppm - Ethylbenzene 18.0 ppm - Xylene 71.0 ppm - 1-methylnaphthalene 0.33 ppm - 2-methylnaphthalene 0.53 ppm <p>Site 2894</p> <ul style="list-style-type: none"> - JP-5 <p>Based on the reported concentrations these contaminants do not pose a significant occupational exposure threat.</p> <p>Further information on these contaminants and/or components of these contaminants are presented in Section 6.1 and Table 6-1.</p> <p>2) Transfer of contamination into clean areas or onto persons.</p> <p>Physical hazards:</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) Vehicular and foot traffic</p> <p>9) Flying projectiles</p> <p>Natural hazards:</p> <p>10) Inclement weather</p>	<p>Chemical hazards:</p> <p>1) Safe work practices will be used as the first line of defense. As a general rule, avoiding contact with contaminated media (air, water, soils, etc.) will be used as a universal control measure.</p> <p>Liquids with an Elevated Boiling Temperature and Particulates - Control measure to minimize potential exposures include good work and personal hygiene practices. These include avoiding hand-to-mouth contact, washing hands and face (or using hygienic wipes) prior to breaks or lunch or other hand to mouth activities. Liquids/gases - Real time monitoring instruments and PPE will be used to support protective measures. All samples will be scanned with a PID. Positive readings noted in these scans will require the SHSO to monitor high-risk worker's breathing zone areas to evaluate the possible inhalation exposure potential. High risk employees in this task are the driller, driller helper, and the sampler.</p> <p>2) Transfer of Contamination into Clean Areas or onto Persons - Restrict the cross use of equipment and supplies between locations and activities without first going through a suitable decontamination. Work practice include:</p> <ul style="list-style-type: none"> - A rigid decontamination procedure for all equipment between locations and between clean and potentially dirty work. This provision will ensure materials are not transferred to unaffected areas. - PE sheeting shall be used to place contaminated tooling for transport to the central decontamination unit as applicable. - Always have the spill kit accessible - All of the drilling systems referenced here operate using hydraulics or hydraulic assisted operating systems. As these systems can leak and at times rupture, rapid containment is the best control measure. <p>Physical hazards:</p> <p>3) Heavy Equipment Hazards - All equipment will be:</p> <ul style="list-style-type: none"> - Inspected in accordance with Federal safety and transportation guidelines, OSHA (1926.600.601.602), and manufacturer's design, as applicable. See the Equipment Inspection Checklist found in Attachment V of this HASP. - Operated and supported by qualified operators and ground crew. - Used within safe work zones, with routes of approach clearly demarcated. All personnel not directly supporting this operation will remain a distance of at least the height of the mast + 5-feet but no less than 25-feet from the rig. See Section 9.1 for initial exclusion zone boundaries. <p>In addition to equipment considerations, the following safe operating procedures will be incorporated:</p> <ul style="list-style-type: none"> - Only manufacturer-approved equipment may be used in conjunction with equipment repair procedures (e.g., auger flight connectors, pressure fittings, etc.). - Work areas will be kept clear of clutter. - All self-propelled equipment shall be equipped with movement warning systems. - All personnel will be instructed in the location and operation of emergency shut-off device(s). These devices will be tested initially (and then periodically) to ensure proper operation. - Areas will be inspected prior to the movement of the drill/DPT rig and support vehicles to eliminate any physical hazards. This will be the responsibility of the FOL and/or SHSO. - The drill rig and support vehicles will be moved no closer than 5-feet to unsupported side-walls of excavations and embankments. - See additional safe work procedures for drilling in Section 5.2 of this HASP. <p>4) Noise in Excess of 85 dBA - Hearing protection will be used during all subsurface activities using the HAS/direct push rig or when noise levels are > 85 dBA. (during operation). As a general rule of thumb</p> <p><i>Excessive noise levels (>80dBA) are being approach when you have to raise your voice to talk to someone within 2 feet of your location. In these situations always employ hearing protection.</i></p> <p>Previous accumulated data indicates an average 8-hour exposure working behind a:</p> <ul style="list-style-type: none"> - Hollow Stem Auger Rig - ~87 to 92 dBA - DPT - ~90-102 dBA <p>Controlling this hazard shall be accomplished employing two separate approaches as follows:</p> <ul style="list-style-type: none"> - Boundaries will be established to limit the affect of the noise hazard. Typically, the height of the mast + 5 feet or a minimum of 25 feet is normal. At this distance and magnitude hearing protection is not required. - Hearing protection <p>5) Energized Systems - All drilling activities will proceed in accordance with the Utility Locating and Excavation Clearance SOP in Attachment IV of this HASP. All utility clearances will be obtained, in writing, and locations identified and marked, prior to activities. If it is not obtainable/unknown or you location infringes within 3-feet of an underground utility advancement must proceed by hand until past the utility. Hand-dug holes should represent the same diameter of the mechanized tooling. Overhead clearances shall be maintained at a minimum distance of 20-Feet from overhead power lines.</p> <p>6) Lifting Hazards - Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques as described in mobilization/demobilization.</p> <p>7) Slips, Trips, and Falls - Preview work locations for unstable/uneven terrain/Raised Platforms/Excavations.</p> <ul style="list-style-type: none"> - Cover, guard and barricade all open pits, ditches, and openings of subsurface structures, as necessary. - Ruts, roots, and other tripping hazards should be eliminated approaching points of operation to minimize trips and falls when approaching rotating/operating equipment. - Maintain a clutter free work area. - As part of site control efforts construct fences or other means of demarcation (i.e. signs and postings) to control and isolate traffic into the exclusion zone. Means of demarcation shall also be constructed isolating resource and/or staging areas. - Raised work platforms greater than 4-feet above ground surface require the use of a handrail and applicable toe-boards meeting specifications as defined in 29 CFR 1910.23. <p>8) Vehicular and Foot Traffic Hazards - Use traffic-warning signs, flag persons, and high visibility vests as determined by the SHSO when working along traffic thoroughfares. In addition, use physical barricades when working within normal traffic flow patterns/traffic lanes.</p> <p>9) Flying Projectiles -</p> <ul style="list-style-type: none"> - Cover or guard all high-pressure operating systems to deflect flying or pressurized media in the event of a leak. - A particularly dangerous aspect of the HSA Drill rigs is that they have cable assisted lifting devices attached to a hoist. Failure of these items have resulted in fatalities within the drilling industry. To control these hazards the following provisions shall apply: <ol style="list-style-type: none"> Complete Equipment Inspection Checklist - Pay close attention to the cable (size and condition), hooks (condition and size compared to that of the cable), and clamps (never saddle a dead horse - The base of the clamp should not be on the dead end of the cable, but the U-shaped should). Monitoring operating pressure to restrict over pressurizing the lifting system. Remove unnecessary personnel from within the release boundary should the lifting system become compromised. <p>Natural hazards:</p> <p>10) Inclement Weather - To minimize hazards of this nature, the following provisions shall be used:</p> <ul style="list-style-type: none"> - Wear appropriate clothing for weather conditions. - Provide replacement liquids for field crews as relief from excessive ambient temperatures. - Electrical storms/high winds - Suspend or terminate operations until directed otherwise by SHSO. <p>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>1) Monitoring shall be conducted to qualify and quantify estimated airborne concentrations of AVGas and JP-5 and associated constituents in support of the prescribed worker protection levels.</p> <p>Monitoring shall be conducted using a Photoionization Detector (PID) with 10.6eV lamp strength. The correction factor used for this lamp strength for these substances is as follows:</p> <ul style="list-style-type: none"> - Mixture of reported contaminants = 0.49 - AVGas = ~1.0 - JP-5 = 0.60 <p>The mixture correction factor, as well as, mixture calculation was selected to determine the actual airborne concentration based on components and percentage representation.</p> <p>Action level -</p> <p><10 ppm in the high risk worker's breathing zone; continue to work, continue to monitor.</p> <p>>10 ppm - Concentration in excess of this action level require personnel to stop work, notify PHSO.</p> <p>Monitoring shall be conducted at the prescribed depths as indicated on the boring logs at the source (borehole) and drillers/drillers helper/samplers breathing zone. At a minimum breathing zone measurements will be conducted at the following frequencies</p> <ul style="list-style-type: none"> - Initially, at each sampling interval, with a minimum breathing zone measurement every 4-feet. - Changes in lithological formation. - Indications of contaminant presence (staining, olfactory sensitization) <p>4) Monitoring for excessive noise levels will not be accomplished in support of this scope of work. Sufficient data exists to select the types of hearing protection required and suitable control measures.</p>	<p>All drilling operations will be initiated in Level D protection, including the following articles:</p> <p>Sampler/Oversight Personnel</p> <ul style="list-style-type: none"> - Standard field dress (long pants, Sleeved shirts) - Steel toe safety shoes or work boots - Hard hat - Safety Glasses - Layered nitrile surgeon style gloves for sampling - Impermeable boot covers - Tyvek or washable cotton coveralls - Reflective vest for traffic areas <p>Driller and Driller Helper</p> <ul style="list-style-type: none"> - Standard field attire including sleeved shirt and long pants - Safety shoes (Steel toe/shank) - Safety glasses - Neoprene outer gloves; Nitrile inner gloves - Hearing protection - Hard hat - Impermeable boot covers - Impermeable outer garments such as PVC Rain-suit or Saranex®, PE coated Tyvek® due to contact with contaminated tooling. An impermeable apron is an acceptable alternative and may also be used when conditions of heat stress are prevalent. <p>As site conditions may change, the following equipment will be maintained during all on-site activities</p> <ul style="list-style-type: none"> - Fire Extinguishers - First-aid Kit <p>Ascension to greater than 10 ppm is not anticipated based on the reported concentrations. Sustained readings in the breathing zone in excess of 10 ppm requires notifying the PHSO.</p> <p>Note: The Safe Work Permit(s) for this task (Attachment VI) 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>Personnel Decontamination 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>For HSA, DPT Operations: The sequential procedure is as follows:</p> <p>Stage 1: Equipment drop, remove outer protective wrapping; Decontamination personnel will wipe down the outer shell and pass hand equipment through as necessary.</p> <p>Stage 2: Soap/water wash and rinse of outer boots and gloves</p> <p>Stage 3: Soap/water wash and rinse of the outer splash suit, as applicable.</p> <p>Stage 4: Disposable PPE will be removed and bagged.</p> <p>Stage 5: Wash face and hands or use hygienic wipes to remove associated contaminants.</p> <p>Note: For remote locations away from the centralized decontamination unit, hygienic wipes may be used for cleaning hands and face, as well as bagging all items for transport back to the centralized decontamination unit.</p> <p>Stage 6: Depending on ambient conditions, levels of PPE, or signs and symptoms of heat/cold stress you may be required to report for medical evaluation. This evaluation consists of pulse, breathing rate, oral temperature, and body weight. This medical screening will be performed when ambient conditions dictate and during periods of acclimatization.</p> <p>Heavy/Sampling Equipment Decontamination - All heavy and sampling equipment decontamination will proceed in accordance with the directives provided in Table 5-1 for that task. Heavy equipment will have the wheels and tires cleaned along with any loose debris removed, prior to transporting to the central decontamination area. Roadways shall be cleared of any debris resulting from the onsite activity. Portable pieces will be wrapped in polyethylene sheeting for transport to a centrally located decontamination facility.</p> <p>The FOL or the SHSO 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**

Task/Operation/Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring - Type and Action Levels	Personal Protective Equipment (Items in <i>italics</i> are deemed optional as conditions or the FOL or S/SSO dictate.)	Decontamination Procedures												
<p>Soil Gas Permeability Testing using:</p> <ul style="list-style-type: none"> - Air Injection Wells - Observation Wells <p>This activity employs an air compressor to supply air pressure to an air injection well.</p> <ol style="list-style-type: none"> 1. Air is applied at a maximum pressure of 50 pounds/square inch (psi) into the air injection well 2. The air is subsequently applied as pressure responses are monitored in the observation wells of the same depth however, spatially oriented at 15, 30, and 60-feet from the air injection well. 3. Pressure responses are recorded at varying time intervals until steady state conditions are achieved in the observation wells. 	<p>Chemical hazards:</p> <p>1) Historical information indicates the following compounds of concern</p> <p>Sites 1438/1439 – AVGas (Aviation Gasoline)</p> <p>Previous analytical data identified the following components of this contaminant of concern within the soils:</p> <table border="0"> <tr><td>- Benzene</td><td>0.13</td></tr> <tr><td>- Toluene</td><td>10.0</td></tr> <tr><td>- Ethylbenzene</td><td>18.0</td></tr> <tr><td>- Xylene</td><td>71.0</td></tr> <tr><td>- 1-methylnaphthalene</td><td>0.33</td></tr> <tr><td>- 2-methylnaphthalene</td><td>0.53</td></tr> </table> <p>Based on the reported concentrations these contaminants do not pose a significant occupational exposure threat.</p> <p>Further information on these contaminants are presented in Section 6.1 and Table 6-1.</p> <p>Physical hazards:</p> <ol style="list-style-type: none"> 3) Pressurized Systems 4) Noise in excess of 85 dBA 5) Flammable/Explosive Atmospheres <p>Natural hazards:</p> <ol style="list-style-type: none"> 6) Inclement weather 	- Benzene	0.13	- Toluene	10.0	- Ethylbenzene	18.0	- Xylene	71.0	- 1-methylnaphthalene	0.33	- 2-methylnaphthalene	0.53	<p>Chemical hazards:</p> <p>1) During the soil gas permeability testing, exposure to the off gassing (TPH or components of the TPH) are not considered to pose an occupational exposure threat as the air injection and pressure measurement are performed within a closed system. The potential for exposure exists, when it is necessary to depressurize the system. To avoid this potential exposure the following control measures will be employed</p> <p>All observation well caps will be fitted with a regulator gauge and safety valve to allow the monitoring of pressure and the controlled release of pressure as necessary. When it is necessary to discharge the air pressure from the system, the following steps will be employed</p> <ol style="list-style-type: none"> a) Shut down the air compressor, close the inlet valve on the air injection well, and release any pressure between the air compressor and the air injection well. b) Step to the farthest observation well (at 60-feet) open the release valve to allow equalization of the pressure. Repeat this step by moving to the next observation well in line (30-feet) and open the release valve; Repeat this step by moving to the next observation well in line (15-feet) and open the release valve. When you open the release valve, do so from an upwind position. Once open, continue to move upwind to avoid exposure to the emissions. c) Once the pressure gauges have reached atmospheric pressure, the system again starting at the far well, may be opened. <p>Physical hazards:</p> <p>3) Pressurized Systems - Hazards associated with pressurized systems include the potential rupture or structural failure of the system or system components, flying projectiles, uncontrolled/uncontained release of pressure from pressurized lines,</p> <p>All equipment will be (Air compressor, lines, locking fittings, connections):</p> <ul style="list-style-type: none"> - Inspected to insure structural integrity of the system to be pressurized. All inspections will be documented using the Soil Gas Permeability Testing Log or Project Logbook. - The air injection connection shall also be equipped with a safety relief valve to prevent over pressurizing the system. - All connections between lines will be locking and equipped with an airline retention cable between sections of airline. In the unlikely event the lines separate, the pressurized end will not whip as the retention cable will permit the control of this line until the pressure from the compressor can be shut off. - All personnel will be instructed in the location and operations of the emergency shut-off device(s). This device will be tested initially (and then periodically) to ensure its operational status. <p>4) Noise in Excess of 85 dBA - Controlling this hazard shall be accomplished employing two separate approaches as follows:</p> <ul style="list-style-type: none"> - Boundaries will be established to limit the affect of the noise hazard. Hearing protection will be used when working within 25-feet of an operating air compressor. - Hearing protection <p>As a general rule of thumb – Excessive noise levels (>80dBA) are being approach when you have to raise your voice to talk to someone within 2 feet of your location.</p> <p>5) Flammable/Explosive Atmospheres – The mechanism by which the soil gas permeability testing works is that an air pressure gradient is established in an injection well and is measured in observation wells within a prescribed radius. One of the concerns associated with this activity is the potential for unintended receivers such as underground vaults, utility banks, storm water tunnels to receive an injection of heavily laden TPH gases and vapors. Under normal circumstances, these gases and vapors may never enter these structures or enter and disperse prior to accumulating significant concentrations. To control hazards of this nature</p> <ul style="list-style-type: none"> - Conduct a utility search using drawings and physical monuments at the site to determine if any subsurface structures are physically located within the determined radius of influence that could be breached by this increased air pressure. - If the atmospheric pressure within the subsurface structure can be influenced by the increase in subsurface air pressure (not an intact unit such as a water line or pressurized sanitary line) identify the unit to be included in the monitoring activities. - Monitor the identified subsurface structures using a Combustible Gas/Oxygen Meter. Engage control measures identified based on achieving specified action levels provided in the Hazard Monitoring column. <p>6) Inclement Weather – To minimize hazards of this nature, the following provisions shall be employed:</p> <ul style="list-style-type: none"> - Wear appropriate clothing for weather conditions. - Provide acceptable shelter and replacement liquids for field crews as relief from excessive ambient temperatures. - Electrical storms/high winds - Suspend or terminate operations until directed otherwise by SSO. <p>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</p> <ul style="list-style-type: none"> - Provided shaded cover for extended periods in the sun. - Wear a hat that shades the face, neck, and ears. - Apply sunscreen with an 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. - 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. - Wear wrap-around sunglasses to protect the eyes and delicate skin around them. <p>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>5) Monitoring shall be conducted to qualify and quantify potential airborne concentrations of petroleum vapors and gasses within subsurface structures during the soil gas permeability testing. Subsurface structures within the radius of influence (estimated 60-feet) of the air injection well will be monitored to determine if the air injection pressurization of the subsurface media is infiltrating into the spaces provided by the subsurface structures. Monitoring shall be conducted</p> <ul style="list-style-type: none"> - Pre-test (prior to pressurizing the system and to establish a baseline) - During (To ensure vapor/gas evolution into the structures are not occurring) - After (Verification) <p>Monitoring shall be conducted using a Combustible Gas Indicator/Oxygen Meter (LEL/O₂). The monitoring shall be conducted in the following sequence</p> <ol style="list-style-type: none"> a) % Oxygen Concentration <ul style="list-style-type: none"> - Optimum level 19.5-23.5% by volume – Continue to work, continue to monitor. - <10% or >23.5%, Cease operations and Notify the PHSO. b) % Combustible Gas (LEL) <ul style="list-style-type: none"> - <10% continue to work, continue to monitor - >10% engage ventilation of the subsurface structure. If this does not reduce airborne concentrations, cease operation, Notify the PHSO. <p>Note: LEL for AVGas = 1.4% For the reported contaminants in the soils = 1.08%. It has been determined that the more conservative value (1.08% or 10,800 ppm) will be employed to represent the LEL concentration. 10% of 1.08% = 1000ppm It is important to determine the oxygen concentration first. <10% oxygen will result in erroneous combustible gas result.</p>	<p>All soil gas permeability testing boring operations will be initiated in Level D protection, including the following articles:</p> <p>Sampler/Oversight Personnel</p> <ul style="list-style-type: none"> - Standard field dress (long pants, Sleeved shirts) - Steel toe safety shoes or work boots - Hard hat - Safety Glasses (When working near the pressurized lines and connections) - Hearing protection (when within 25-feet of an operating air compressor) - <i>Leather or cotton work gloves for handling air lines and connections</i> <p>As site conditions may change, the following equipment will be maintained during all on-site activities</p> <ul style="list-style-type: none"> - Fire Extinguishers - First-aid Kit <p>Note: The Safe Work Permit(s) for this task Attachment VI of this HASP) 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>Personnel Decontamination will not be required as part of this task as the system will be completely contained.</p> <p>However, as stated earlier good personnel hygiene practices such as washing hands and face or the use of hygienic wipes prior to breaks, food/drink consumption is recommended.</p>
- Benzene	0.13																
- Toluene	10.0																
- Ethylbenzene	18.0																
- Xylene	71.0																
- 1-methylnaphthalene	0.33																
- 2-methylnaphthalene	0.53																

**TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES
NAS WHITING FIELD, MILTON, FLORIDA**

Task/Operation/Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring - Type and Action Levels	Personal Protective Equipment (Items in <i>italics></i> are deemed optional as conditions or the FOL or SHSO dictate.)	Decontamination Procedures
<p>Multi-media sampling, including</p> <ul style="list-style-type: none"> - Ground water – Peristaltic pumps - Subsurface soils – during well installation using mechanized support including Split spoon sampling (HSA), MacroCore Sampler (DPT) - Air sampling using an air sampling pump and tedlar bags <p>Protective measures as recommended her shall also apply to aquifer development.</p>	<p>Chemical hazards:</p> <p>1) Historical information indicates the following compounds of concern</p> <p>Sites 1438/1439 – AVGas (Aviation Gasoline)</p> <p>Previous analytical data identified the following components of this contaminant of concern within the soils:</p> <ul style="list-style-type: none"> - Benzene 0.13 ppm - Toluene 10.0 ppm - Ethylbenzene 18.0 ppm - Xylene 71.0 ppm - 1-methylnaphthalene 0.33 ppm - 2-methylnaphthalene 0.53 ppm <p>Site 2894</p> <ul style="list-style-type: none"> - JP-5 <p>Based on the reported concentrations these contaminants do not pose a significant occupational exposure threat.</p> <p>Further information on these contaminants and/or components of these contaminants are presented in Section 6.1 and Table 6-1.</p> <p>2) Transfer of contamination into clean areas.</p> <p>Physical hazards:</p> <p>3) Slip, trip, and fall hazards</p> <p>4) Strain/muscle pulls from manual lifting</p> <p>5) Cuts and Lacerations</p> <p>6) Ambient temperature extremes (heat/cold stress)</p> <p>7) Site characterization</p> <p>Natural hazards:</p> <p>8) Animal and insect bites and encounters</p> <p>9) Inclement weather</p>	<p>Chemical hazards:</p> <p>1) Safe work practices will be employed as the first line of defense. As a general rule, avoiding contact with contaminated media (air, water, soils, etc.) will be employed as a universal control measure.</p> <p>Particulates/Liquids with an Elevated Boiling Temperature -As some of the materials in question are solids (i.e., naphthalenic distillates (PAHs) and/or bound to particulates, the next control measure to be employed to minimize potential exposure will be good work and personal hygiene practices. These control measures include avoiding hand-to-mouth contact to the extent possible, washing hands and face or using hygienic wipes to remove potential contaminants from hands and face prior to breaks or lunch or other hand to mouth activities will restrict the most predominant route of exposure.</p> <p>Liquids/gases – In situations where contaminants exist in soils or liquid media and present a vapor or gas hazard threat, real time monitoring instruments and PPE will be employed to support protective measures. As part of the evaluation method, all samples will be scanned with a PID to determined potential source concentrations. Positive indications at the source require the SHSO to monitor the high-risk worker's breathing zone to evaluate the possible inhalation exposure potential. High-risk employees in this task are the driller, driller helper, and the sampler.</p> <p>2) Transfer of Contamination into Clean Areas or onto Persons - Restrict the cross use of equipment and supplies between locations and activities without first going through a suitable decontamination. Work practices including</p> <ul style="list-style-type: none"> - A rigid decontamination procedure will be employed for all equipment between locations and between clean and potentially dirty work. This provision will insure materials are not carried and deposited in unaffected areas. - Polyethylene sheeting shall be employed to place contaminated tooling for transport to the central decontamination unit, as applicable. - Always have the spill kit at the ready - All of the drilling systems referenced here operate using hydraulics or hydraulic assisted operating systems. As these systems can leak and at times rupture rapid containment is the best control measure for controlling environmental contamination. <p>3) Slip, Trip, and Fall Hazards – These hazards shall be minimized by adherence to the practices indicated in Section 6.2.1 of this HASP. These include</p> <ul style="list-style-type: none"> - Maintain proper housekeeping in all work areas. - Preview and inspect work areas to identify and eliminate slip, trip, or fall hazards. - Activities to be conducted from more than 6-feet above floor or ground level will require fall protection training and the use of 100% fall protection equipment. - Cover, guard, barricade, and/or place warning postings over/at holes or openings that personnel may fall or step into. - Use multiple persons and pack small loads to remote locations. <p>4) Strain/Muscle Pulls from Manual Lifting - Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques (See Lifting Mobilization/Demobilization, Page 1 of 6, Table 5-1).</p> <p>Items 3 & 4 are not considered to be predominant hazards in support of these planned activities. The reason is that most of these activities are to be conducted in light industrial areas that are regularly maintained eliminating many of the physical challenges evident in more remote settings. However, as statistics indicate for 1999 that 4 out 10 cases resulting in significant injuries requiring time off to heal were associated with slips, trips and falls and sprains most predominantly back injuries.</p> <p>5) Cuts and Lacerations – Employ the following measures to reduce and/or eliminate the potential for cuts and lacerations</p> <ul style="list-style-type: none"> - Obtain and 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. These items have been engineered to allow sample acquisition without putting the sampler at risk. - Select and secure the most favorable route to monitoring wells and sampling locations. - Previewing pathways - Where possible, remove or demarcate the physical hazards. - Inspect all cutting equipment to be used to clear access routes for defects. - When cutting items - always use a sharp knife and always cut away from your body. Do not place items to be cut in your opposite hand or on your knee. - Carry all glassware and items that present a potential for cuts, lacerations, or impalement such as machetes or brush hooks in protective packaging or sheathed to avoid breakage or exposure in the event of a slip, trip, and/or fall. <p>6) Ambient Temperature Extremes (Heat/Cold Stress) - Wear appropriate clothing for weather conditions. Provide acceptable shelter, where possible, 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. To reduce the potential for sunburn and melanoma the following measures should be employed</p> <ul style="list-style-type: none"> - Wear a hat that shades the face, neck, and ears. - Apply sunscreen with an 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 alot. - 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. - Wear wrap-around sunglasses to protect the eyes and delicate skin around them. <p>7) Site Characterization - Work areas will be surveyed prior to committing personnel or resources. The survey will be conducted by the FOL and/or the SHSO. The purpose is to identify physical and natural hazards that may impact the proposed work area. These hazards are to be identified, barricaded, or eliminated to the extent possible to minimize potential effect to field crew.</p> <p>8) Animal and Insect Bites and Encounters – This is not considered to be a predominant hazard as the activities are to be conducted in a light industrial are regularly maintained. However, as hazards of this nature cannot be eliminated the following is presented for informational purposes</p> <ul style="list-style-type: none"> - Avoid nesting – Preview routes, avoid nests, if at all possible. Check existing well casings for spider and bee nests. - Wear light color clothes. This will allow easier detection of ticks and insects crawling on your body. It will also assist in heat stress control. - Tape pant legs to work boots to block direct access. - 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. - Upon exiting the high brush and wooded areas perform a close body inspection to remove any ticks or other insects that have attached to your clothing or skin. - If you leave your work boots in the trailer during days off, always shake them out prior to putting them on. The purpose is to remove any insects/spiders who may have set up house. <p>9) Suspend or terminate operations until directed otherwise by the SSO.</p>	<p>1) Monitoring shall be conducted to qualify and quantify estimated airborne concentrations of AVGas and JP-5 and associated constituents in support of the prescribed worker protection levels.</p> <p>Monitoring shall be conducted using a Photoionization Detector (PID) with 10.6eV lamp strength. The correction factor employed for this lamp strength for these substances is as follows:</p> <ul style="list-style-type: none"> - Mixture of reported contaminants = 0.49 - AVGas = ~1.0 - JP-5 = 0.60 <p>The mixture correction factor, as well as, mixture calculation was selected to determine the actual airborne concentration based on components and percentage representation.</p> <p>Action level –</p> <p><10 ppm in the high risk worker's breathing zone; continue to work, continue to monitor.</p> <p>>10 ppm - Concentration in excess of this action level require personnel to stop work, notify PHSO.</p> <p>Monitoring shall be conducted at the prescribed depths as indicated on the boring logs at the source (borehole) and drillers/drillers helper/samplers breathing zone. At a minimum breathing zone measurements will be conducted at the following frequencies</p> <ul style="list-style-type: none"> - Initially, at each sampling interval, with a minimum breathing zone measurement every 4-feet. - Changes in lithological formation. - Indications of contaminant presence (staining, olfactory sensitization) <p>Monitoring will be conducted upon initially opening the well when groundwater sampling, however, after that it is not required in support of this task.</p> <p>Monitoring will not be required in support of the air sampling task identified as part of this scope.</p> <p>Concentration in excess of this action level require personnel to stop work, notify PHSO.</p>	<p>Where possible, when sampling always position yourself upwind of the operating drill rig or discharge container to avoid airborne emissions.</p> <p>Level D protection will be utilized for the following sampling activities</p> <ul style="list-style-type: none"> - Ground water and subsurface soils <p>Sampling Personnel</p> <p>Level D - (Minimum Requirements)</p> <ul style="list-style-type: none"> - Standard field attire (Sleeved shirt; long pants) - Safety shoes (steel toe/shank) - Safety glasses - Surgical style gloves – Nitrile (<i>double-layered, if necessary</i>) - Tyvek coveralls and disposable boot covers, if surface contamination is present or if the potential for soiling work attire exists. <p>Upgrades to Level C protection are not anticipated.</p> <p>Note: The Safe Work Permit(s) for this task (See Attachment VI) 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>Personnel Decontamination</p> <p>Sampling groundwater and subsurface soils the following provisions will apply</p> <ul style="list-style-type: none"> - Upon completion of the sampling dedicated trowels, tubing, etc. will be bagged for transport back to the central decontamination area. - PPE (gloves) will be removed and also bagged for disposal. - Handi-Wipes or similar product will be used to clean hands, prior to moving to the next location. <p>Equipment Decontamination</p> <p>All equipment used in remote sampling locations will be brought back to the central decontamination area for decontamination and re-use or disposal.</p> <p>Decontamination of equipment (sampling and hand tools) will proceed as indicated in the Work Plan and in Section 4.6.1 and 4.6.2 of this HASP.</p>

Jason Bourgeois

Attention: ~~Paul Calligan~~

Date: 10/31/01

Company:

Number of Pages: 11

Fax Number: 623-7238

Voice Number:

From: **Lori K Forbush**

Company:

Fax Number: 850-477-7001

Voice Number: 850-477-7088

Subject: Paul Calligan, BOQ - room 7149

Comments:

Paul,

Here is the information you requested. Please let me know if you need anything else.

Lori

*** MEDICAL RECORD COPY ***



MEDICAL CLEARANCE

ATTN: Mr. Micheal Stockton
5139 Mike Griffith Drive
Milton, FL 32570

July 7, 2000

RE: Employee: Micheal A. Stockton
SSN: 051-56-9928

Exam No: 406910
Exam Date: 06/23/00

Mr. Stockton has completed a(n) Baseline Field Exp./DOT Examination for GUL PENSACOLA with the following results and clearances.

- | YES | NO | |
|-----|-----|---|
| [X] | [] | To work with HAZARDOUS MATERIALS in accordance with 29 CFR 1910.129. |
| [X] | [] | To use RESPIRATORY PROTECTIVE EQUIPMENT in accordance with 29 CFR 1910.134. |
| [X] | [] | To receive DOT Certification. |
| [X] | [] | In accordance with Public Law 100-690. |

Work-related limitations and additional recommendations:

NONE.

By separate letter, Mr. Stockton has been informed of the medical findings of this examination and their specific health implications.

Elayne F. Theriault, M.D.
Elayne F. Theriault, M.D.
Medical Director

Presented By
Pensacola Testing Laboratories, Inc.

This is to Certify

Michael Anthony Stockton

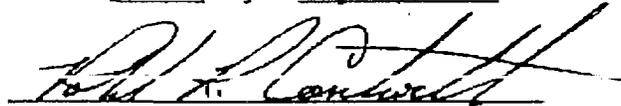
Has Successfully completed a 40 Hour Course in Health & Safety Training

Hazardous Materials and Site Investigations

- General Site Worker (E-3-1) -

Required by OSHA 29 CFR 1910.120

Presented This 16th day of April, 2000



Robert R. Cantwell, Environmental Trainer

PROSONIC CORPORATION CERTIFICATE OF COMPLETION

This is to certify that

Michael Stockton

Has successfully completed the requirements of 29 CFR 1910.120 for
8 Hour Hazardous Waste Operations & Emergency Response Refresher

Presented on this 15th day of June 2001



Daniel Palmer-Operations Manager

*** MEDICAL RECORD COPY ***



MEDICAL CLEARANCE

ATTN: Mr. Walter Lambert, Jr.
2702 Weyland Circle
Pensacola, FL 32526

November 7, 2000

RE: Employee: Walter Lambert, Jr.
SSN: 263-33-0151

Exam No: 424346
Exam Date: 10/24/00

Mr. Lambert, Jr. has completed a(n) Baseline Field Exp./DOT Examination for GUL PENSACOLA with the following results and clearances:

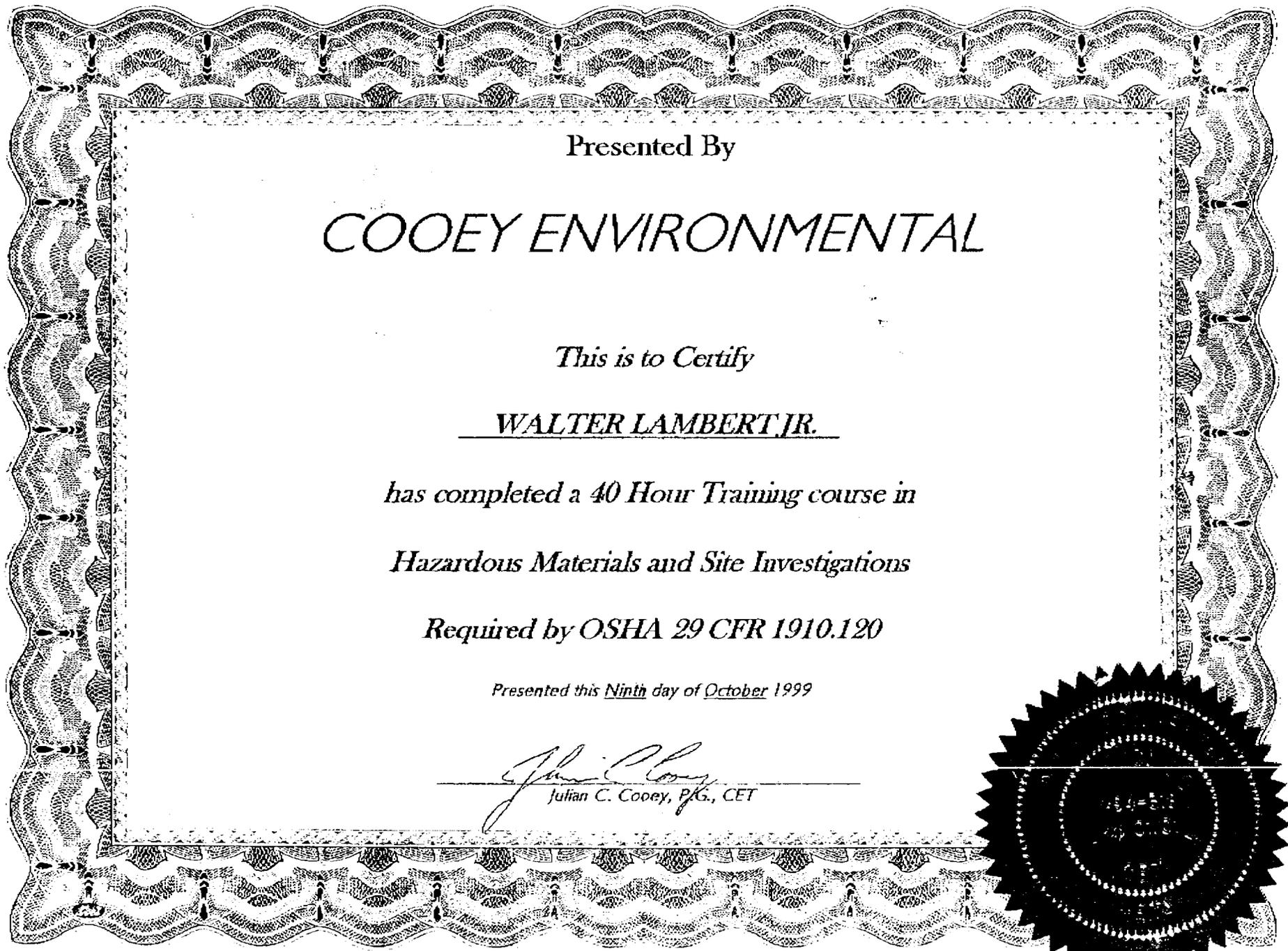
- | YES | NO | |
|-----|-----|---|
| --- | --- | |
| [X] | [] | To work with HAZARDOUS MATERIALS in accordance with 29 CFR 1910.120. |
| [X] | [] | To use RESPIRATORY PROTECTIVE EQUIPMENT in accordance with 29 CFR 1910.134. |
| [X] | [] | To receive DOT Certification. |
| [X] | [] | In accordance with Public Law 100-690. |

Work-related limitations and additional recommendations:

NONE.

By separate letter, Mr. Lambert, Jr. has been informed of the medical findings of this examination and their specific health implications.

Elayne F. Theriault, MD
Elayne F. Theriault, M.D.
Medical Director



Presented By

COOEY ENVIRONMENTAL

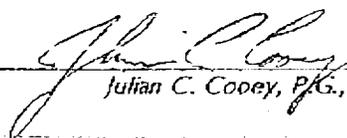
This is to Certify

WALTER LAMBERT JR.

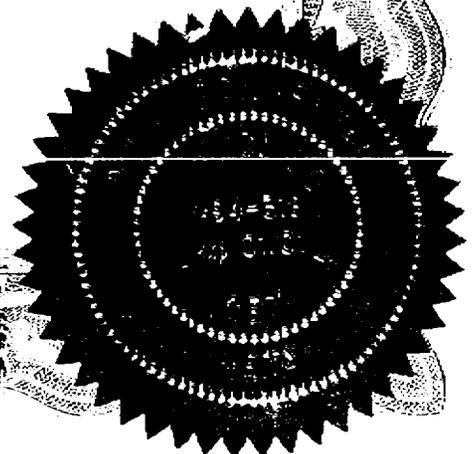
*has completed a 40 Hour Training course in
Hazardous Materials and Site Investigations*

Required by OSHA 29 CFR 1910.120

Presented this Ninth day of October 1999



Julian C. Cooley, P.G., CET





CERTIFICATE OF COMPLETION

This is to certify that

Walter Lambert, Jr.

Has successfully completed the requirements of 29 CFR 1910.120 for
8 Hour Hazardous Waste Operations & Emergency Response Refresher

Presented on this 13th day of October 2000


Daniel Palmer-Operations Manager

PROSONIC CORPORATION

CERTIFICATE OF COMPLETION

This is to certify that

Walter Lambert

Has successfully completed the requirements of 29 CFR 1910.120 for
8 Hour Hazardous Waste Operations & Emergency Response Refresher

Presented on this 13th day of September 2001



J. Robert Baker-Manager



CERTIFICATE OF COMPLETION

This is to certify that

Scotti Garrett

Has successfully completed the requirements of 29 CFR 1910.120 for
40 Hour Hazardous Waste Operations & Emergency Response Course

Presented on this 6th day of November 2000

A handwritten signature in black ink, appearing to read 'T. Peterson', is written over a horizontal line.

Thomas Peterson-Safety Trainer



3850 Holcomb Bridge Road, Suite 300
Norcross, GA 30092
770-209-9088
770-209-9634 Fax

EXAMINEE MEDICAL CLEARANCE SUMMARY

ATTN: Scotti Garrett
Gulf Atlantic Drilling, Inc.
3224 Northwest Street,
Pensacola, FL 32505

Nov 27, 2000

RE: Employee : Scotti Garrett Exam No : 10018877
SSN : 595-03-1756 Exam Date : 11-3-2000

Scotti Garrett has completed a(n) **BASELINE** examination for **GUL PENSACOLA** with the following results and clearances :

<u>STATUS</u>	<u>VALID THRU</u>	<u>CLEARANCE</u>
Cleared	Nov 03, 2002	To receive DOT Certifications.
Cleared	Nov 03, 2001	To work with HAZARDOUS MATERIALS in accordance with 29 CFR 1910.120.
Not Cleared		To use RESPIRATORY PROTECTIVE EQUIPMENT in accordance with 29 CFR 1910.134.
Cleared		In accordance with Public Law 100-690. Federal Drug Screen Form Attached

Work-related limitations and additional recommendations :

NOTE:

Chest x-ray was not performed; therefore, respiratory clearance cannot be issued at this time. If a chest x-ray was performed within 24 months of this examination, please send the film to Continuum Healthcare. If not, please request individual to return to the clinic as soon as possible to complete this evaluation.

Elayne F. Theriault, M.D.

Elayne F. Theriault, M.D.
Medical Director

**TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES
NAS WHITING FIELD, MILTON, 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 SHSO dictate.)</i>	Decontamination Procedures
<p>Decontamination of Sampling and Heavy Equipment</p> <p>It is anticipated that this activity will take place at centralized location. 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>Chemical hazards:</p> <p>1) Historical information indicates the following compounds of concern</p> <p>Sites 1438/1439 – AVGas (Aviation Gasoline)</p> <p>Previous analytical data identified the following components of this contaminant of concern within the soils:</p> <ul style="list-style-type: none"> - Benzene 0.13 ppm - Toluene 10.0 ppm - Ethylbenzene 18.0 ppm - Xylene 71.0 ppm - 1-methylnaphthalene 0.33 ppm - 2-methylnaphthalene 0.53 ppm <p>Site 2894</p> <ul style="list-style-type: none"> - JP-5 <p>Based on the reported concentrations these contaminants do not pose a significant occupational exposure threat.</p> <p>Further information on these contaminants are presented in Section 6.1 and Table 6-1.</p> <p>2) Decontamination fluids - Liquinox (detergent); isopropanol (decontamination solvent)</p> <p>Physical hazards:</p> <p>3) Lifting (strain/muscle pulls)</p> <p>4) Noise in excess of 85 dBA</p> <p>5) Flying projectiles</p> <p>6) Falling objects/Struck by</p> <p>7) Slips, trips, and falls</p> <p>Natural hazards:</p> <p>8) Inclement weather</p>	<p>1) and 2) Employ protective equipment to minimize contact with site contaminants 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 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 such as auger flights for decontamination purposes.</p> <ul style="list-style-type: none"> - Employ proper lifting techniques as described in Table 5-1, Mobilization/Demobilization. <p>4) Wear hearing protection when operating the pressure washer. Sound pressure levels measured during the operation of similar pieces of equipment indicate a range of 87 to 93 dBA.</p> <p>5) Flying projectiles - 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</p> <ul style="list-style-type: none"> - 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. - Conduct 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>6) Falling objects/Struck by – Ensure wash and drying racks are suitable construction to support heavier items such as push rod flights and will secure them against falling during this process.</p> <p>7) Slips, trips, and falls - 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 used, it is recommended that a light coating of sand be spread over the walking surface to provide traction.</p> <ul style="list-style-type: none"> - 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>8) Suspend or terminate operations until directed otherwise by SHSO.</p>	<p>Use visual observation and real-time monitoring instrumentation (PID) to ensure all equipment has been properly cleaned of contamination and dried.</p> <p>Monitoring instrumentation will be used to determine if all of the decontamination solvent (isopropanol) has been removed through the rinse process. Any positive indication/results greater than background require the article that has been decontaminated to be re-rinsed and scanned again. If necessary this process should be repeated until no measurable indication of the decontamination solvent exists.</p> <p>Monitoring of the decontamination station for purposes of worker safety is not anticipated to be performed based on anticipated concentrations. Should concerns of elevated contaminant concentrations at this station occur, previous provided action levels shall be used, as well as, the protective measures used in response to achieving those action levels.</p>	<p>For Heavy Equipment</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:</p> <ul style="list-style-type: none"> - Standard field attire (Long sleeve shirt; long pants) - Safety shoes (Steel toe/shank) - Chemical resistant boot covers - Neoprene outer gloves over nitrile inner gloves - Safety glasses underneath a splash shield - Hearing protection (plugs or muffs) - PVC Rain suit or coveralls - Impermeable aprons may be used instead of coveralls if they offer adequate protection against overspray and back splash. <p>For sampling equipment (trowels, bailers, etc.), the following PPE is required</p> <p>Note: Consult MSDS for PPE guidance. Otherwise, observe the following.</p> <p>Level D Minimum requirements -</p> <ul style="list-style-type: none"> - Standard field attire (Long sleeve shirt; long pants) - Safety shoes (Steel toe/shank) - Neoprene outer gloves over nitrile inner gloves - Safety glasses - Impermeable (butyl or neoprene) apron <p>In the event of overspray of chemical decontamination fluids cannot be controlled using aprons, employ PVC Rainsuits or PE or PVC coated Tyvek as necessary.</p> <p>Note: The Safe Work Permit(s) for this task (See Attachment VI) 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>Personnel Decontamination in support of this activity 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:</p> <p>Stage 1: Equipment drop, remove outer protective wrapping; personnel will wipe down the outer shell and pass hand equipment through as necessary.</p> <p>Stage 2: Soap/water wash and rinse of outer boots and gloves</p> <p>Stage 3: Soap/water wash and rinse of the outer splash suit, as applicable</p> <p>Stage 4: Disposable PPE will be removed and bagged.</p> <p>Stage 5: Wash face and hands</p> <p>The FOL or the SHSO 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 WHITING FIELD, MILTON, FLORIDA**

Tasks/Operation Locations	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring - Type And Action Levels	Personal Protective Equipment (Items in <i>Italics</i> Are Deemed Optional As Conditions Or The FOL Or the SHSO Dictate.)	Decontamination Procedures
<p>IDW Management and Handling</p> <p>This activity includes the following tasks:</p> <ul style="list-style-type: none"> - Containerization - Labelling - Staging - Monitoring <p>of IDW generated in support of site activities.</p>	<p>Chemical hazards: The only anticipated hazard associated with IDW management is the potential for a spill. In situations such as that the spill containment program identified in Section 10.0 of this HASP will be employed.</p> <p>Physical hazards:</p> <ol style="list-style-type: none"> 1) Strains and sprains 2) Back injuries 3) Compressions 4) Loading bulk transport containers 	<p>Chemical hazards: It is not anticipated that chemical hazards will be significant during this operation, as the IDW will be in sealed containers. It is anticipated that the IDW will represent a limited chemical hazard, if the container is breached. Control measures in this case will represent PPE and good work hygiene practices to control potential exposures during the implementation of the Spill Containment Program (See Section 10.0 of this HASP).</p> <p>Physical hazards:</p> <p>1 & 2) Strains and sprains (lifting hazards)/Back Injuries – The predominant hazard associated with this activity is the movement of full or partially full 55-gallon drums of soils and/or water. To minimize hazards of this nature the following provisions shall be incorporated as applicable:</p> <ul style="list-style-type: none"> - Use machinery (preferred method) or multiple personnel for heavy lifts. A drum dolly with pneumatic tires should be made available to move drums. - Use proper lifting techniques <ol style="list-style-type: none"> a. Lift with your legs, not your back, bend your knees move as close to the load as possible, and ensure good hand holds are available. b. Minimize the horizontal distance to the center of the lift to your center of gravity. c. Minimize turning and twisting when lifting as the lower back is especially vulnerable at this time. <p>In determining whether you can lift or move an item several factors must be considered, these are as follows:</p> <ul style="list-style-type: none"> - Area available to maneuver the lift. - Area of the lift – Work place clutter, slippery surfaces, rough terrain - Overall physical condition <p>3) Compressions – Another hazard frequently associated with this task is the compression of hands and fingers when placing the containers on pallets. This typically occurs when rolling and lowering the container in its place. To combat this hazard, the following provision shall be employed:</p> <p>Material handling devices shall be used for moving drums within the satellite storage area. This includes drum dollies with pneumatic tires, drum grapplers, etc. to handle drums of IDW. These pieces of equipment are engineered to allow placement of these containers while removing hands from the point of operation.</p> <p>Reminder: The drums you are attempting to move, lift and/or relocate weigh on the average of</p> <ul style="list-style-type: none"> - 55-Gallon container of purge or decontamination waters = 485 lbs. (including the container) - 55-Gallon container of soils (moist) = 687 lbs. (including the container) <p>Satellite Storage Area – Emphasis has been placed on the physical surroundings and how they can influence the potential hazards associated with material handling aspects of this task. To further reduce material handling hazards, support spill containment and control, and sampling when necessary, the IDW storage area should be structured as follows:</p> <ul style="list-style-type: none"> - 4-drums to a pallet with retaining ring bolt and label on the outside for easy access/reference. - Maintain a minimum of 4-feet between each row of pallets. This is the minimum distance necessary to wheel drums on a drum dolly. - If the site is not secured, the satellite storage area shall be fenced and signs placed indicating the following: <ol style="list-style-type: none"> a. Primary Point of Contact (Preferably someone identified as the Emergency Response Contact. As a reminder, make sure they know they been identified as the Primary Point of Contact). b. Phone Number c. Emergency Contact (If different from the Primary) - Locate this area as close as possible to the site exit where the hauler will enter to pick the material up. - Provide an adequate area for trucks to enter and exit in a singular direction. This will minimize U-turns and backing up, activities typically associated with accidents. - Provide a Drum/Container Inventory to the Primary Point of Contact and to Emergency Services, if they deem it necessary. The inventory should contain: <ol style="list-style-type: none"> a. Each drum shall be assigned a unique identification number. This number shall be placed on the label and drum shell using a paint marker (Note: Do not paint the number on the lid as these have a tendency to get exchanged from time to time.) b. Types of waste materials (Subsurface soils, drill cuttings; purge/development waters, etc.) This will assist in the future should it be necessary to sample these containers. c. Volumes (Full or level associated with the container after completion of the project location) d. Where it was derived from (IDW should be separated by Area and media) e. Dates (For all filled containers and at the completion of work for that Area) f. Contact – For more information <p>Note: All drums should be labeled with the same information.</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 test pitting activities.</p>	<p>Level D - (Minimum Requirements)</p> <ul style="list-style-type: none"> - Standard field attire (Sleeved shirt; long pants) - Safety shoes (Steel toe/shank) - Leather or canvas work gloves - <i>Safety glasses (When utilizing cables or slings to move the containers)</i> - <i>Hardhat (when overhead hazards exists, or identified as a operation requirement)</i> <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>Not required, unless the implementation of the Spill Containment Program is required due to a spill and/or release. At that point the decontamination procedures for those activities such as soil borings and/or well installation. The reference reflects the tasks conducted when the materials were generated.</p>

6.0 HAZARD ASSESSMENT

The following section provides information regarding the chemical, physical, and natural hazards associated with the sites to be investigated and the activities that are to be conducted as part of the scope of work. Section 6.1 provides general information regarding predominant contaminants that may be present at the site.

6.1 CHEMICAL HAZARDS

The potential health hazards associated with work to be conducted at NAS Whiting Field include inhalation, ingestion, and dermal contact of various contaminants that may be present in shallow and deep soils, and groundwater. Based on the site histories and prior sampling efforts, the types of contaminants anticipated include petroleum products and associated compounds. The following have been identified as the primary contaminants:

- Site 1438/1439 – AVGAS
Compositional make-up:
 - >90 percent naphtha (petroleum) (64741-66-8)
 - Toluene (108-88-3) up to 10 percent
 - Lead additives up to 0.14 percent
 - Benzene (71-43-2) up to 0.1 percent
 - Hexane (110-54-3) up to 3 percent
 - 1,2,4-Trimethylbenzene (95-63-6) up to 2 percent
- Site 2894 - JP-5
Compositional make-up:
 - Petroleum distillates (64742-47-8) ~100 percent
 - Antioxidant and metal deactivator <100 ppm

General Toxicities - Both of these aviation fuels are considered to be a moderate skin, eye, and pulmonary irritants when present in sufficient concentrations. Given the outdoor open air setting where this task will take place, this is not anticipated. Generally, the most toxic response is aspiration pneumonitis. Both through excessive exposure to the skin will cause defatting and possibly dermatitis.

Of both compounds, the AVGAS is more volatile and mobile within environmental media. Therefore, extra caution should be exercised at Sites 1438/1439 due to the increased potential for exposure. Additional

information is provided in Table 6-1 regarding the physical, chemical, and toxicological properties of these substances.

6.2 PHYSICAL HAZARDS

In addition to the chemical hazards discussed above, the following physical hazards may be present during the performance of the site activities.

- Slips, trips, and falls
- Lifting (strain/muscle pulls)
- Noise in excess of 85 decibels on the Decibel A-weighted scale (dBA)
- Heavy equipment hazards (pinch/compression points, rotating equipment, etc.).
- Energized systems (contact with underground or overhead utilities)
- Heat/Cold Stress (Ambient temperature extremes)
- Flammable Atmospheres

These physical hazards are discussed in Table 5-1 as applicable to each site task. Further, many of these hazards are discussed in detail in Section 4.0 of the Health and Safety Guidance Manual. Specific discussions on some of these hazards are presented below.

6.2.1 Slip, Trip and Fall Hazards

Various potential slip, trip and fall hazards may be encountered during the performance of planned site activities. This is considered a minimal to moderate hazard associated with the well installation activities. These hazards are associated with working out doors where uneven or wet terrain may be encountered. To minimize the potential for worker injury from these hazards, the following requirements must be observed:

- Maintain proper housekeeping in all work areas. Stage drill tooling and equipment, wrap up hoses at the decontamination area when not in use, construct the decontamination pad to drain to one end to avoid standing in water.
- Preview and inspect work areas to identify and eliminate slip, trip, or fall hazards. In outdoor locations, pay particular attention to sink holes or other depressions that may be encountered. Ensure steps leading to the trailer have non-skid coatings on the tread areas. When constructing temporary decontamination facilities, care should be taken when using polyethylene sheeting or tarps to contain

wash waters. These surfaces can become extremely slippery. Where necessary, apply a light coating of sand to provide necessary traction.

- Any work that is to be done on structures that are more than 6 feet above floor or ground level will require fall protection training and the use of 100 percent fall protection equipment.
- Cover, guard, barricade, and or place warning postings over/at holes or openings that personnel may fall into or step into. All stairs leading to elevated structures (such as a trailer or elevated work platform greater than 4 feet shall be protected by handrails in accordance with applicable OSHA standard (1910.23).
- Footwear with an adequate traction.
- Prepare work areas by removing tripping hazards (ruts, roots, debris). This is especially critical concerning approach pathways leading to or around rotating equipment. A fall into the rotating auger flights/apparatus could be life threatening.

TTNUS recorded 3 incidents (slip and fall) of this nature during the year 2000.

6.2.2 Strains/Muscle Pulls

This hazard potential is greatest during mobilization/demobilization activities when most of the physical handling is accomplished. Other activities which present this hazard include handling heavy auger flights, bags of Portland cement (~94 pounds) and bags of sand during well installation and construction.

Worker injuries resulting from improper manual material handling activities are easily prevented through observation of proper lifting and carrying methods. These types of injuries are not limited to merely the factor of the weight of the load. Other considerations include

- How many lifts will be involved (i.e., repetitive lifting of even small loads),
- The size, shape, and/or configuration of the load to be lifted,
- Whether or not the load will need to be lifted to another height or carried to another location,
- The area available to maneuver the lift.

All workers involved with these types of activities are to be instructed by the SHSO in the following manner:

- First estimate the weight and configuration of the load. This means determine if it is too bulky or hard to safely grasp/lift/control alone. If so, either use a mechanical lifting device or obtain help from another employee to lift the load (Note: The use of mechanical lifting devices is ***always*** preferable over manual lifting).
- Bend at the knees (not at the waist) when attempting a lift.
- Ensure that a firm hold is obtained, and keep the load as close to the body as possible.
- Lift the load using your legs, and not the back.
- Avoid turning or twisting while holding a load.
- If the load is to be moved, preview the path of travel first to identify and eliminate any tripping hazards.
- Do not attempt to carry loads that obstruct the line of sight.
- When setting a load down, again use the leg muscles and do not bend at the waist.
- Take rest breaks as necessary to prevent fatigue and injury.

You are most vulnerable to hazards of this nature early in the day prior to limbering and stretching and late in the day due to fatigue. Additional care should be exercised during these periods.

6.2.3 Noise in Excess of 85 dBA

Worker exposure to noise that can approach hazardous levels is a common potential hazard on most project work sites. All workers who must work in areas or who must perform operations where noise levels can approach an 8 hour time weighted average of 85 dBA must have received hearing conservation training within the past 12 month period. If personnel have not had this training within the last 12 months they will be provided such training by the SHSO at the project site prior to participating in high noise level activities. On this project, high noise levels may be encountered when working near the drill rig, during decontamination operations, when using a pressure washer (during equipment decontamination activities), and during operation of the air compressor (associated with the soil gas permeability test).

As a general rule-of-thumb to prevent worker exposure to high noise levels, workers will be informed to observe the following:

If ambient noise levels are loud enough that they have to raise their voice in order to communicate with another person who is less than 2 feet away, hearing protection will be required.

Also, if any existing base operations are posted as high noise areas or that hearing protection is required in that area, then hearing protection will be used.

Site boundaries for Exclusion Zone demarcation have included sufficient distances to accommodate potential noise hazards associated with the identified operations. This information is provided in Section 9.1.

Hearing protection will be the primary control measure for personnel who must work within the vicinity of excessive noise levels. Those activities anticipated to have excessive noise levels have been identified in Table 5-1.

The use and application of the hearing protection in support of on-site activities requires the implementation of the Site-Specific Hearing Conservation Program provided in Attachment X. This program requires the following:

- Instruct all personnel as to their rights, roles, and responsibilities under this Hearing Conservation Program and per the Occupational Noise Exposure Standard 29 CFR 1910.95.
- Identification of the Hearing Conservation Program Administrator and personnel responsible for program completion (Fill-in the Blanks) administration and for question or comment resolution.
- Personnel (By way of assignment who will wear hearing protection)
 - Make or models of hearing protection employed by the identified personnel
 - Hearing Protection Noise Reduction Ratings of the makes and/or models of hearing protection selected.

Note: The remainder of the site-specific program identifies monitoring methods and will only apply at the direction of the PHSO. Typically, monitoring will be conducted where there is an absence of quantitative information, which is not the case as it pertains to the planned site activities.

- Hearing Protection – Acquisition, use and application, care and maintenance as applicable.

6.2.4 Exposure to Pinch or Compression Points and/or Entanglement or Contact With Moving or Rotating Equipment/Machinery

Moving and operating machinery present potential hazards of entanglement, caught in or between, and/or to be struck by machines or machine parts. Hazards of this nature are considered a predominant hazard associated with drilling operations and is a significant hazard associated with HSA activities. Many of the recorded fatalities within the drilling industry have been associated with entanglement within the spinning augers. The factors associated with this hazard include snag points on the rotating apparatus, as well as the existence of loose clothing, jewelry and long hair. This hazard is often compounded by inoperable emergency stop devices. Recognition and control shall focus on identification to minimize these risks. The following measures shall be instituted

- All equipment that is to be operated must first be closely inspected to ensure that adequate machine guarding is in place.
- No maintenance or other activities are to be performed on operating machines. Also, employees whose duties places them in proximity to moving machinery items are to avoid wearing jewelry, or have long (unrestricted) hair, or loose fitting clothing that could become entangled in rotating equipment.
- Also, the use of home-made or jury-rigged machine parts is strictly prohibited. All equipment parts must be manufacturer-provided or approved.

In addition, to further minimize hazards of this nature and as this activity shall take place within a light industrial area, the following additional precautions shall be employed:

Traffic Patterns in and around the drilling area – Traffic for heavy equipment and pedestrians shall be separated by flow patterns. All heavy equipment (drill rigs and support vehicles) shall be routed in a singular direction to minimize backing, U-turns, and other maneuvers that could result in an accident. A demarcation area shall be established in plain view, so all personnel recognize the boundary of potential physical hazards. Boundaries established to control hazards of this nature are as follows:

- HAS Drilling Operation - The height of the mast plus 5 feet. Non-essential personnel will be restricted from being within this area.

The positioning of drill rig and support vehicles will utilize a ground spotter. Flag persons, barriers, and high visibility vests will be used in areas where operations may impede or impact vehicle and/or pedestrian traffic, to provide visual recognition and control of the work zone.

6.2.5 Contact with Energized Sources, Including Operating Processes and Utilities
(Aboveground and Underground)

Contact with energized sources can result in severe injury and even death. There are two areas of concern with this potential hazard: contact with energized processing equipment and contact with energized utilities including underground utilities (including electrical transmission lines, gas lines, water lines, etc.) and overhead utilities (i.e., power lines).

To protect against the first concern, contact with energized processing equipment, any work on or near these types of items will be required to follow the Company Safe Work Practice on the Control of Hazardous Energy Sources (Lockout/Tag out), SWP number 6-2. This is not included in this HASP, however, should the need arise, it is available to all employees on the intranet at http://go2.tetrattech.com/Emp_docs/hs/vol3/swp6-02_Control_of_Hazardous_Energy_Sources.doc.

Contact with Energized Systems – Much of the work to be done at NAS Whiting Field will be within light industrial areas that are serviced by underground and overhead energy sources. Preliminary efforts to control hazards of this nature will include:

- Use and application of Attachment IV, Standard Operating Procedure (SOP) for Utility Locating and Excavation Clearance. This procedure provides step by step instructions for clearance of underground utilities, as well as, avoidance techniques, and required documentation.
- Establishing a suitable clearance distance (20 feet) from overhead utilities will be the primary method to control hazards conveyed through contact with these power sources.

Of primary concern associated with this hazard is electrocution. Electricity seeks the path of least resistance to complete the circuit and go to ground. In the evaluation of this hazard, the Driller, often presents this pathway (through contact with the controls and standing on the ground). In areas prone to this hazard, the Driller must use a non-conductive material such as wood or rubber matting as a work platform to break this link when and where contact could possibly occur.

Historical information on this site indicates that fuel transmission lines to the North and South Field have been abandoned in place and filled with concrete. However, supply lines to the former tanks, fueling ports along those lines were not discussed. If a line still exists containing fuel and it is accidentally damaged, it could result in the release of fuel contamination into the environment, as well as potential fire hazards and hazards associated with pressurized releases. To avoid hazards of this nature, ensure that:

- The valves of fuel lines identified in the close proximity have been closed and/or secured. If the valves are not secured (locked out/tagged out, valve handles removed, etc.) the FOL must contact Mr. Holland to facilitate this control measure before proceeding.
- Pressure gauges associated with the identified fuel transmission lines within the area show no pressure within the system.
- Avoidance measures have been taken to avoid striking the lines. This may include utility clearance, hand-digging pilot holes, magnetic detection (remember that fuel line construction is often stainless steel which will not provide a magnetic signature or response). In these cases a tone or signal may need to be applied to the lines in order to enhance detection.

Pressurized Systems – An additional concern associated with this scope of work is the activity of pressurizing the injection wells to force air through the subsurface media. The hazards and potential emergency conditions associated with this task are obvious. To minimize the potential effect, the following measures shall be employed:

- During pressurization of the injection well, the air compressor will be manned at all times. Kill switches and pressure relief valves will be tested to ensure operational status.
- Pressurization shall not exceed the intended design pressure for the entire system.
- All fittings will be checked to ensure they are securely fastened and not leaking. All transfer lines will be inspected to validate their structural integrity.
- All activities (groundwater measurements, air pressure measurements, etc.) conducted at the observation wells will be done from a position upwind as it is anticipated that this procedure will increase the level of volatile Off gassing at the observation well.
- Well heads that have been pressurized should be equipped with a cap and valve to allow the control release of air pressure introduced into the system should it be necessary.

Implementation of these control measures should minimize hazards associated with this activity and thereby eliminate the potential for an emergency situation.

Regarding protection from contacting underground or overhead utilities, the procedures and restrictions of the company SOP on Utility Location and Excavation Clearance (see Attachment IV) is to be followed

during site operations. This SOP addresses both underground and overhead utilities. This SOP is also available to all employees on the intranet at http://webmail.nus.tetrattech.com/_private/_sop/HS-1.0.pdf.

Utility Locating Procedures

- 1) Contact Jim Holland regarding points that are to be cleared. Provide necessary drawings. Where possible mark the locations on the ground using white paint/flagging.
- 2) Mr. Holland will request utility clearance through Sunshine (Florida One-Call System) at 1(800) 432-4770 and appropriate personnel within the Public Works Department at NAS Whiting Field.
- 3) 10 Working Days advance notification is required. Sunshine will require at least 2 days advanced notification.
- 4) All utility clearances are good for 14 days from the day of issue. In situation where the completion of subsurface activities will not be completed in this time frame, extensions may be obtained.
- 5) Copies of the ticket and clearance should be obtained prior to the commencement of subsurface activities.

If all else fails and a utility is struck, contact emergency numbers provided in Table 2-1.

6.2.6 Heat Stress

Given the geographic location of the site and the planned work schedule, overexposure to ambient temperature extremes, 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.

Heat stress recognition, evaluation and control are discussed in greater detail in Section 4.0 of the TtNUS Health and Safety Guidance Manual. Additionally, information on the associated control measures for these hazards are discussed in Table 5-1 of this HASP.

6.2.7 Flammable Atmospheres

The soil gas permeability testing applies air to the subsurface medium through an air injection well(s). The test then measures pressure gradients at same depth observation wells spatially located (15, 30, and 60 feet) from the air injection well. Pressure variations are measured in timed intervals until a steady state condition is achieved.

Based on the mechanism of the test, air pressure gradient is increased within the subsurface medium. This pressurizing mechanism applied to achieve this pressure gradient may (will likely) also push Total Petroleum Hydrocarbons (TPH) concentrations levels into subsurface and surface structures to a higher level than would normally be experienced. Of primary concern is the existence of underground vaults, storm water tunnels, where these vapors may accumulate. In order to control these hazards, any such structures near the work area will be monitored using a Combustible Gas/Oxygen Meter (including pre-test prior to task initiation, periodic testing during the task, and post-testing after task completion). Should they become necessary, vapor/gas control measures within these structures will be accomplished using ventilation air movers hooked to the compressor or by applying water through the storm tunnels to carry and evacuate gases and vapors. These control measures will be instituted upon achieving specified action levels noted in Table 5-1 for this task.

6.3 NATURAL HAZARDS

As most of the work to be conducted will occur in areas that are improved or maintained, the potential to encounter natural hazards is not considered to be significant. The following information is provided as a precaution to help recognize and avoid these types of hazards.

Insect/animal bites and stings, poisonous plants, and inclement weather are natural hazards that may be present given the location of activities to be conducted. In general, avoidance of areas of known infestation or growth will be the preferred exposure control for insects/animals and poisonous plants. Specific discussion on principle hazards of concern follows:

6.3.1 Insect Bites and Stings

Insect/animal bites and stings maybe difficult to control. At NAS Whiting Field climatic and environmental setting may directly effect populations and levels of infestation. However, in an effort to minimize this hazard the following control measures will be implemented where possible.

- Commercially available bug sprays and repellents will be used whenever possible – Pesticides analytical screening includes chlordane, endrin, lindane, methoxychlor, toxaphene and heptachlor. Commercially available repellants may be used providing they don't contain substances which appear on the analytical list for pesticide analysis. Products such as DEET should not be applied directly to the skin due to potential irritation. This product, when permitted for use, should be applied over clothing articles.
- Where possible, loose-fitting and light-colored clothing with long sleeves should be worn. This will also aid in insect control by providing a barrier between the field person and the insects and will aid in visual recognition of crawling insects against the lighter background. Pant legs should be secured to the work-boots using duct tape to prevent access by ticks. Mosquito nets are also recommended for use when commercially available repellents are not permitted.
- Clothing/limited body checks for ticks and other crawling insects should be conducted upon exiting heavily vegetated areas. Workers should perform a more detailed check of themselves when showering in the evening. Ticks prefer moist areas of the body (arm-pits, genitals, etc.) and will migrate to those locations.
- The FOL/SHSO will preview all access routes and work areas in an effort to identify physical hazards including nesting areas in and around the work sites. These areas will be flagged and communicated to all site personnel.
- The FOL/SHSO should attempt to determine if site personnel are allergic to bee and other insect stings and bites (using completed Medical Data Sheets). Field crew members who are allergic to bites should have access to an emergency kit containing antihistamine or whatever method of response is recommended by their Health Care Provider.

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

6.3.1.1 Tick and Mosquito Transmitted Illnesses and Diseases

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

Malaria may occur when a mosquito or other infected insect sucks blood from an infected person, and the insect becomes the carrier to infect other hosts. The parasite reproduces within the mosquito, and is then passed on to another person through the biting action. Acute symptoms include chills accompanied by fever

and general flu like symptoms. This generally terminates in a sweating stage. These symptoms may recur every 48 to 72 hours.

6.3.1.2 Fire Ants

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 bite injects a venom that causes an extreme burning sensation. Pustules from 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.

6.3.2 Snakes and Other Wild Animals

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

To avoid the obvious hazards conveyed as part of a direct encounter, the following actions will be taken to minimize impact on the field crews and/or operations.

- The FOL/SHSO will preview access routes and work locations for nesting areas or signs of animal activities (tracks, foraging areas, etc.).
- All identified suspect areas will be communicated to the field crews. Snake chaps will be required as a precaution in areas potentially inhabited by snakes.

This is not anticipated to be a significant hazard as most of the work is taking place within light industrial areas. Although this is not considered a predominant hazard, various species will exit from dens along waterways to sun themselves along rocks and concrete structures. It is during these periods when encounters may occur.

6.3.2.1 Snake Bites

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

- Obtain a detailed description of the snake. This and the bite mark will enable medical personnel administering medical aid to provide prompt and correct antidotes, as necessary. Within northern

Florida predominant species include the Rattle snake, copperhead, cottonmouth, and to a lesser degree the Massasauga Rattle snake. Of these the most predominant along waterways are the copperhead and cottonmouth.

- Immobilize the bite victim to the extent possible. Physical exertion will mobilize the toxins (if poisonous varieties) from the bite point systemically through the body.
- Apply a pressure wrap (for extremities), just above and over the bite area. With a couple wraps of the pressure wrap in place over the bite area, apply a splint, and continue the application of the pressure wrap. The purpose for the splint is to restrict the movement of the extremity, this along with the pressure wrap will aid in restricting the toxins from leaving the site of the bite.
- Seek medical attention immediately.

6.3.3 Inclement Weather

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

**TABLE 6-1
CHEMICAL, PHYSICAL, AND TOXICOLOGICAL INFORMATION
NAS WHITING FIELD, MILTON, FLORIDA**

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Substance	CAS No.	Air Monitoring/Sampling Information	Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information	
Fuel Products Identified as the Primary Contaminants							
<p>AVGas (Aviation Gasoline) Composition</p> <p>Naphtha (petroleum), light alkylation; 64741-66-8 (>90%)</p> <p>Toluene; 108-88-3 (up to 10%)</p> <p>Benzene; 71-43-2 (up to 0.1%)</p> <p>Hexane; 110-54-3 (0-3%)</p> <p>1,2,4-Trimethylbenzene; 95-63-6 (0-2%)</p> <p>Organic lead additives (up to 0.14%)</p>	See component list	<p>PID (10.6 eV Lamp Strength Correction factor = 0.6</p> <p>FID =</p> <p>LEL Meter = 0.85</p>	<p>Air sample using charcoal tube. Sampling and analytical protocol shall proceed in accordance with NIOSH Method #1501.</p> <p>See also OSHA CSI Method application</p>	<p>Manufacturer's Recommendation -</p> <p>100 ppm (300 mg/m³) for 8-Hour work day.</p> <p>No regulatory or advisory limits have been set.</p>	<p>Petroleum odor threshold - 800 ppm Rating - Poor to Adequate</p> <p>Recommended Air Purifying cartridges: Organic vapor</p> <p>Recommended gloves: NitrilSolve 727 (>480 minutes) or Neporene 6780 (287 minutes)</p>	<p>Characteristics vary by fuel blending, grade, and manufacturer (e.g., impurities and additives)</p> <p>Boiling Pt: 158°F, -70°C Melting Pt: -72° F; -58°C Molecular Weight: ~86-170 Flash Pt: -50°F, -45°C LEL: 1.4% UEL: 7.6% Autoignition Temp.: 824°F; 439°C Vapor Density: ~4 Vapor Pressure: 5.5 to 7.0 psi SG: 0.71 @ 60° F; 15.6°C PH: ~7.0 Solubility in water: Negligible (<0.1%) @ 77°F; 25°C Viscosity: 0.6 cST@ 77°F; 25°C Appearance and Odor: Clear green liquid with gasoline hydrocarbon odor Avoid contact with heat, sparks and flame</p>	<p>AVGas is irritating to the eyes, skin, respiratory tract, and CNS (This through direct contact or reaching concentrations >1000 ppm).</p> <p>Direct contact may result in mild irritation with a possible drying and defatting of the skin.</p> <p>Ingestion may result in gastrointestinal irritation, nausea, and vomiting and may be harmful or even fatal. Inhalation of vapors or mists of AVGas may result in headache, nausea, confusion, narcotic effect, and drowsiness. Acute exposures to extreme airborne concentration can result in death. Chronic inhalation of aviation gas vapors may produce symptoms such as fatigue, anxiety, mood changes, liver and kidney damage, and memory difficulties in exposed workers. Repeated exposures to the skin may cause skin cancer. This product does contain components which have demonstrated carcinogenic capabilities.</p>
<p>JP-5</p> <p>Jet Petroleum - 5</p> <p>Components Petroleum distillates, hydrotreated light (64742-47-8) (100%) and antioxidant and metal deactivator <100 ppm</p>	64742-47-8	<p>PID (10.6 eV Lamp Strength Correction factor = 0.6</p> <p>FID =</p> <p>LEL Meter = 0.85</p>	<p>Air sample using charcoal tube. Sampling and analytical protocol shall proceed in accordance with NIOSH Method #1501.</p> <p>See also OSHA CSI Method application.</p>	<p>Manufacturer's Recommendation -</p> <p>100 ppm (750 mg/m³) for 8-Hour work day.</p> <p>No regulatory or advisory limits have been set.</p>	<p>Petroleum odor threshold - 800 ppm Rating - Poor to Adequate</p> <p>Recommended Air Purifying cartridges: Organic vapor</p> <p>Recommended gloves: NitrilSolve 727 (>480 minutes) or Neporene 6780 (287 minutes)</p>	<p>Characteristics vary by fuel blending, grade, and manufacturer (e.g., impurities and additives)</p> <p>Boiling Pt: 338-554°F, 170-290°C Melting Pt: -51° F; -46°C Molecular Weight: ~185 Flash Pt: 140°F, 60°C LEL: 0.9% UEL: 7% Autoignition Temp.: 475°F; 246°C Vapor Density: >1 - 5 Vapor Pressure: <5 @ 20°C SG: 0.788 to 0.845 Solubility in water: Negligible (<0.1%) @ 77°F; 25°C Viscosity: 8.5 cST@ -4°F -20°C Appearance and Odor: Clear water-white liquid with faint petroleum odor Avoid contact with heat, sparks and flame Avoid contact with strong oxidizing agents.</p>	<p>JP-5 is irritating to the eyes, skin, and respiratory tract (This through direct contact or reaching concentrations >700 ppm).</p> <p>Direct contact may result in mild irritation with a possible drying and defatting of the skin.</p> <p>Ingestion may result in gastrointestinal irritation, nausea, and vomiting and may be harmful or even fatal. Inhalation of vapors or mists of JP-5 may result in headache, nausea, confusion, narcotic effect, and drowsiness. Acute exposures to extreme airborne concentration can result in death. Chronic inhalation of jet fuel vapors may produce symptoms such as fatigue, anxiety, mood changes, liver and kidney damage, and memory difficulties in exposed workers. Repeated exposures to the skin may cause skin cancer.</p>

**TABLE 6-1
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Substance	CAS No.	Air Monitoring/Sampling Information	Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information	
<i>Volatile Organic Constituents of the Primary Contaminants</i>							
Benzene	71-43-2	PID: I.P 9.24 eV, 100% response with PID and 10.2 eV lamp. FID: 150% relative response ratio with FID.	Air sample using charcoal tube; carbon disulfide desorption; Sampling and analytical protocol in accordance with OSHA 07 or NIOSH Method #1500.	OSHA: 1 ppm ACGIH: 10 ppm NIOSH: 0.1 ppm IDLH: 500 ppm	Inadequate - Odor threshold 34-199 ppm. OSHA accepts the use of air-purifying respirators with organic vapor cartridge up to 10 ppm despite the inadequate warning properties providing cartridges are changed at the beginning of each shift. Recommended gloves: Butyl/neoprene blend - >8.00 hrs; Silver shield as a liner - >8.00 hrs; Viton - >8.00 hrs	Boiling Pt: 176°F; 80°C Melting Pt: 42°F; 5.5°C Solubility: 0.07% Flash Pt: 12°F; -11°C LEL/LFL: 1.3% UEL/UFL: 7.9% Vapor Density: 2.77 Vapor Pressure: 75 mmHg Specific Gravity: 0.88 Incompatibilities: Strong oxidizers, fluorides, perchlorates, and acids Appearance and Odor: Colorless to a light yellow liquid with an aromatic odor	Overexposure may result in irritation to the eyes, nose, throat, and respiratory system. CNS effects include giddiness, lightheadedness, headaches, staggered gait, fatigue, and lassitude and depression. Additional effects may include nausea. Long duration exposures may result in respiratory collapse. Regulated as an OSHA carcinogen. May cause damage to the blood forming organs and may cause a form of cancer called leukemia.
Ethylbenzene	100-41-4	PID: I.P 8.76, High response with PID and 10.2 eV lamp. FID: 100% response with FID.	Air sample using charcoal tube; carbon disulfide desorption; GC/FID detection. Sampling and analytical protocol in accordance with OSHA Method #07 or NIOSH Method #1501 Aromatic Hydrocarbon.	ACGIH & NIOSH: 100 ppm; 125 ppm STEL OSHA: 100 ppm IDLH: 800 ppm	Adequate - Can use air-purifying respirator with organic vapor cartridge up to 1,000 ppm. Recommended gloves: Neoprene or nitrile w/ silver shield when potential for saturation; Teflon >3.00 hrs	Boiling Pt: 277°F; 136°C Melting Pt: -139°F; -95°C Solubility: 0.01% Flash Pt: 55°F; 13°C LEL/LFL: 1.0% UEL/UFL: 6.7% Vapor Density: 3.66 Vapor Pressure: 10 mmHg @ 79°F; 26° C Specific Gravity: 0.87 Incompatibilities: Strong oxidizers Appearance and odor: Colorless liquid with an aromatic odor. Odor Threshold of 0.092-0.60.	Regulated primarily because of its potential to irritate the eyes and respiratory system. In addition, effects of overexposure may include headaches, narcotic effects, CNS changes (i.e., coordination impairment, impaired reflexes, tremoring) difficulty in breathing, possible chemical pneumonia, and potentially respiratory failure or coma.
Toluene	108-88-3	PID: I.P 8.82 eV, High response with PID and 10.2 eV lamp. FID: 110% response with FID.	Air sample using charcoal tube; carbon disulfide desorption. Sampling and analytical protocol shall proceed in accordance with OSHA Method #07, or NIOSH Method #1500.	OSHA: 200 ppm 300 ppm (Ceiling) ACGIH: 50 ppm (skin) NIOSH: 100 ppm 150 ppm STEL IDLH: 500 ppm	Adequate - Odor threshold 1.6 ppm is considered good. Can use air-purifying respirator with organic vapor cartridge up to 1,000 ppm. Recommended gloves: Teflon >15.00 hrs; Viton >16.00 hrs; silver shield >6.00 hrs; supported nitrile (Useable time limit 0.5 hr, complete submersion for the nitrile selection); PV alcohol >25.00 hrs	Boiling Pt: 232°F; 111°C Melting Pt: -139°F; -95°C Solubility: 0.05% (61°F; 16°C) Flash Pt: 40°F; 4°C LEL/LFL: 1.2% UEL/UFL: 7.1% Vapor Density: 3.14 Vapor Pressure: 20 mmHg @ 65°F; 18° C Specific Gravity: 0.87 Incompatibilities: Strong oxidizers Appearance and odor: Colorless liquid with a sweet pungent aromatic odor.	Overexposure to this substance may result in mild to moderate irritation at all points of contact, and CNS changes including euphoria, confusion, nervousness, and possibly paresthesia characterized by an abnormal burning sensation, pricking, or numbness. At 200-500 ppm exposure has resulted in headaches, nausea, eye irritation, loss of appetite, bad taste, impair coordination, fatigue, and weariness. Chronically, toluene overexposure may result in dermatitis, liver, and kidney damage.

**TABLE 6-1
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Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
<i>Volatile Organic Constituents of the Primary Contaminants</i>							
Xylene All isomers o-,m-, p-	1330-20-7	PID: I.P. 8.56 eV, High response with PID and 10.2 eV lamp. FID: 110% response with FID.	Air sample using charcoal tube; carbon disulfide desorption; GC/FID detection. Sampling and analytical protocol shall proceed in accordance with OSHA 07, or NIOSH Method 1500.	ACGIH, & NIOSH: 100 ppm, 150 ppm STEL OSHA: 100 ppm IDLH: 900 ppm	Adequate - Odor thresholds for the following isomers: 0.6 m-; 5.4 p-; 20 o- ppm. Can use air-purifying respirator with organic vapor cartridge up to 1,000 ppm concentrations. Recommended gloves: PV Alcohol >12.67 hrs; Viton >8.00 hrs; CPE >1.00 hr; Butyl 0.87 hrs; Nitrile is acceptable for limited operations and contact (>0.20 hrs)	Boiling Pt: 269-281°F; 132-138°C Melting Pt: -13o/-54m/56p°F; -25o/-48m/13p °C Solubility: 0.02 % Flash Pt: 81-90°F;27-32°C LEL/LFL: 0.9% UEL/UFL: 7.0% Vapor Density: 3.66 Vapor Pressure: 7-9 mmHg @ 70°F; 21° C Specific Gravity: 0.86-0.88 Incompatibilities: Strong oxidizers and strong acids Appearance and odor: Colorless liquid with an aromatic odor.	Effects may of overexposure include irritation at all points of contact, CNS changes (i.e. dizziness, excitement, drowsiness, incoherent, staggering gait), difficulty in breathing, pulmonary edema, and possibly respiratory failure. Chronic effects may include dermatitis and cornea vacuolization.
<i>Polyaromatic Hydrocarbon Constituents of the Identified Contaminants</i>							
Methylnaphthalene	90-12-0 (1-) 91-57-6 (2-) 1321-94-4	There is no information available regarding this substance. It is assumed that this substance based on its characteristics is detectable using an FID however, relative response ratio was not available.	Air sample using charcoal tube; carbon disulfide desorption; GC/FID detection; Sampling and analytical protocol in accordance with OSHA 07 or NIOSH Method #1501.	None established for this compound. However, it is recommended that 0.2 mg/m ³ for coal tar pitch volatiles be employed where excessive concentrations may exist. This is more relevant for those PAHs considered carcinogenic.	Information regarding this substance was limited. This material is a natural constituent of coal tar. Adequate - Odor threshold 0.012-0.023 mg/m ³ . OSHA accepts the use of air-purifying respirators with organic vapor cartridge/HEPA filter up to 10 ppm, providing cartridges are changed at the beginning of each shift. Recommended gloves: Butyl - >8.00 hrs; are recommended for other coal tar pitch associated substances; Neoprene >4.00 hrs; Nitrile >1.00 hrs	Boiling Pt: 434-507°F; 241-264°C Melting Pt: -8°F(1-),94°F (2-); -22°C (1-), 35°C (2-) Solubility: Insoluble in water Flash Pt: Not available LEL/LFL: Not available UEL/UFL: Not available Density: 1.0058 (Beta isomer); 1.02 (alpha isomer) Vapor Density: 4.91 (1-) Vapor Pressure: 180-260 mmHg Specific Gravity: 0.994 (2-); 1.025(1-) Incompatibilities: Strong oxidizers, alkalis, and acids. Appearance and Odor: Colorless liquid (alpha isomer) with an acrid odor. The Beta isomer is a solid with slight odor.	Overexposure to this substance has shown to be a skin, eye, and mucous membrane irritant. This substance is not considered a photosensitizer. This substance is considered mildly to moderately toxic by ingestion.

**TABLE 6-1
CHEMICAL, PHYSICAL, AND TOXICOLOGICAL INFORMATION
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Substance	CAS No.	Air Monitoring/Sampling Information	Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information	
<i>Polyaromatic Hydrocarbon constituents of the Identified Contaminants</i>							
Naphthalene	91-20-3	<p>PID: I.P. 8.12 eV, relative response ratio unknown.</p> <p>No information was found as to the relative response for FID, however it is certain it is detectable at a high response.</p>	<p>Air sample using charcoal tube; carbon disulfide desorption; GC/FID detection.</p> <p>Sampling and analytical protocol in accordance with OSHA Method #35 or NIOSH Method #1501.</p>	<p>OSHA; NIOSH; ACGIH: 10 ppm</p> <p>NIOSH; ACGIH: have established a STEL of 15 ppm.</p> <p>IDLH: 250 ppm</p>	<p>Odor Threshold 0.038 ppm, Adequate - Use an air purifying respirator with organic vapors and dust/mists cartridges for concentrations up to 250 ppm.</p> <p>Recommended glove: Nitrile >6.00 hrs; Neoprene >6.00 hrs</p>	<p>Boiling Pt: 424°F; 218°C Melting Pt: 176°F; 80°C Solubility: 0.003% Flash Pt: 174°F; 79°C LEL/LFL: 0.9% UEL/UFL: 5.9% Vapor Density: Not available Vapor Pressure: 1 mmHg Specific Gravity: 1.15 Incompatibilities: Strong oxidizers, chromic anhydride Appearance and odor: Colorless to brown solid with and odor of mothballs</p>	<p>Overexposure to this substance may result in irritation to the eyes, headache, confusion, excitement, nausea, vomiting, abdominal pain, irritation of the bladder, profuse sweating, jaundice, blood in the urine, renal (kidney shutdown), and dermatitis. Prolonged or chronic exposure may further cause optical neuritis, and corneal damage. Target organs are listed as eyes, blood, liver, kidneys, skin, red blood cells, and central nervous system.</p>

7.0 HAZARD MONITORING

Direct reading instruments will be used as a general screening device at the site to detect and evaluate the presence of site contaminants and other potentially hazardous conditions.

This section provides direction and protocol for real time air monitoring. The monitoring of hazardous conditions has a single primary objective.

- Qualify and quantify potential hazards (chemical, physical, and biological) that, may impact the work force.

7.1 HAZARD MONITORING APPROACH

The tasks identified in Table 7-1 are to be conducted as part of the scope of work at NAS Whiting Field. It is hazards associated with these tasks, that may be monitored for the purpose of quantification/qualification of those hazards. It should be noted that in some cases hazard monitoring will not be required, as sufficient information exists to quantify and qualify the hazards associated with that particular operation. This is the case as it applies to the excessive noise levels associated with soil boring/well installation.

Table 7-1 Hazard Monitoring Approach

Task to be Conducted	Potential Hazard(s)	Hazard Monitoring Instrumentation(s)	Action Levels	Response measures
Soil boring/Air Injection/ Observation Well Installation	<p>Volatile gas/vapor emissions above the recommended Threshold Limit Values/Time Weighted Averages (TLV-TWA)</p> <p>Noise</p>	<p>Volatile gas/vapor emissions will be monitored using a PID w/10.6eV lamp strength.</p> <p>Noise - Not required</p>	<ol style="list-style-type: none"> 1. Calibrate to 100 ppm isobutylene in air, pre- and post use (daily). 2. Establish background levels in a clean zone unaffected by site contaminants. 3. Monitoring frequency per boring logs (Initial source, then based on results at least every 4-feet, High risk employees (Driller and driller's helper, sampler workers breathing zone) <ul style="list-style-type: none"> - 0-10 ppm in the workers breathing zone. - >10 ppm in the worker's breathing zone (This is not anticipated) <p>Note: The above action levels incorporates the correction factor of 0.49 for the mixture of reported soil contaminants.</p> <p>Noise – Monitoring not required</p>	<ol style="list-style-type: none"> 1. Pre-/post use each day. Record results on Table 7-2. 2. Pre-use each day. Record background readings on Table 7-2 or equivalent (i.e. Boring Log). 3. Response to results obtained within the high risk employees breathing zones <ul style="list-style-type: none"> - Continue to work, continue to monitor. - Temporarily suspend operations; Contact the PHSO (This is not anticipated based on reported concentrations). <p>Noise monitoring not required.</p>
<p>Multi-Media sampling including</p> <ol style="list-style-type: none"> 1. Subsurface soils 2. Groundwater 3. Air 	<p>Volatile gas/vapor emissions above the recommended Threshold Limit Values/Time Weighted Averages (TLV-TWA)</p>	<p>Volatile gas/vapor emissions monitored with a PID w/10.6eV Lamp strength.</p> <ol style="list-style-type: none"> 1. Per Soil boring listed above. 2. Monitor the head space, when opening the monitoring well. 3. None required. 	<ol style="list-style-type: none"> 1. Establish background levels 2. Record head space reading on sample logsheet. 3. None required 	<ol style="list-style-type: none"> 1. Pre-use each day 2. Monitor from an up wind location to avoid exposure to potential off gas emissions when the well is opened. 3. None required

Table 7-1 Hazard Monitoring Approach

Task to Conducted	Potential Hazard(s)	Hazard Monitoring Instrumentation(s)	Action Levels	Response measures
Soil Gas Permeability Testing	Evolution and accumulation of flammable gases and vapors within subsurface structures is the primary concern during this activity.	Combustible Gas/Oxygen Meter – Tests will be conducted pre-test, during soil gas permeability testing, and post-testing of identified underground structures within the identified maximum radius of influence (60-feet). This includes subsurface vaults (electrical, control pits, stormwater tunnels, etc.) Note: If there are no subsurface structures, then this monitoring will not apply.	Monitor in the following sequence Establish background measurements in all subsurface structures within the radius of influence (60-feet from the Air Injection well). This is a pre-test measurement. 1. Oxygen Concentrations - Optimum oxygen levels would be 19.5 to 23.5% - >23.5 oxygen enriched atmosphere - Note: <10% oxygen content will result in erroneous combustible gas results. LEL Concentrations exceeding 2. <10% of LEL by volume, 3. >10% of the LEL Note: LEL for AVGas (Aviation Gasoline) is 1.4%. The LEL for the mixture of components reported in the subsurface media is 1.08%. In this case we will utilize the more conservative value of 1.08% (10,800 ppm). 10% of that value equals 1000 ppm.	Record background measurement as well as results from the monitoring in the project logbook, soil gas permeability testing sheet of equivalent. Oxygen Concentrations 1. 19.5 to 23.5 Continue to work continue to monitor. - <10% or >23.5 % cease operations, Notify PHSO. Contingency measures - Evaluate sensors to ensure operational status using calibration standards. - Notify Fire Dept. LEL Concentrations 2) <10% (1,000 ppm) LEL by volume, Continue to work continue to monitor during, and post testing. Initial and periodic measurements should co-inside with the establishment of the pressure gradient established during the testing. 3) Engage ventilation to evacuate the accumulated flammable atmosphere from the subsurface structure

7.2 ASSOCIATED HAZARDS

Hazards associated with these tasks for which monitoring currently will not be employed, include:

- Noise – Information obtained from previous monitoring efforts indicate excessive noise levels, depending on the type of rig.
 - Monitoring well installation using HSA Applications – Based on the type of drill rig operate between 89 – 96 dBA.
 - DPT range from 90 to 102 dBA-Time-Weighted Average
 - Generators – When generators are used as portable power sources for well development or sampling, the generator should be placed a sufficient distance from the operation to eliminate the noise hazard. The generators emit approximately 82 to 88 dBA.
 - Steam Cleaners and pressure washers – Previous data indicate that these machines emit from 94 to 102 dBA.

Based on the above noted noise levels hearing protection will be required when working within the defined Exclusion Zone boundary (See Section 9.1). All hearing protection employed must meet a minimum Noise Reduction Rating of 25dB.

The decision to proceed with noise monitoring will be at the discretion of the PHSO and the SHSO. This decision will be based on the necessity to quantify noise levels associated with a particular type of rig selected to perform the subsurface investigation and/or extenuating circumstances. In addition noise quantification may be performed to ensure the hearing protection devices selected attenuation capabilities are sufficient for those noise levels produced, if noise levels are excessive. All noise monitoring if conducted will proceed in accordance with the Hearing Conservation Program provided in Attachment X. Currently, sufficient information exists to quantify the potential noise hazards and to select appropriate control mechanisms. Therefore, sound level measurements and noise dosimetry will not be required in support of these field activities.

- Heat Stress Monitoring – Given the location of these sites the potential for heat stress exists. Currently, no plans exist to conduct heat stress monitoring in support of planned activities. This decision was based on the tasks to be conducted and the level of protection to be employed. Section 4.0 of the TtNUS Health and Safety Guidance Manual for additional information on heat stress recognition, evaluation, and control.

Any heat stress monitoring performed will be proceed in accordance with that information. Results of this monitoring will be recorded on Figure 7-2 Heat/Cold Stress – Pre-/Post Evaluation Record.

7.3 INSTRUMENT MAINTENANCE AND CALIBRATION

Hazard monitoring instruments will be maintained and pre-field calibrated by the TtNUS Equipment Manager or commercial provider. Operational checks and field calibration will be performed on all instruments each day, prior to and after 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 procedure (copies of which can be found in the Health & Safety Guidance Manual which will be maintained on site for reference). 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

Figure 7-2

Heat/Cold Stress Monitoring – Pre-/Post Evaluation Record

Site Name: _____

Tetra Tech NUS, Inc. Personnel: _____

CTO: _____

SWMU/Location: _____

Subcontractor Personnel: _____

Name	Age	Level of Protection	Work Activity Level – Light, medium, heavy	Environmental Conditions		Oral Temperature		Pulse Rate		Body Weight (Heat Stress only)		Time	
				Temperature	Humidity	Pre-	Post-	Pre-	Post-	Pre-	Post-	Time In	Time Out

Comments: _____

8.0 TRAINING/MEDICAL SURVEILLANCE REQUIREMENTS

8.1 INTRODUCTORY/REFRESHER/SUPERVISORY TRAINING

This section specifies health and safety training and medical surveillance requirements for both TtNUS and subcontractor personnel participating in on site activities.

8.1.1 Requirements for All Field Personnel

All TtNUS and subcontractor personnel who will engage in field associated activities as described in this HASP must have:

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

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

Subcontractors may submit a letter similar to the one provided in Figure 8-1 along with copies of training certificates as proof of training.

8.2 SITE-SPECIFIC TRAINING

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

Figure 8-2 will be used to document the provision and content of the project-specific and associated training. All site personnel will be required to sign this form prior to commencement of site activities. This training documentation will be employed to identify personnel who through record review and attendance of the site-specific training are cleared for participation in site activities. This document shall be posted to maintain an active list of all cleared site personnel.

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

8.3 MEDICAL SURVEILLANCE

8.3.1 Medical Surveillance Requirements for TtNUS and Subcontractor Personnel

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

Documentation for medical clearances will be maintained at the job site and made available, as necessary. Subcontractor personnel may use an alternative documentation for this purpose. The "Subcontractor Medical Approval Form" (Figure 8-3) can be used to satisfy this requirement, or a letter from an officer of the company (Figure 8-4).

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

8.3.2 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 also supplied to eligible subcontractors as part of the Bid Specifications Package and is available in Attachment IX of this HASP. This shall be provided to the SHSO, prior to participating in site activities. The purpose of this document is to provide

site personnel and emergency responders with additional information that may be necessary in order to administer medical attention.

8.4 SUBCONTRACTOR EXCEPTION

If through the execution of their contract elements the subcontractor will not enter the Exclusion Zone and there is no potential for exposure to site contaminants, subcontractor personnel may be exempt from the training and medical surveillance requirements with the exception of Section 8.2. Examples of subcontractors who may qualify as exempt from training and medical surveillance requirements may include surveyors who perform surveying activities in site perimeter areas or areas where there is no potential for exposure to site contaminants and support or restoration services. **Use of this Subcontractor Exception is strictly limited to the authority of the TtNUS HSM.**

8.5 SITE VISITORS

Site visitor qualifications for access to the site while engaged in planned activities is addressed in Section 9.5 of this document. Site visitors must be escorted at all times when in/near any TtNUS work site. Ensuring that proper escorting is accomplished is the FOL's responsibility. See section 9.5 for more information regarding site visitors.

FIGURE 8-1

TRAINING LETTER

The following statements must be typed on company letterhead, signed by an officer of the company and accompanied by copies of personnel training certificates:

LOGO
XYZ CORPORATION
555 E. 5th Street
Nowheresville, Kansas 55555

Month, day, year

Mr. Paul Calligan
Task Order Manager
Tetra Tech NUS, Inc.
1311 Executive Center Drive, Suite 220
Tallahassee, Florida 32301

Subject: HAZWOPER Training for NAS Whiting Field, Milton, Florida

Dear Mr. Calligan:

As an officer of XYZ Corporation, I hereby state that I am aware of the potential hazardous nature of the subject project. I also understand that it is our responsibility to comply with all applicable occupational safety and health regulations, including those stipulated in Title 29 of the Code of Federal Regulations (CFR), Parts 1900 through 1910 and Part 1926.

I also understand that Title 29 CFR 1910.120, entitled "Hazardous Waste Operations and Emergency Response," requires an appropriate level of training for certain employees engaged in hazardous waste operations. In this regard, I hereby state that the following employees have had 40 hours of introductory hazardous waste site training or equivalent work experience as requested by 29 CFR 1910.120(e) and have had 8 hours of refresher training as applicable and as required by 29 CFR 1910.120(e)(8) and that site supervisory personnel have had training in accordance with 29 CFR 1910.120(e)(4).

LIST FULL NAMES OF EMPLOYEES AND THEIR SOCIAL SECURITY NUMBERS HERE.

Should you have any questions, please contact me at (555) 555-5555.

Sincerely,

(Name and Title of Company Officer)

FIGURE 8-2

SITE-SPECIFIC TRAINING DOCUMENTATION

My signature below indicates that I am aware of the potential hazardous nature of performing investigatory activities at NAS Whiting Field located in Milton, Florida, and that I have received site-specific training which included the elements presented below:

- Names of designated personnel and alternates responsible for site safety and health (Section 1.2)
- Safety, health, and other hazards present on site (Table 5-1, 6-1; Section 2.0)
- Use of personal protective equipment (Table 5-1 and Section 10.0)
- Safe use of engineering controls and equipment (Table 5-1 and HSGM)
- Safe work practices to minimize risks from hazards (Sections 5.1 and 5.2)
- Medical surveillance requirements (Section 8.3)
- Signs and symptoms of overexposure (Table 6-1)
- Decontamination procedures (Table 5-1)
- Contents of the Health and Safety Plan
- Emergency action procedures (evacuation and assembly points, Section 2.0)
- Incipient response procedures (Section 10.0)
- Review of the contents of relevant Material Safety Data Sheets (Section 5.0 of the HSGM)
- Use and application of the Safe Work Permits (Section 9.4 and Attachment VI)
- Spill containment program (Section 10.0)

I further state that I have been given the opportunity to ask questions, that all of my questions have been answered to my satisfaction, and that I agree to abide by the procedures and policies addresses in this plan.

I further state, by the presence of my signature below, that the date of my training (introductory, refresher, and supervisory, as applicable) and my medical surveillance requirements are accurate and correct to the best of my knowledge.

Name (Printed and Signature)	Site-Specific Training Date	40-Hour Training (Date)	8-Hour Refresher Training (Date)	8-Hour Supervisory Training (Date)	Medical Exam
Jason Bourgeois	10/31/01			N/A	
Paul E. Calligan	10/31/01				
Scott Cassady	10/31/01	10-6-00	N/A		5/10/01
Scott Brown	10/31/01	11			
Michael A. Stockton	10/31/01	4/16/00	6/15/01		6/27/00
Walter Lambert	10/31/01	10/9/99	9/13/01		10/24/00
Walter Lambert	10/31/01	10/9/99	9/13/01		10/24/00
Larry W. Smith	12/20/01	87	6/15/01		
Larry W. Smith	12/20/01	87	6/15/01		

**FIGURE 8-3
SUBCONTRACTOR MEDICAL APPROVAL FORM**

For employees of _____
Company Name

Participant Name: _____ Date of Exam: _____

Part A

The above-named individual has:

1. Undergone a physical examination in accordance with OSHA Standard 29 CFR 1910.120, paragraph (f), and was found to be medically -
 - () qualified to perform work at the NAS Whiting Field, Milton, Florida work site
 - () Not qualified to perform work at the NAS Whiting Field, Milton, Florida work site and,

2. Undergone a physical examination in accordance with OSHA 29 CFR 1910.134(b)(10) and was found to be medically -
 - () Qualified to wear respiratory protection
 - () Not qualified to wear respiratory protection

My evaluation has been based on the following information, as provided to me by the employer.

- () A copy of OSHA Standard 29 CFR 1910.120 and appendices.
- () A description of the employee's duties as they relate to the employee's exposures.
- () A list of known/suspected contaminants and their concentrations (if known).
- () A description of any personal protective equipment used or to be used.
- () Information from previous medical examinations of the employee that is not readily available to the examining physician.

Part B

I, _____, have examined _____
Physician's Name (print) Participant's Name (print)

And have determined the following information:

**FIGURE 8-3
SUBCONTRACTOR MEDICAL APPROVAL FORM
PAGE TWO**

1. Results of the medical examination and tests (excluding finding or diagnoses unrelated to occupational exposure):

2. Any detected medical conditions that would place the employee at increased risk of material impairment of the employee's health:

3. Recommended limitations upon the employee's assigned work:

I have informed this participant of the results of this medical examination and any medical conditions that require further examination or treatment.

Based on the information provided to me, and in view of the activities and hazard potentials involved at the NAS Whiting Field, Milton, Florida work site, this participant

- May
 May not

Perform his/her assigned task.

Physician's Signature _____

Address _____

Phone Number _____

NOTE: Copies of test results are maintained and available at:

Address

FIGURE 8-4

MEDICAL SURVEILLANCE LETTER

The following statements must be typed on company letterhead and signed by an officer of the company:

LOGO
XYZ CORPORATION
555 E. 5th Street
Nowheresville, Kansas 55555

Month, day, year

Mr. Paul Calligan
Task Order Manager
Tetra Tech NUS, Inc.
1311 Executive Center Drive, Suite 220
Tallahassee, Florida 32301

Subject: Medical Surveillance for NAS Whiting Field, Milton, Florida

Dear Mr. Calligan:

As an officer of XYZ Corporation, I hereby state that the persons listed below participate in a medical surveillance program meeting the requirements contained in paragraph (f) of Title 29 of the Code of Federal Regulations (CFR), Part 1910.120, entitled "Hazardous Waste Operations and Emergency Response: Final Rule." I further state that the persons listed below have had physical examinations under this program within the past 12 months and that they have been cleared, by a licensed physician, to perform hazardous waste site work and to wear positive- and negative-pressure respiratory protection. I also state that, to my knowledge, no person listed below has any medical restriction that would preclude him/her from working at the NAS Whiting Field, Milton, Florida site.

LIST FULL NAMES OF EMPLOYEES AND THEIR SOCIAL SECURITY NUMBERS HERE.

Should you have any questions, please contact me at (555) 555-5555.

Sincerely,

(Name and Title of Company Officer)

9.0 SITE CONTROL

This section outlines the means by which TtNUS will delineate work zones and use these work zones in conjunction with decontamination procedures to prevent the spread of contaminants into previously unaffected areas of the site. It is anticipated that a three-zone approach will be used during work at this site: Exclusion Zone, Contamination Reduction Zone, and 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 potentials for the spread of contaminants and to protect individuals who are not cleared to enter the work areas.

9.1 EXCLUSION ZONE

The Exclusion Zone will be considered those areas of the site of known or suspected contamination. It is not anticipated that significant amounts of surface contamination are in the proposed work areas of this site. It is anticipated that this will remain so until/unless contaminants are brought to the surface by intrusive activities such as drilling and/or DPT operations. Furthermore, once such activities have been completed and surface contamination has been removed, the potential for exposure is again diminished and the area can then be reclassified as part of the Contamination Reduction Zone or Support Zone. Therefore, the Exclusion Zones for this project will be limited to those areas if the site where active work is being performed plus so many feet surrounding the point of operation. All Exclusion Zones will be delineated in some manner. This manner may include using barrier tape, cones and /or drive poles, and postings to inform and direct facility personnel.

9.1.1 Exclusion Zone Clearance

Exclusion Zone boundaries are as follows:

HSA Drilling Operations – The Exclusion Zone boundary for this operation will be set at the height of the mast plus 5 feet. It is determined at this distance, non-essential personnel will be removed from potential physical hazards associated with this operation. This determination would include catastrophic failure of the boom and associated cables. In addition it has been determined that at this distance (typical mast height 35 feet plus 5 feet = 40 feet) will remove personnel from areas impacted by noise levels associated with these types of rigs.

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 impacting noise intensity.

Groundwater sampling – 10 feet surrounding the well and discharge receptacle container.

Soil sampling – 5 feet surrounding the point of operation.

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

Soil Gas Permeability Testing – 25 feet surrounding the air compressor to remove non-essential personnel from the potential impact associated with excessive noise levels. In addition, this distance is sufficient to remove persons from within the area in the event of a pressurized line failure.

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:

- As samplers move from location to location during sampling activities, dedicated sampling devices and PPE will be removed, separated, and bagged. 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 site 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 basis. An example of the Safe Work Permit to be used is provided in Figure 9-1. Partially completed Permits for the work to be performed are included in Attachment VI. The daily meetings conducted at the site will further support these work permits. This effort will ensure all site-specific considerations and changing conditions are incorporated into the planning effort, as well as, give personnel an opportunity to ask questions and make suggestions. All permits will require the signature of the FOL or SHSO.

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.

Upon completion of the tasks for which the permit was assigned, the permit shall be given to the FOL and/or the SHSO.

**FIGURE 9-1
SAFE WORK PERMIT**

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

SECTION I: General Job Scope (To be filled in by person performing work)

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

II. Names: _____

III. On-site Inspection conducted Yes No Initials of Inspector _____
TtNUS OLF Bronson

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

IV. Protective equipment required	Respiratory equipment required		
Level D <input type="checkbox"/> Level B <input type="checkbox"/>	Full face APR <input type="checkbox"/>	Escape Pack <input type="checkbox"/>	
Level C <input type="checkbox"/> Level A <input type="checkbox"/>	Half face APR <input type="checkbox"/>	SCBA <input type="checkbox"/>	
Detailed on Reverse	SKA-PAC SAR <input type="checkbox"/>	Bottle Trailer <input type="checkbox"/>	
	Skid Rig <input type="checkbox"/>	None <input type="checkbox"/>	

Modifications/Exceptions: _____

V. Chemicals of Concern	Action Level(s)	Response Measures
_____	_____	_____

VI. Additional Safety Equipment/Procedures	
Hardhat <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 type="checkbox"/> No
Chemical/splash goggles <input type="checkbox"/> Yes <input type="checkbox"/> No	Radio <input type="checkbox"/> Yes <input type="checkbox"/> No
Splash Shield <input type="checkbox"/> Yes <input 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) <input type="checkbox"/> Yes <input type="checkbox"/> No
Steel toe/shank Workboots... <input type="checkbox"/> Yes <input type="checkbox"/> No	Work/rest regimen <input type="checkbox"/> Yes <input type="checkbox"/> No

Modifications/Exceptions: _____

VII. Procedure review with permit acceptors	Yes	NA	Yes	NA
Safety shower/eyewash (Location & Use)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Procedure for safe job completion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Contractor tools/equipment inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

VIII. Equipment Preparation	Yes	NA
Equipment drained/depressured	<input type="checkbox"/>	<input type="checkbox"/>
Equipment purged/cleaned.....	<input type="checkbox"/>	<input type="checkbox"/>
Isolation checklist completed.....	<input type="checkbox"/>	<input type="checkbox"/>
Electrical lockout required/field switch tested	<input type="checkbox"/>	<input type="checkbox"/>
Blinds/misalignments/blocks & bleeds in place	<input type="checkbox"/>	<input type="checkbox"/>
Hazardous materials on walls/behind liners considered.....	<input type="checkbox"/>	<input type="checkbox"/>

IX. Additional Permits required (Hot work, confined space entry, excavation etc.) Yes No
If yes, fill out appropriate section(s) on safety work permit addendum

X. Special instructions, precautions: _____

Permit Issued by: _____ Permit Accepted by: _____
 Job Completed by: _____ Date: _____

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 (Department of Defense (DOD), OSHA, Environmental Protection Agency (EPA), FDEP, etc.)
- Southern Division Navy Personnel
- Other authorized visitors

It is not anticipated that this operation will result in a large number of site visitors. However, as some visitors can reasonably be expected, the following requirements will be enforced:

- All site visitors will be routed to the FOL, who will sign them in to the field logbook. Information to be recorded in the logbook will include the individual's name (proper identification required), who they represent, and purpose for the visit.
- All site visitors will be required to produce the necessary information supporting clearance onto the site. This includes information attesting to applicable training (40 hours of Hazardous Waste Operations and Emergency Response (HAWOPER) training required for all Southern Division Navy personnel) and medical surveillance, as stipulated in Section 8.0 of this document, if they wish to enter operational zones during on-going activities. In addition, to enter the site's 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 document.

NOTE: All site visitors will be escorted while at the site at all times.

Following this, the site visitor will be permitted to enter the site and applicable operational areas. All visitors are required to observe the protective equipment and site restrictions in effect at the area of their visit. 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 all on-site activities to be terminated until that visitor can be removed. Removal of unauthorized visitors will be accomplished with support from the Base Contact, if necessary. At a minimum, the Navy On-site Representative will be notified of any unauthorized visitors.

9.5.1 Base Pass and Security

TtNUS visitor and subcontractor access will be facilitated through the following mechanism:

All persons requesting access to NAS Whiting Field will be required to submit the following information to the TOM, who will in turn pass the information to the NAS Whiting Field Point of Contact:

- Name: First, Middle, and Last
- Date of Birth
- Place of Birth
- Social Security Number
- Driver License Number

Base Access and Security will be notified by our NAS Whiting Field Point of Contact of personnel to arrive under Tetra Tech NUS, Inc. Upon arrival visitor and/or subcontractor access to NAS Whiting Field will be facilitated through Base Pass and Security located at Building 1400 (near Main Gate). Hours of Operation for Base Pass and Security are 7-4 ctl.

For those persons requiring One Day Visitor Passes or Contractor Decals must have on their person to be presented at Base Pass and Security, the following information:

- Current Valid Vehicle Registration or Rental Agreement
- Valid Proof of Insurance or Rental Agreement
- Current Valid Drivers License

Failure to have these items available for review will result in denied access to NAS Whiting Field. For More information contact Base Pass and Security at 623-7709.

9.6 SITE SECURITY

Site security will be accomplished using TtNUS field personnel. TtNUS will retain complete control over active operational areas. As these activities will take place at a United States Navy facility the first line of security will take place at the Main Gate. The second line of security will take place at the exclusion zone using exclusion zone barriers, signs, and other indicators to restrict direct the general public. The final line of security will take place at the work site referring interested parties to the FOL or designee. The FOL will serve as a focal point for all non-project interested parties, and serve as the final line of security and the primary enforcement contact.

9.7 SITE MAP

Once the areas of contamination, access routes, topography, and dispersion routes are determined, a site map will be generated and adjusted as site conditions change. When possible, 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 this operation.

9.9 MATERIAL SAFETY DATA SHEET REQUIREMENTS

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

9.10 COMMUNICATION

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

Cellular Phone Power Output 5 watts (Maximum)

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 reusable 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 at support vehicles.
- 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.

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, a structured suitable locations for work breaks and warming/cooling regimens will not be necessary. These activities as necessary can take place at the site vehicles in the Support Zone.

10.0 SPILL CONTAINMENT PROGRAM

10.1 SCOPE AND APPLICATION

It is not anticipated that quantities of bulk potentially hazardous materials (greater than 55 gallons per container) will be handled during the site activities conducted as part of this scope of work. Significant quantities of waste water (decontamination, purge and development) and soil cuttings to be collectively referred to as IDW may be generated, as part of site activities. It is not anticipated, however, that spillage of these materials would constitute a significant danger to human health or the environment.

All purge and development waters and soils will be profiled based on the information derived from the sampling data. This information will be used to determine the most appropriate disposal measures. Once characterized they can be removed from the staging area and disposed of in accordance with Federal, State and local regulations.

10.1.1 Investigative Derived Waste Management

This task includes the containerization, labeling, staging, monitoring, and final disposition of IDW. It is anticipated that this investigation will generate five types of potentially contaminated residues or IDW which will be handled as described below:

PPE, tubing, and DPT Sample Liners – All PPE, limited amounts of tubing, and DPT sample liners will be decontaminated and double bagged and placed in the trash receptacles (dumpsters – provided service in support of this operation) at the facility.

Wastes Cuttings (Soil and Sludge Cores) from DPT and Manual Coring Activities – For each boring, the additional cuttings will be collected and drummed. Disposal will be determined through sampling and analytical evaluation.

Decontamination Fluids – Fluids generated during the decontamination process will be collected and containerized. Disposal will be determined through sampling and analytical evaluation.

Once characterized they can be removed from the staging area and disposed of in accordance with Federal, State and local regulations.

Containerization/Labeling/Staging

For all materials that are containerized, staged, or used as a temporary means for transport will be properly labeled. These activities are to be conducted as follows:

Containerization – Contaminated materials generated (soils and groundwater) shall be collected and containerized in 55 gallon drums and staged in a centralized location.

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

Drums -

- Site
- Job Number
- Location (Area)
- Date – To be completed upon filling the container or when no more material is to be added
- Drum # - Assign an inventory number to be added to a comprehensive log
- Contents – Description
- Volume – Final volume
- Contact – This TtNUS person should be available should inquiries arise.
- Emergency Number – Emergency Services Number and Contact person should be provided during off days or shifts. This can be the local Fire Dept. or Base Contact. An up-dated inventory should be provided at the close of each shift to this person.

10.1.2 Waste Storage

The 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., soil cuttings, etc.).

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

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.

10.1.2.1 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 used for waste storage that must be manually moved or positioned. This cart will be used to relocate drums within the staging and satellite storage location.

Other means of material handling are acceptable and may be presented to the SHSO for evaluation based on their ability to minimize or eliminate material handling hazards.

10.1.3 Resource Storage – Limited fuel and Lubricant Storage

This spill containment and control plan will apply to all resource storage. Currently, storage includes

- Diesel fuel or gasoline for the steam cleaner and/or pressure washer (Estimated volume = 5 gallons)
- Diesel fuel or gasoline for the air compressor (Estimated Volume = 5 gallons)
- Isopropanol (Decontamination Solvent, Estimated Volume = 4 gallons)
- Miscellaneous oils and lubricants (Consumer commodity levels)

The first step in spill control and containment will be prevention

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:

- All fuels, which will be stored and dispensed from portable containers, will utilize safety cans.
- All portable hand held storage containers will be labeled per Hazard Communication requirements.
- All dispensing locations will be supported by a Fire Extinguisher.

10.2 PERSONNEL TRAINING AND SPILL PREVENTION

All 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 the SHSO will serve as the Spill Response Coordinators for this operation, should the need arise.

10.3 LEAK AND SPILL DETECTION

To establish an early detection of potential spills or leaks, a periodic walk-around by personnel staging or disposing of containers will be conducted at least once each day during working hours, to visually determine that containers are not leaking. Any leaks identified will be collected and contained using absorbents such as Oil-dry, vermiculite, or sand, stored at the staging area in an appropriate replacement vessel or container conspicuously marked. This material too, will be containerized for disposal pending analyses. All inspections will be documented in the Project Logbook.

10.4 SPILL PREVENTION AND CONTAINMENT EQUIPMENT

The following represents examples of the types of equipment that should be maintained at the staging areas at all times for 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.
- Necessary means for transferring liquids from leaking containers (i.e., pumps, tubing, buckets, etc.)
- Drum Repair Kit
- Shovels, rakes, and brooms
- Container labels
- PPE
 - Nitrile outer gloves
 - Splash Shield
 - Impermeable over-boots
 - Rain suit or impermeable apron

10.5 SPILL CONTAINMENT/CONTROL RESPONSE PLAN

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

- Notify the SHSO or FOL immediately upon detection of a leak or spill.
- The FOL or the SHSO shall assess the leak and make a determination as to whether the response measure required is within the capabilities of the field crew or whether it is necessary to notify designated emergency response units.

Within the capabilities of the Field Crew:

- Employ the personal protective equipment stored at the staging area. 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.
- Recontainerize spills, including 2 inch of top cover (if over soils) impacted by the spill. Await test results for treatment or disposal options.

Outside of the Capabilities of the Field Crew/Notify Emergency Response Units:

- Activate emergency alerting procedures for that area to remove all non-essential personnel.
- Take defensive measures such as
 - Spread the absorbent material in the area of the spill, covering it completely.
 - Raising the leak to the highest point in the vessel.
- Establish site security, direct emergency crews to the area of the leak.

It is not anticipated that a spill would 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 SHSO 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 is a confined space that:

- 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 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 TtNUS 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 decontamination solution(s), fuels, sample preservations, calibration gases, etc.
- A full size OSHA Job Safety and Health Poster (See Attachment XI)
- Training/Medical Surveillance Documentation Form (blank)
- Emergency Reference Form (Section 2.0, extra copies for posting)

12.1 MATERIALS TO BE POSTED OR MAINTAINED AT THE SITE

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

Chemical Inventory Listing (posted) - This list represents all chemicals brought on-site, including decontamination solutions, sample preservations, fuel, etc.. This list should be posted in a central area. Copies are to be provided to the Base Contact upon request.

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.

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 indicates not only clearance but also status. If personnel do not meet these requirements, they do not enter the site while site personnel are engaged in activities. In addition, **ALL** TtNUS personnel will be required to be indicated on a Site Clearance Letter attesting to the training and medical surveillance status.

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 (Attachment IX) will accompany any injury or illness requiring medical attention to the medical facility.

Hearing Conservation Standard (29 CFR 1910.95) (posted) - this standard will be posted anytime hearing protection or other noise abatement procedures are employed. In addition, the Site-specific Hearing Conservation Program will also be posted.

Personnel Monitoring (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 US Department of Transportation (DOT) placards and acceptable Hazard Communication 29 CFR 1910.1200(f) labels.

The purpose, as stated above, 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 GLOSSARY

ACGIH	American Conference of Governmental Industrial Hygienists
ANSI	American National Standards Institute
APR	Air Purifying Respirators
AVGAS	Aviation Gasoline
bls	below land surface
CPR	Cardio-Pulmonary Resuscitation
°C	Degrees Centigrade or Celsius
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CLEAN	Comprehensive Long-term Environmental Action - Navy
CNS	Central Nervous System
CTO	Contract Task Order
CRZ	Contamination Reduction Zone
dBA	Decibel A-weighted scale
DI	Deionized
DRMO	Defense Reutilization Marketing Office
DOD	Department of Defense
DOT	US Department of Transportation
DPT	Direct Push Technology
EPA	Environmental Protection Agency
eV	electron Volts
°F	Degrees Fahrenheit
FDEP	Florida Department of Environmental Protection
FID	Flame Ionization Detector
FOL	Field Operations Leader
GC	Gas Chromatograph
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HEPA	High Efficiency Particulate Air Filter
HSA	Hollow Stem Auger
HSM	Health and Safety Manager
IAS	Initial Assessment Study
IDLH	Immediate Dangerous to Life or Health

IDW	Investigative Derived Wastes
LEL/LFL	Lower Explosive Limit / Lower Flammable Limit
µg/L	micrograms per liter
µg/kg	micrograms per kilograms
mg/m ³	milligrams per cubic meter
MEK	methyl ethyl ketone
MSDS	Material Safety Data Sheets
N/A	Not Available
NAS	Naval Air Station
NIOSH	National Institute for Occupational Safety and Health
NTC	Naval Training Center
NTP	National Toxicity Program
OSHA	Occupational Safety and Health Administration (U.S. Department of Labor)
PAPR	Powered Air Purifying Respirator
PCBs	polychlorinated biphenyls
PEL	Permissible Exposure Limit
PHSO	Project Health and Safety Officer
PID	Photoionization Detector
POL	petroleum/oil/lubricants
ppm	Parts per million
PPE	Personal Protective Equipment
psi	pounds per square inch
PVC	polyvinyl chloride
RAP	Remedial Action Plan
RI	Remedial Investigation
SAP	Sampling and Analyses Plan
SAR	Site Assessment Report
SOPs	Standard Operating Procedures
SHSO	Site Health and Safety Officer
STEL	Short Term Exposure Limit
SWMU	Solid Waste Management Units
SWP	Safe Work Permits
TBD	To be determined
TLV	Threshold Limit Value
TOM	Task Order Manager
TPH	Total Petroleum Hydrocarbons

TtNUS
TWA
WP

Tetra Tech NUS, Inc.
Time-Weighted Average
Work Plan

ATTACHMENT I

TETRA TECHNUS, INC. HEALTH AND SAFETY POLICY



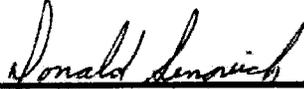
TETRA TECH NUS, INC. HEALTH AND SAFETY POLICY

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

To implement these Program objectives, we require that our managers and employees:

- Recognize a *personal responsibility* for his/her own health and safety, and for actions which affect fellow employees.
- Integrate safety and health into all aspects of their work, focusing on the well-being of employees as the primary concern in all activities.
- Comply with applicable federal, state and local regulations, as well as with Company policies and procedures.
- Be actively involved in the Health and Safety Program by providing input and constructive criticism for Program improvements.




Donald Senovich
President



Tetra Tech NUS, Inc.




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

February 1998



ATTACHMENT II

**FIELD TASK/HEALTH AND SAFETY PLAN
MODIFICATION REQUEST FORM**



TETRA TECH NUS
FIELD TASK/HEALTH & SAFETY PLAN MODIFICATION REQUEST FORM

NAS Whiting Field, Milton, Florida Project/Installation Name	0200 CTO & Project Number	Task Modification Number
Modification to (e.g. HASP & Section, WP, SAP, Specifications, etc.)	Site Location	Date of Request
Activity Description:		
Reason for Change/Modification:		
Recommended Disposition:		
Site Safety Officer (Signature)	Date (Resolution Required By)	
Approved/Disapproved Disposition (Please provide written explanation):		
Health Safety Manager (Signature)	Date	
Accepted By Contractor/Subcontractor Representative (Signature)	Date	
Distribution: Program/Project File Project/Task Order Manager Other:		

ATTACHMENT III

**INJURY/ILLNESS PROCEDURE
AND REPORT FORM**

**TETRA TECH NUS, INC.****INJURY/ILLNESS PROCEDURE
WORKER'S COMPENSATION PROGRAM**

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

- 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.
- If incident involves a 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 Diethorn at (412) 921-8475, and the Corporate Health and Safety Manager, Matt Soltis at (412) 921-8912 within 24 hours. You will be required to complete an Injury/Illness Report (attached). You may also be required to participate in a more detailed investigation from the Health Sciences Department.
- If further medical treatment is needed, The Hartford Network Referral Unit will furnish a list of network providers customized to the location of the injured employee. These providers are to be used for treatment of Worker's Compensation injuries subject to the laws of the state in which you work. Please call Marilyn Diethorn at (412) 921-8475 for the number of the Referral Unit.

ADDITIONAL QUESTIONS REGARDING WORKER'S COMPENSATION:

Contact your local human resources representative, corporate health and safety coordinator, 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 (Tetra Tech or Company) pay premiums on behalf of their employees. The type 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.



case no. _____

All employees must follow the above injury/illness reporting procedures. Consultants, independent contractors, and employees of subcontractors 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. Please note that if you are working out-of-state and away from your home office, you are still eligible for worker's compensation benefits.



case no. _____

**TETRA TECH NUS, INC.
INJURY/ILLNESS PROCEDURE
WORKER'S COMPENSATION PROGRAM**

To: Corporate Health and Safety Manager
Human Resource Administrator

Prepared by: _____

Position: _____

Project Name: _____

Office: _____

Project No. _____

Telephone: _____

Information Regarding Injured or Ill Employee:

Name: _____

Office: _____

Home address: _____

Gender: M F No. of dependents: _____

Marital status: _____

Home telephone: _____

Date of birth: _____

Occupation (regular job title): _____

Social Security No.: _____

Department: _____

Date of Accident: _____

Time of Accident: _____

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

Street address: _____

City, state, and zip code: _____

County: _____

Narrative Description of How Accident Occurred: (Be specific. Explain what the employee was doing and how the accident occurred.)



**TETRA TECH, INC.
INJURY/ILLNESS REPORT**

Did employee die? Yes No

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 accident report.

Witness(es):

Name:

Address:

Telephone:

Describe the Illness or Injury and Part of Body Affected:

Name the Object or Substance which Directly Injured the Employee:

Medical Treatment Required:

No Yes First Aid Only

Physician's Name: _____

Address: _____

Hospital or Office Name: _____

Address: _____

Telephone No.: _____

Lost Work Days:

No. of Lost Work Days _____

Last Date Worked _____

Time Employee Left Work _____

Date Employee Returned to Work _____

No. of Restricted Work Days _____

None

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:** _____

	Printed Name	Signature	Telephone No.	Date
Project or Office Manager				
Site Safety Coordinator				
Injured Employee				

To be completed by Human Resources:

Date of hire: _____ Hire date in current job: _____

Wage information: \$_____ per _____ (hour, day, week, or month)

Position at time of hire: _____

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 insurance carrier:

Date reported: _____ Reported by: _____

TeleClaim phone number: _____

TeleClaim account number: _____

Location code: _____

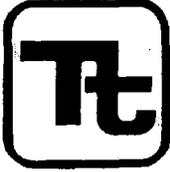
Confirmation number: _____

Name of contact: _____

Field office of claims adjuster: _____

ATTACHMENT IV

STANDARD OPERATING PROCEDURE FOR UTILITY LOCATING AND EXCAVATION CLEARANCE



TETRA TECH NUS, INC.

STANDARD OPERATING PROCEDURES

Number	HS-1.0	Page	1 of 11
Effective	03/00	Date	Revision 1
Applicability	Tetra Tech NUS, Inc.		
Prepared	Health & Safety		
Approved	D. Senovich <i>DS</i>		

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 the TtNUS Utility Locating and Clearance Policy. The TtNUS Utility Locating and Clearance Policy must be reviewed by anyone potentially involved with underground or overhead utility services.

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 or absence of 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 development of detailed operating procedures. This guidance is not intended to provide a detailed description of methodology and instrument operation. Specialized expertise during both planning and execution of several of the geophysical methods may also be required.

3.0 GLOSSARY

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

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

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

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

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

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

4.0 RESPONSIBILITIES

Project Manager (PM)/Task Order Manager (TOM) - Responsible for ensuring that all field activities are conducted in accordance with this procedure and the TtNUS Utility Locating and Clearance Policy.

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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 and the TtNUS Utility Locating and Clearance Policy. 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.

Site Personnel – Responsible for understanding and implementing this SOP and the TtNUS Utility Locating and Clearance 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. The following procedure must be followed prior to beginning any 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 locations shall be added to project maps upon completion of this exercise and returned to the PM/TOM.

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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 such methods as passive and intrusive surveys, physical probing, or hand augering. Each method has advantages and disadvantages including complexity, applicability, and price. It also should be noted that in many 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 with a hand auger or pole (tile probe) made of non-conductive material. If these efforts are not successful in clearing the excavation area of suspect utilities, hand shoveling must be performed for the perimeter of the intended excavation.
8. All utilities uncovered or undermined during excavation must be structurally supported to prevent potential damage. Unless necessary as an emergency corrective measure, TtNUS shall not make any repairs or modifications to existing utility lines without prior permission of the utility owner, property owner, and Corporate HSM. All repairs require that the line be locked-out/tagged-out prior to work.

5.2 Overhead Power Lines

If it is necessary to work within the minimum clearance distance of an overhead power line, the overhead line must be de-energized and grounded, or re-routed by the utility company or a registered electrician. If protective measures such as guarding, isolating, or insulating are provided, these precautions must be

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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

6.1 Geophysical Methods

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

Electromagnetic Induction

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

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

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

Magnetics

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

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

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Ground Penetrating Radar

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

6.2 Passive Detection Surveys

Acoustic Surveys

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

Thermal Imaging

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

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

6.3 Intrusive Detection Surveys

Vacuum Excavation

Vacuum excavation is used to physically expose utility services. The process involves removing the surface material over approximately a 1' x 1' area at the site location. The air-vacuum process proceeds with the simultaneous action of compressed air-jets to loosen soil and vacuum extraction of the resulting debris. This process ensures the integrity of the utility line during the excavation process, as no hammers, blades, or heavy mechanical equipment comes into contact with the utility line, eliminating the risk of damage to utilities. The process continues until the utility is uncovered. Vacuum excavation can be used at the proposed site location to excavate below the "utility window" which is usually 8 feet.

Hand-auger Surveys

When the identification and location of underground utilities cannot be positively confirmed through document reviews and/or other methods, borings must be hand-augered for all locations where there is a potential to impact buried utilities. The minimum hand-auger depth that must be reached is to be determined considering the geographical location of the work site. This approach recognizes that the

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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-auger depths must be at least to the frost line depth plus two (2) feet, but never less than 4 feet below ground surface (bgs). For augering, the hole must be reamed by hand to 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-auger. It is important to note that a post-hole digger must not be used in place of a hand-auger.

Tile Probe Surveys

For some soil types, site conditions, and excavation requirements, tile probes may be used instead of or in addition to hand-augers. Tile probes must be performed to the same depth requirements as hand-augers. Depending upon the site conditions and intended probe usage, tile probes should be made of non-conductive material such as fiberglass.

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 subsurface 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. 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

TiNUS Utility Locating and Clearance Policy
TiNUS SOP GH-3.1; Resistivity and Electromagnetic Induction
TiNUS SOP GH-3.2; Magnetic and Metal Detection Surveys
TiNUS SOP GH-3.4; Ground-penetrating Radar Surveys

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**ATTACHMENT 1
LISTING OF UNDERGROUND UTILITY CLEARANCE RESOURCES**

ALABAMA Alabama Line Location (800) 292-8525 Tucson Blue Stake Center (800) 782-5348	Maine Dig Safe – Maine (800) 225-4977
Alaska Locate Call Center of Alaska Inc. (800) 478-3121	Maryland Miss Utility (800) 257-777 Miss Utility of Delmarva (800) 282-8555
Arizona Arizona Blue Stake Inc. (800) 782-5348	Massachusetts Dig Safe – Massachusetts (800) 322-4844
Arkansas Arkansas One Call System Inc. (800) 482-8998	Michigan Miss Dig System (800) 482-7171
California Underground Service Alert North (800) 227-2600 Underground Service Alert South (800) 227-2600	Minnesota Gopher State One Call (800) 252-1166
Colorado Utility Notification Center of Colorado (800) 922-1987	Mississippi Mississippi One-Call System Inc. (800) 227-6477
Connecticut Call Before You Dig (800) 922-4455	Missouri Missouri One Call System Inc. (800) 344-7483
Delaware Miss Utility of Delmarva (800) 282-8555	Montana Utilities Underground Location Center (800) 424-5555 Montana One Call Center (800) 551-8344
District of Columbia Miss Utility (800) 257-7777	Nebraska Diggers Hotline of Nebraska (800) 331-5666
Florida Call Sunshine (800) 432-4770	Nevada Underground Service Alert North (800) 227-2600
Georgia Utilities Protection Center Inc. (800) 282-7411	New Hampshire Dig Safe – New Hampshire (800) 225-4977
Idaho Palouse Empire Underground Coordinating Council (800) 882-1974 Utilities Underground Location Center (800) 424-5555 Kootenai Country Utility Coordinating Council (800) 428-4950 Shoshone County One Call (800) 398-3285 Dig Line (800) 342-1585 One Call Concepts (800) 626-4950	New Jersey New Jersey One Call (800) 272-1000
Illinois Julie Inc. (800) 892-0123 Digger (Chicago Utility Alert Network) (312) 744-7000	New Mexico New Mexico One Call System Inc. (800) 321-ALERT Las Cruces-Dona Utility Council (505) 526-0400
Indiana Indiana Underground Plant Protection Services (800) 382-5544	New York Underground Facilities Protection Organization (800) 962-7962 New York City: Long Island One Call Center (800) 272-4480
Iowa Underground Plant Location Service Inc. (800) 292-8989	North Carolina The North Carolina One-Call Center Inc. (800) 632-4949
Kansas Kansas One-Call Center (800) 344-7233	North Dakota Utilities Underground Location Center (800) 795-0555
Kentucky Kentucky Underground Protection Inc. (800) 752-6007	Ohio Ohio Utilities Protection Service (800) 362-2764 Oil & Gas Producers Underground Protection Service (800) 925-0988
Louisiana Louisiana One Call (800) 272-3020	Oklahoma Call Okie (800) 522-6543

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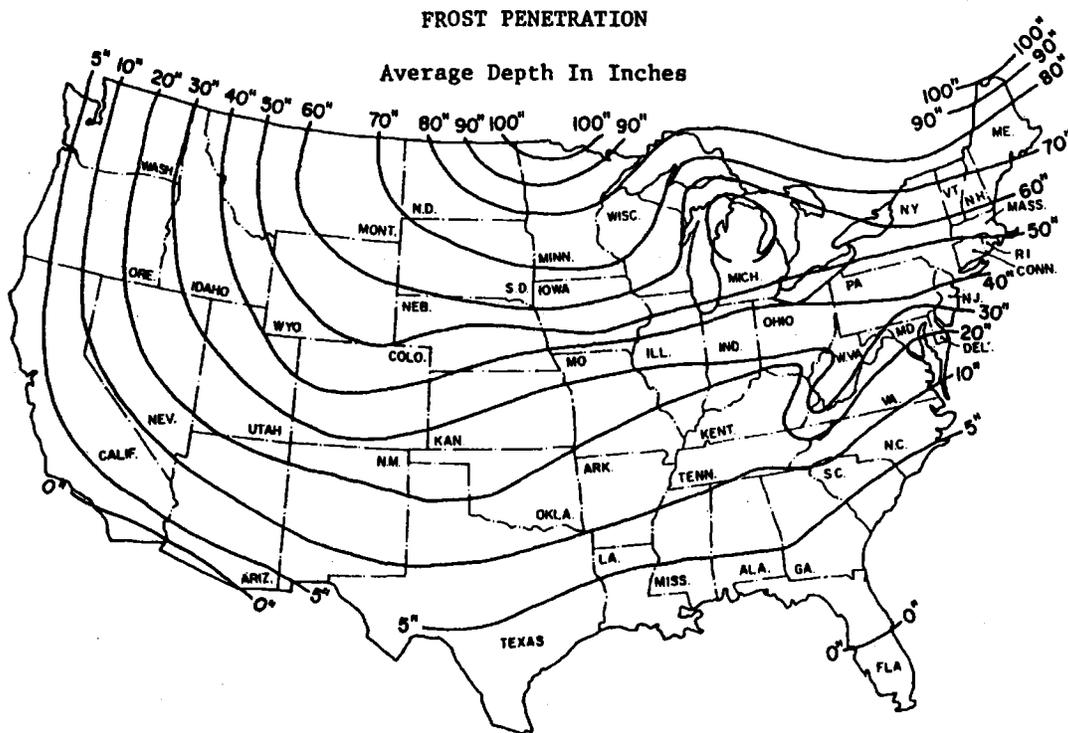
Oregon Utilities Underground Location Center (800) 424-5555 Douglas Utilities Coordinating Council (503) 673-6676 Josephine Utilities Coordinating Council (503) 476-6676 Rogue Basin Utility Coordinating Council (503) 779-6676 Utilities Notification Center (800) 332-2344
Pennsylvania Pennsylvania One Call System Inc. (800) 242-1776
Rhode Island Dig Safe – Rhode Island (800) 225-4977
South Carolina Palmetto Utility Protection Service Inc. (800) 922-0983
South Dakota South Dakota One Call (800) 781-7474
Tennessee Tennessee One-Call System (800) 351-1111
Texas Texas One Call System (800) 245-4545 Texas Excavation Safety System (800) 344-8377 Lone Star Notification Center (800) 669-8344
Utah Blue Stakes Location Center (800) 662-4111
Vermont Dig Safe – Vermont (800) 225-4977
Virginia Miss Utility of Virginia (800) 552-7001 Miss Utility (800) 257-7777 Miss Utility of Delmarva (800) 441-8355
Washington Utilities Underground Location Center (800) 424-5555 Grays Harbor & Pacific County Utility Coordinating Council (206) 535-3550 Utilities County of Cowlitz County (360) 425-2506 Chelan-Douglas Utilities Coordinating Council (509) 663-6111 Upper Yakima County Underground Utilities Council (800) 553-4344 Inland Empire Utility Coordinating Council (509) 456-8000 Palouse Empire Utilities Coordinating Council (800) 822-1974 Utilities Notification Center (800) 332-2344
West Virginia Miss Utility of West Virginia Inc. (800) 245-4848
Wisconsin Diggers Hotline Inc. (800) 242-8511

Wyoming West Park Utility Coordinating Council (307) 587-4800 Call-In Dig-In Safety Council (800) 300-9811 Fremont County Utility Coordinating Council (800) 489-8023 Central Wyoming Utilities Coordinating Council (800) 759-8035 Southwest Wyoming One Call (307) 362-8888 Carbon County Utility Utility Coordinating Council (307) 324-6666 Albany County Utility Coordinating Council (307) 742-3615 Southeast Wyoming Utilities Coordinating Council (307) 638-6666 Wyoming One-Call (800) 348-1030 Utilities Underground Location Center (800) 454-5555 Converse County Utility Coordination Council (800) 562-5561

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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 augering performed? yes no N/A
 Augering completed by: _____
 Total depth: _____ feet Date: _____
 - j) Trench/excavation probed? yes no N/A
 Probing completed by: _____
 Depth/frequency: _____ Date: _____
2. **Overhead Utilities** Present Absent
- a) Determination of nominal voltage yes no N/A
 - b) Marked on site maps yes no N/A
 - c) Necessary to lockout/insulate/re-route yes no N/A
 - d) Document procedures used to lockout/insulate/re-route yes no N/A
 - e) Minimum acceptable clearance (SOP Section 5.2): _____

3. **Notes:**

Approval:

 Site Manager/Field Operations Leader

 Date

c: PM/Project File
 Program File

ATTACHMENT V

EQUIPMENT INSPECTION CHECKLISTS

EQUIPMENT INSPECTION FOR DRILL RIGS

COMPANY: _____ UNIT NO. _____

FREQUENCY: Inspect at the initiation of the project, after repairs, once every 10-day shift.

Inspection Date: ___/___/___ Time: _____ Equipment Type: _____
 (e.g., Drill Rigs Hollow Stem, Mud Rotary, Direct Push)

	Good	Need Repair	N/A
Emergency Stop Devices (At points of operation)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tires (Tread) 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"/>
Mast condition (Mast Height _____)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access-ways: Frame, hand holds, ladders, walkways (non-slip surfaces), guardrails?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Steering (standard and emergency)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Power cable and/or hoist cable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
➤ Hooks (As Applicable)			
- Safety Latch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Wear in excess of 10% original dimension	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- A bend or twist exceeding 10% from the plane of an unbent hook	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Increase in throat opening exceeding 15% from new condition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Excessive nicks and/or gouges	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
➤ Wire Rope (Hoist Mechanism, As Applicable)			
- Reduction in Rope diameter (5/16 wire rope > 1/64 reduction nominal size -replace) (3/8 to 1/2 wire rope > 1/32 reduction nominal size -replace) (9/16 to 3/4 wire rope > 3/64 reduction nominal size -replace)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Number of broken wires (12 randomly broken wires in one rope lay) (4 broken wires in one strand)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Number of wire rope wraps left on the Running Drum at nominal use (≥3 required)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Lead (primary) sheave is centered on the running drum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Lubrication of wire rope (adequate?)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Good Needs Repaired N/A

- Number of U-Type (Crosby) Clips
(5/16 – 5/8 = 3 clips minimum)
(3/4 – 1 inch = 4 clips minimum)
(1 1/8 – 1 3/8 inch = 5 clips minimum)
- Kinks, bends – Flattened to > 50% diameter
- Hemp/Fiber rope (Cathead/Split Spoon Hammer)
 - Minimum 3/4; maximum 1 inch rope diameter (Inspect for physical damage)
 - Rope to hammer is securely fastened

Safety Guards:

Yes No

- Around rotating apparatus (belts, pulleys, sprockets, spindles, drums, flywheels, chains) all points of operations protected from accidental contact?
- Hot pipes and surfaces exposed to accidental contact?
- All emergency shut offs have been identified and communicated to the field crew?
- Are any structural members bent, rusted, or otherwise show signs of damage?
- Are fueling cans used with this equipment approved type safety cans?
- Have the attachments designed for use (as per manufacturer's recommendation) with this equipment been inspected and are considered suitable for use?

Cleanliness:

- Overall condition (was 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? _____
- Flammable solvents stored in the operators cab? _____

Operator Qualifications (as applicable for all heavy equipment):

- Does the operator have proper licensing where applicable, (e.g., CDL)? _____
- Does the operator, understand the equipment's operating instructions? _____
- Is the operator experienced with this equipment? _____
- Is the operator 21 years of age or more? _____

ADDITIONAL INSPECTION REQUIRED PRIOR TO USE ON-SITE

- Does equipment emit noise levels above 90 decibels?
- If so, has an 8-hour noise dosimetry test been performed?
- Results of noise dosimetry: _____
- Defects and repairs needed: _____
- General Safety Condition: _____
- Operator or mechanic signature: _____

Site Safety Officer Signature: _____

Approved for Use: Yes No

ATTACHMENT VI

SAFE WORK PERMITS

**SAFE WORK PERMIT
DECONTAMINATION ACTIVITIES
NAS WHITING FIELD, MILTON, FLORIDA**

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

SECTION I: General Job Scope

I. Work limited to the following (description, area, equipment used): Decontamination of heavy and sampling equipment (i.e., drill rigs and flights, drive rods, etc.). Pressure washers or steam cleaning units will be used to decontaminate heavy equipment. Decontamination of sampling equipment (i.e., MacroCore Samplers, reusable stainless steel trowels, etc.). Brushes and spray bottles will be used to decontaminate small sampling equipment.

II. Required Monitoring Instrument(s): PID with 10.6eV lamp [Note: This instrument will be used to determine if all of the chemical solvent (isopropanol) has been removed. It will not be used for purposes of monitoring exposure.]

V. Field Crew: _____

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

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

V. Protective equipment required

Level D Level B
Level C Level A
Detailed on Reverse

Respiratory equipment required

Full face APR	<input type="checkbox"/>	Escape Pack	<input type="checkbox"/>
Half face APR	<input type="checkbox"/>	SCBA	<input type="checkbox"/>
SKA-PAC SAR	<input type="checkbox"/>	Bottle Trailer	<input type="checkbox"/>
Skid Rig	<input type="checkbox"/>	None	<input checked="" type="checkbox"/>

Modifications/Exceptions: None anticipated

VI. Chemicals of Concern	Action Level(s)	Response Measures
Decontamination Solvents		Per MSDS

Note: COPC are not considered to be present in sufficient concentrations to present an occupational exposure threat to the decontamination workers.

VII. Additional Safety Equipment/Procedures

Hard-hat.....	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Hearing Protection (Plugs/Muffs).....	<input 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.....	<input type="checkbox"/> Yes	<input checked="" 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 or Neoprene)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Steel toe Work shoes or boots.....	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Work/rest regimen	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Chemical Resistant Boot Covers	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Impermeable apron	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Modifications/Exceptions: Impermeable aprons are preferred protection against soiling work clothes when lifting auger flights because of the need to carry close to the body. This is also the preferred protection during decontamination operations in the control of heat stress providing it offers adequate protection against splashes and over spray. If it (impermeable apron) does not offer adequate protection, PVC rain suits or PE or PVC coated Tyvek should be employed. Chemical resistant boot covers if excessive liquids are generated or to protected footwear. Hearing protection is required when operating the steam cleaner or pressure washer.

VIII. Procedure review with permit acceptors	Yes	NA	Yes	NA
Safety shower/eyewash (Location & Use)	<input type="checkbox"/>	<input type="checkbox"/>	Emergency alarms.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Procedure for safe job completion	<input type="checkbox"/>	<input type="checkbox"/>	Evacuation routes	<input type="checkbox"/>	<input type="checkbox"/>
Contractor tools/equipment/PPE inspected	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Assembly points ()	<input type="checkbox"/>	<input type="checkbox"/>

IX. Site Preparation	Yes	No	NA
Utility Locating and Excavation Clearance completed	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vehicle and Foot Traffic Routes Cleared and Established.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Physical Hazards Barricaded and Isolated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Emergency Equipment Staged	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

X. Additional Permits required (Hot work, confined space entry, excavation etc.) Yes No
If yes, complete permit required or contact Health Sciences, Pittsburgh Office

XI. Special instructions, precautions: Review MSDSs for decontamination solvents prior to use. To minimize the potential for exposure to site contaminants personnel will use PPE and prevent contact with potentially contaminated equipment. For pressure washers or steam cleaners in excess of 3,000 psi a fan tip of 25° or greater will be used to control potential for water cuts or lacerations. All hoses and fittings will be inspected to insure structural integrity prior to use. Decontamination Pad construction – sloped a sufficient degree to allow collection at a sump away from the work area; the temporary pad constructed of 10-30 mil polyethylene sheeting should be covered in a light coating of sand if the surface becomes to slippery. Hoses should be rolled up when not in use to eliminate potential tripping hazards. Drying racks or some other suitable mechanism should be employed to secure and support piece work (auger flights, etc.) during decontamination and drying. This will aid preventing collapse of unstable equipment and the possibility of striking someone in this process. Site control boundary demarcation for this operation is set at 35 feet surrounding the point of operation.

Permit Issued by: _____ Permit Accepted by: _____

**SAFE WORK PERMIT
MULTI-MEDIA SAMPLING ACTIVITIES
NAS WHITING FIELD, MILTON, FLORIDA**

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

SECTION I: General Job Scope

- I. Work limited to the following (description, area, equipment used): Multi media sampling including soils (subsurface) and groundwater and air sampling. Sampling will be accomplished as follows HSA Drill rig (split spoon), DPT (MacroCore Sampler); Groundwater (Low flow purge and sample using peristaltic pump and dedicate tubing); air sampling (air sampling pump and Tedlar Bag)
- II. Required Monitoring Instrument(s): PID with an 10.6 eV Lamp Strength (See Table 5-1)
- III. Field Crew: _____
- IV. On-site Inspection conducted Yes No Initials of Inspector _____

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

- | | |
|--|--|
| V. Protective equipment required | Respiratory equipment required |
| Level D <input checked="" type="checkbox"/> Level B <input type="checkbox"/> | Full face APR <input type="checkbox"/> Escape Pack <input type="checkbox"/> |
| Level C <input type="checkbox"/> Level A <input type="checkbox"/> | Half face APR <input type="checkbox"/> SCBA <input type="checkbox"/> |
| Detailed on Reverse | SKA-PAC SAR <input type="checkbox"/> Bottle Trailer <input type="checkbox"/> |
| | Skid Rig <input type="checkbox"/> None <input checked="" type="checkbox"/> |

Modifications/Exceptions: Minimum requirement are stated below. Ascension to higher level of protection is not anticipated based on reported concentrations. If monitoring indicates the action levels specified below are achieved, notify the PHSO.

VI. Chemicals of Concern	Action Level(s)	Response Measures
*BTEX compounds	0-10ppm	Continue to work; Continue to Monitor
*BTEX compounds	>10ppm in the Identified Workers Breathing Zone	Cease operations, Notify PHSO

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 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 | <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 – Nitrile Surgeon style) | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| Steel toe Work shoes or boots | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Work/rest regimen | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Chemical Resistant Boot Covers | <input type="checkbox"/> Yes <input type="checkbox"/> No | Impermeable apron..... | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |

Modifications/Exceptions: Impermeable aprons may be used when handling split spoons or MacroCore Samplers to prevent soiling of work clothes, if it is determined to be necessary. Nitrile or neoprene outer gloves for breaking open spoons and/or samplers. If DPT is employed utilizing the MacroCore Sampler and acetate liners a Geoprobe Sampling Kit and Cut resistant gloves will be required for cutting open the acetate liners. Chemical resistant boot covers when working around the rig amidst the spoils. Hard hat and hearing protection must be worn when working within the established exclusion zone of the HSA Drill or DPT rig. Reflective vests will be employed when working along designated traffic thoroughfares.

VIII. Procedure review with permit acceptors	Yes	NA	Emergency alarms	Yes	NA
Safety shower/eyewash (Location & Use)	<input type="checkbox"/>	<input type="checkbox"/>	Evacuation routes	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Procedure for safe job completion	<input type="checkbox"/>	<input type="checkbox"/>	Assembly points	<input type="checkbox"/>	<input type="checkbox"/>
Contractor tools/equipment/PPE inspected	<input type="checkbox"/>	<input type="checkbox"/>			

IX. Site Preparation

- | | | | |
|--|--------------------------|--------------------------|--------------------------|
| Utility Locating and Excavation Clearance completed | Yes | No | NA |
| Vehicle and Foot Traffic Routes Cleared and Established..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Physical Hazards Barricaded and Isolated | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Emergency Equipment Staged | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- X. Additional Permits required (Hot work, confined space entry, excavation etc.)..... Yes No
If yes, complete permit required or contact Health Sciences, Pittsburgh Office

XI. Special instructions, precautions: The FOL and/or the SHSO shall preview all work areas for physical hazards where sampling is to be conducted. Physical hazards will be removed, barricaded, or indicated to exist to the field crew prior to committing personnel or resources. Personal decontamination for this task shall include efforts at remote locations such as bagging contaminated PPE and reusable sampling tools and using hygienic wipes for hands and face until persons can reach the structured decontamination unit. Minimize contact with potentially contaminated media. Suspend site activities in the event of inclement weather. Employ proper lifting techniques as described on Table 5-1 for mobilization/demobilization. For remote locations pack glass ware in hard sided containers to prevent falls breakage of glassware and possible lacerations.

* - General Contaminant Classifications based on components detected in the soils. The action levels have been established based on component % concentration (as a mixture) as reported from previous sample results.

Permit Issued by: _____ Permit Accepted by: _____

**SAFE WORK PERMIT
MONITORING WELL INSTALLATION/SOIL BORING ACTIVITIES
NAS WHITING FIELD, MILTON, FLORIDA**

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

SECTION I: General Job Scope

- I. Work limited to the following (description, area, equipment used): Soil boring and temporary air injection and observation monitoring well installation using Hollow Stem Auger and possibly direct push application methods including MacroCore Sampling and Dual Tube Systems for well installation.
- II. Required Monitoring Instruments: PID with a 10.6eV Lamp strength
- III. Field Crew: _____
- IV. On-site Inspection conducted Yes No Initials of Inspector TtNUS

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

- | | |
|--|---|
| V. Protective equipment required | Respiratory equipment required |
| Level D <input checked="" type="checkbox"/> Level B <input type="checkbox"/> | Full face APR <input type="checkbox"/> Escape Pack <input type="checkbox"/> |
| Level C <input type="checkbox"/> Level A <input type="checkbox"/> | Half face APR <input type="checkbox"/> SCBA <input type="checkbox"/> |
| Detailed on Reverse | SAR <input type="checkbox"/> Bottle Trailer <input type="checkbox"/> |
| | Skid Rig <input type="checkbox"/> None <input checked="" type="checkbox"/> |

Modifications/Exceptions: Modification to the selected level of protection is not anticipated based on previous reported contaminant concentrations. Ascension over the established action levels requires notification of the PHSO to determine the most appropriate option.

VI. Chemicals of Concern	Action Level(s)	Response Measures
*BTEX compounds	0-10ppm	Continue to work; Continue to Monitor
*BTEX compounds	>10ppm in the Identified Workers Breathing Zone	Cease operations, Notify PHSO

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 | <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 checked="" type="checkbox"/> No | Gloves (Type – Nitrile or Neoprene) | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| Steel toe Work shoes or boots..... | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Work/rest regimen | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Chemical Resistant Boot Covers | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Impermeable apron | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |

Modifications/Exceptions: Reflective vests for high traffic areas. Tyvek coverall if there is a potential for soiling work clothes. PVC or PE coated Tyvek, if saturation or work clothes may occur. It is recommended that the Driller and the Driller's helper wear impermeable aprons to prevent soiling of work clothes when handling auger flights close and/or against the body. This measure can be used in place of the Tyvek or PE or PVC coated Tyvek providing it offers the same level of protection. Once the task is complete remove disposable PPE and double bag for disposal. All reusable PPE will go through a soap and water wash and rinse.

- | | | | | |
|--|--------------------------|--------------------------|---------------------------|--|
| VIII. Procedure review with permit acceptors | Yes | NA | Yes | NA |
| Safety shower/eyewash (Location & Use) | <input type="checkbox"/> | <input type="checkbox"/> | Emergency alarms | <input checked="" type="checkbox"/> <input type="checkbox"/> |
| Procedure for safe job completion | <input type="checkbox"/> | <input type="checkbox"/> | Evacuation routes | <input type="checkbox"/> <input type="checkbox"/> |
| Contractor tools/equipment/PPE inspected | <input type="checkbox"/> | <input type="checkbox"/> | Assembly points () | <input type="checkbox"/> <input type="checkbox"/> |

IX. Site Preparation

- | | | | |
|--|--------------------------|--------------------------|--------------------------|
| Utility Locating and Excavation Clearance completed | Yes | No | NA |
| Vehicle and Foot Traffic Routes Cleared and Established..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Physical Hazards Barricaded and Isolated | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Emergency Equipment Staged | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- X. Additional Permits required (Utility Locating and Excavation Clearance – Attachment IV)..... Yes No
If yes, complete permit required or contact Health Sciences, Pittsburgh Office

XI. Special instructions, precautions: Follow the safe work practices for drilling specified in Section 5.2 of this HASP. Use proper lifting techniques defined in Table 5-1 for mobilization/demobilization. Complete an Equipment Inspection Checklist for the HSA and Direct Push Rig upon arrival to the site, and then every 10 day shift thereafter or after major repairs. Test all emergency stop devices initially then periodically to insure operational status. Decontamination of equipment will consist of soap and water wash and rinse with the use of a pressure washer until visibly clean. If a centralized decontamination unit is employed wrap all equipment in polyethylene sheeting for transport to this location. Personnel decontamination will consist of disposing of single use PPE and washing hands and face prior to breaks or meals. The greatest potential for exposure may occur only through mechanical dispersion (inhalation) or hand to mouth contact (ingestion) through poor work hygiene practices. Minimization of these hazards can control potential exposures. Utility clearance will proceed all subsurface installations employing clearance services and hand dug pilot holes in accordance with Attachment IV of this HASP. Site control boundaries shall be established at the height of the mast + 5-feet for HSA drilling and a minimum of 25-feet from a DPT rig. This distance will remove persons from within the boundaries potentially impacted by physical hazards associated with this operation. All operation will be temporarily suspended during approaching electrical storms and/or high winds.

* - General Contaminant Classifications based on components detected in the soils. The action levels have been established based on component % concentration (as a mixture) as reported from previous sample results.

Permit Issued by: _____ Permit Accepted by: _____

**SAFE WORK PERMIT
GEOGRAPHICAL SURVEYING ACTIVITIES
NAS WHITING FIELD, MILTON, FLORIDA**

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

SECTION I: General Job Scope

- I. Work limited to the following (description, area, equipment used): Geographical Surveying
- II. Required Monitoring Instruments: None
- III. Field Crew: _____
- IV. On-site inspection conducted Yes No Initials of Inspector TINUS

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

- | | | |
|--|--|--|
| V. Protective equipment required | Respiratory equipment required | |
| Level D <input checked="" type="checkbox"/> Level B <input type="checkbox"/> | Full face APR <input type="checkbox"/> | Escape Pack <input type="checkbox"/> |
| Level C <input type="checkbox"/> Level A <input type="checkbox"/> | Half face APR <input type="checkbox"/> | SCBA <input type="checkbox"/> |
| Detailed on Reverse | SAR <input type="checkbox"/> | Bottle Trailer <input type="checkbox"/> |
| | Skid Rig <input type="checkbox"/> | None <input checked="" type="checkbox"/> |

Modifications/Exceptions: None Anticipated. Minimum requirements include sleeved shirt and long pants and safety footwear.(except for magnetometer, geophysical surveys).

VI. Chemicals of Concern	Action Level(s)	Response Measures
<u>None anticipated</u>		

VII. Additional Safety Equipment/Procedures

- | | | | |
|------------------------------------|---|---------------------------------------|---|
| Hard-hat..... | <input type="checkbox"/> Yes <input 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 | <input type="checkbox"/> Yes <input checked="" 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 - <u>Work</u>) | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| Steel toe Work shoes or boots..... | <input type="checkbox"/> Yes <input type="checkbox"/> No | Work/rest regimen | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |

Modifications/Exceptions: Pant legs are to be taped to work boots to prevent entry under the clothing by ticks and other insects when working in heavy brush and wooded areas. Use repellants applied directly to the clothing at all entry points(pants to boots, shirt to pants, etc.) Tyvek coveralls may be used in heavy brush to protect against natural hazards (e.g., ticks) and also to make identification easier. If working in areas where snakes are a threat, wear snake chaps to protect against bites. Surveyors working along highways and traffic pathways shall wear high visibility vests to increase visual recognition.

- | | | | | |
|--|--------------------------|-------------------------------------|-------------------------|--|
| VIII. Procedure review with permit acceptors | Yes | NA | Yes | NA |
| Safety shower/eyewash (Location & Use) | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Emergency alarms..... | <input checked="" type="checkbox"/> <input type="checkbox"/> |
| Procedure for safe job completion | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Evacuation routes | <input checked="" type="checkbox"/> <input type="checkbox"/> |
| Contractor tools/equipment/PPE inspected | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Assembly points..... | <input checked="" type="checkbox"/> <input type="checkbox"/> |

- | | | | |
|--|--------------------------|--------------------------|-------------------------------------|
| IX. Site Preparation | Yes | No | NA |
| Utility Locating and Excavation Clearance completed | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Vehicle and Foot Traffic Routes Cleared and Established..... | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Physical Hazards Barricaded and Isolated | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Emergency Equipment Staged | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

- X. Additional Permits required (Hot work, confined space entry, excavation etc.) Yes No
If yes, complete permit required or contact Health Sciences, Pittsburgh Office

XI. Special instructions, precautions: Preview work locations to identify potential hazards (slips, trips, and falls, natural hazards, etc.) Avoid potential nesting areas. Wear light colored clothing so that ticks and other biting insects can be easily visible and can be removed. Decontamination is not required for this operation, it is however, required that persons perform a close body inspection upon exiting wooded or brush areas for ticks prior to entering vehicles and work trailers, etc.. Natural hazards are not necessarily anticipated unless survey crews need to carry bench marks and control points from or through remote locations. Minimize contact with potentially contaminated media. Suspend site activities in the event of inclement weather. Inspect all hand tools to insure in good condition prior to use (i.e., cutting tools are sharp, handles are free from defects, etc.). When cutting tools are not in use insure they placed in protective sheath. Maintain a ten foot radius around anyone clearing brush using a brush hook or machete.

Permit Issued by: _____ Permit Accepted by: _____

**SAFE WORK PERMIT
SOIL GAS PERMEABILITY TESTING ACTIVITIES
NAS WHITING FIELD, MILTON, FLORIDA**

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

SECTION I: General Job Scope

- I. Work limited to the following (description, area, equipment used): Soil Gas Permeability Testing activities shall consist of using an air compressor to inject air into an air injection well (<50 psi) and monitoring the pressure responses at observation monitoring wells of the same depth spatially arranged at 15, 30, and 60-feet from the air injection well. Pressure responses will be recorded at varying intervals until steady state condition is achieved.
- II. Required Monitoring Instruments: Combustible Gas/Oxygen Meter – This instrument shall be employed to pre-, during, and post- monitor any subsurface structures within the radius of influence (<60-feet of the air injection well). Monitoring will be conducted to determine if the accumulation of volatile emissions are being driven into these structures through the establishment of the increased air pressure gradient within the subsurface media.
- III. Field Crew: _____
- IV. On-site Inspection conducted Yes No Initials of Inspector _____

TtNUS

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

- | | | |
|--|--|--|
| V. Protective equipment required | Respiratory equipment required | |
| Level D <input checked="" type="checkbox"/> Level B <input type="checkbox"/> | Full face APR <input type="checkbox"/> | Escape Pack <input type="checkbox"/> |
| Level C <input type="checkbox"/> Level A <input type="checkbox"/> | Half face APR <input type="checkbox"/> | SCBA <input type="checkbox"/> |
| Detailed on Reverse | SKA-PAC SAR <input type="checkbox"/> | Bottle Trailer <input type="checkbox"/> |
| | Skid Rig <input type="checkbox"/> | None <input checked="" type="checkbox"/> |

Modifications/Exceptions: None anticipated

VI. Chemicals of Concern	Action Level(s)	Response Measures
*Oxygen concentrations	<u>19.5 to 23.5% (optimum 21.9%)</u>	<u>Continue to work; Continue to Monitor</u>
*Oxygen concentrations	<u><10 or >23.5%</u>	<u>Cease operations, Notify PHSO</u>
*BTEX compounds	<u>0-10% of the LEL</u>	<u>Continue to work; Continue to Monitor</u>
*BTEX compounds	<u>>10% of the LEL within the identified structures</u>	<u>Cease operations, engage ventilation, Notify PHSO</u>

The LEL for the mixture reported is 1.08%. Concentration considered safe within the subsurface structure is 10% of 1.08% or 1,000 ppm. Monitoring is to be conducted in the above-identified sequence – oxygen first, then combustible gas. See note below concerning pressure release within the system.

- VII. Additional Safety Equipment/Procedures
- | | | | |
|------------------------------------|---|-------------------------------------|---|
| Hard-hat..... | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Hearing Protection (Plugs/Muffs) .. | <input 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..... | <input type="checkbox"/> Yes <input checked="" 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 -) | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Steel toe Work shoes or boots..... | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Work/rest regimen..... | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Chemical Resistant Boot Covers. | <input type="checkbox"/> Yes <input type="checkbox"/> No | Impermeable apron..... | <input type="checkbox"/> Yes <input type="checkbox"/> No |

Modifications/Exceptions: Safety Glasses and hardhats will be worn when working near any portion of the system under pressure. Hearing protection will be worn when working within close proximity (<25 feet) of an operating air compressor. Remember the general rule of thumb – Excessive noise levels are being approached, if you must raise you voice to be heard by someone within two feet of your position. Selection of additional items will be based on site-specific conditions.

- VIII. Procedure review with permit acceptors Yes NA
- | | | | |
|--|---|---------------------------|---|
| Safety shower/eyewash (Location & Use) | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> NA | Emergency alarms | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> NA |
| Procedure for safe job completion | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> NA | Evacuation routes | <input type="checkbox"/> Yes <input type="checkbox"/> NA |
| Contractor tools/equipment/PPE inspected | <input type="checkbox"/> Yes <input type="checkbox"/> NA | Assembly points () | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> NA |

- IX. Site Preparation
- | | |
|--|--|
| Utility Locating and Excavation Clearance completed | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA |
| Vehicle and Foot Traffic Routes Cleared and Established..... | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA |
| Physical Hazards Barricaded and Isolated | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA |
| Emergency Equipment Staged | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA |

- X. Additional Permits required (Hot work, confined space entry, excavation etc.) Yes No
If yes, complete permit required or contact Health Sciences, Pittsburgh Office

XI. Special instructions, precautions: Pressurized systems – This testing relies on this system to be a closed system to permit pressure generation then accumulation at a observation point. Therefore, exposure to chemical contaminants is not considered as a predominant hazard unless the system must be opened. To minimize this hazard during this operation, the following steps should be employed: Preview work locations to identify potential hazards (slips, trips, and falls, natural hazards, etc.). Remove or barricade as appropriate. All equipment will be inspected upon arrival, then every 10-day shift thereafter or after major repairs. Suspend site activities in the event of inclement weather. Caution should be exercised when working outdoors due to the harmful effects of the sun. Precautions should include wearing hat that shades the face neck and ears; liberal use of sunscreen; wrap around sunglasses; where possible, for static operations provide shade using canopies or like equipment. Employ proper lifting techniques as described on Table 5-1 for this task. Although chemical contaminants and a structured decontamination process are not of a concern during this operation good personal hygiene should be employed prior to breaks, lunch, or other periods of hand to mouth contact.

Permit Issued by: _____ Permit Accepted by: _____

ATTACHMENT VII

AMERICAN RED CROSS FIRST-AID POSTER



American Red Cross

First Aid

EMERGENCY TELEPHONE NUMBERS

Police _____
Fire Department _____
Doctor _____
Ambulance _____
Hospital _____
Poison Control Center _____

BITES Animal Bites - Thoroughly wash the wound with soap and water. Flush the area with running water and apply a sterile dressing. Immobilize affected part until the victim has been attended by a physician. See that the animal is kept alive and in quarantine. Obtain name and address of the owner of the animal.

Insect Bites - Remove "stinger" if present. Keep affected part down below the level of the heart. Apply ice bag. For minor bites and stings apply soothing lotions, such as calamine.

BURNS AND SCALDS Minor Burns - DO NOT APPLY VASELINE OR GREASE OF ANY KIND. Apply cold water applications until pain subsides. Cover with a dry, sterile gauze dressing. Do not break blisters or remove tissue. Seek medical attention.

Severe Burns - Do not remove adhered particles of clothing. Do not apply ice or immerse in cold water. Do not apply ointment, grease or vaseline. Cover burns with thick sterile dressings. Keep burned feet or legs elevated. Seek medical attention immediately.

Chemical Burns - Wash away the chemical soaked clothing with large amounts of water. Remove victim's chemical soaked clothing. If dry lime, brush away before flushing. Apply sterile dressing and seek medical attention.

CRAMPS Symptoms - Cramps in muscles of abdomen and extremities. Heat exhaustion may also be present.

Treatment - Same as for heat exhaustion.

CUTS Apply pressure with sterile gauze dressing, and elevate the area until bleeding stops. Apply a bandage and seek medical attention.

EYES Foreign Objects - Keep the victim from rubbing his eye. Flush the eye with water. If flushing fails to remove the object, apply a dry, protective dressing and consult a physician.

Chemicals - Flood the eye thoroughly with water for 15 minutes. Cover the eye with a dry pad and seek medical attention.

FAINING Keep the victim lying down. Loosen tight clothing. If victim vomits, roll him onto his side or turn his head to the side. If necessary wipe out his mouth. Maintain an open airway. Bathe his face gently with cool water. Unless recovery is prompt, seek medical attention.

FRACTURES Deformity of an injured part usually means a fracture. If fracture is suspected, splint the part, DO NOT ATTEMPT TO MOVE INJURED PERSON; seek medical attention immediately.

FROSTBITE Symptoms - Just before frostbite occurs skin may be flushed, then change to white or grayish-yellow. Pain may be felt early then subsides. Blisters may appear, affected part feels very cold and numb.

Treatment - Bring victim indoors, cover the frozen area, provide extra clothing and blankets. Rewarm frozen area quickly by immersion in warm water--NOT HOT WATER. DO NOT RUB THE PART. Seek medical attention immediately.

HEAT EXHAUSTION Caused by exposure to heat - either sun or indoors. Symptoms - Near normal body temperature. Skin is pale and clammy. Profuse sweating, tiredness, weakness, headache, perhaps cramps, nausea, dizziness, and possible fainting.

Treatment - Keep in lying position and raise victim's feet. Loosen clothing, apply cool wet cloths. If conscious, give sips of salt water (1 teaspoon of salt per glass) over a period of one hour. If vomiting occurs, discontinue the salt water. Seek medical attention immediately.

SUNSTROKE Symptoms - Body temperature is high (106 degrees F or higher). Skin is hot, red, and dry. Pulse is rapid and strong. Victim may be unconscious.

Treatment - Keep victim in lying position with head elevated. Remove clothing and repeatedly sponge the bare skin with cool water or rubbing alcohol. Seek medical attention immediately.

POISONING Call the poison control center for instruction on immediate care. If victim becomes unconscious, keep the airway open. If breathing stops give artificial respiration, by mouth to mouth breathing. Call an emergency squad as soon as possible.

POISON IVY Remove contaminated clothing; wash all exposed areas thoroughly with soap and water followed by rubbing alcohol. If rash is mild, apply calamine or other soothing skin lotion. If a severe reaction occurs, seek medical attention.

PUNCTURE WOUNDS If puncture wound is deeper than skin surface, seek medical attention. Serious infection can arise unless proper treatment is received.

SPRAINS Elevate injured part and apply ice bag or cold packs. DO NOT SOAK IN HOT WATER. If pain and swelling persist, seek medical attention.

UNCONSCIOUSNESS Never attempt to give anything by mouth. Keep victim lying flat, maintain open airway. If victim is not breathing provide artificial respiration by mouth to mouth breathing and call an emergency squad as soon as possible.

ATTACHMENT VIII

**FIRE EXTINGUISHER
USE AND INSPECTION**

FIRE EXTINGUISHER

USE AND INSPECTION

Fire Extinguisher Use and Inspection procedures will be conducted in support of the activities to be conducted at NAS Whiting Field, Milton, Florida. The following text is intended to provide general instruction to the field personnel charged with this responsibility.

Fire Extinguisher Use

All personnel trained in incidental response measures may be required to use and operate a fire extinguisher in response to an incipient stage fire. Therefore, the following instruction is provided and will be conveyed to all field personnel as part of site-specific training.

To use a portable fire extinguisher, the user should be familiar with the operation of the specific fire extinguisher located in the workplace. The following procedure will properly extinguish a small fire.

1) IDENTIFY THE TYPE OF FIRE (CLASS A, B, C, D).

CLASSES OF FIRE/FIRE EXTINGUISHER IDENTIFICATION

Fire is divided into four classes for easy identification and extinguishment. The type of fuel or ignition source will determine the type of extinguishing medium required.

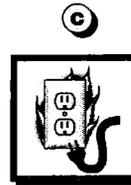
Class A - Ordinary combustibles (wood, paper, rubber, plastic, and cloth). Extinguishers suitable for Class A fires should be identified by a triangle containing the letter "A." If colored, the triangle is green.



Class B - Flammable liquids, gases, and greases. Extinguishers suitable for Class B fires should be identified by a square containing the letter "B." This type of extinguisher is effective on small petroleum product fires.



Class C - Electrically energized systems. Extinguishers suitable for Class C fires should be identified by a circle containing the letter "C." If colored, the circle is blue.



Class D - Combustible metals (sodium, magnesium, phosphorus). Extinguishers suitable for fires involving metals should be identified by a five-pointed star containing the letter "D." If colored, the star is yellow.

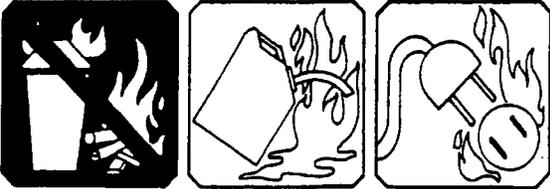


Note: Water and other extinguishing media, such as carbon dioxide and dry chemicals, are ineffective on metal fires.

New NFPA Markings



Class A, B, C



Class B, C



Class A, B



Class A

Multi-class (ABC) Fire extinguishers will be provided for use on site. If you will buy a Fire Extinguisher, this is the type recommended. Size or rating recommended is 2 1/2 to 5 lbs.

1. Determine whether the extinguisher is adequate for this fire.

Rating number – The rating number assigned to a fire extinguisher is based on the capabilities of that fire class, for example

Class 5 A – Will provide extinguishing capabilities equal to that of 5 gallons of water.

Class 20 B - Will provide extinguishing capabilities equal to 20 square feet of flammable liquid burning.

Class C & D are not rated as to their limitations.

2. If adequate, hold the extinguisher upright and pull the ring pin.
3. Stand back 10 feet and aim at base of fire. Be careful not to spread burning material with pressurized extinguishing material.
4. Squeeze lever; sweep extinguisher in a side-to-side motion.

Portable Fire Extinguisher Placement/Mounting

Portable Fire Extinguishers will be placed/mounted in clear view in the areas where flammable materials are stored and/or dispensed. Mounting and placement of fire extinguishers will follow the following requirements

Fixed Locations (Flammable Storage)

- Extinguisher location will be marked by a red painted post to indicate extinguisher location
- The travel distance to access a fire extinguisher shall be no greater than 50 feet.
- The fire extinguisher will be mounted at a maximum height of four feet.

Mobile Locations (Drill Rigs, Support Vehicles)

All vehicles carrying fuel containers or used in the dispensing of fuel will carry at a minimum a 5 pound rated fire extinguisher.

Portable Fire Extinguisher Inspection

All fire extinguishers used in support of this field effort will be inspected on the following frequencies:

- A certified provider will perform maintenance checks of fire extinguishers at least once a year. A tag attached to the neck of the fire extinguisher will indicate documentation of the maintenance check.
- All fire extinguishers will have a current hydrostatic inspection. For the type of extinguishers selected for use at NAS Whiting Field hydrostatic inspections are required every 5 years.
- All fire extinguishers will be inspected monthly. The monthly inspection will cover the following
 - Are the fire extinguisher(s) placed in their designated location(s)?
 - Is the location conspicuously marked (Top 18 inches of the mounting pole to be painted red)?
 - Is the access impeding travel to the fire extinguisher blocked or restricted in any way?
 - Has the fire extinguisher been partially or completely discharged?
 - Is there signs of obvious physical damage?
 - Does the fire extinguisher shows sufficient pressure and are all of the tamper indicators are in place?

This inspection shall be documented on the attached tag provided by the maintenance/hydrostatic inspection service.

FIRE EXTINGUISHER CHECKLIST
NAS WHITING FIELD, MILTON, FLORIDA

Project Name: <u>NAS Whiting Field</u>	CTO 0200	Date of Inspection: _____			
Fire Extinguisher Identification Number: _____		Fire Extinguisher Location: _____			
Measurement Criteria	Yes	No	N/A	Needs Repaired	
Are the fire extinguisher(s) placed in their designated location(s)?					
Is the location conspicuously marked (Top 18 inches of the mounting pole to be painted red)?					
Is the access impeding travel to the fire extinguisher blocked or restricted in any way?					
Has the fire extinguisher been partially or completely discharged?					
Is there signs of obvious physical damage?					
Does the fire extinguisher shows sufficient pressure and are all of the tamper indicators are in place?					

FIRE EXTINGUISHER CHECKLIST
NAS WHITING FIELD, MILTON, FLORIDA

Project Name: <u>NAS Whiting Field</u>	CTO 0200	Date of Inspection: _____			
Fire Extinguisher Identification Number: _____		Fire Extinguisher Location: _____			
Measurement Criteria	Yes	No	N/A	Needs Repaired	
Are the fire extinguisher(s) placed in their designated location(s)?					
Is the location conspicuously marked (Top 18 inches of the mounting pole to be painted red)?					
Is the access impeding travel to the fire extinguisher blocked or restricted in any way?					
Has the fire extinguisher been partially or completely discharged?					
Is there signs of obvious physical damage?					
Does the fire extinguisher shows sufficient pressure and are all of the tamper indicators are in place?					

ATTACHMENT IX
MEDICAL DATA SHEET

MEDICAL DATA SHEET

This Medical Data Sheet must be completed by all 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 WHITING FIELD, MILTON, FLORIDA CTO 0200; SOW 0217

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? _____

Last Tetanus Shot or Booster: _____

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

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

Signature

Date

ATTACHMENT X

**HEARING CONSERVATION PROGRAM
AND OCCUPATIONAL NOISE EXPOSURE
STANDARD**

TETRA TECHNUS, INC.

**HEARING CONSERVATION
PROGRAM**

**HEARING CONSERVATION
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TETRA TECH NUS, INC.
HEARING CONSERVATION PROGRAM

1.0 PURPOSE

To establish general and site-specific hearing conservation procedures and guidelines.

2.0 SCOPE

Applies to all hazardous waste and other field activities where exposure to high levels of noise may occur. This program is designed to comply with OSHA General Industry Standard 29 CFR 1910.95.

3.0 RESPONSIBILITIES

Project Health and Safety Officer (PHSO) - The PHSO shall ensure that hearing conservation measures are adequately addressed in the Site Specific Health and Safety Plan.

Site Safety Officer (SSO) - The SSO is responsible for establishing and implementing a hearing conservation program. The SSO also ensures that adequate procedures are followed to prevent excessive exposure of individuals to high levels of noise.

Project Manager (PM) - The PM will ensure that sufficient information has been provided to the PHSO to prepare adequate procedures for inclusion in the site-specific Health and Safety Plan (HASP). The PM is also ultimately responsible for the effective compliance with these requirements.

4.0 MONITORING AND ESTABLISHING HIGH-NOISE AREAS

4.1 The SSO, as necessary, will perform an initial noise survey on Tetra Tech NUS and Subcontractors operations and work areas by the use of a sound meter and/or dosimetry. All monitoring will be done in accordance with 29 CFR 1910.95. Areas and operations which are expected to reach or exceed 85 decibels (dBA) will be required to adhere to the requirements for this program.

4.2 The HASP will set policy on mandatory use of hearing protection in affected areas, and while performing certain operations. The FOL and/or SSO will notify all Tetra Tech NUS and Subcontractor personnel of high noise areas and operations prior to work initiation.

The FOL and/or the SSO will be responsible for implementation and enforcement of the site-specific Hearing Conservation elements.

- 4.3** The FOL and/or the SSO will post or otherwise identify areas of operations which exceed 85 dBA. If significant changes in noise levels occur (such as a shutdown in an operating unit, change in procedures), the noise levels shall be re-evaluated by the SSO to determine if hearing protection will be worn.

5.0 HEARING PROTECTION

Each employee will have the opportunity to choose from a variety of hearing protection devices. Hearing protectors shall be replaced as necessary. The SSO will evaluate the attenuation factors of hearing protection devices and will select appropriate types based on sound level monitoring or personal dosimetry.

6.0 TRAINING PROGRAM

The Health Sciences Department will institute and maintain an initial training program for new employees and provide an annual training program for employees who may be exposed to noise sources 85 dBA or greater. The annual training will be incorporated with the refresher health and safety training curricula. All affected employees will be involved in the program and their participation documented.

- 6.1** The training program shall include the effects of noise on hearing. It will also include the purpose of hearing protectors; the advantages, disadvantages, and attenuation factors of the various types. Instruction shall be given on issue points, selection, fitting, use and care of hearing protectors.

- 6.2** A copy of the OSHA Noise Standard and applicable informational and training material will be available to all employees.

7.0 RECORDKEEPING

Exposure measurements, related records will be kept at the site. Record retention will be done in accordance with the time periods stated in 29 CFR 1910.95 and 1910.20.

8.0 ATTACHMENTS

8.1 29 CFR 1910.95 Occupational Noise Exposure

8.1.1 Code of Federal Regulations, Subsection 1910.95

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ATTACHMENT 8.1

29 CFR 1910.95 OCCUPATIONAL NOISE EXPOSURE

Site:		Type of Audio Monitoring Equipment:		Date:
Employee Name	Operation	Hearing Protection Type Attenuation Factor	Noise Levels Measured	Duration of Use

Forward completed table (with backup noise monitoring data) to the Manager, Health Sciences.

ATTACHMENT 8.1.1

CODE OF FEDERAL REGULATIONS, SUBSECTION 1910.95

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FR 5322, Feb. 10, 1984; 55 FR 32015, Aug. 6, 1990; 58 FR 35308, June 30, 1993

TABLE G-16—PERMISSIBLE NOISE EXPOSURES¹

§ 1910.95 Occupational noise exposure.

(a) Protection against the effects of noise exposure shall be provided when the sound levels exceed those shown in Table G-16 when measured on the A scale of a standard sound level meter at slow response. When noise levels are determined by octave band analysis, the equivalent A-weighted sound level may be determined as follows:

Duration per day, hours	Sound level dBA slow response
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
¾	110
½ or less	115

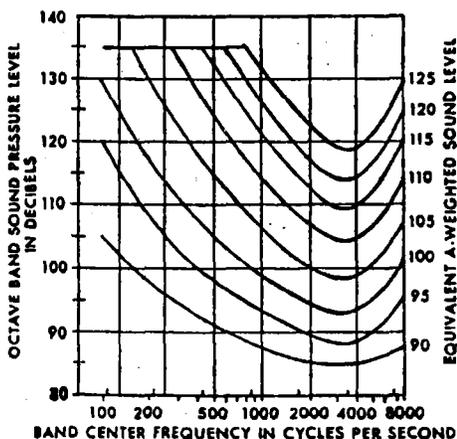


FIGURE G-9

Equivalent sound level contours. Octave band sound pressure levels may be converted to the equivalent A-weighted sound level by plotting them on this graph and noting the A-weighted sound level corresponding to the point of highest penetration into the sound level contours. This equivalent A-weighted sound level, which may differ from the actual A-weighted sound level of the noise, is used to determine exposure limits from Table 1.G-16.

(b)(1) When employees are subjected to sound exceeding those listed in Table G-16, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound levels within the levels of Table G-16, personal protective equipment shall be provided and used to reduce sound levels within the levels of the table.

(2) If the variations in noise level involve maxima at intervals of 1 second or less, it is to be considered continuous.

¹ When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the sum of the following fractions: $C_1/T_1 + C_2/T_2 + C_3/T_3$, exceeds unity, then, the mixed exposure should be considered to exceed the limit value. C_i indicates the total time of exposure at a specified noise level, and T_i indicates the total time of exposure permitted at that level. Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

(c) Hearing conservation program.

(1) The employer shall administer a continuing, effective hearing conservation program, as described in paragraphs (c) through (o) of this section, whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level (TWA) of 85 decibels measured on the A scale (slow response) or, equivalently, a dose of fifty percent. For purposes of the hearing conservation program, employee noise exposures shall be computed in accordance with appendix A and Table G-16a, and without regard to any attenuation provided by the use of personal protective equipment.

(2) For purposes of paragraphs (c) through (n) of this section, an 8-hour time-weighted average of 85 decibels or a dose of fifty percent shall also be referred to as the action level.

(d) Monitoring. (1) When information indicates that any employee's exposure may equal or exceed an 8-hour time-weighted average of 85 decibels, the employer shall develop and implement a monitoring program.

(i) The sampling strategy shall be designed to identify employees for inclusion in the hearing conservation program and to enable the proper selection of hearing protectors.

(ii) Where circumstances such as high worker mobility, significant variations in sound level, or a significant

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component of impulse noise make area monitoring generally inappropriate, the employer shall use representative personal sampling to comply with the monitoring requirements of this paragraph unless the employer can show that area sampling produces equivalent results.

(2)(i) All continuous, intermittent and impulsive sound levels from 80 decibels to 130 decibels shall be integrated into the noise measurements.

(ii) Instruments used to measure employee noise exposure shall be calibrated to ensure measurement accuracy.

(3) Monitoring shall be repeated whenever a change in production, process, equipment or controls increases noise exposures to the extent that:

(i) Additional employees may be exposed at or above the action level; or

(ii) The attenuation provided by hearing protectors being used by employees may be rendered inadequate to meet the requirements of paragraph (j) of this section.

(e) *Employee notification.* The employer shall notify each employee exposed at or above an 8-hour time-weighted average of 85 decibels of the results of the monitoring.

(f) *Observation of monitoring.* The employer shall provide affected employees or their representatives with an opportunity to observe any noise measurements conducted pursuant to this section.

(g) *Audiometric testing program.* (1) The employer shall establish and maintain an audiometric testing program as provided in this paragraph by making audiometric testing available to all employees whose exposures equal or exceed an 8-hour time-weighted average of 85 decibels.

(2) The program shall be provided at no cost to employees.

(3) Audiometric tests shall be performed by a licensed or certified audiologist, otolaryngologist, or other physician, or by a technician who is certified by the Council of Accreditation in Occupational Hearing Conservation, or who has satisfactorily demonstrated competence in administering audiometric examinations, obtaining valid audiograms, and properly using,

maintaining and checking calibration and proper functioning of the audiometers being used. A technician who operates microprocessor audiometers does not need to be certified. A technician who performs audiometric tests must be responsible to an audiologist, otolaryngologist or physician.

(4) All audiograms obtained pursuant to this section shall meet the requirements of Appendix C: *Audiometric Measuring Instruments.*

(5) *Baseline audiogram.* (i) Within 6 months of an employee's first exposure at or above the action level, the employer shall establish a valid baseline audiogram against which subsequent audiograms can be compared.

(ii) *Mobile test van exception.* Where mobile test vans are used to meet the audiometric testing obligation, the employer shall obtain a valid baseline audiogram within 1 year of an employee's first exposure at or above the action level. Where baseline audiograms are obtained more than 6 months after the employee's first exposure at or above the action level, employees shall be wearing hearing protectors for any period exceeding six months after first exposure until the baseline audiogram is obtained.

(iii) Testing to establish a baseline audiogram shall be preceded by at least 14 hours without exposure to workplace noise. Hearing protectors may be used as a substitute for the requirement that baseline audiograms be preceded by 14 hours without exposure to workplace noise.

(iv) The employer shall notify employees of the need to avoid high levels of non-occupational noise exposure during the 14-hour period immediately preceding the audiometric examination.

(6) *Annual audiogram.* At least annually after obtaining the baseline audiogram, the employer shall obtain a new audiogram for each employee exposed at or above an 8-hour time-weighted average of 85 decibels.

(7) *Evaluation of audiogram.* (i) Each employee's annual audiogram shall be compared to that employee's baseline audiogram to determine if the audiogram is valid and if a standard threshold shift as defined in paragraph (g)(10) of this section has oc-

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curred. This comparison may be done by a technician.

(ii) If the annual audiogram shows that an employee has suffered a standard threshold shift, the employer may obtain a retest within 30 days and consider the results of the retest as the annual audiogram.

(iii) The audiologist, otolaryngologist, or physician shall review problem audiograms and shall determine whether there is a need for further evaluation. The employer shall provide to the person performing this evaluation the following information:

(A) A copy of the requirements for hearing conservation as set forth in paragraphs (c) through (n) of this section;

(B) The baseline audiogram and most recent audiogram of the employee to be evaluated;

(C) Measurements of background sound pressure levels in the audiometric test room as required in Appendix D: Audiometric Test Rooms.

(D) Records of audiometer calibrations required by paragraph (h)(5) of this section.

(8) *Follow-up procedures.* (i) If a comparison of the annual audiogram to the baseline audiogram indicates a standard threshold shift as defined in paragraph (g)(10) of this section has occurred, the employee shall be informed of this fact in writing, within 21 days of the determination.

(ii) Unless a physician determines that the standard threshold shift is not work related or aggravated by occupational noise exposure, the employer shall ensure that the following steps are taken when a standard threshold shift occurs:

(A) Employees not using hearing protectors shall be fitted with hearing protectors, trained in their use and care, and required to use them.

(B) Employees already using hearing protectors shall be refitted and retrained in the use of hearing protectors and provided with hearing protectors offering greater attenuation if necessary.

(C) The employee shall be referred for a clinical audiological evaluation or an otological examination, as appropriate, if additional testing is necessary or if the employer suspects that a

medical pathology of the ear is caused or aggravated by the wearing of hearing protectors.

(D) The employee is informed of the need for an otological examination if a medical pathology of the ear that is unrelated to the use of hearing protectors is suspected.

(iii) If subsequent audiometric testing of an employee whose exposure to noise is less than an 8-hour TWA of 90 decibels indicates that a standard threshold shift is not persistent, the employer:

(A) Shall inform the employee of the new audiometric interpretation; and

(B) May discontinue the required use of hearing protectors for that employee.

(9) *Revised baseline.* An annual audiogram may be substituted for the baseline audiogram when, in the judgment of the audiologist, otolaryngologist or physician who is evaluating the audiogram:

(i) The standard threshold shift revealed by the audiogram is persistent; or

(ii) The hearing threshold shown in the annual audiogram indicates significant improvement over the baseline audiogram.

(10) *Standard threshold shift.* (i) As used in this section, a standard threshold shift is a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2000, 3000, and 4000 Hz in either ear.

(ii) In determining whether a standard threshold shift has occurred, allowance may be made for the contribution of aging (presbycusis) to the change in hearing level by correcting the annual audiogram according to the procedure described in Appendix F: *Calculation and Application of Age Correction to Audiograms.*

(h) *Audiometric test requirements.*

(1) Audiometric tests shall be pure tone, air conduction, hearing threshold examinations, with test frequencies including as a minimum 500, 1000, 2000, 3000, 4000, and 6000 Hz. Tests at each frequency shall be taken separately for each ear.

(2) Audiometric tests shall be conducted with audiometers (including microprocessor audiometers) that

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meet the specifications of, and are maintained and used in accordance with, American National Standard Specification for Audiometers, S3.6-1969.

(3) Pulsed-tone and self-recording audiometers, if used, shall meet the requirements specified in Appendix C: *Audiometric Measuring Instruments*.

(4) Audiometric examinations shall be administered in a room meeting the requirements listed in Appendix D: *Audiometric Test Rooms*.

(5) *Audiometer calibration.* (i) The functional operation of the audiometer shall be checked before each day's use by testing a person with known, stable hearing thresholds, and by listening to the audiometer's output to make sure that the output is free from distorted or unwanted sounds. Deviations of 10 decibels or greater require an acoustic calibration.

(ii) Audiometer calibration shall be checked acoustically at least annually in accordance with Appendix E: *Acoustic Calibration of Audiometers*. Test frequencies below 500 Hz and above 6000 Hz may be omitted from this check. Deviations of 15 decibels or greater require an exhaustive calibration.

(iii) An exhaustive calibration shall be performed at least every two years in accordance with sections 4.1.2; 4.1.3; 4.1.4.3; 4.2; 4.4.1; 4.4.2; 4.4.3; and 4.5 of the American National Standard Specification for Audiometers, S3.6-1969. Test frequencies below 500 Hz and above 6000 Hz may be omitted from this calibration.

(1) *Hearing protectors.* (1) Employers shall make hearing protectors available to all employees exposed to an 8-hour time-weighted average of 85 decibels or greater at no cost to the employees. Hearing protectors shall be replaced as necessary.

(2) Employers shall ensure that hearing protectors are worn:

(i) By an employee who is required by paragraph (b)(1) of this section to wear personal protective equipment; and

(ii) By any employee who is exposed to an 8-hour time-weighted average of 85 decibels or greater, and who:

(A) Has not yet had a baseline audiogram established pursuant to paragraph (g)(5)(ii); or

(B) Has experienced a standard threshold shift.

(3) Employees shall be given the opportunity to select their hearing protectors from a variety of suitable hearing protectors provided by the employer.

(4) The employer shall provide training in the use and care of all hearing protectors provided to employees.

(5) The employer shall ensure proper initial fitting and supervise the correct use of all hearing protectors.

(j) *Hearing protector attenuation.* (1) The employer shall evaluate hearing protector attenuation for the specific noise environments in which the protector will be used. The employer shall use one of the evaluation methods described in Appendix B: *Methods for Estimating the Adequacy of Hearing Protection Attenuation*.

(2) Hearing protectors must attenuate employee exposure at least to an 8-hour time-weighted average of 90 decibels as required by paragraph (b) of this section.

(3) For employees who have experienced a standard threshold shift, hearing protectors must attenuate employee exposure to an 8-hour time-weighted average of 85 decibels or below.

(4) The adequacy of hearing protector attenuation shall be re-evaluated whenever employee noise exposures increase to the extent that the hearing protectors provided may no longer provide adequate attenuation. The employer shall provide more effective hearing protectors where necessary.

(k) *Training program.* (1) The employer shall institute a training program for all employees who are exposed to noise at or above an 8-hour time-weighted average of 85 decibels, and shall ensure employee participation in such program.

(2) The training program shall be repeated annually for each employee included in the hearing conservation program. Information provided in the training program shall be updated to be consistent with changes in protective equipment and work processes.

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(3) The employer shall ensure that each employee is informed of the following:

- (i) The effects of noise on hearing;
- (ii) The purpose of hearing protectors, the advantages, disadvantages, and attenuation of various types, and instructions on selection, fitting, use, and care; and
- (iii) The purpose of audiometric testing, and an explanation of the test procedures.

(1) *Access to information and training materials.* (1) The employer shall make available to affected employees or their representatives copies of this standard and shall also post a copy in the workplace.

(2) The employer shall provide to affected employees any informational materials pertaining to the standard that are supplied to the employer by the Assistant Secretary.

(3) The employer shall provide, upon request, all materials related to the employer's training and education program pertaining to this standard to the Assistant Secretary and the Director.

(m) *Recordkeeping*—(1) *Exposure measurements.* The employer shall maintain an accurate record of all employee exposure measurements required by paragraph (d) of this section.

(2) *Audiometric tests.* (1) The employer shall retain all employee audiometric test records obtained pursuant to paragraph (g) of this section:

- (i) This record shall include:
 - (A) Name and job classification of the employee;
 - (B) Date of the audiogram;
 - (C) The examiner's name;
 - (D) Date of the last acoustic or exhaustive calibration of the audiometer; and
 - (E) Employee's most recent noise exposure assessment.

(F) The employer shall maintain accurate records of the measurements of the background sound pressure levels in audiometric test rooms.

(3) *Record retention.* The employer shall retain records required in this paragraph (m) for at least the following periods.

(i) Noise exposure measurement records shall be retained for two years.

(ii) Audiometric test records shall be retained for the duration of the affected employee's employment.

(4) *Access to records.* All records required by this section shall be provided upon request to employees, former employees, representatives designated by the individual employee, and the Assistant Secretary. The provisions of 29 CFR 1910.20 (a)-(e) and (g)-(i) apply to access to records under this section.

(5) *Transfer of records.* If the employer ceases to do business, the employer shall transfer to the successor employer all records required to be maintained by this section, and the successor employer shall retain them for the remainder of the period prescribed in paragraph (m) (3) of this section.

(n) *Appendices.* (1) Appendices A, B, C, D, and E to this section are incorporated as part of this section and the contents of these appendices are mandatory.

(2) Appendices F and G to this section are informational and are not intended to create any additional obligations not otherwise imposed or to detract from any existing obligations.

(o) *Exemptions.* Paragraphs (c) through (n) of this section shall not apply to employers engaged in oil and gas well drilling and servicing operations.

(p) *Startup date.* Baseline audiograms required by paragraph (g) of this section shall be completed by March 1, 1984.

(Approved by the Office of Management and Budget under control number 1218-0048)

APPENDIX A TO § 1910.95—NOISE EXPOSURE COMPUTATION

This Appendix is Mandatory

I. Computation of Employee Noise Exposure

(1) Noise dose is computed using Table G-16a as follows:

(i) When the sound level, L, is constant over the entire work shift, the noise dose, D, in percent, is given by: $D = 100 C/T$ where C is the total length of the work day, in hours, and T is the reference duration corresponding to the measured sound level, L, as given in Table G-16a or by the formula shown as a footnote to that table.

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(1) When the workshift noise exposure is composed of two or more periods of noise at different levels, the total noise dose over the work day is given by:

$$D = 100 (C_1/T_1 + C_2/T_2 + \dots + C_n/T_n)$$

where C_n indicates the total time of exposure at a specific noise level, and T_n indicates the reference duration for that level as given by Table G-16a.

(2) The eight-hour time-weighted average sound level (TWA), in decibels, may be computed from the dose, in percent, by means of the formula: $TWA = 16.61 \log_{10} (D/100) + 90$. For an eight-hour workshift with the noise level constant over the entire shift, the TWA is equal to the measured sound level.

(3) A table relating dose and TWA is given in Section II.

TABLE G-16a

A-weighted sound level, L (decibel)	Reference duration, T (hour)
80.....	32
81.....	27.9
82.....	24.3
83.....	21.1
84.....	18.4
85.....	16
86.....	13.9
87.....	12.1
88.....	10.6
89.....	9.2
90.....	8
91.....	7.0
92.....	6.1
93.....	5.3
94.....	4.6
95.....	4
96.....	3.5
97.....	3.0
98.....	2.6
99.....	2.3
100.....	2
101.....	1.7
102.....	1.5
103.....	1.3
104.....	1.1
105.....	1
106.....	0.87
107.....	0.76
108.....	0.66
109.....	0.57
110.....	0.5
111.....	0.44
112.....	0.38
113.....	0.33
114.....	0.29
115.....	0.25
116.....	0.22
117.....	0.19
118.....	0.16
119.....	0.14
120.....	0.125
121.....	0.11
122.....	0.095
123.....	0.082

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TABLE G-16a—Continued

A-weighted sound level, L (decibel)	Reference duration, T (hour)
124.....	0.072
125.....	0.063
126.....	0.054
127.....	0.047
128.....	0.041
129.....	0.036
130.....	0.031

In the above table the reference duration, T, is computed by

$$T = \frac{8}{2^{(L-90)/10}}$$

where L is the measured A-weighted sound level.

II. Conversion Between "Dose" and "8-Hour Time-Weighted Average" Sound Level

Compliance with paragraphs (c)-(r) of this regulation is determined by the amount of exposure to noise in the workplace. The amount of such exposure is usually measured with an audiodosimeter which gives a readout in terms of "dose." In order to better understand the requirements of the amendment, dosimeter readings can be converted to an "8-hour time-weighted average sound level." (TWA).

In order to convert the reading of a dosimeter into TWA, see Table A-1, below. This table applies to dosimeters that are set by the manufacturer to calculate dose or percent exposure according to the relationships in Table G-16a. So, for example, a dose of 91 percent over an eight hour day results in a TWA of 89.3 dB, and, a dose of 50 percent corresponds to a TWA of 85 dB.

If the dose as read on the dosimeter is less than or greater than the values found in Table A-1, the TWA may be calculated by using the formula: $TWA = 16.61 \log_{10} (D/100) + 90$ where TWA = 8-hour time-weighted average sound level and D = accumulated dose in percent exposure.

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TABLE A-1—CONVERSION FROM "PERCENT NOISE EXPOSURE" OR "DOSE" TO "8-HOUR TIME-WEIGHTED AVERAGE SOUND LEVEL" (TWA)

TABLE A-1—CONVERSION FROM "PERCENT NOISE EXPOSURE" OR "DOSE" TO "8-HOUR TIME-WEIGHTED AVERAGE SOUND LEVEL" (TWA)—Continued

Dose or percent noise exposure	TWA	Dose or percent noise exposure	TWA
10.....	73.4	180.....	94.2
15.....	76.3	185.....	94.4
20.....	78.4	190.....	94.6
25.....	80.0	195.....	94.8
30.....	81.3	200.....	95.0
35.....	82.4	210.....	95.4
40.....	83.4	220.....	95.7
45.....	84.2	230.....	96.0
50.....	85.0	240.....	96.3
55.....	85.7	250.....	96.6
60.....	86.3	260.....	96.9
65.....	86.9	270.....	97.2
70.....	87.4	280.....	97.4
75.....	87.9	290.....	97.7
80.....	88.4	300.....	97.9
81.....	88.5	310.....	98.2
82.....	88.6	320.....	98.4
83.....	88.7	330.....	98.6
84.....	88.7	340.....	98.8
85.....	88.8	350.....	99.0
86.....	88.9	360.....	99.2
87.....	89.0	370.....	99.4
88.....	89.1	380.....	99.6
89.....	89.2	390.....	99.8
90.....	89.2	400.....	100.0
91.....	89.3	410.....	100.2
92.....	89.4	420.....	100.4
93.....	89.5	430.....	100.5
94.....	89.6	440.....	100.7
95.....	89.6	450.....	100.8
96.....	89.7	460.....	101.0
97.....	89.8	470.....	101.2
98.....	89.9	480.....	101.3
99.....	89.9	490.....	101.5
100.....	90.0	500.....	101.6
101.....	90.1	510.....	101.8
102.....	90.1	520.....	101.9
103.....	90.2	530.....	102.0
104.....	90.3	540.....	102.2
105.....	90.4	550.....	102.3
106.....	90.4	560.....	102.4
107.....	90.5	570.....	102.6
108.....	90.6	580.....	102.7
109.....	90.6	590.....	102.8
110.....	90.7	600.....	102.9
111.....	90.8	610.....	103.0
112.....	90.8	620.....	103.2
113.....	90.9	630.....	103.3
114.....	90.9	640.....	103.4
115.....	91.1	650.....	103.5
116.....	91.1	660.....	103.6
117.....	91.1	670.....	103.7
118.....	91.2	680.....	103.8
119.....	91.3	690.....	103.9
120.....	91.3	700.....	104.0
125.....	91.6	710.....	104.1
130.....	91.9	720.....	104.2
135.....	92.2	730.....	104.3
140.....	92.4	740.....	104.4
145.....	92.7	750.....	104.5
150.....	92.9	760.....	104.6
155.....	93.2	770.....	104.7
160.....	93.4	780.....	104.8
165.....	93.6	790.....	104.9
170.....	93.8	800.....	105.0
175.....	94.0	810.....	105.1

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TABLE A-1—CONVERSION FROM "PERCENT NOISE EXPOSURE" OR "DOSE" TO "8-HOUR TIME-WEIGHTED AVERAGE SOUND LEVEL" (TWA)—Continued

Dose or percent noise exposure	TWA
820	105.2
830	105.3
840	105.4
850	105.4
860	105.5
870	105.6
880	105.7
890	105.8
900	105.8
910	105.9
920	106.0
930	106.1
940	106.2
950	106.2
960	106.3
970	106.4
980	106.5
990	106.5
999	106.6

APPENDIX B TO § 1910.95—METHODS FOR ESTIMATING THE ADEQUACY OF HEARING PROTECTOR ATTENUATION

This Appendix is Mandatory

For employees who have experienced a significant threshold shift, hearing protector attenuation must be sufficient to reduce employee exposure to a TWA of 85 dB. Employers must select one of the following methods by which to estimate the adequacy of hearing protector attenuation.

The most convenient method is the Noise Reduction Rating (NRR) developed by the Environmental Protection Agency (EPA). According to EPA regulation, the NRR must be shown on the hearing protector package. The NRR is then related to an individual worker's noise environment in order to assess the adequacy of the attenuation of a given hearing protector. This appendix describes four methods of using the NRR to determine whether a particular hearing protector provides adequate protection within a given exposure environment. Selection among the four procedures is dependent upon the employer's noise measuring instruments.

Instead of using the NRR, employers may evaluate the adequacy of hearing protector attenuation by using one of the three methods developed by the National Institute for Occupational Safety and Health (NIOSH), which are described in the "List of Personal Hearing Protectors and Attenuation Data," HEW Publication No. 76-120, 1975, pages 21-37. These methods are known as NIOSH methods #1, #2 and #3. The NRR described below is a simplification of NIOSH method

#2. The most complex method is NIOSH method #1, which is probably the most accurate method since it uses the largest amount of spectral information from the individual employee's noise environment. As in the case of the NRR method described below, if one of the NIOSH methods is used, the selected method must be applied to an individual's noise environment to assess the adequacy of the attenuation. Employers should be careful to take a sufficient number of measurements in order to achieve a representative sample for each time segment.

NOTE: The employer must remember that calculated attenuation values reflect realistic values only to the extent that the protectors are properly fitted and worn.

When using the NRR to assess hearing protector adequacy, one of the following methods must be used:

(i) When using a dosimeter that is capable of C-weighted measurements:

(A) Obtain the employee's C-weighted dose for the entire workshift, and convert to TWA (see appendix A, II).

(B) Subtract the NRR from the C-weighted TWA to obtain the estimated A-weighted TWA under the ear protector.

(ii) When using a dosimeter that is not capable of C-weighted measurements, the following method may be used:

(A) Convert the A-weighted dose to TWA (see appendix A).

(B) Subtract 7 dB from the NRR.

(C) Subtract the remainder from the A-weighted TWA to obtain the estimated A-weighted TWA under the ear protector.

(iii) When using a sound level meter set to the A-weighting network:

(A) Obtain the employee's A-weighted TWA.

(B) Subtract 7 dB from the NRR, and subtract the remainder from the A-weighted TWA to obtain the estimated A-weighted TWA under the ear protector.

(iv) When using a sound level meter set on the C-weighting network:

(A) Obtain a representative sample of the C-weighted sound levels in the employee's environment.

(B) Subtract the NRR from the C-weighted average sound level to obtain the estimated A-weighted TWA under the ear protector.

(v) When using area monitoring procedures and a sound level meter set to the A-weighting network.

(A) Obtain a representative sound level for the area in question.

(B) Subtract 7 dB from the NRR and subtract the remainder from the A-weighted sound level for that area.

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gram hearing threshold at 4000 Hz (22). Thus the age-corrected threshold shift would be 17 dB (as opposed to a threshold shift of 20 dB without age correction).

TABLE F-1—AGE CORRECTION VALUES IN DECIBELS FOR MALES

Years	Audiometric Test Frequencies (Hz)				
	1000	2000	3000	4000	6000
20 or younger.....	5	3	4	5	8
21.....	5	3	4	5	8
22.....	5	3	4	5	8
23.....	5	3	4	6	9
24.....	5	3	5	6	9
25.....	5	3	5	7	10
26.....	5	4	5	7	10
27.....	5	4	6	7	11
28.....	6	4	6	8	11
29.....	6	4	6	8	12
30.....	6	4	6	9	12
31.....	6	4	7	9	13
32.....	6	5	7	10	14
33.....	6	5	7	10	14
34.....	6	5	8	11	15
35.....	7	5	8	11	15
36.....	7	5	9	12	16
37.....	7	6	9	12	17
38.....	7	6	9	13	17
39.....	7	6	10	14	18
40.....	7	6	10	14	19
41.....	7	6	10	14	20
42.....	8	7	11	16	20
43.....	8	7	12	16	21
44.....	8	7	12	17	22
45.....	8	7	13	18	23
46.....	8	8	13	19	24
47.....	8	8	14	19	24
48.....	9	8	14	20	25
49.....	9	9	15	21	26
50.....	9	9	16	22	27
51.....	9	9	16	23	28
52.....	9	10	17	24	29
53.....	9	10	18	25	30
54.....	10	10	18	26	31
55.....	10	11	19	27	32
56.....	10	11	20	28	34
57.....	10	11	21	29	35
58.....	10	12	22	31	36
59.....	11	12	22	32	37
60 or older.....	11	13	23	33	38

TABLE F-2—AGE CORRECTION VALUES IN DECIBELS FOR FEMALES—Continued

Years	Audiometric Test Frequencies (Hz)				
	1000	2000	3000	4000	6000
30.....	8	6	5	5	9
31.....	8	6	6	5	9
32.....	9	6	6	6	10
33.....	9	6	6	6	10
34.....	9	6	6	6	10
35.....	9	6	7	7	11
36.....	9	7	7	7	11
37.....	9	7	7	7	12
38.....	10	7	7	7	12
39.....	10	7	8	8	12
40.....	10	7	8	8	13
41.....	10	8	8	8	13
42.....	10	8	9	9	13
43.....	11	8	9	9	14
44.....	11	8	9	9	14
45.....	11	8	10	10	15
46.....	11	9	10	10	15
47.....	11	9	10	11	16
48.....	12	9	11	11	16
49.....	12	9	11	11	16
50.....	12	10	11	12	17
51.....	12	10	12	12	17
52.....	12	10	12	13	18
53.....	13	10	13	13	18
54.....	13	11	13	14	19
55.....	13	11	14	14	19
56.....	13	11	14	15	20
57.....	13	11	15	15	20
58.....	14	12	15	16	21
59.....	14	12	16	16	21
60 or older.....	14	12	16	17	22

APPENDIX G TO § 1910.95—MONITORING NOISE LEVELS NON-MANDATORY INFORMATIONAL APPENDIX

This appendix provides information to help employers comply with the noise monitoring obligations that are part of the hearing conservation amendment.

WHAT IS THE PURPOSE OF NOISE MONITORING?

This revised amendment requires that employees be placed in a hearing conservation program if they are exposed to average noise levels of 85 dB or greater during an 8 hour workday. In order to determine if exposures are at or above this level, it may be necessary to measure or monitor the actual noise levels in the workplace and to estimate the noise exposure or "dose" received by employees during the workday.

WHEN IS IT NECESSARY TO IMPLEMENT A NOISE MONITORING PROGRAM?

It is not necessary for every employer to measure workplace noise. Noise monitoring or measuring must be conducted only when exposures are at or above 85 dB. Factors which suggest that noise exposures in the workplace may be at this level include employee complaints about the loudness of noise, indications that employees are losing

TABLE F-2—AGE CORRECTION VALUES IN DECIBELS FOR FEMALES

Years	Audiometric Test Frequencies (Hz)				
	1000	2000	3000	4000	6000
20 or younger.....	7	4	3	3	6
21.....	7	4	4	3	6
22.....	7	4	4	4	6
23.....	7	5	4	4	7
24.....	7	5	4	4	7
25.....	8	5	4	4	7
26.....	8	5	5	4	8
27.....	8	5	5	5	8
28.....	8	5	5	5	8
29.....	8	5	5	5	9

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their hearing, or noisy conditions which make normal conversation difficult. The employer should also consider any information available regarding noise emitted from specific machines. In addition, actual workplace noise measurements can suggest whether or not a monitoring program should be initiated.

HOW IS NOISE MEASURED?

Basically, there are two different instruments to measure noise exposures: the sound level meter and the dosimeter. A sound level meter is a device that measures the intensity of sound at a given moment. Since sound level meters provide a measure of sound intensity at only one point in time, it is generally necessary to take a number of measurements at different times during the day to estimate noise exposure over a workday. If noise levels fluctuate, the amount of time noise remains at each of the various measured levels must be determined.

To estimate employee noise exposures with a sound level meter it is also generally necessary to take several measurements at different locations within the workplace. After appropriate sound level meter readings are obtained, people sometimes draw "maps" of the sound levels within different areas of the workplace. By using a sound level "map" and information on employee locations throughout the day, estimates of individual exposure levels can be developed. This measurement method is generally referred to as *area* noise monitoring.

A dosimeter is like a sound level meter except that it stores sound level measurements and integrates these measurements over time, providing an average noise exposure reading for a given period of time, such as an 8-hour workday. With a dosimeter, a microphone is attached to the employee's clothing and the exposure measurement is simply read at the end of the desired time period. A reader may be used to read-out the dosimeter's measurements. Since the dosimeter is worn by the employee, it measures noise levels in those locations in which the employee travels. A sound level meter can also be positioned within the immediate vicinity of the exposed worker to obtain an individual exposure estimate. Such procedures are generally referred to as *personal* noise monitoring.

Area monitoring can be used to estimate noise exposure when the noise levels are relatively constant and employees are not mobile. In workplaces where employees move about in different areas or where the noise intensity tends to fluctuate over time, noise exposure is generally more accurately estimated by the personal monitoring approach.

In situations where personal monitoring is appropriate, proper positioning of the microphone is necessary to obtain accurate measurements. With a dosimeter, the microphone is generally located on the shoulder and remains in that position for the entire workday. With a sound level meter, the microphone is stationed near the employee's head, and the instrument is usually held by an individual who follows the employee as he or she moves about.

Manufacturer's instructions, contained in dosimeter and sound level meter operating manuals, should be followed for calibration and maintenance. To ensure accurate results, it is considered good professional practice to calibrate instruments before and after each use.

HOW OFTEN IS IT NECESSARY TO MONITOR NOISE LEVELS?

The amendment requires that when there are significant changes in machinery or production processes that may result in increased noise levels, remonitoring must be conducted to determine whether additional employees need to be included in the hearing conservation program. Many companies choose to remonitor periodically (once every year or two) to ensure that all exposed employees are included in their hearing conservation programs.

WHERE CAN EQUIPMENT AND TECHNICAL ADVICE BE OBTAINED?

Noise monitoring equipment may be either purchased or rented. Sound level meters cost about \$500 to \$1,000, while dosimeters range in price from about \$750 to \$1,500. Smaller companies may find it more economical to rent equipment rather than to purchase it. Names of equipment suppliers may be found in the telephone book (Yellow Pages) under headings such as: "Safety Equipment," "Industrial Hygiene," or "Engineers-Acoustical." In addition to providing information on obtaining noise monitoring equipment, many companies and individuals included under such listings can provide professional advice on how to conduct a valid noise monitoring program. Some audiological testing firms and industrial hygiene firms also provide noise monitoring services. Universities with audiology, industrial hygiene, or acoustical engineering departments may also provide information or may be able to help employers meet their obligations under this amendment.

Free, on-site assistance may be obtained from OSHA-supported state and private consultation organizations. These safety and health consultative entities generally give priority to the needs of small businesses. See the attached directory for a listing of organizations to contact for aid.

ATTACHMENT 8.1.1
 CODE OF FEDERAL REGULATIONS, SUBSECTION 1910.95
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Occupational Safety and Health Admin., Labor		§ 1910.95
OSHA ONSITE CONSULTATION PROJECT DIRECTORY		
State	Office and address	Contact
Alabama	Alabama Consultation Program, P.O. Box 8005, University, Alabama 35486.	(205) 348-7136, Mr. William Weems, Director.
Alaska	State of Alaska, Department of Labor, Occupational Safety & Health, 3301 Eagle St., Pouch 7-022, Anchorage, Alaska 99510.	(907) 276-5013, Mr. Stan Godeoe, Project Manager (Air Mail).
American Samoa	Service not yet available.	
Arizona	Consultation and Training, Arizona Division of Occupational Safety and Health, P.O. Box 19070, 1824 W. Adams, Phoenix, AZ 85005.	(602) 255-5795, Mr. Thomas Ramaley, Manager.
Arkansas	OSHA Consultation, Arkansas Department of Labor, 1022 High St., Little Rock, Ark. 72202.	(501) 371-2892, Mr. George Smith, Project Director.
California	CAL/OSHA Consultation Service, 2nd Floor, 525 Golden Gate Avenue, San Francisco, CA 94102.	(415) 557-2870, Mr. Emmett Jones, Chief.
Colorado	Occupational Safety & Health Section, Colorado State University, Institute of Rural Environmental Health, 110 Veterinary Science Building, Fort Collins, CO 80523.	(303) 491-6151, Dr. Roy M. Buchan, Project Director.
Connecticut	Division of Occupational Safety & Health, Connecticut Department of Labor, 200 Folly Brook Boulevard, Wethersfield, Conn. 06109.	(203) 566-4550, Mr. Leo Alik, Director.
Delaware	Delaware Department of Labor, Division of Industrial Affairs, 820 North French Street, 6th Floor, Wilmington, DE 19801.	(302) 571-3908, Mr. Bruno Salvadori, Director.
District of Columbia	Occupational Safety & Health Division, District of Columbia, Department Employment Services, Office of Labor Standards, 2900 Newton Street NE., Washington, DC 20018.	(202) 832-1230, Mr. Lorenzo M. White, Acting Associate Director.
Florida	Department of Labor & Employment Security, Bureau of Industrial Safety and Health, LaFayette Building, Room 204, 2551 Executive Center Circle West, Tallahassee, FL 32301.	(904) 488-3044, Mr. John C. Glenn, Administrator.
Georgia	Economic Development Division, Technology and Development Laboratory, Engineering Experiment Station, Georgia Institute of Technology, Atlanta, GA 30332.	(404) 894-3806, Mr. William C. Howard, Assistant to Director, Mr. James Burson, Project Manager.
Guam	Department of Labor, Government of Guam, 23548 Guam Main Facility, Agana, Guam 96921.	(671) 772-6291, Joe R. San Agustin, Director.
Hawaii	Education and Information Branch, Division of Occupational Safety and Health, Suite 910, 677 Ala Moana, Honolulu, HI 96813.	(808) 548-2511, Mr. Don Alper, Manager (Air Mail).
Idaho	OSHA Onsite Consultation Program, Boise State University, Community and Environmental Health, 1910 University Drive, Boise, ID 83725.	(208) 385-3929, Dr. Eldon Edmondson, Director.
Illinois	Division of Industrial Services, Dept. of Commerce and Community Affairs, 310 S. Michigan Avenue, 10 Floor, Chicago, IL 60601.	(800) 972-4140/4216 (Toll-free in State), (312) 793-3270, Mr. Stan Czwiniski, Assistant Director.
Iowa	Bureau of Labor, 307 E. Seventh Street, Des Moines, IA 50319.	(515) 281-3608, Mr. Allen J. Meier, Commissioner.
Indiana	Bureau of Safety, Education and Training, Indiana Division of Labor, 1013 State Office Building, Indianapolis, IN 46204.	(317) 833-5845, Mr. Harold Mills, Director.
Kansas	Kansas Dept. of Human Resources, 401 Topeka Ave., Topeka, KS 66603.	(913) 296-4086, Mr. Jerry Abbott, Secretary.
Kentucky	Education and Training, Occupational Safety and Health, Kentucky Department of Labor, 127 Building, 127 South, Frankfort, KY 40601.	(502) 564-6895, Mr. Larry Potter, Director.
Louisiana	No services available as yet (Pending FY 83).	
Maine	Division of Industrial Safety, Maine Dept. of Labor, Labor Station 45, State Office Building, Augusta, ME 04333.	(207) 299-3331, Mr. Lester Wood, Director.
Maryland	Consultation Services, Division of Labor & Industry, 501 St. Paul Place, Baltimore, Maryland 21202.	(301) 659-4210, Ms. Heana O'Brien, Project Manager. 7(c)(1) Agreement.
Massachusetts	Division of Industrial Safety, Massachusetts Department of Labor and Industries, 100 Cambridge Street, Boston, MA 02202.	(617) 727-3567, Mr. Edward Noseworthy, Project Director.

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OSHA ONSITE CONSULTATION PROJECT DIRECTORY—Continued		
State	Office and address	Contact
Michigan (Health).....	Special Programs Section, Division of Occupational Health, Michigan Dept. of Public Health, 3500 N. Logan, Lansing, MI 48909.	(517) 373-1410, Mr. Irving Davis, Chief.
Michigan (Safety).....	Safety Education & Training Division Bureau of Safety and Regulation, Michigan Department of Labor, 7150 Harris Drive, Box 30015, Lansing, Michigan 48909.	(517) 322-1808, Mr. Alan Harvie, Chief.
Minnesota.....	Training and Education Unit, Department of Labor and Industry, 5th Floor, 444 Lafayette Road, St. Paul, MN 55101.	(612) 296-2973, Mr. Timothy Tierney, Project Manager.
Mississippi.....	Division of Occupational Safety and Health, Mississippi State Board of Health, P.O. Box 1700, Jackson, MS 39205.	(601) 982-6315, Mr. Henry L. Laird, Director.
Missouri.....	Missouri Department of Labor and Industrial Relations, 722 Jefferson Street, Jefferson City, MO 65101.	1-(800) 392-0208, (314) 751-3403, Ms. Paula Smith, Mr. Jim Brake.
Montana.....	Montana Bureau of Safety & Health, Division of Workers Compensation, 615 Front Street, Helena, MT 59601.	(406) 449-3402, Mr. Ed Gatzemeier, Chief.
Nebraska.....	Nebraska Department of Labor, State House Station, State Capitol, P.O. Box 94600, Lincoln, NB 68509.	475-8451 Ext. 258, Mr. Joseph Carroll, Commissioner.
Nevada.....	Department of Occupational Safety and Health, Nevada Industrial Commission, 515 E. Muffer Street, Carson City, NV 89714.	(702) 885-5240, Mr. Allen Traenkner, Director.
New Hampshire.....	For information contact.....	Office of Consultation Programs, Room N3472 200 Constitution Avenue, NW, Washington, DC 20210, Phone: (202) 523-8985.
New Jersey.....	New Jersey Department of Labor and Industry Division of Work Place Standards, CN-054, Trenton, NJ 08625.	(609) 292-2313, FTS-8-477-2313, Mr. William Clark, Assistant Commissioner.
New Mexico.....	OSHA Consultation, Health and Environment Department, Environmental Improvement Division, Occupational Health & Safety Section, 4215 Montgomery Boulevard, NE., Albuquerque, NM 87109.	(505) 842-3387, Mr. Albert M. Stevens, Project Manager.
New York.....	Division of Safety and Health, New York State Department of Labor, 2 World Trade Center, Room 6995, New York, NY 10047.	(212) 488-7746/7, Mr. Joseph Alleva, Project Manager, DOSH.
North Carolina.....	Consultation Services, North Carolina Department of Labor, 4 West Edenton Street, Raleigh, NC 27601.	(919) 733-4885, Mr. David Pierce, Director.
North Dakota.....	Division of Environmental Research, Department of Health, Missouri Office Building, 1200 Missouri Avenue, Bismarck, ND 58505.	(701) 224-2348, Mr. Jay Crawford, Director.
Ohio.....	Department of Industrial Relations, Division of Onsite Consultation, P.O. Box 825, 2323 5th Avenue, Columbus, OH 43216.	(800) 282-1425 (Toll-free in State), (614) 466-7485, Mr. Andrew Doehnel, Project Manager.
Oklahoma.....	OSHA Division, Oklahoma Department of Labor, State Capitol, Suite 118, Oklahoma City, OK 73105.	(405) 521-2461, Mr. Charles W. McGlon, Director.
Oregon.....	Consultative Section, Department of Workers' Compensation, Accident Prevention Division, Room 102, Building 1, 2110 Front Street NE., Salem, OR 97310.	(503) 378-2890, Mr. Jack Buckland, Supervisor.
Pennsylvania.....	For information contact.....	Office of Consultation Programs, Room N3472, 200 Constitution Avenue NW., Washington, DC 20210, Phone: (202) 523-8985.
Puerto Rico.....	Occupational Safety & Health, Puerto Rico Department of Labor and Human Resources, 505 Munoz Rivera Ave., 21st Floor, Hato Rey, Puerto Rico 00919.	(809) 754-2134, Mr. John Cinque, Assistant Secretary, (Air Mail).
Rhode Island.....	Division of Occupational Health, Rhode Island Department of Health, The Cannon Building, 206 Health Department Building, Providence, RI 02903.	(401) 277-2438, Mr. James E. Hickey, Chief.

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State	Office and address	Contact
South Carolina	Consultation and Monitoring, South Carolina Department of Labor, P.O. Box 11329, Columbia, SC 29211.	(803) 758-8921, Mr. Robert Peck, Director, 7(c)(1), Project.
South Dakota	South Dakota Consultation Program, South Dakota State University, S.T.A.T.E.-Engineering Extension, 201 Pugsley Center-SOSO, Brookings, SD 57007.	(605) 688-4101, Mr. James Ceglian, Director.
Tennessee	OSHA Consultative Services, Tennessee Department of Labor, 2nd Floor, 501 Union Building, Nashville, TN 37219.	(615) 741-2793, Mr. L. H. Craig Director.
Texas	Division of Occupational Safety and State Safety Engineer, Texas Department of Health and Resources, 1100 West 49th Street, Austin, TX 78756.	(512) 458-7287, Mr. Walter G. Martin, P.E. Director.
Trust Territories	Service not yet available.	
Utah	Utah Job Safety and Health Consultation Service, Suite 4004, Crane Building, 307 West 200 South, Salt Lake City, UT 84101.	(801) 533-7927/8/9, Mr. H. M. Bergeson, Project Director.
Vermont	Division of Occupational Safety and Health, Vermont Department of Labor and Industry, 118 State Street, Montpelier, VT 05602.	(802) 828-2765, Mr. Robert McLeod, Project Director.
Virginia	Department of Labor and Industry, P.O. Box 12064, 205 N. 4th Street, Richmond, Va. 23241.	(804) 786-5875, Mr. Robert Beard, Commissioner.
Virgin Islands	Division of Occupational Safety and Health, Virgin Islands Department of Labor, Lagoon Street, Room 207, Frederiksted, Virgin Islands 00840.	(809) 772-1315, Mr. Louis Llanos, Deputy Director-DOSH.
Washington	Department of Labor and Industry, P.O. Box 207, Olympia, WA 98504.	(206) 753-6500, Mr. James Sullivan, Assistant Director.
West Virginia	West Virginia Department of Labor, Room 451B, State Capitol, 1900 Washington Street, Charleston, WV 25305.	FTS 8-885-7890, Mr. Lawrence Barker, Commissioner.
Wisconsin (Health)	Section of Occupational Health, Department of Health and Social Services, P.O. Box 309, Madison, WI 53701.	(608) 266-0417, Ms. Patricia Natzke, Acting Chief.
Wisconsin (Safety)	Division of Safety and Buildings, Department of Industry, Labor and Human Relations, 1570 E. Moreland Blvd., Waukesha, WI 53186.	(414) 544-8686, Mr. Richard Michelski, Supervisor.
Wyoming	Wyoming Occupational Health and Safety Department, 200 East 8th Avenue, Cheyenne, Wyo. 82002.	(307) 777-7786, Mr. Donald Owsley, Health and Safety Administrator.

APPENDIX H TO § 1910.95—AVAILABILITY OF REFERENCED DOCUMENTS

Paragraphs (c) through (o) of 29 CFR 1910.95 and the accompanying appendices contain provisions which incorporate publications by reference. Generally, the publications provide criteria for instruments to be used in monitoring and audiometric testing. These criteria are intended to be mandatory when so indicated in the applicable paragraphs of § 1910.95 and appendices.

It should be noted that OSHA does not require that employers purchase a copy of the referenced publications. Employers, however, may desire to obtain a copy of the referenced publications for their own information.

The designation of the paragraph of the standard in which the referenced publications appear, the titles of the publications, and the availability of the publications are as follows:

Paragraph designation	Referenced publication	Available from—
Appendix B	"List of Personal Hearing Protectors and Attenuation Data," HEW Pub. No. 78-120, 1975. NTIS-PB267461.	National Technical Information Service, Port Royal Road, Springfield, VA 22161.
Appendix D	"Specification for Sound Level Meters," S1.4-1971 (R1978).	American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.
§ 1910.95(k)(2), appendix E	"Specifications for Audiometers," S3.6-1969.	American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.

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(vi) When using area monitoring procedures and a sound level meter set to the C-weighting network:

(A) Obtain a representative sound level for the area in question.

(B) Subtract the NRR from the C-weighted sound level for that area.

APPENDIX C to § 1910.95—AUDIOMETRIC MEASURING INSTRUMENTS

This Appendix is Mandatory

1. In the event that pulsed-tone audiometers are used, they shall have a tone on-time of at least 200 milliseconds.

2. Self-recording audiometers shall comply with the following requirements:

(A) The chart upon which the audiogram is traced shall have lines at positions corresponding to all multiples of 10 dB hearing level within the intensity range spanned by the audiometer. The lines shall be equally spaced and shall be separated by at least ¼ inch. Additional increments are optional. The audiogram pen tracings shall not exceed 2 dB in width.

(B) It shall be possible to set the stylus manually at the 10-dB increment lines for calibration purposes.

(C) The slewing rate for the audiometer attenuator shall not be more than 6 dB/sec except that an initial slewing rate greater than 6 dB/sec is permitted at the beginning of each new test frequency, but only until the second subject response.

(D) The audiometer shall remain at each required test frequency for 30 seconds (± 3 seconds). The audiogram shall be clearly marked at each change of frequency and the actual frequency change of the audiometer shall not deviate from the frequency boundaries marked on the audiogram by more than ± 3 seconds.

(E) It must be possible at each test frequency to place a horizontal line segment parallel to the time axis on the audiogram, such that the audiometric tracing crosses the line segment at least six times at that test frequency. At each test frequency the threshold shall be the average of the mid-points of the tracing excursions.

APPENDIX D to § 1910.95—AUDIOMETRIC TEST ROOMS

This Appendix is Mandatory

Rooms used for audiometric testing shall not have background sound pressure levels exceeding those in Table D-1 when measured by equipment conforming at least to the Type 2 requirements of American National Standard Specification for Sound Level Meters, S1.4-1971 (R1976), and to the Class II requirements of American National Standard Specification for Octave, Half-Octave, and Third-Octave Band Filter Sets, S1.11-1971 (R1976).

TABLE D-1—MAXIMUM ALLOWABLE OCTAVE-BAND SOUND PRESSURE LEVELS FOR AUDIO-METRIC TEST ROOMS

Octave-band center frequency (Hz)	500	1000	2000	4000	8000
Sound pressure level (dB)	40	40	47	57	62

APPENDIX E to § 1910.95—ACOUSTIC CALIBRATION OF AUDIOMETERS

This Appendix is Mandatory

Audiometer calibration shall be checked acoustically, at least annually, according to the procedures described in this appendix. The equipment necessary to perform these measurements is a sound level meter, octave-band filter set, and a National Bureau of Standards 9A coupler. In making these measurements, the accuracy of the calibrating equipment shall be sufficient to determine that the audiometer is within the tolerances permitted by American Standard Specification for Audiometers, S3.6-1969.

(1) Sound Pressure Output Check

A. Place the earphone coupler over the microphone of the sound level meter and place the earphone on the coupler.

B. Set the audiometer's hearing threshold level (HTL) dial to 70 dB.

C. Measure the sound pressure level of the tones at each test frequency from 500 Hz through 6000 Hz for each earphone.

D. At each frequency the readout on the sound level meter should correspond to the levels in Table E-1 or Table E-2, as appropriate, for the type of earphone, in the column entitled "sound level meter reading."

(2) Linearity Check

A. With the earphone in place, set the frequency to 1000 Hz and the HTL dial on the audiometer to 70 dB.

B. Measure the sound levels in the coupler at each 10-dB decrement from 70 dB to 10 dB, noting the sound level meter reading at each setting.

C. For each 10-dB decrement on the audiometer the sound level meter should indicate a corresponding 10 dB decrease.

D. This measurement may be made electrically with a voltmeter connected to the earphone terminals.

(3) Tolerances

When any of the measured sound levels deviate from the levels in Table E-1 or Table E-2 by ± 3 dB at any test frequency between 500 and 3000 Hz, 4 dB at 4000 Hz, or 5 dB at 6000 Hz, an exhaustive calibra-

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tion is advised. An exhaustive calibration is required if the deviations are greater than 15 dB or greater at any test frequency.

TABLE E-1—REFERENCE THRESHOLD LEVELS FOR TELEPHONICS—TDH-39 EARPHONES

Frequency, Hz	Reference threshold level for TDH-39 ear-phones, dB	Sound level meter reading, dB
500.....	11.5	81.5
1000.....	7	77
2000.....	9	79
3000.....	10	80
4000.....	9.5	79.5
6000.....	15.5	85.5

TABLE E-2—REFERENCE THRESHOLD LEVELS FOR TELEPHONICS—TDH-49 EARPHONES

Frequency, Hz	Refer-ence threshold level for TDH-49 ear-phones, dB	Sound level meter reading, dB
500.....	13.5	83.5
1000.....	7.5	77.5
2000.....	11	81.0
3000.....	9.5	79.5
4000.....	10.5	80.5
6000.....	13.5	83.5

APPENDIX F TO § 1910.95—CALCULATIONS AND APPLICATION OF AGE CORRECTIONS TO AUDIOTAPES

This Appendix Is Non-Mandatory

In determining whether a standard threshold shift has occurred, allowance may be made for the contribution of aging to the change in hearing level by adjusting the most recent audiogram. If the employer chooses to adjust the audiogram, the employer shall follow the procedure described below. This procedure and the age correction tables were developed by the National Institute for Occupational Safety and Health in the criteria document entitled "Criteria for a Recommended Standard . . . Occupational Exposure to Noise," ((HSM)-11001).

For each audiometric test frequency;

(i) Determine from Tables F-1 or F-2 the age correction values for the employee by:

(A) Finding the age at which the most recent audiogram was taken and recording the corresponding values of age corrections at 1000 Hz through 6000 Hz;

(B) Finding the age at which the baseline audiogram was taken and recording the corresponding values of age corrections at 1000 Hz through 6000 Hz.

(ii) Subtract the values found in step (i)(B) from the value found in step (i)(A).

(iii) The differences calculated in step (ii) represented that portion of the change in hearing that may be due to aging.

EXAMPLE: Employee is a 32-year-old male. The audiometric history for his right ear is shown in decibels below.

Employee's age	Audiometric test frequency (Hz)				
	1000	2000	3000	4000	6000
26.....	10	5	5	10	5
*27.....	0	0	0	5	5
28.....	0	0	0	10	5
29.....	5	0	5	15	5
30.....	0	5	10	20	10
31.....	5	10	20	15	15
*32.....	5	10	10	25	20

The audiogram at age 27 is considered the baseline since it shows the best hearing threshold levels. Asterisks have been used to identify the baseline and most recent audiogram. A threshold shift of 20 dB exists at 4000 Hz between the audiograms taken at ages 27 and 32.

(The threshold shift is computed by subtracting the hearing threshold at age 27, which was 5, from the hearing threshold at age 32, which is 25). A retest audiogram has confirmed this shift. The contribution of aging to this change in hearing may be estimated in the following manner:

Go to Table F-1 and find the age correction values (in dB) for 4000 Hz at age 27 and age 32.

	Frequency (Hz)				
	1000	2000	3000	4000	6000
Age 32.....	6	5	7	10	14
Age 27.....	5	4	6	7	11
Difference.....	1	1	1	3	3

The difference represents the amount of hearing loss that may be attributed to aging in the time period between the baseline audiogram and the most recent audiogram. In this example, the difference at 4000 Hz is 3 dB. This value is subtracted from the hearing level at 4000 Hz, which in the most recent audiogram is 25, yielding 22 after adjustment. Then the hearing threshold in the baseline audiogram at 4000 Hz (5) is subtracted from the adjusted annual audio-

ATTACHMENT XI

OSHA POSTER

You Have a Right to a Safe and Healthful Workplace. **IT'S THE LAW!**

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



The *Occupational Safety and Health Act of 1970 (OSH Act)*, P.L. 91-596, assures safe and healthful working conditions for working men and women throughout the Nation. The Occupational Safety and Health Administration, in the U.S. Department of Labor, has the primary responsibility for administering the *OSH Act*. The rights listed here may vary depending on the particular circumstances. To file a complaint, report an emergency, or seek OSHA advice, assistance, or products, call 1-800-321-OSHA or your nearest OSHA office: • Atlanta (404) 562-2300 • Boston (617) 565-9860 • Chicago (312) 353-2220 • Dallas (214) 767-4731 • Denver (303) 844-1600 • Kansas City (816) 426-5861 • New York (212) 337-2378 • Philadelphia (215) 861-4900 • San Francisco (415) 975-4310 • Seattle (206) 553-5930. Teletypewriter (TTY) number is 1-877-889-5627. To file a complaint online or obtain more information on OSHA federal and state programs, visit OSHA's website at www.osha.gov. If your workplace is in a state operating under an OSHA-approved plan, your employer must post the required state equivalent of this poster.

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