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HEALTH AND SAFETY PLAN FOR THE CONTAMINATION ASSESSMENT AT AREA OF
CONCERN 2 NSA PANAMA CITY FL
10/2/2007
TETRA TECH

HEALTH AND SAFETY PLAN
FOR
CONTAMINATION ASSESSMENT AT AREA OF CONCERN (AOC) 2
AT
NAVAL SUPPORT ACTIVITY PANAMA CITY
PANAMA CITY, FLORIDA
COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY CONTRACT

Submitted to:
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Naval Facilities Engineering Command
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1.0 INTRODUCTION

This Health and Safety Plan (HASP) is specifically written for site activities that are to be conducted at the Naval Support Activity (NSA) Panama City, located in Panama City, Florida. This investigation will further characterize contamination in surface soils and ground water at Area of Concern (AOC) 2; the former location of Fuel Oil Tank No. 11. In addition to this HASP, a copy of the Tetra Tech NUS, Inc. (TtNUS) Health and Safety Guidance Manual (HSGM) must be at the site during the performance of site activities. The HSGM provides detailed information pertaining to the TtNUS H&S programs as well as TtNUS standard operating procedures (SOPs). Both documents must be present at the site to comply with the requirements stipulated in the Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120.

This HASP has been developed using the latest available information regarding known or suspected chemical contaminants and potential physical hazards associated with the proposed work and site activities. This HASP will be modified if new information becomes available. Changes to the HASP will be requested through the TtNUS Health and Safety Manager (HSM) and the Task Order Manager (TOM). It is the responsibility of the TOM to notify affected personnel of changes to this HASP.

1.1 AUTHORITY

This work is authorized under the Comprehensive Long - Term Environmental Action Navy (CLEAN) contract, administered through the U.S. Navy Southeast Naval Facilities Engineering Command, as defined under Contract No. N62467-94-D-0888; Contract Task Order (CTO) Number 0326.

1.2 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 on-site health and safety. These persons will be the primary points of contact for any questions regarding the safety and health procedures and the selected control measures that are to be implemented for on-site activities.

- The TtNUS TOM is responsible for the overall direction of health and safety for this project.
- The Project Health and Safety Officer (PHSO) is responsible for developing the HASP in accordance with applicable OSHA regulations. Specific responsibilities include:
 - i. Providing information regarding site contaminants and physical hazards associated with the site.

- ii. Establishing air monitoring and decontamination procedures.
 - iii. Assigning personal protective equipment (PPE).
 - iv. Determining emergency response procedures.
 - v. Stipulating training and appropriate training and medical surveillance requirements for TtNUS and subcontractor personnel.
 - vi. Identifying relevant standard work practices to minimize potential injuries and exposures associated with the project scope of work.
- The TtNUS Field Operations Leader (FOL) is responsible for implementation of the HASP with the assistance of an appointed Site Safety Officer (SSO). The FOL manages field activities, executes the work plan, and enforces safety procedures as applicable to the work plan.
 - The SSO supports site activities by advising the FOL on the aspects of health and safety on-site. These duties may include:
 - i. Coordinating health and safety activities with the FOL.
 - ii. Selecting, applying, inspecting, and maintenance of personal protective equipment.
 - iii. Establishing work zones and control points in areas of operation.
 - iv. Implementing air monitoring program for on-site activities.
 - v. Verifying training and medical clearance of on-site personnel status in relation to site activities.
 - vi. Implementing Hazard Communication and other associated health and safety programs, as they may apply to site activities.
 - vii. Coordinating emergency services.
 - viii. Providing site-specific training for on-site personnel.
 - ix. Investigating accidents and injuries (see Attachment I - 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 is monitored by the SSO and coordinated through the CLEAN Health and Safety Manager.

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

1.3 SITE INFORMATION AND PERSONNEL ASSIGNMENTS

Site Name: Naval Support Activity Panama City **Client Contact:** Arturo McDonald
Address: Panama City, Florida **Phone Number:** (850) 234-4773
Alternate Contact: _____
Phone Number: _____

Purpose of Site Visit: This field investigation will entail multiple tasks and activities (see Section 4.0), including installation of monitoring wells, development, purging, sampling and analysis for the purpose of a nature and extent investigation at AOC2

Proposed Dates of Work: September 2007 to completion

Project Team:

TtNUS Personnel:

Discipline/Tasks Assigned:

Rich May
Matthew M. Soltis, CIH, CSP
Rick Samuels
Larry Smith
Jacob Halfhill
Larry Smith

TOM
HSM
PHSO
FOL
Field Technician
SSO

Non-TtNUS Personnel

Affiliation/Discipline/Tasks Assigned

TBD

Drilling subcontractor(s)

Hazard Assessments (for purposes of OSHA 29 CFR 1910.132) and HASP preparation conducted by:

Rick Samuels

2.0 EMERGENCY ACTION PLAN

2.1 INTRODUCTION

This section has been developed as part of a planning effort to direct and guide field personnel in the event of an emergency. In the event of on-site emergencies, which cannot be handled by on-site personnel, site personnel will be evacuated to a safe place of refuge and the appropriate emergency response agencies will be notified. It has been determined that a majority of potential emergency situations would be better supported by outside emergency responders. Based on this determination, TtNUS personnel will not provide emergency response support beyond the capabilities of on-site response. Workers who are ill or who have suffered a non-serious injury may be transported by site personnel to nearby medical facilities, provided that such transport does not aggravate or further endanger the welfare of the injured/ill person. The emergency response agencies listed in this plan are capable of providing the most effective response, and as such, will be designated as the primary responders. These agencies are located within a reasonable distance from the area of site operations, which ensures adequate emergency response time. This emergency action plan conforms to the requirements of OSHA 29 CFR 1910.38(a), as allowed in OSHA 29 CFR 1910.120(l)(1)(ii).

TtNUS will through necessary services include incidental response measures for incidents such as:

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

2.2 EMERGENCY PLANNING

Through the initial hazard/risk assessment effort, injuries or illnesses resulting from exposure to chemical or physical hazards or fire are the most probable emergencies that could be encountered during site activities. To minimize and eliminate these potential emergency situations, emergency planning activities associated with this project include the following. The SSO and/or the FOL are responsible for:

- Coordinating with NSA Panama City Emergency Services personnel to ensure that TtNUS emergency action activities are compatible with existing facility emergency response procedures.

- Establishing and maintaining information at the project staging area (support zone) for easy access in the event of an emergency. This information will include the following:
 - Chemical Inventory (used on-site), with Material Safety Data Sheets (MSDSs).
 - On-site personnel medical records (medical data sheets).
 - A logbook identifying personnel on site each day.
 - Emergency notification phone numbers in site vehicles.

- Identifying a chain of command for emergency action. For this field effort, the FOL or the SSO shall serve as Incident Coordinator in the event of an incident. In the event the release cannot be controlled, Incident Command responsibilities 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.

It is understood that the use of two-way communication devices (cellular phones and radios) must be approved by the NSA Panama City Safety Office and such equipment will only be used with official permission. However, TtNUS is authorized to utilize two-way radio assigned to the Environmental Department. This radio is to be used only in the event of an emergency. It should only be activated if needed as the battery will only be charged periodically throughout the shift.

2.3 EMERGENCY RECOGNITION AND PREVENTION

The FOL and/or the SSO will preview site work locations prior to committing personnel or resources. They will:

- 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 vehicular 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, PPE, and emergency equipment such as portable fire extinguishers and first-aid kits]. Ensure emergency equipment and resources are at the ready, should they be needed for emergency response measures.

- Secure necessary permits and clearances, such as Utility Clearances, provided by the facility. When utility clearances are obtained record the proper documentation in the log book.
- Ensure personnel are adequately trained in the provisions of this HASP and this Emergency Action Plan.
- Identify potential emergencies during site activities such as: being struck by the equipment, becoming entangled in rotating machinery, striking an underground utility, being exposed to excessive noise levels, handling material injuries, and traffic hazards. The control measures for these hazards are presented in Section 6.2 of this HASP.

2.4 SAFE DISTANCES AND PLACES OF REFUGE

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

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

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

2.5 DECONTAMINATION PROCEDURES / EMERGENCY MEDICAL TREATMENT

During any site evacuation, decontamination procedures will be performed only if doing so does not further jeopardize the welfare of site workers. Decontamination will be postponed if the incident warrants immediate evacuation. However, it is unlikely that an incident would occur which would require workers to evacuate the site without first performing the necessary decontamination procedures.

TtNUS personnel will remove personnel from emergency situations and may provide initial medical support for injury/illnesses requiring only "Basic First-Aid" level support. Basic First-Aid is considered medical treatment that can be rendered by a trained first aid provider at the injury location and not requiring follow-up treatment or examination by a physician (for example; minor cuts, bruises, stings, scrapes, and burns). Treatment beyond basic first-aid, such as second or third degree burns, cuts, lacerations requiring stitches or butterfly bandaging, heat exhaustion, severe poisonous plant or insect bite reactions, or sprains will require more advanced medical attention. Personnel providing medical assistance are required to be trained in First-Aid and in the requirements of OSHA's Bloodborne Pathogen Standard (29 CFR 1910.1030). Medical attention above Basic First-Aid will require assistance and support from the designated emergency response agencies. If the emergency involves personnel exposures to chemicals, follow the steps provided in Figure 2-2, Potential Exposure Protocol.

2.5.1 Emergency Medical Treatment

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

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

- The FOL and/or the SSO 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 sterile gloves when handling cuts, abrasions, bites, punctures, etc. or any part of the injured person. The use of safety glasses and surgeons masks maybe necessary if there is the potential for uncontrolled spread of body fluids. The PHSO will be immediately notified in event that personnel providing emergency first-aid come into contact with body fluids or other potentially infectious tissues.

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

2.6 EMERGENCY ALERTING AND ACTION/RESPONSE PROCEDURES

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

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

- Initiate incident alerting procedures by radio or voice
- 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 the SSO will enact the emergency notification procedure to secure additional outside assistance in the following manner:

- Call 911 and report the emergency. Give the emergency operator the location of the emergency and a brief description of what has occurred
- Stay on the phone and follow the instructions given by the operator.
- The appropriate agency will be notified and dispatched.

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

- Initiate an evacuation (if needed) by voice commands, hand signals, air horns or two-way radio.
- Direct field personnel to proceed to the appropriate assembly points (as directed by NSA Panama City Emergency Services or other designated Navy personnel).

2.7 EMERGENCY CONTACTS

Prior to performing work at the site, personnel will be thoroughly briefed on the emergency procedures to be followed in the event of an incident. A cellular phone or designated land-line phone shall be identified and made available during on-site operations for the purpose of emergency notification. Table 2-1 provides a list of emergency contacts and their corresponding telephone numbers. This table must be posted on-site, where it is readily available to site personnel. If field personnel are operating at a number of isolated locations, additional copies should be made available to the field crew.

**TABLE 2-1
EMERGENCY CONTACTS
NAVAL SUPPORT ACTIVITY
PANAMA CITY, FLORIDA**

CONTACT	PHONE NUMBER
EMERGENCY (Police, Fire, and Ambulance Services)	911
Bay Medical Center (Primary Hospital)	(850) 769-1511
Seawind Medical Center (Alternate Hospital)	(850) 872-9701
Navy Onsite Representative at NSA, Panama City Arturo McDonald	(850) 234-4773
NSA Safety Officer	(850) 234-4332
Chemtrec	(800) 424-9300
National Response Center	(800) 424-8802
FOL Larry Smith	(850) 385-9866
TtNUS Office on Base	TBD
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 Rick Samuels	(770) 413-0965 ext 232
Task Order Manager Richard D. May	(850) 385-9899
Utilities Arturo McDonald	(850) 234-4743

2.8 EMERGENCY ROUTE TO HOSPITAL

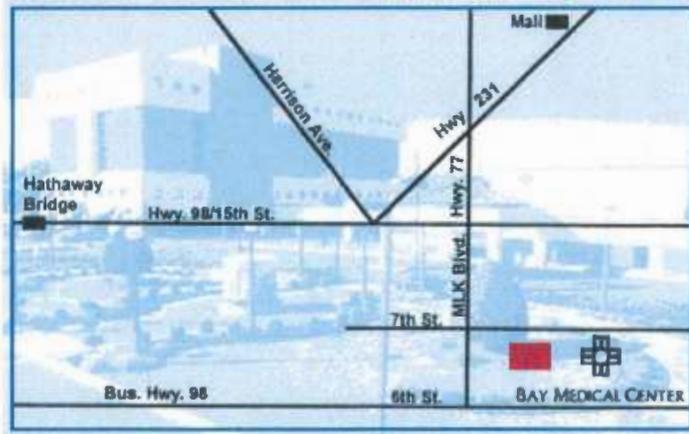
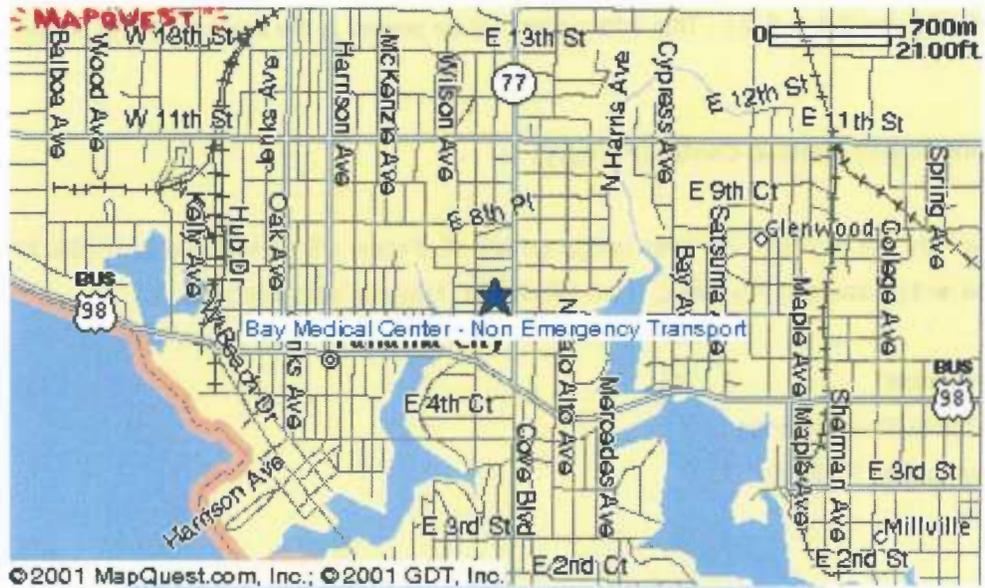
Maps and directions to both the Primary (Bay Medical Center) and Alternate (Seawind Medical Clinic) are provided (Figures 2-1 & 2-2.). This information will be posted in the field office and within each site project vehicle.

Directions to Bay Medical Center (Primary)

Take right out of NSA. Go over bridge on US 98. Follow US 98 to Cove Blvd (SR 77). Turn right on Cove and go south to 7th Street. Turn left on 7th. Hospital will be on right.

Bay Medical
615 North Bonita Avenue
Panama City, FL 32401

FIGURE 2-1
BAY MEDICAL CENTER MAP



Directions to Seawind Medical Clinic (Alternate)

The alternate source of medical assistance is Seawind Medical Clinic. Directions to this hospital are:

Take right out of NSA. Go over the bridge on US 98. Follow US 98 (1 1/2 mi. east of Hathaway Bridge)
Clinic is on the right side after crossing bridge.

Seawind Medical Clinic 4121 W. Highway 98 Panama City, FL

**FIGURE 2-2
SEAWIND CLINIC MAP**



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 SSO.

The FOL and/or the SSO should ensure the First-Aid Kits are stocked with the necessary equipment. First-aid kits purchased for the job-site shall be American National Standards Institute (ANSI) Z308.1 approved for industrial applications. The SSO 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.

2.10 INJURY/ILLNESS REPORTING

If any TtNUS personnel are injured or develop an illness as a result of working on site, the TtNUS "Incident Report Form" (Attachment I) must be followed. Following this procedure is necessary for documenting 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 II) which are to be completed for each worker and filed on-site. If an exposure to hazardous materials has occurred, provide information on the chemical, physical, and toxicological properties of the subject chemical(s) to medical service personnel, and follow the protocol specified in Figure 2-3.

FIGURE 2-3 POTENTIAL EXPOSURE PROTOCOL

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

In the event of a personnel injury or accident:

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

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

FIGURE 2-3 (continued)
WORKCARE
POTENTIAL EXPOSURE REPORT

Name: _____ Date of Exposure: _____
Social Security No.: _____ Age: _____ Sex: _____
Client Contact: _____ Phone No.: _____
Company Name: _____

I. Exposing Agent

Name of Product or Chemicals (if known): _____

Characteristics (if the name is not known)

Solid Liquid Gas Fume Mist Vapor

II. Dose Determinants

What was individual doing? _____

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

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

Was their skin contact? _____

Was the exposing agent inhaled? _____

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

III. Signs and Symptoms (check off appropriate symptoms)

Immediately With Exposure:

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

Delayed Symptoms:

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

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

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

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

Improved: _____ Worsened: _____ Remained Unchanged: _____

V. Treatment of Symptoms (check off appropriate response)

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

3.0 SITE BACKGROUND

This section provides information pertaining to NSA Panama City and the site that is to be investigated. This information will be revised if additional information becomes available or if additional sites are going to be investigated.

3.1 SITE HISTORY

NSA is located in Panama City, Bay County, Florida. Bay County is located on the Gulf of Mexico in Florida's panhandle, approximately 100 miles southwest of Tallahassee. NSA was placed on the United States Environmental Protection Agency's (EPA's) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) National Priorities List (NPL) as a result of pollution resulting from past waste disposal practices that predate CERCLA. NSA was first established in 1942 as a harbor for World War II convoy ships and as a liaison with a nearby shipyard. The United States Department of the Navy has entered into a Federal Facilities Agreement with EPA to define the overall extent of contamination. Additional information concerning the historical background, current site conditions, and other contamination assessments may be found in the accompanying project plan.

NSA is a government-owned and contractor-operated facility. NSA consists of two operational areas, which together comprise approximately 657 acres. The laboratory consists of approximately 360 acres and the ordnance area, which covers approximately 300 acres, is primarily for ordnance storage and limited research. (Note: The planned activities described in this HASP will occur outside of ordnance areas.)

3.2 SPECIFIC SITE AREA TO BE INVESTIGATED – AOC2

AOC2 was defined by the former location of Fuel Oil Tank No. 11, which was a 420,000 gallon aboveground storage tank (AST), and the associated transfer piping. Tank 11 was part of a petroleum storage and distribution facility that included pump houses and a fuel dispensing station with other storage tanks.

Tank 11 was constructed in 1943 and was originally used to store diesel fuel. Petroleum products were transferred to Tank 11 from the South Dock via a 6 inch underground transfer line connected to a pump house at the South Dock. A smaller 3 inch transfer line connected Tank 11 to a pump house located approximately 100 feet to the northwest of the tank (the current location of Building 543). A circular earthen berm spaced approximately 60 feet from the tank provided secondary containment.

The pump house associated with Tank 11 was used to distribute fuel from Tank 11 and tanks associated with the former fuel dispensing facility located approximately 200 feet to the northwest of Tank 11 (the current location of Building 400). Two parallel 3 inch transfer lines distributed diesel fuel and gasoline from the pump house to the South Dock. Additional smaller diameter fuel lines may have been used to distribute fuel to other locations in the vicinity of Tank 11.

Approximately 50,000 gallons of diesel fuel were reportedly lost from the tank system in 1953. The exact location of the leak and whether or not the underground piping had failed is unknown. Tank 11 was completely refurbished in 1957, including replacement of 28 bottom plates. The tank was then reportedly used to store gasoline, aviation fuel, diesel fuel, and waste oil. Numerous small leaks, primarily at the tank seams, were reported to have occurred both before and after the tank was refurbished. In the mid 1960s, an estimated 10,000 gallons of oil were released from ruptured fuel transfer lines located between the dock and storage tank. Following the rupture, seepage of diesel oil was observed in Alligator Bayou at the South Dock bulkhead.

Tank 11 and the containment berm were removed in 1979. Reportedly, the bottom plates of the tank had completely deteriorated. The transfer piping from the tank wall to the containment berm was removed. The remaining piping was capped and abandoned in place. Based on utility drawings of the area, the fuel dispensing station and the fuel pump house were apparently removed at some time after 1984. Building 400 was built in the area of the former fuel dispensing station. Building 543 has recently been constructed in the area of the former fuel pump house.

In July 1997, NSA personnel detected a fuel release into Alligator Bayou. During the investigation of the fuel release, petroleum product was detected entering a storm sewer drain junction box located down gradient of AOC2. The storm sewer drainpipe runs beneath Site 333 and adjacent to Tank 307 before entering an outfall in the sea wall at Alligator Bayou, where the initial fuel release was detected. A Contamination Assessment Report (CAR) was submitted for Site 333 in February 1997. The CAR indicated that dissolved hydrocarbon concentrations exceeded the groundwater cleanup target levels (GCTLs) in some wells. Over pumping of these wells was performed in June 1997. The wells were resampled and the CoC concentrations were below the GCTLs, however, while the CAR Addendum was in preparation, a product release occurred in Alligator Bayou. It was then agreed that the preparation of the report would be cancelled and Site 333 and AOC2/SWMU1 would be combined.

TtNUS conducted assessment activities in 1998 to determine the source of the free product observed in the storm sewer and Alligator Bayou. Approximately 29 soil borings, nine monitoring wells and five piezometers were installed and sampled to evaluate the nature and extent of petroleum impacted soil and groundwater in the vicinity of AOC2. Free product was detected in one of the monitoring wells, PCY-

AOC2-MW07, which is located approximately 100 feet to the southwest of the former location of Tank 11 and adjacent to the parallel 3 inch transfer lines.

Additional soil and groundwater screening was conducted in 2000 to evaluate the extent of free product in the vicinity of PCY-AOC2-MW07 and to provide a preliminary assessment of the transfer piping, evaluating the need for a pipeline closure assessment. Twenty-four soil borings were advanced in the AOC2/SWMU1 study area to collect soil samples for headspace screening and soil and groundwater samples for analysis by an onsite laboratory. A total of nine monitoring wells were installed during this site investigation. Five of the wells were completed as permanent wells and four of the wells were abandoned. The soil and groundwater screening results from this investigation indicate that petroleum impact has occurred in the area south and southwest of AOC2. The area of petroleum impact to soil and groundwater apparently extends to the north, west, and east of the area previously investigated.

Additional site assessment activities were conducted in September 1999 and June 2002. During each of these events, data was collected to further characterize the nature and extent of petroleum impacted soil and groundwater. Data collected during the June 2003 event indicates that additional assessment is required to delineate the horizontal and vertical extent of contamination.

4.0 SCOPE OF WORK

This section describes the project tasks that will be performed at NSA. Additionally, each task has been evaluated and the associated hazards and recommended control measures are listed in Table 5-1 of this HASP. The planned activities involved in this effort are presented in detail in the Corrective Measures Implementation Plan developed for the project. If new tasks are to be performed at the site, Table 5-1 and this section will be modified accordingly. Specific tasks to be conducted include, but are not necessarily limited to, the following:

- Mobilization/Demobilization Activities
- Soil boring and monitoring well installation using hollow stem auger (HSA) methods
- Groundwater Sampling
- Soil Sampling
- Decontamination of Sampling and Heavy Equipment
- Geographical and Geophysical Surveying of Monitoring Well Locations

For additional information on scope of work activities, refer to the associated Plan of Action for CTO 0326 or other related documents (Work Plan, Sampling and Analysis Plan (SAP)).

5.0 TASKS/HAZARDS/ASSOCIATED CONTROL MEASURES

Table 5-1 of this section serves as the primary portion of the site specific HASP which identifies the tasks that are to be performed as part of the scope of work. The anticipated hazards, recommended control measures, air monitoring recommendations, required PPE, and decontamination measures for each site task are discussed in detail. This table and the associated control measures will be revised, if the scope of work, contaminants of concern, or other conditions change.

Through using the table, site personnel can determine which hazards are associated with each task at each site, and what associated control measures are necessary to minimize potential exposure or injuries related to those hazards. The table also assists field team members in determining which PPE and decontamination procedures to use based on proper air monitoring techniques and site-specific conditions.

A Health and Safety Guidance Manual must accompany this table and the HASP. The HSGM should be referenced for additional information regarding air monitoring instrumentation, decontamination activities, emergency response, hazard assessments, hazard communication and hearing conservation programs, medical surveillance, PPE, respiratory protection, site control measures, standard work practices, and training requirements. Many of TtNUS' SOPs are also provided in this Guidance Manual.

Safe Work Permits issued for major activities (See Section 9.4) will use elements defined in Table 5-1 as the primary reference. The FOL or the SSO completing the safe work permit will add additional site-specific information. In situations where the safe work permit is more conservative than the direction provided in Table 5-1 due to the incorporation of site-specific elements, the safe work permit will be followed.

5.1 GENERAL SAFE WORK PRACTICES

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

- Refrain from eating, drinking, chewing gum or tobacco, taking medication, or smoking in contaminated or potentially contaminated areas or where the possibility for the transfer of contamination exists.

- Wash hands and face thoroughly upon leaving a contaminated or suspected contaminated area. A thorough shower and washing must be conducted as soon as possible if excessive skin contamination occurs.
- Avoid contact with potentially contaminated substances by walking around puddles, pools, mud, or other such areas. Avoid, whenever possible, kneeling on the ground or leaning or sitting on equipment. Do not place monitoring equipment on potentially contaminated surfaces.
- Be familiar with and adhere to the instructions in the site-specific HASP.
- Be aware of the location of the nearest telephone and emergency telephone numbers. See Section 2.0, Table 2-1.
- Attend briefings on anticipated hazards, equipment requirements, Safe Work Permits, emergency procedures, and communication methods before going on site.
- Plan and mark entrance, exit, and emergency escape routes. See Section 2.0.
- Rehearse unfamiliar operations prior to implementation.
- Maintain visual contact with each other and with other on-site team members by remaining in close proximity in order to assist each other in case of emergency.
- Establish appropriate Safety Zones including Support, Contamination Reduction, and Exclusion Zones.
- Minimize the number of personnel and equipment in contaminated areas (such as the Exclusion Zone). Non-essential vehicles and equipment should remain within the Support Zone.
- Establish appropriate decontamination procedures for leaving the site.
- Immediately report injuries, illnesses, and unsafe conditions, practices, and equipment to the SSO.
- Observe coworkers for signs of toxic exposure and heat or cold stress.
- Inform co-workers of potential symptoms of illness, such as headaches, dizziness, nausea, or blurred vision.

**TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES NAVAL SUPPORT ACTIVITY PANAMA CITY PANAMA CITY, FLORIDA**

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Task/Operation and Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring Times and Action Levels	Personal Protective Equipment	Decontamination Procedures
<p>Mobilization and Demobilization</p> <p>This activity includes, but is not limited to:</p> <ul style="list-style-type: none"> - Equipment Preparation and Inspection - Resource acquisition and unpacking of supplies - Site clearance and preparation – Utility clearances, etc. - Establish and construct access routes to sample/work locations, where applicable. - Construct decontamination and IDW operation and 	<p>Chemical hazards:</p> <p>1) Chemicals brought on site by TtNUS personnel</p> <p>Physical hazards:</p> <p>2) Lifting (strain/muscle pulls) 3) Cuts and lacerations 4) Pinches and compressions/Struck by 6) Vehicular and foot traffic</p> <p>Natural hazards:</p> <p>7) Ambient temperature extremes (heat/cold stress) 8) Insect and animal bites and poisonous plants 9) Inclement weather</p>	<p>1) All personnel will be required to review the appropriate MSDS's, prior to the use of a specified chemical substance. Information on hazards and PPE will be communicated on the Safe Work Permit 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. The on-site Hazard Communication Program (Section 5.0 TtNUS Health and Safety Guidance Manual) will be followed. All chemicals brought onto the site by Tetra Tech NUS and subcontractor personnel will be inventoried with each applicable chemical having an MSDS on site. This effort shall include</p> <p>Accurate Chemical Inventory List (Entries will match chemicals brought on-site, as the names appear on the MSDS and the label) This list, which also includes quantities and storage locations will be maintained in a centralized location and made available upon request.</p> <p>MSDS's will be maintained in a central location, accessible to all personnel.</p> <p>All containers will have labels specifying the following information:</p> <ul style="list-style-type: none"> - Chemical Identity (As it appears on the label, MSDS, and Chemical Inventory List) - Appropriate Warning (i.e., Eye and skin irritation, flammable, etc.) - Manufacturer's Name Address and Phone Number <p>It will be the FOL and/or the SSO's responsibility to insure this is completed.</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. - Use proper lifting techniques - 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. - 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>In determining whether you can lift an item several factors must be considered, these are as follows: Maximum weight lifted by a single person should not exceed 70 pounds. Items over 70 pounds or the amount you feel you can confidently lift up to 70 pounds should define the point where assistance in the</p>	<p>Visual observation of work practices by the FOL and/or the SSO to minimize potential physical hazards (i.e., improper lifting, unsecured loads, cutting practices, etc.). Monitoring for chemical hazards are not required during this activity.</p>	<p>(Items in italics are deemed optional as conditions or the FOL or SSO dictate.)</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</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 (At the direction of the FOL and/or the SSO).</i> - <i>Flotation Devices when near waters edge/muddy/bog areas</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"> - <i>Fire Extinguishers</i> - <i>First-aid kit</i> 	<p>Not required.</p> <p>Good personal hygiene practices should be employed prior to lunch breaks or other periods when hand to mouth contact occurs. This will minimize potential ingestion exposures.</p> <p>Site Preparation – A structured decontamination is not required for this activity. However, as some site preparation activities may require personnel to enter unimproved areas (heavy underbrush wooded areas) personnel should inspect themselves and one another for the presence of ticks when exiting wooded areas, grassy fields, etc. This action will be employed to assist in stopping the transfer of these insects into vehicles, homes, and offices.</p>

**TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES NAVAL SUPPORT ACTIVITY PANAMA CITY, PANAMA CITY, FLORIDA**

Rev. 0
10/02/07

Task/Operation/Location	Identified Hazards	Recommended Control Measures	Hazard Monitoring Type and Action Levels	Personal Protective Equipment that shall be worn when a control of the FOL or SSO is used	Decontamination Procedures
<p>Hollow Stem Auger (HSA) Operations including:</p> <ul style="list-style-type: none"> - Soil borings - Subsurface, soil sampling using HSA with split spoon - Monitoring Well Installations <p>This activity will also include monitoring well installation and site restoration.</p>	<p>Chemical hazards:</p> <p>1) Background information indicates the potential for the following contaminants to be present:</p> <ul style="list-style-type: none"> • BTEX and diesel <p>The potential exists for elevated concentrations of contaminated airborne particulate. The greatest potential for exposure is anticipated to occur through inhalation of airborne dusts or incidental ingestion of contaminated media.</p> <p>Further information on these contaminants is provided in 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 (inch/compressions points)</p>	<p>1) Safe work practices are used as the first line of defense. Avoid contact with contaminated media (air, water, soils, etc.). These control measures include avoiding hand-to-mouth contact, washing hands and face or using hygienic wipes to remove potential contaminants from hands and face prior to breaks or lunch. Airborne dusts should be avoided, and whenever possible, controlled through the use of area wetting methods. If dusts are observed and cannot be controlled, then site activities will be suspended until dust monitoring is available or upgraded levels of protection are provided.</p> <p><i>Liquids/gases</i> – 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.</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 along with dedicated sampling equipment will insure materials are not carried and deposited in unaffected areas. <p>3) Heavy Equipment Hazards - All equipment will be:</p> <ul style="list-style-type: none"> - Inspected prior to use on site and at least weekly thereafter. All inspections will be documented using the Equipment Inspection Checklist found in (See Attachment III) of this HASP. - Operated and supported by knowledgeable operators and ground crew. - Used within safe work zones, with routes of approach clearly demarcated. All personnel not directly supporting this operation will remain at least 25 feet from the point of operation. See Section 9.0 of this HASP. This will be the area identified as the exclusion zone. - 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. - Areas will be inspected prior to the movement of the HAS and support vehicles to eliminate any physical hazards. This will be the responsibility of the FOL and/or SSO. - The drill rigs, and support vehicles will be moved no closer than 5-feet to unsupported side-walls of excavations and embankments. - See safe work permit for drilling in Appendix V of this HASP. <p>4) Noise in Excess of 85 dBA - Hearing protection will be used during all subsurface activities using the HSA drill or when noise levels are >85 dBA. (during operation). Previous accumulated data indicates the HSA Drill rig averaged 89-96dBA. 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 plus 5-feet is suitable for the HSA Drill Rig. - Hearing protection. +Excessive noise levels (>85dBA) are being approached when you have to raise your voice to talk to someone within 2 feet of your location. <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</p>	<p>1) Monitoring shall be conducted to as a general screening effort to qualify and quantify estimated source concentrations of site contaminants in support of the prescribed worker protection levels.</p> <p>Monitoring shall be conducted using a Photoionization Detector (PID) with 10.2eV lamp strength or greater, or an FID (at the SSO's discretion).</p> <p>Action Level for Volatile Emissions</p> <p>Action level - 10 ppm in the workers breathing zone for no greater than 10 minutes duration, no more than 4 occurrences in a single day. Action levels of this level will protect personnel from achieving the most conservative TLV/TWA.</p> <p>Concentration in excess of this action level requires personnel to stop work and notify PHSO.</p> <p>Monitoring shall be conducted at the prescribed depths as indicated on the</p>	<p>All soil 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(when within 25-feet of the direct push rig) - Safety Glasses(when within the established site control boundaries of the drill or direct push rig or when sampling) - Nitrile surgeon style inner gloves for sampling - Hearing protection(when within established boundaries of an operating direct push and/or drill rig) - <i>Impermeable boot covers</i> - <i>Reflective vest for traffic areas</i> <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 	<p>Personnel Decontamination will consist of a soap/water wash and rinse for reusable and non-reusable outer protective equipment (boots, gloves, impermeable apron, as applicable</p> <p>Gross contamination of outer boots and outer gloves will be removed at a satellite location near the operation. Final wash and rinse will take place at the centralized decontamination pad. The sequential procedure is as follows:</p> <p>Stage 1: Equipment drop, remove any outer protective wrapping; Decontamination personnel will wipe down the outer shells 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 or impermeable apron, as applicable.</p> <p>Stage 4: Disposable PPE will be removed and bagged.</p> <p>Stage 5: Wash face and hands</p> <p>Note: For remote locations away from the centralized decontamination unit.</p>

**TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES NAVAL SUPPORT ACTIVITY PANAMA CITY PANAMA CITY, 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 of the FOL or SSO dictate)	Decontamination Procedures
<p>Multi-media sampling, including</p> <ul style="list-style-type: none"> - Groundwater - Surface soils - Subsurface soils - IDW. 	<p>Chemical hazards:</p> <p>1) Background information indicates the potential for the following contaminants to be present:</p> <ul style="list-style-type: none"> • BTEX, diesel <p>Elevated airborne readings are unlikely to be encountered during sampling activities. Further information on these contaminants is provided in 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>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. Minimize potential exposure with sampling materials by using latex gloves along with good work and personal hygiene practices. These control measures including 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. Dust suppression methods including area wetting will be employed to control mechanically generated dust emissions. <i>Liquids/gases</i> – 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 of these subsurface media, all samples will be scanned with a PID to determined potential source concentration.</p> <p>2) Transfer of Contamination into Clean Areas - Decontaminate all equipment and supplies between sampling locations and prior to leaving the site. See decontamination of heavy and sampling equipment for direction in this task.</p> <p>3) Slip, Trip, and Fall Hazards – These hazards shall be minimized by adherence to the practices listed below. This includes</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. - Cover, guard, barricade, and or place warning postings over/at holes or openings that personnel may fall or step into. - For traversing steep, slippery, or sloped terrain establish rope ladders to control ascent and descent to sampling areas or use alternative pathways. - Regular Ladders should be placed to allow access and egress from steep embankment and levy walls when collecting samples along Pettibone Creek and the Boat Basin. - 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>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"> - Select and secure the most favorable route to monitoring wells and sampling locations. - Previewing pathways - Where possible, remove or demarcate the physical hazards. 	<p>1) Monitoring shall be conducted as a general screening effort to qualify and quantify estimated source concentrations of site contaminants in support of the prescribed worker protection levels.</p> <p>Monitoring shall be conducted using a Photoionization Detector (PID) with 10.2eV lamp strength or greater or an PID (at the SSO's discretion)</p> <p>Action level – Any sustained reading greater than 10 ppm in the workers breathing zone for no greater than 10 minutes duration, no more than 4 occurrences in a single day. Action levels of this level will protect personnel from achieving the most conservative TLV/TWA.</p> <p>Concentration in excess of this</p>	<p>Level D protection will be utilized for the following sampling activities</p> <p>Surface water, groundwater and soils</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 - Safety Glasses - Nitrile surgeon style inner gloves for sampling - <i>Impermeable boot covers</i> - <i>Reflective vest for traffic areas</i> <p>Protective Measures as specified for drilling and soil boring will be employed for all subsurface soil and groundwater sampling.</p>	<p>Personnel Decontamination</p> <p>Sampling groundwater and soils, the following provisions will apply</p> <p>Upon completion of the sampling dedicated trowels, tubing, etc. will be bagged for transport back to the central decontamination area.</p> <ul style="list-style-type: none"> - 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</p>

**TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES NAVAL SUPPORT ACTIVITY PANAMA CITY PANAMA CITY, FLORIDA**

Tasks/Operational Locations	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring Type and Action Level	Personal Protective Equipment (Items in <i>italics> are deemed optional, as conditions or the FOL or SSO dictate.)</i>	Decontamination Procedures
<p>Decontamination of Sampling and Heavy Equipment</p> <p>It is anticipated that this activity will take place at a centralized location. Gross contamination will be removed to the extent possible at the site. Contaminated tools 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) Background information indicates the potential for the following contaminants to be present:</p> <ul style="list-style-type: none"> • BTEX and Diesel fuel <p>2) Decontamination fluids - Liquinox (detergent); isopropanol (decontamination solvent)</p> <p>Physical hazards:</p> <p>3) Lifting (strain/muscle pulls) 4) Noise in excess of 85 dBA 5) Flying projectiles 6) Falling hazards 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 decontamination fluids. Control potential 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 TINUS Health and Safety Guidance Manual.</p> <p>3) Use multiple persons where necessary for lifting and handling heavy equipment for decontamination purposes.</p> <ul style="list-style-type: none"> - Use proper lifting techniques as described in Table 5-1, Mobilization/Demobilization. <p>4) Wear hearing protection when operating the pressure washer and/or steam cleaner. Sound pressure levels measured during the operation of similar pieces of equipment indicate a range of 87 to 93 dBA.</p> <p>5) Use eye and face protective equipment when operating the pressure washer and/or steam cleaner, due to flying projectiles. All other personnel must be restricted from the area. In addition to minimize hazards (flying projectiles, water lacerations and burns) associated with this operation, the following controls will be implemented</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. - Thermostat control will be in place and operational to control the temperature levels of the water where applicable. - Visual evaluations of hoses and fittings for structural defects - Construct deflection screens as necessary to control overspray and to guard against dispersion of 	<p>Use visual observation and real-time monitoring instrumentation to ensure all equipment has been properly cleaned of contamination and dried.</p> <p>Monitoring instrumentation (FID or PID) will be employed 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>Concentrations in excess of the action level require personnel to stop work, notify</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 - Nitrile outer gloves over nitrile inner gloves - Safety glasses underneath a splash shield - Hearing protection (plugs or muffs) - Hooded PVC Rainsuits or PE or PVC coated Tyvek. 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 for decontamination fluids/solvents. 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) - Nitrile outer gloves over nitrile inner gloves 	<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>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. Stage 2: Soap/water wash and rinse of outer boots and gloves Stage 3: Soap/water wash and rinse of the outer splash suit, as applicable Stage 4: Disposable PPE and equipment will be removed and bagged. Stage 5: Wash face and hands</p> <p>Equipment Decontamination - All heavy equipment decontamination will take place at a centralized decontamination pad utilizing a steam cleaner or pressure washer. Heavy equipment will have the wheels and tires cleaned along with any loose debris removed, prior to transporting to the central decontamination area. All site vehicles will have restricted access to exclusion zones, and have their wheels/tires cleaned/sprayed off as not to track mud onto the roadways servicing this installation. Roadways shall be cleared of any debris resulting from the on-site activity.</p> <p>Sampling Equipment Decontamination</p> <p>Sampling equipment will be decontaminated as per the requirements indicated within the Work Plan.</p> <p>All equipment used in the exclusion zone will require a complete decontamination</p>

**TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES NAVAL SUPPORT ACTIVITY PANAMA CITY PANAMA CITY, FLORIDA**

Tasks/Operation/Conditions	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring (Type And Action Levels)	Personal Protective Equipment (Items In Italic Are Deemed Optional As Conditions Of The OIL OSHA SSC Directives)	Decontamination Procedures
<p>Land Surveying – Geographical and Geophysical</p> <p>The locations identified to be surveyed are predominantly located within light industrial improved areas.</p>	<p>Chemical hazards:</p> <p>Significant exposure to site contaminants is anticipated to be unlikely given the nature of this task.</p> <p>Physical hazards:</p> <p>1) Slips, trips, and falls</p> <p>2) Struck by</p> <p>3) Ambient temperature extremes (heat/cold stress)</p> <p>Natural hazards:</p> <p>4) Inclement weather</p> <p>5) Insect/animal bites or stings, poisonous plants, etc.</p>	<p>Physical hazards:</p> <p>1) Preview work locations and site lines for uneven and unstable terrain. Clear necessary vegetation; establish temporary means for traversing hazardous terrain (i.e., rope ladders, etc.)</p> <p>2) If hand tools (brush hooks, machetes, etc.) are necessary to clear and carry lines and bench marks to the area of operation the following precautions are recommended:</p> <ul style="list-style-type: none"> - Insure handles are of good construction (no cracks, splinters, and 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. - All personnel will maintain a 10-foot perimeter around persons clearing brush. <p>Note: It is not anticipated that trees >2-inch girth will be required to be dropped as part of this operation or that significant amount of clearing will be required. Therefore the use of chainsaws and chippers as well as other motorized equipment will not be addressed.</p> <p>3) Ambient Temperature Extremes (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. - Under conditions of elevated temperatures allow for periods of acclimatization. <p>Natural hazards:</p> <p>4) Suspend or terminate operations until directed otherwise by SSO</p> <p>5) To combat the potential impact of natural hazards, the following actions are recommended</p> <ul style="list-style-type: none"> - Avoid nesting – Preview routes, avoid nests if at all possible 	<p>Air monitoring is not required given the unlikelihood that airborne contaminants will be present. The potential for exposure to site contaminants during this activity is considered minimal.</p>	<p>Surveying activities shall be performed in Level D protection</p> <p>Level D Protection consists of the following:</p> <ul style="list-style-type: none"> - Standard field dress including sleeved shirt and long pants - Shoes rugged lug sole for traction - Work gloves shall be worn when clearing brush. - <i>Safety glasses, hard hats (if working near machinery, overhead hazards, or clearing brush)</i> - <i>Snake chaps for heavily wooded area where encounters are likely.</i> - <i>Tyvek coveralls may be worn to provide additional protection against poisonous plants and insects particularly ticks.</i> - <i>Reflective or blaze orange vests should be worn when working along traffic thoroughfares.</i> - <i>Identified flotation devices for work on or near waters edge.</i> <p>Note: The Safe Work Permit(s) for this task (See Attachment V) 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 - A structured decontamination is not required as the likelihood of encountering contaminated media is considered remote. However, survey parties should inspect themselves and one another for the presence of ticks when exiting wooded areas, grassy fields, etc. This action will be employed to stop the transfer of these insects into vehicles, homes, and offices. In addition, early detection shall provide for early removal.</p>

6.0 HAZARD ASSESSMENT

The following section provides information regarding the chemical and physical hazards associated with the activities that are to be conducted as part of the scope of work. Table 6-1 provides information related to the chemical hazards that may be present at the site. Specifically, toxicological information, exposure limits, symptoms of exposure, physical properties, and air monitoring and sampling data are discussed in the table. It should be noted that the contaminants of concern might vary between tasks.

6.1 CHEMICAL HAZARDS

The potential health hazards associated with the scope of work include inhalation, ingestion, and dermal contact of site contaminants. Exposure is most likely to occur through ingestion (hand-to-mouth contact) and inhalation of contaminated soil or water, or contact with the skin. For this reason, PPE and basic hygiene practices (washing face and hands before leaving site) is extremely important.

6.1.1 Site Specific Chemical Hazards

Based on available analytical data from previous site investigations, none of the contaminants of concern are likely to present an inhalation hazard to site workers. Additionally, site personnel have limited potential for contact with contaminants based on the planned activities, and the generation of contaminant-laden dusts is unlikely to be present. As a precaution, exposures (via inhalation, ingestion, or skin contact) to potential contaminants of concern will be minimized by the use of PPE and good hygiene practices. Site personnel will also use the safe work practices outlined in this HASP. For further information on these contaminants and other potential contaminants see Table 6-1.

**TABLE 6-1
CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA
NAVAL SUPPORT ACTIVITY, PANAMA CITY, FLORIDA – CTO 0326**

Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Diesel Fuel No.2-D	Mixture	Components of this substance will be detected readily; however, no documentation exists as to the relative response ratio of an FID.	Air sampling use charcoal tube as a collection media; carbon disulfide desorption; GC/FID detection. Sampling and analytical protocol in accordance with NIOSH Method #1550.	OSHA; NIOSH; ACGIH: 5 mg/m ³ as mineral oil mist. In addition NIOSH and ACGIH establish 10 mg/m ³ as a STEL.	Kerosene odor Recommended air-purifying cartridges: Organic vapor Recommended gloves: Nitrile	Boiling Pt: <300-550°F; 149-288°C Melting Pt: Not available Solubility: Negligible Flash Pt: 95-145°F; 35-62°C Autoignition: 475°F, 246°C LEL/LFL: 0.6% UEL/UFL: 8.0% Vapor Density: >5 Vapor Pressure: <0.1 mmHg @ 70°F; 21°C Specific Gravity: 0.80 Incompatibilities: strong oxidizers, halogens, and hypochlorites Appearance and odor: Colorless to amber with a kerosene odor	Prolonged or repeated exposures to this product may cause skin and eye irritation. Because of the defatting capabilities, this exposure may lead to a dermatitis condition. High vapor concentrations are irritating to the eyes and respiratory tract. Exposure to high airborne concentrations may result in narcotic effects, including dizziness, headaches, and anesthetic capabilities leading to unconsciousness. High concentrations in a confined space may adequately displace oxygen thereby resulting in suffocation.
Benzene	71-43-2	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: 0.5 ppm (skin) STEL: 2.5 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.
Toluene	108-88-3	FID: 110% response	Air sample using charcoal tube; carbon	OSHA: 200 ppm	Adequate - Odor threshold 1.6 ppm is considered good. Can	Boiling Pt: 232°F; 111°C Melting Pt: -139°F; -95°C	Overexposure to this substance may result in mild to moderate irritation at

**TABLE 6-1
CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA
NAVAL SUPPORT ACTIVITY, PANAMA CITY, FLORIDA – CTO 0326**

Substance	CAS No.	Air Monitoring/Sampling Information	Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information	
Xylene All isomers o-, m-, p-	1330-20-7	FID: 110% response with FID.	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, STEL 150 ppm 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.

6.2 PHYSICAL HAZARDS

The following is a list of physical hazards that may be encountered at the site or may present during the performance of site activities associated with the scope of work. Some of these hazards are discussed below while the rest are discussed in the TiNUS Health and Safety Guidance Manual.

- Slips, trips, and falls
- Cuts (or other injuries associated with hand tool use)
- Energized systems (contact with underground or overhead utilities)
- Lifting (strain/muscle pulls)
- Ambient temperature extremes (cold and heat stress)
- Pinches and compressions
- Heavy equipment hazards (rotating equipment, hydraulic lines, etc.)
- Vehicular and foot traffic
- Noise in excess of 85 dBA

6.2.1 Slips, Trips, And Falls

Conditions such as steep terrain and/or heavy vegetation may create an increased potential for slip, trip, and fall hazards

- The safest approach to sample points will be identified and cleared to permit field crew access to sample locations.
- Establish anchor points and rope handrails for traversing/ascending/descending angles and slopes greater than 45 percent grade.
- Footwear with an adequate traction.
- Prepare work areas by removing tripping hazards (ruts, roots, debris, etc.). This is especially critical around operating equipment, where a fall could be life threatening.

6.2.2 Cuts or Other Injuries Associated with Hand Tool Use

The control measures presented below will help minimize the potential for injuries associated with sharp objects or material handling activities related to field work.

- Wear leather or heavy cotton work gloves when using tools to protect against blisters, cuts, or other hand injuries.
- Wear eye protection (safety glasses with side shields) to protect the eyes from flying debris.
- Wear long pants and long-sleeved shirts to protect against abrasions.

- Inspect hand tools before each use.
- Ensure knives are sharp to facilitate cutting action. This will avoid persons forcing to cut and increasing potential hazards.
- Use the proper tool for the intended purpose. This will avoid potential injury possibly created through improper cutting procedures.

6.2.3 Strains/Muscle Pulls

This hazard potential is greatest during mobilization/demobilization activities or when handling sampling coolers when most of the physical lifting is accomplished. Other activities which present this hazard include handling heavy auger flights and 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, and
- The area available to maneuver the lift.

Workers involved with these types of activities are to be instructed by the SSO in the following manner:

- First estimate the weight and configuration of the load. See 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 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.

6.2.4 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. Workers who must work in areas or who must perform operations where noise levels can approach an 8-hour time weighted average of 85 decibels must have received hearing conservation training within the past 12 month period (this is normally provided as part of the 8-hour refresher training). If personnel have not had this training within the last 12 months, they will be provided such training by the SSO 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 HSA rig, and during decontamination operations when using a pressure washer.

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.

6.2.5 Heat Stress

Because of the geographical location of the planned work, the likely seasonal weather conditions that will exist during the planned schedule, and the physical exertion that can be anticipated with some of the planned tasks, it will be necessary for the field team to be aware of the signs and symptoms and the measures appropriate to prevent heat stress. This is addressed in detail in section 4.0 of the TtNUS Health and Safety Guidance Manual, which the SSO is responsible for reviewing and implementing as appropriate on this project.

In general, early signs of heat-related disorders include heat rash, cramps, heavy sweating which may be followed by the complete shutdown of a person's ability to sweat, pale/clammy skin, headaches, dizziness, incoordination, and other maladies. To prevent heat stress disorders, the following preventive measures are to be implemented by the SSO:

- When possible, schedule the most physically-demanding tasks so that they are performed during cooler periods of the day such as early morning or late afternoon
- Educate the field staff in heat stress signs and symptoms so that they can monitor themselves and their co-workers
- Schedule frequent breaks during the hottest parts of the day (such as a few minutes each hour). Breaks should be in shaded areas, and in a location where workers can remove PPE, wash their hands, and drink fluids
- Drinking fluids should be cool and non-caffeinated. Sports-drinks with electrolytes are acceptable provided that they do not contain alcohol. Water is also acceptable.

For more information on heat stress recognition and prevention, consult section 4.0 of the TtNUS Health and Safety Guidance Manual.

6.2.6 Before Drilling

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

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

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

6.2.7 During Drilling

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

6.2.8 After Drilling

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

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

6.2.9 Heat Stress

Because of the geographical location of the planned work, the likely seasonal weather conditions that will exist during the planned schedule, and the physical exertion that can be anticipated with some of the planned tasks, it will be necessary for the field team to be aware of the signs and symptoms and the measures appropriate to prevent heat stress. This is addressed in detail in section 4.0 of the TiNUS Health and Safety Guidance Manual, which the SSO is responsible for reviewing and implementing as appropriate on this project.

In general, early signs of heat-related disorders include heat rash, cramps, heavy sweating which may be followed by the complete shutdown of a person's ability to sweat, pale/clammy skin, headaches, dizziness, incoordination, and other maladies. To prevent heat stress disorders, the following preventive measures are to be implemented by the SSO:

- When possible, schedule the most physically-demanding tasks so that they are performed during cooler periods of the day such as early morning or late afternoon
- Educate the field staff in heat stress signs and symptoms so that they can monitor themselves and their co-workers
- Schedule frequent breaks during the hottest parts of the day (such as a few minutes each hour). Breaks should be in shaded areas, and in a location where workers can remove PPE, wash their hands, and drink fluids
- Drinking fluids should be cool and non-caffeinated. Sports-drinks with electrolytes are acceptable provided that they do not contain alcohol. Water is also acceptable.

For more information on heat stress recognition and prevention, consult section 4.0 of the TtNUS Health and Safety Guidance Manual.

6.3 NATURAL HAZARDS

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

6.3.1 Insect Bites and Stings

Insect/animal bites and stings are difficult to control given the climate and environmental setting of NSA Panama City. 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 do not 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 to provide easy 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.
- Clothing/limited body checks for ticks and other crawling insects should be conducted upon exiting heavily vegetated areas. Workers should perform a more detailed check of themselves when showering in the evening. Ticks prefer moist areas of the body (arm-pits, genitals, etc.) and will migrate to those locations.
- The FOL/SSO will preview 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 site personnel.

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

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

Tick and Mosquito Transmitted Illnesses and Diseases

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

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

Mild infections are common and include fever, headache, and body aches, often with skin rash and swollen lymph glands. More severe infection is marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, occasional convulsions, paralysis and, rarely, and death (especially in the elderly and very young). The incubation period of West Nile encephalitis is usually 3 to 12 days. There is no specific therapy or vaccine against West Nile encephalitis.

Precautions include:

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

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/SSO will preview access routes and work locations for nesting areas or signs of animal activities (tracks, foraging areas, etc.). Identified suspect areas will be communicated to the field crews. Snake chaps will be required as a precaution.

Indigenous animals, including snakes (poisonous and non-poisonous), raccoons, and other animals native to the region may be encountered as part of field operations. Some of the work locations may encroach on nesting areas 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 field crews and/or site operations.

- The FOL and/or SSO will preview access routes and work locations for nesting areas or signs of animal activities (tracks, foraging areas, etc.). Identified suspect areas will be communicated to the field crews. Where avoidance of these areas, or the animals that inhabit them, is not possible, the relocation of animals and nests will be coordinated with the Florida Department of Environmental Protection.

Snake Bites

Areas to be investigated on this project could be prime nesting and/or hiding locations for snakes. Personnel should avoid reaching into areas that are not visibly clear of snakes or insects. Snake chaps will be worn in areas of known or anticipated snake infestation.

Although 45 species of snakes are found in Florida, only the 6 are poisonous and a danger to humans. If you find a snake and you do not know whether or not it is poisonous, the safest thing to do is leave it alone. Florida snakes are not aggressive and, unless they are cornered, most will flee when humans approach. Occasionally, you might encounter one that is reluctant to leave because it is basking in the sun to get warm. Among snakebite victims, an unacceptably high number are bitten on the hands and arms when they are handling the snake. **Do not catch a snake and do not handle one unless you are sure it is not poisonous.** In addition, for a short time after a snake is killed, its reflexes may continue to

work. Those reflexes typically cause the body to writhe slowly for awhile, but they can cause a convulsive contraction and a bite, so you should not handle a freshly killed venomous snake.

The following snakes are indigenous to the Florida panhandle:

Copperhead - Average adult size is 22-36 inches (56-91 cm), record is 53 inches (135 cm). It is a stout-bodied snake with broad, light brown to gray cross bands, alternating with dark brown to reddish-brown cross bands. Constrictions along the backbone give the dark bands an hourglass shape. On the sides of the body the dark bands usually have light centers, and occasionally one dark spot. Southern copperheads sometimes have an overall pinkish tint. The top of head in front of the eyes is covered with large plate-like scales. The pupil is elliptical, a catlike vertical slit. There is a deep facial pit between the nostril and the eye. The preferred habitat is low, wet areas around swamps, streambeds, river bottoms, and damp ravines, but it also occurs on the hillsides above the wet areas. It also is found in suburban neighborhoods near people. Copperhead bites are extremely painful but usually are not life-threatening for healthy adults. As with poisonous snakebites, the victim should seek immediate medical care from a physician or hospital experienced in treating snakebite

Cottonmouth - Average adult size is 20-48 inches (51-121 cm), record is 74.5 inches (189 cm) and is a dark-colored, heavy-bodied snake. Juveniles are brightly colored with reddish-brown cross bands on a brown ground color. The dark cross bands contain many dark spots and speckles. The pattern darkens with age so adults retain only a hint of the former banding or are a uniform black. The eye is camouflaged by a broad, dark, facial stripe. The head is thick and distinctly broader than the neck, and when viewed from above, the eyes cannot be seen. The top of head in front of the eyes is covered with large plate-like scales. The pupil is vertical (catlike). There is a deep facial pit between the nostril and the eye. Its habitat is any wetlands or waterway in the state. Cottonmouths can be found along streams, springs, rivers, lakes, ponds, marshes, swamps, sloughs, reservoirs, retention pools, canals, and roadside ditches. It occasionally wanders far from water, and has been found in bushes and trees. Cottonmouth bites can be quite dangerous. The victim should seek immediate medical care from a physician or hospital experienced in treating snakebite.

Eastern Diamondback Rattlesnake - Average adult size is 36-72 inches (91-183 cm), record is 96 inches (244 cm). It is a large, heavy-bodied snake with a row of large dark diamonds with brown centers and cream borders down its back. The ground color of the body is brownish. The tail ends in a rattle. The tail is usually a different shade, brownish or gray, and toward the end of the tail the diamonds fade out or break into bands. The large and thick head has a light bordered dark stripe running diagonally through the eye and there are vertical light stripes on the snout. The pupil is vertical (catlike) and there is a deep facial pit between the nostril and the eye. Diamondbacks are often found in pine flat woods, longleaf pine

and turkey oak, and sand pine scrub areas. These habitats contain palmetto thickets and gopher tortoise burrows in which the Diamondback may seek refuge. This is a large and potentially dangerous snake. It can strike up to 2/3 its body length; a 6-foot (183 cm) specimen may strike 4 feet (122 cm).

Timber Rattlesnake - Average adult size is 36-60 inches (76-152 cm), record is 74.5 inches (189 cm). Can be a large, heavy-bodied snake. The reddish brown stripe running down the center of the back is disrupted by a series of large, black, chevron-like cross bands on the pinkish gray or tan body. The tail is uniform black. The head is large and sometimes with a dark diagonal line through the eye or just behind the eye. The pupil is vertical (catlike) and there is a facial pit between the nostril and the eye. The tail ends in a rattle. Timber rattlesnakes in Florida prefer low bottomlands where it is fairly damp, river beds, hammocks pine flat woods, swamps, and cane thickets. This snake should be given a wide berth and left alone. Because of its cryptic coloration (camouflage), it can be easily overlooked, especially if it does not rattle.

Dusky Pygmy Rattlesnake - Average adult size is 12-24 inches (30-61 cm), record is 31 inches (79 cm). This is a small snake, but very thick for its size. The top of the triangular shaped head is covered with 9 large scales. The body color is light to dark gray. A longitudinal row of black or charcoal transverse blotches disrupts a reddish brown stripe running down the middle of the back. Dark spots on the side line up with the blotches. The tail is slender and ends in a miniature rattle. The belly is heavily mottled with black and white. The pupil of the eye is vertical (catlike), and there is a deep facial pit between the nostril and the eye. This snake is common in lowland pine flat woods, prairies, around lakes and ponds, and along the borders of many freshwater marshes and cypress swamps. This small snake has a reputation for being very aggressive. Its bite, while usually not life threatening, is extremely painful and can result in the loss of a digit. However, in some cases it can be fatal. The rattle is so small it is seldom heard. When it is heard, it sounds like an insect buzzing. Florida's two hognose snakes occasionally are confused with the Pygmy Rattlesnake. It is easy to distinguish between the harmless hognose snakes and the Pygmy Rattlesnake. The harmless hognose snakes defend themselves against potential predators by spreading (flattening) their heads and necks. If this does not scare the threat away, the hognose snakes will turn onto their backs and play dead. The hognose snakes have upturned noses and round pupils, and they also have no facial pits or rattles.

Eastern Coral Snake - Average adult size is 20-30 inches (51-76 cm), record is 47.5 inches (121 cm). Body ringed with black, yellow, and red; narrow yellow rings separating the wider red and black rings. The rings continue across the belly of the snake. From tip of snout to just behind the eye the head is black. The tail is black and yellow, without any red rings. The red rings usually contain black flecks or spots. The pupil is round. This snake occupies a variety of habitats, from dry, well-drained flat woods and scrub areas to low, wet hammocks and the borders of swamps. They are quite secretive and are usually found

under debris and in the ground, but occasionally they are found in the open, and have even been seen climbing the trunks of live oaks. Good numbers of them are turned up when pine flat woods are bulldozed. Because they also are ringed with red, black, and yellow or white, two harmless snakes in Florida, the Scarlet Kingsnake and the Scarlet Snake, often are confused with the Coral Snake. Both of these mimics (look-a-likes) can be distinguished from the Coral Snake by their red snouts and red on their tails. In addition, the red bands of the Scarlet Kingsnake and the Scarlet Snake never touch the yellow bands (the red and yellow are separated by the black). Also, on both the Coral Snake and the Scarlet Kingsnake the rings go all the way around the body, but not on the Scarlet Snake which has a white belly. If you have difficulty separating the harmless mimics from the Coral Snake, the following mnemonic rhymes will identify the Coral Snake for you: 'If red touches yellow, it can kill a fellow,' and 'If its nose is black, it's bad for jack.' Because the Coral Snake is a relative of the cobras, people believe its bite nearly always is fatal. While its bite is serious and should receive immediate medical attention, statistics suggest that the bite of the Coral Snake is less threatening than the bite of a Diamondback Rattlesnake.

Should field personnel 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 aid to provide prompt and correct antidotes as necessary.
- Immobilize the bite victim to the greatest extent possible. Physical exertion will mobilize the toxins (in 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.

Alligators

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

Mature alligators seek open water areas during the April-to-May courtship and breeding season. After mating, the females move into marsh areas to nest in June and early July where they remain until the

following spring. Males generally prefer open and deeper water year-round. Alligators less than four feet long typically inhabit the marshy areas of lakes and rivers. Dense vegetation in these habitats provides protective cover and many of the preferred foods of young alligators.

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

6.3.3 Poisonous Plants

Various plants which can cause allergic reactions may be encountered during field work. These include, poison ivy, poison oak, and poison sumac. Contact with these plants may occur when clearing vegetation for access to work areas, or as a result of movement through these plants. An irritating, allergic reaction can occur after direct contact with the plant or indirect contact through some piece of equipment or clothing article. Oils are transferred from the plant to exposed skin, clothing, or piece of equipment. The degree of the irritating, allergic reaction can vary significantly from one person to the next.

Protective measures to control and minimize the effects of this hazard may include, but not be limited to, the following:

- Identify plants for field personnel.
 - Poison Ivy - Characterized by climbing vines, three leaf configuration ovate to elliptical in shape, deep green leaves with a reddish tint, greenish flowers, and white berries.
 - Poison Sumac - Characterized as a tall bush of the sumac family bearing compound leaves (7-13 entire leaflets), branched from a central axis, drooping, with axillary clusters of white fruit: However, these white fruits and berries may exist only during pubescent stages.

- Poison oak - Characterized as similar to poison ivy consisting of a shrub, stems erect, 0.3 to 2.0 meters tall, leaflets consist of broad thick lobes coarsely serrated configuration, denser at the base, less so than the top.
- Protective measures may include wearing disposable garments such as Tyvek when clearing brush. These may be carefully removed and disposed of along with any oils accumulated from the plants.
- Personal Hygiene - The oils obtained from the plants will only elicit an allergic response when the person's bare skin layer is contacted. This can be aggravated when skin pores are open (perspiring), or through breaks in the skin such as cuts, nicks, scratches, etc. This can also be accomplished when using excessively hot water for cleaning the skin, which also causes pores to open. Prior to break time, lunchtime, etc. personnel should wash with cool water and soap to remove as much of the oils as possible. In heavily vegetated areas of these plants, additional measures including barrier creams and blocks may be used to prevent the oils from accessing and penetrating the skin.

These plants present an airborne sensitization hazard when burned. This is not to occur as part of this scope of work and therefore will not be addressed.

6.3.4 Inclement Weather

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

7.0 AIR MONITORING

Direct reading instruments will be used at the site to evaluate the presence of contaminants and other potentially hazardous conditions. Air monitoring measures and requirements are established in Table 5-1 pertaining to the specific task and operations. Additionally, the Health and Safety Guidance Manual, Section 1.0, contains detailed information regarding direct reading instrumentation, as well as general calibration procedures of various instruments.

7.1 INSTRUMENTS AND USE

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

7.1.1 Flame Ionization Detector/Photoionization Detector

In order to accurately monitor for any substances which may present an exposure potential to site personnel, either a Flame Ionization Detector (FID) or Photoionization Detector (PID) will be used. One of these instruments will be used to monitor potential source areas (monitoring wells, and soil borings, samples, etc.) and to screen the breathing zones of employees during site activities. Either of these instruments may be used (at the SSO's discretion) as they are both capable of detecting potential organic vapors of concern and operates better in an environment with high humidity.

Prior to the commencement of any field activities, the background levels of the site must be determined and noted. Daily background readings will be taken away from any areas of potential contamination. These readings, any influencing conditions (i.e., weather, temperature, humidity) and site location must be documented in the field operations logbook or other site documentation (e.g., sample log sheet).

7.1.2 Hazard Monitoring Frequency

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

7.2 INSTRUMENT MAINTENANCE AND CALIBRATION

Hazard monitoring instruments will be maintained and pre-field calibrated by the equipment vendor. Operational checks and field calibration will be performed on the instruments each day prior to their use. Field calibration will be performed on instruments according to manufacturer's recommendations, but not

less than daily. 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 (which will be maintained on site for reference). 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 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

7.3 DOCUMENTING INSTRUMENT READINGS

The SSO is responsible for ensuring that monitoring instruments are used in accordance with the specifications of this HASP and with manufacturer's specifications/recommendations. In addition, the SSO is also responsible for ensuring that the instrument use is documented. This requirement can be satisfied either by recording instrument readings on pre-printed sampling log sheets or in a field log book. This includes the requirement for documenting instrument readings that indicate no elevated readings above noted daily background levels (i.e., no-exposure readings). At a minimum, the SSO must document the following information for each use of an air monitoring device:

- Date, time, and duration of the reading
- Site location where the reading was obtained
- Instrument used (e.g., PID, FID)
- Personnel present at the area where the reading was noted
- Other conditions that are considered relevant to the SSO (such as possible instrument interferences, etc.)

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

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

8.2 SITE-SPECIFIC TRAINING

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

Figure 8-1 will be used to document the provision and content of the project-specific and associated training. Site personnel will be required to sign this form prior to commencement of site activities. This training documentation will be employed to identify personnel who through record review and attendance of the site-specific training are cleared for participation in site activities. This document shall be posted to maintain an active list of cleared site personnel.

TtNUS will conduct a pre-activities training session prior to initiating site work. Additionally, a brief meeting may be held daily to discuss operations planned for that day as well as, a short meeting may be held at the end of the day to discuss the operations completed and any problems encountered. This activity will

be supported through the use of a Safe Work Permit System (See Section 9.10) and/or documented in the Project Logbook.

8.3 MEDICAL SURVEILLANCE

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

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

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

8.3.1 Medical Data Sheet

Each field team member, including subcontractors and visitors, entering the exclusion zone(s) shall be required to complete and submit a copy of the Medical Data Sheet (see Attachment II). This shall be filled out and collected, reviewed and maintained by the SSO. The purpose of this document is to provide site personnel and emergency responders with additional information that may be necessary in order to administer medical attention.

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.

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 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 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 of the site where active work is being performed, plus a designated area surrounding the point of operation. Exclusion Zones will also be delineated and may include the use of barrier tape, cones and /or drive poles, and postings to inform and direct facility personnel. The Exclusion Zone for this activity will be fragmented to represent the areas where the soil is disturbed through drilling or sampling activities. When possible, Exclusion Zones will be delineated using barrier tape, cones and/or drive poles, and postings to inform site personnel.

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

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 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. 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

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 V. The daily meetings conducted at the site will further support these work permits. This effort will ensure the 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. The permits require the signature of the FOL or SSO.

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.

FIGURE 9-1
SAFE WORK PERMIT

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

SECTION I: General Job Scope

- I. Work limited to the following (description, area, equipment used): _____
- II. Primary Hazards: _____
- III. Field Crew: _____
- IV. On-site Inspection conducted Yes No Initials of Inspector _____ TtNUS
 Equipment Inspection required Yes No Initials of Inspector _____ TtNUS

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

- V. Protective equipment required Level D Level B
 Level C Level A
 Respiratory equipment required Yes Specify on the reverse
 No
 Modifications/Exceptions: None anticipated

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

Primary Route of Exposure/Hazard: _____

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

VII. Additional Safety Equipment/Procedures

- | | |
|--|--|
| Hard-hat..... <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/Cellular Phone..... <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 |
| Impermeable apron..... <input type="checkbox"/> Yes <input type="checkbox"/> No | Work/rest regimen <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Steel toe Work shoes or boots <input type="checkbox"/> Yes <input type="checkbox"/> No | Chemical Resistant Boot Covers..... <input type="checkbox"/> Yes <input type="checkbox"/> No |
| High Visibility vest..... <input type="checkbox"/> Yes <input type="checkbox"/> No | Tape up/use insect repellent <input type="checkbox"/> Yes <input type="checkbox"/> No |
| First Aid Kit <input type="checkbox"/> Yes <input type="checkbox"/> No | Fire Extinguisher..... <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Safety Shower/Eyewash <input type="checkbox"/> Yes <input type="checkbox"/> No | Other..... <input type="checkbox"/> Yes <input type="checkbox"/> No |
- Modifications/Exceptions: _____

VIII. Site Preparation

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

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

X. Special instructions, precautions: _____

Permit Issued by: _____ Permit Accepted by: _____

Upon completion of the tasks for which the permit was assigned, the permit shall be turned into the FOL and/or the SSO.

9.5 SITE VISITORS

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

- Personnel invited to observe or participate in operations by TtNUS
- Regulatory personnel
- Southeast Navy Personnel
- Other authorized visitors

Site visitors will be directed 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.

9.6 SITE SECURITY

Site security will be accomplished using existing base security resources and procedures, supplemented by TtNUS or subcontractor personnel if necessary. TtNUS will retain control over active operational areas. The first line of security will take place at the station wide fences restricting the general public. The second line of security will take place at the work site referring interested parties to the FOL. The FOL will serve as a focal point for site personnel, and will 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 personnel involved in this operation.

9.9 MSDS REQUIREMENTS

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

9.10 COMMUNICATION

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

10.0 SPILL CONTAINMENT PROGRAM

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 wastewater (decontamination) referred to as investigative-derived wastes (IDW) will not be generated, as part of site activities. It is not anticipated that spillage would constitute a significant danger to human health or the environment.

10.2 PERSONNEL TRAINING AND SPILL PREVENTION

Personnel will be instructed in the procedures for incipient spill prevention, containment, and collection of hazardous materials in the site-specific training. The FOL and the SSO 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 week while site activities are underway. These inspections are to be performed 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 a drum conspicuously marked. This material too, will be containerized for disposal pending analyses. All inspections are to be documented in the Project Logbook.

10.4 SPILL PREVENTION AND CONTAINMENT EQUIPMENT

The following represents examples of the equipment that may be maintained at the staging area for the purpose of supporting this Spill Prevention/Containment Program.

- Sand, clean fill, vermiculite, or other noncombustible absorbent (Oil-dry);
- 55-gallon U.S. DOT 17-E or 17-H drums
- Shovels, rakes, and brooms
- Labels

10.5 SPILL CONTAINMENT/CONTROL RESPONSE PLAN

It is not anticipated that a spill will occur which the field crews cannot handle. Should one occur, however, the FOL or SSO will carry out notification of appropriate emergency response agencies. The following describes the steps field personnel will implement upon detecting a spill or leak.

1. Notify the SSO or FOL immediately upon the detection of a leak or spill.
2. Use the personal protective equipment stored at the staging area. Take immediate actions to stop the leak or spill by plugging or patching the drum/container or raising the leak to the highest point. Spread the absorbent material in the area of the spill covering completely.
3. Transfer the material to a new drum/container, collect and containerize the absorbent material. Label the new drum/container appropriately. Await analyses for shipment or disposal options.

11.0 CONFINED SPACE ENTRY

Personnel under the provisions of this HASP are not allowed, under any circumstances, to enter confined spaces. A confined space is defined as an area that has one or more of the following characteristics:

- Is large enough and so configured that an employee can bodily enter and perform assigned work.
- Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry).
- Is not designed for continuous employee occupancy.
- Contains or has a potential to contain a hazardous atmosphere.
- Contains a material that has the potential to engulf an entrant.
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross-section.
- Contains any other recognized, serious, safety or health hazard.

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

12.0 MATERIALS AND DOCUMENTS

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

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

12.1 MATERIALS TO BE POSTED OR MAINTAINED AT THE SITE

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

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

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

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

Site Clearance (maintained) - This list is found within the training section of the HASP (See Figure 8-1). This list identifies site personnel, dates of training (including site-specific training), and medical surveillance. The list indicates not only clearance but also status. If personnel do not meet these requirements, they do not enter the site while site personnel are engaged in activities.

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

Medical Data Sheets/Cards (maintained) - Medical Data Sheets will be filled out by on-site personnel and filed in a central location. The Medical Data Sheet will accompany any injury or illness requiring medical attention to the medical facility. a copy of this sheet or a wallet card will be given to personnel to be carried on their person.

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

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

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

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

13.0 GLOSSARY

ACGIH	American Conference of Governmental Industrial Hygienists
APR	Air Purifying Respirators
BTEX	Benzene, Toluene, Ethyl Benzene, Xylene(s)
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CLEAN	Comprehensive Long-Term Environmental Action Navy
CNS	Central Nervous System
CSP	Certified Safety Professional
CTO	Contract Task Order
DEET	N,N-diethyl-meta-toluamide
DRI	Direct Reading Instruments
FID	Flame Ionization Detector
FOL	Field Operations Leader
HSGM	Health and Safety Guidance Manual
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSM	Health and Safety Manager
IDLH	Immediately Dangerous to Life and Health
IDW	Investigative Derived Waste
MSDS	Material Safety Data Sheet
N/A	Not Available
NIOSH	National Institute Occupational Safety and Health
NSA	Naval Support Activity
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PHSO	Project Health and Safety Manager
PM	Project Manager
PPE	Personal Protective Equipment
PPM	Parts Per Million
PVC	Poly Vinyl Chloride
RCRA	Resource Conservation and Recovery Act
SSO	Site Safety Officer
STEL	Short Term Exposure Limit
SWMU	Solid Waste Management Unit
TBD	To Be Determined

TOM Task Order Manager
UV Ultra Violet
VOC Volatile Organic Compound
WP Work Plan

ATTACHMENT I

INCIDENT REPORT FORM



Report Date	Report Prepared By	Incident Report Number

INSTRUCTIONS:

All incidents (including those involving subcontractors under direct supervision of Tetra Tech personnel) must be documented on the IR Form.

Complete any additional parts to this form as indicated below for the type of incident selected.

TYPE OF INCIDENT (Check all that apply)	Additional Form(s) Required for this type of incident
Near Miss (No losses, but could have resulted in injury, illness, or damage)	<input type="checkbox"/> Complete IR Form Only
Injury or Illness	<input type="checkbox"/> Complete Form IR-A; Injury or Illness
Property or Equipment Damage, Fire, Spill or Release	<input type="checkbox"/> Complete Form IR-B; Damage, Fire, Spill or Release
Motor Vehicle	<input type="checkbox"/> Complete Form IR-C; Motor Vehicle

INFORMATION ABOUT THE INCIDENT

Description of Incident

Date of Incident	Time of Incident
	_____ AM <input type="checkbox"/> PM <input type="checkbox"/> OR Cannot be determined <input type="checkbox"/>
Weather conditions at the time of the incident	Was there adequate lighting?
	_____ Yes <input type="checkbox"/> No <input type="checkbox"/>

Location of Incident
_____ Was location of incident within the employer's work environment? Yes <input type="checkbox"/> No <input type="checkbox"/>

Street Address	City, State, Zip Code and Country
Project Name	Client:
Tt Supervisor or Project Manager	Was supervisor on the scene?
	_____ Yes <input type="checkbox"/> No <input type="checkbox"/>

WITNESS INFORMATION (attach additional sheets if necessary)

Name	Company
Street Address	City, State and Zip Code
Telephone Number(s)	

CORRECTIVE ACTIONS

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

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

ROOT CAUSE ANALYSIS LEVEL REQUIRED

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

Root Cause Analysis Level Definitions

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

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

NOTIFICATIONS

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

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

INSTRUCTIONS:

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

Incident Report Number: (From the IR Form)

EMPLOYEE INFORMATION

Company Affiliation

Tetra Tech Employee? TetraTech subcontractor employee (directly supervised by Tt personnel)?

Full Name

Company (if not Tt employee)

Street Address, City, State and Zip Code

Address Type

Home address (for Tt employees)

Business address (for subcontractors)

Telephone Numbers

Work: _____

Home: _____

Cell: _____

Occupation (regular job title)

Department

Was the individual performing regular job duties?

Yes No

Time individual began work

_____ AM PM OR Cannot be determined

Safety equipment

Provided? Yes No

Used? Yes No If no, explain why

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

NOTIFICATIONS

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

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

Yes No

Date of report

H&S Personnel Notified

Time of report

Time of Report

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

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

INJURY / ILLNESS DETAILS

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

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

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

MEDICAL CARE PROVIDED

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

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

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

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

SIGNATURES

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

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

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

INSTRUCTIONS:

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

Incident Report Number: (From the IR Form)

TYPE OF INCIDENT (Check all that apply)

Property Damage Equipment Damage Fire or Explosion Spill or Release

INCIDENT DETAILS

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

Response Actions Taken:

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

Agency(s) Contact Name(s)

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

Item:	Extent of damage:	Estimated repair cost

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

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

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

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

NOTIFICATIONS

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

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

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

INSTRUCTIONS:

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

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

DRIVER INFORMATION

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

PASSENGERS IN VEHICLES (NON-INJURED)

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

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

INJURIES TO NON-TETRATECH EMPLOYEES

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

OTHER PROPERTY DAMAGE

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

COMPLETE AND SUBMIT DIAGRAM DEPICTING WHAT HAPPENED

ATTACHMENT II
MEDICAL DATA SHEET

MEDICAL DATA SHEET

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

Project _____

Name _____ Home Telephone _____

Address _____

Age _____ Height _____ Weight _____

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

Phone: _____

Drug or other Allergies: _____

Particular Sensitivities : _____

Do You Wear Contacts? _____

What medications are you presently using? _____

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

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

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

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

Name (Print clearly)

Signature

Date

ATTACHMENT III

UTILITY LOCATING

AND

EXCAVATION CLEARANCE



TETRA TECH NUS, INC.

STANDARD OPERATING PROCEDURES

Number	HS-1.0	Page	1 of 15
Effective Date	12/03	Revision	2
Applicability	Tetra Tech NUS, Inc.		
Prepared	Health & Safety		
Approved	D. Senovich <i>[Signature]</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. (TINUS) to provide a safe and healthful work environment for the protection of our employees. The purpose of this Standard Operating Procedure (SOP) is to aid in achieving the objectives of this policy, to present the acceptable procedures pertaining to utility locating and excavation clearance activities, and to present requirements and restrictions relevant to these types of activities. This SOP must be reviewed by any employee potentially involved with underground or overhead utility locating and avoidance activities.

2.0 SCOPE

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

3.0 GLOSSARY

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

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

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

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

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

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

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4.0 RESPONSIBILITIES

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

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

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

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

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

5.0 PROCEDURES

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

5.1 Buried Utilities

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

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

1. A comprehensive review must be made of any available property maps, blue lines, or as-builts prior to site activities. Interviews with local personnel familiar with the area should be performed to provide additional information concerning the location of potential underground utilities. Information regarding utility locations shall be added to project maps upon completion of this exercise.
- 2., A visual site inspection must be performed to compare the site plan information to actual field conditions. Any findings must be documented and the site plan/maps revised. The area(s) of proposed excavation or other subsurface activities must be marked at the site in white paint or pin flags to identify those locations of the proposed intrusive activities. The site inspection should focus on locating surface indications of potential underground utilities. Items of interest include the presence of nearby area lights, telephone service, drainage grates, fire hydrants, electrical service vaults/panels, asphalt/concrete scars and patches, and topographical depressions. Note the location of any emergency shut off switches. Any additional information regarding utility

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

3. If the planned work is to be conducted on private property (e.g., military installations, manufacturing facilities, etc.) the FOL must identify and contact appropriate facility personnel (e.g., public works or facility engineering) before any intrusive work begins to inquire about (and comply with) property owner requirements. It is important to note that private property owners may require several days to several weeks advance notice prior to locating utilities.
4. If the work location is on public property, the state agency that performs utility clearances must be notified (see Attachment 1). State "one-call" services must be notified prior to commencing fieldwork per their requirements. Most one-call services require, by law, 48- to 72-hour advance notice prior to beginning any excavation. Such services typically assign a "ticket" number to the particular site. This ticket number must be recorded for future reference and is valid for a specific period of time, but may be extended by contacting the service again. The utility service will notify utility representatives who then mark their respective lines within the specified time frame. It should be noted that most military installations own their own utilities but may lease service and maintenance from area providers. Given this situation, "one call" systems may still be required to provide location services on military installations.
5. Utilities must be identified and their locations plainly marked using pin flags, spray paint, or other accepted means. The location of all utilities must be noted on a field sketch for future inclusion on project maps. Utility locations are to be identified using the following industry-standard color code scheme, unless the property owner or utility locator service uses a different color code:

white	excavation/subsurface investigation location
red	electrical
yellow	gas, oil, steam
orange	telephone, communications
blue	water, irrigation, slurry
green	sewer, drain
6. Where utility locations are not confirmed with a high degree of confidence through drawings, schematics, location services, etc., the work area must be thoroughly investigated prior to beginning the excavation. In these situations, utilities must be identified using safe and effective methods such as passive and intrusive surveys, or the use of non-conductive hand tools. Also, in situations where such hand tools are used, they should always be used in conjunction with suitable detection equipment, such as the items described in Section 6.0 of this SOP. Each method has advantages and disadvantages including complexity, applicability, and price. It also should be noted that in some states, initial excavation is required by hand to a specified depth.
7. At each location where trenching or excavating will occur using a backhoe or other heavy equipment, and where utility identifications and locations cannot be confirmed prior to groundbreaking, the soil must be probed using a device such as a tile probe which is made of non-conductive material such as fiberglass. If these efforts are not successful in clearing the excavation area of suspect utilities, hand shoveling must be performed for the perimeter of the intended excavation.
8. All utilities uncovered or undermined during excavation must be structurally supported to prevent potential damage. Unless necessary as an emergency corrective measure, TINUS shall not make any repairs or modifications to existing utility lines without prior permission of the utility owner, property owner, and Corporate HSM. All repairs require that the line be locked-out/tagged-out prior to work.

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5.2 Overhead Power Lines

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

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

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

6.0 UNDERGROUND LOCATING TECHNIQUES

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

6.1 Geophysical Methods

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

Electromagnetic Induction

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

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

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

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Magnetics

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

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

Ground Penetrating Radar

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

6.2 Passive Detection Surveys

Acoustic Surveys

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

Thermal Imaging

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

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

6.3 Intrusive Detection Surveys

Vacuum Excavation

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

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

Hand Excavation

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

Tile Probe Surveys

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

7.0 INTRUSIVE ACTIVITIES SUMMARY

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

1. Map and mark all subsurface locations and excavation boundaries using white paint or markers specified by the client or property owner.
2. Notify the property owner and/or client that the locations are marked. At this point, drawings of locations or excavation boundaries shall be provided to the property owner and/or client so they may initiate (if applicable) utility clearance.

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

3. Notify "One Call" service. If possible, arrange for an appointment to show the One Call representative the surface locations or excavation boundaries in person. This will provide a better location designation to the utilities they represent. You should have additional drawings should you need to provide plot plans to the One Call service.
4. Implement supplemental utility detection techniques as necessary and appropriate to conform utility locations or the absence thereof.

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

8.0 REFERENCES

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

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



American Public Works Association
2345 Grand Boulevard, Suite 800, Kansas City, MO 64108-2625
Phone (816) 472-6100 • Fax (816) 472-1610
Web www.apwa.net • E-mail apwa@apwa.net

**ONE-CALL SYSTEMS INTERNATIONAL
CONDENSED DIRECTORY**

- | | | |
|--|---|--|
| <p>Alabama
Alabama One-Call
1-800-292-8525</p> <p>Alaska
Locate Call Center of Alaska, Inc.
1-800-478-3121</p> <p>Arizona
Arizona Blue Stake
1-800-782-5348</p> <p>Arkansas
Arkansas One Call System, Inc.
1-800-482-8998</p> <p>California
Underground Service Alert North
1-800-227-2600
Underground Service Alert of Southern
California
1-800-227-2600</p> <p>Colorado
Utility Notification Center of Colorado
1-800-922-1987</p> <p>Connecticut
Call Before You Dig
1-800-922-4455</p> <p>Delaware
Miss Utility of Delmarva
1-800-282-8555</p> <p>Florida
Sunshine State One-Call of Florida, Inc.
1-800-432-4770</p> <p>Georgia
Underground Protection Center, Inc.
1-800-282-7411</p> <p>Hawaii
Underground Service Alert North
1-800-227-2600</p> <p>Idaho
Dig Line Inc.
1-800-342-1585
Kootenai County One-Call
1-800-428-4950
Shoshone - Benawah One-Call
1-800-398-3285</p> <p>Illinois
JULIE, Inc.
1-800-892-0123
Digger (Chicago Utility Alert Network)
312-744-7000</p> <p>Indiana
Indiana Underground Plant Protection
Service
1-800-382-5544</p> | <p>Iowa
Iowa One-Call
1-800-292-8989</p> <p>Kansas
Kansas One-Call System, Inc.
1-800-344-7233</p> <p>Kentucky
Kentucky Underground Protection Inc.
1-800-752-6007</p> <p>Louisiana
Louisiana One Call System, Inc.
1-800-272-3020</p> <p>Maine
Dig Safe System, Inc.
1-888-344-7233</p> <p>Maryland
Miss Utility
1-800-257-7777
Miss Utility of Delmarva
1-800-282-8565</p> <p>Massachusetts
Dig Safe System, Inc.
1-888-344-7233</p> <p>Michigan
Miss Dig System, Inc.
1-800-482-7171</p> <p>Minnesota
Gopher State One Call
1-800-252-1188</p> <p>Mississippi
Mississippi One-Call System, Inc.
1-800-227-8477</p> <p>Missouri
Missouri One-Call System, Inc.
1-800-344-7483</p> <p>Montana
Utilities Underground Protection Center
1-800-424-6555
Montana One Call Center
1-800-551-8344</p> <p>Nebraska
Diggers Hotline of Nebraska
1-800-331-6666</p> <p>Nevada
Underground Service Alert North
1-800-227-2600</p> <p>New Hampshire
Dig Safe System, Inc.
1-888-344-7233</p> | <p>New Jersey
New Jersey One Call
1-800-272-1000</p> <p>New Mexico
New Mexico One Call System, Inc.
1-800-321-2537
Las Cruces- Dona Ana Blue Stakes
1-888-528-0400</p> <p>New York
Dig Safely New York
1-800-982-7962
New York City- Long Island One Call
Center
1-800-272-4480</p> <p>North Carolina
The North Carolina One-Call Center,
Inc.
1-800-632-4948</p> <p>North Dakota
North Dakota One-Call
1-800-798-0555</p> <p>Ohio
Ohio Utilities Protection Service
1-800-352-2764
Oil & Gas Producers Underground
Protect'n Svc
1-800-925-0988</p> <p>Oklahoma
Call Okla
1-800-522-6543</p> <p>Oregon
Oregon Utility Notification Center/One
Call Concepts
1-800-332-2344</p> <p>Pennsylvania
Pennsylvania One Call System, Inc.
1-800-242-1776</p> <p>Rhode Island
Dig Safe System, Inc.
1-888-344-7233</p> <p>South Carolina
Palmetto Utility Protection Service Inc.
1-888-721-7877</p> <p>South Dakota
South Dakota One Call
1-800-781-7474</p> <p>Tennessee
Tennessee One-Call System, Inc.
1-800-351-1111</p> |
|--|---|--|

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ATTACHMENT 1 (Continued)

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

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

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

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

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

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

Wisconsin
Diggers Hotline, Inc.
1-800-242-6511

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

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

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

British Columbia
BC One Call
1-800-474-6888

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

Quebec
Info-Excavation
1-800-663-9228

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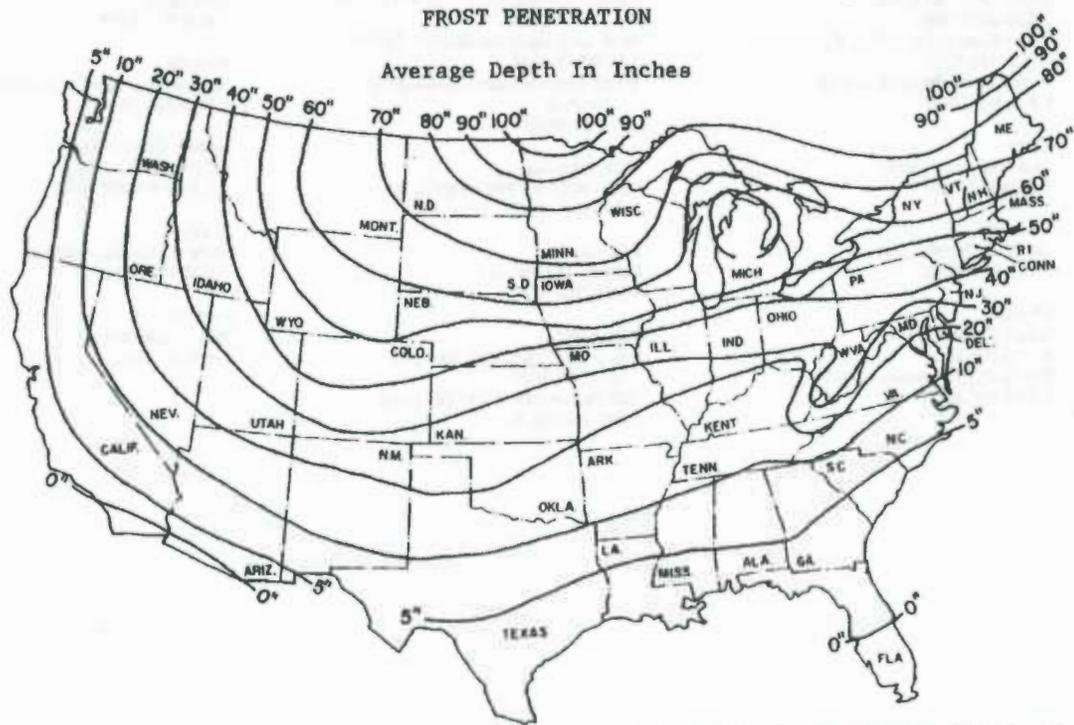
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ATTACHMENT 2

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

3. Notes:

Approval:
 Site Manager/Field Operations Leader _____ Date _____

c: PM/Project File
 Program File

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**ATTACHMENT 4
OSHA LETTER OF INTERPRETATION**

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

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

Dear Mr. Caldwell:

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

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

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

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

Answer

Background

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

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

Paragraph (b)(3) provides:

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

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

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

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

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

Non-conductive hand tools are permitted

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

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

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Hydro-vacuum excavation

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

Other technologies

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

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

Sincerely,

Russell B. Swanson, Director
Directorate of Construction

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

ATTACHMENT IV

EQUIPMENT INSPECTION CHECKLIST

Equipment Inspection Checklist for Drill Rigs

Company: _____

Unit/Serial No#: _____

Inspection Date: ____ / ____ / ____ Time: ____ :

Equipment Type: _____
(e.g, Drill Rigs Hollow Stem, Mud Rotary, Direct Push, HDD)

Project Name: _____

Project No#: _____

Yes	No	NA	Requirement	Comments
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Emergency Stop Devices	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	• Emergency Stop Devices (At points of operation)	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	• Have all emergency shut offs identified been communicated to the field crew?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	• Has a person been designated as the Emergency Stop Device Operator?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Highway Use	
<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"/>	• Seat Belts?	
<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"/>	• Tires (Tread) or tracks	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	• Windshield wipers	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	• Exhaust system	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	• Steering (standard and emergency)	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	• Wheel Chocks?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	• Are tools and material secured to prevent movement during	

Equipment Inspection Checklist for Drill Rigs
Page 4

Unit/Serial No#: _____

Inspection Date: ____ / ____ / ____

Yes	No	NA	Requirement	Comments
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	High Pressure Hydraulic Lines <ul style="list-style-type: none"> • Obvious damage • Operator protected from accidental release • Coupling devices, connectors, retention cables/pins are in good condition and in place 	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Mast Condition <ul style="list-style-type: none"> • Structural components/tubing • Connection points • Pins • Welds • Outriggers • Operational • Plumb (when raised) 	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Hooks <ul style="list-style-type: none"> • Are the hooks equipped with Safety Latches? • Does it appear that the hook is showing signs of wear in excess of 10% original dimension? • Is there a bend or twist exceeding 10% from the plane of an unbent hook? • Increase in throat opening exceeding 15% from new condition • Excessive nicks and/or gouges • Clips • Number of U-Type (Crosby) Clips (cable size 5/16 - 5/8 = 3 clips minimum) (cable size 3/4 - 1 inch = 4 clips minimum) (cable size 1 1/8 - 1 3/8 inch = 5 clips minimum) 	

Equipment Inspection Checklist for Drill Rigs

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Unit/Serial No#: _____

Inspection Date: ____ / ____ / ____

Yes	No	NA	Requirement	Comments
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Power cable and/or hoist cable <ul style="list-style-type: none"> Reduction in Rope diameter π (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) Number of broken wires (6 randomly broken wires in one rope lay) (3 broken wires in one strand) Number of wire rope wraps left on the Running Drum at nominal use (≥3 required) - Lead (primary) sheave is centered on the running drum Lubrication of wire rope (adequate?) Kinks, bends - Flattened to > 50% diameter 	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hemp/Fiber rope (Cathead/Split Spoon Hammer) <ul style="list-style-type: none"> Minimum 3/4; maximum 1 inch rope diameter (Inspect for physical damage) Rope to hammer is securely fastened 	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Safety Guards - <ul style="list-style-type: none"> 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? High pressure lines Nip/pinch points 	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Operator Qualifications <ul style="list-style-type: none"> Does the operator have proper licensing where applicable, (e.g., 	

Equipment Inspection Checklist for Drill Rigs
Page 6

Unit/Serial No#: _____

Inspection Date: ____ / ____ / ____

Yes	No	NA	Requirement	Comments
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	PPE Required for Drill Rig Exclusion Zone <ul style="list-style-type: none"> • Hardhat • Safety glasses • Work gloves • Chemical resistant gloves _____ • Steel toed Work Boots • Chemical resistant Boot Covers • Apron • Coveralls Tyvek, Saranex, cotton) _____ 	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Other Hazards <ul style="list-style-type: none"> • Excessive Noise Levels? _____ dBA • Chemical hazards (Drilling supplies - Sand, bentonite, grout, fuel, etc.) <ul style="list-style-type: none"> - MSDSs available? • Will On-site fueling occur <ul style="list-style-type: none"> - Safety cans available? - Fire extinguisher (Type/Rating - _____) 	

Approved for Use Yes No See Comments

Site Health and Safety Officer

Operator

ATTACHMENT V

SAFE WORK PERMITS

**SAFE WORK PERMIT
DECONTAMINATION ACTIVITIES
NAVAL SUPPORT ACTIVITY PANAMA CITY, PANAMA CITY, 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 equipment and machinery (i.e., HSA rigs and accessories) will occur using pressure washers and/or steam cleaning units. Sampling equipment will be decontaminated using buckets, brushes and spray bottles at the work site or designated location.
- II. **Primary Hazards:** Potential hazards associated with this task include lifting (strain/muscle pulls lifting heavy drilling equipment); Flying projectiles propelled by the force of the pressure washer/stream cleaner; noise; Burns/water lacerations; Stacked equipment - falling hazards; slips, trips, and falls – slippery surfaces.
- III. **Field Crew:** _____
- IV. **On-site Inspection conducted** Yes No Initials of Inspector _____ TtNUS
Equipment Inspection required Yes No Initials of Inspector _____ TtNUS

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

- V. **Protective equipment required**
 Level D Level B
 Level C Level A
 Modifications/Exceptions: None anticipated
- Respiratory equipment required**
 Yes Specify on the reverse
 No

VI. Chemicals of Concern	Hazard Monitoring	Action Level(s)	Response Measures
<u>Liquinox (soap).</u>	<u>PID/FID screening</u>	<u>Any reading > BG</u>	<u>Repeat decon and rescreen</u>

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

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

VII. Additional Safety Equipment/Procedures

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

Modifications/Exceptions: If contact with overspray is likely, Impermeable aprons may be used at SSO's discretion. Another option is to use rainsuit or PE coated Tyvek. Hard hat, splash shield, hearing protection will be worn for pressure washer/steam cleaner operation. Gloves – Nitrile (surgeons style) or outer for cleaning hand tools, nitrile supported for steam cleaner/pressure washer operation.

VIII. 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 Established/Traffic Control Barricades/Signs in Place..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Physical Hazards Identified and Isolated (Splash and containment barriers)..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Emergency Equipment Staged (Spill control, fire extinguishers, first aid kits, etc). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

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

- X. **Special instructions, precautions:** Suspend site activities in the event of inclement weather. Employ proper lifting techniques as described on Table 5-1 for this task. Use drying racks to secure heavy equipment to prevent items from falling during washing and drying. In addition, avoid pointing the wand at other people or place it against any part of your body. Accidental compression of the trigger can cause water lacerations or burns. All hoses and fittings will be inspected to insure structural integrity prior to use. 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. A light coating of sand should be applied to the plastic liner should the surface becomes to slippery to prevent slips. Keep hoses gathered to prevent trips and falls. A site control boundary for this activity is 35-feet surrounding the point of operation. Follow MSDS for any decontamination solutions/solvents used.

Permit Issued by: _____ Permit Accepted by: _____

**SAFE WORK PERMIT
MOBILIZATION/DEMobilIZATION ACTIVITIES
NAVAL SUPPORT ACTIVITY PANAMA CITY, PANAMA CITY, FLORIDA**

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

SECTION I: General Job Scope

- I. **Work limited to the following (description, area, equipment used):** Mobilization and demobilization activities. These activities include site reconnaissance/site characterization, site preparation including the layout of sampling locations, securing the necessary utility clearances, and identifying/isolating physical hazards; Secure, construct, or equip decontamination and IDW storage facilities.
- II. **Primary Hazards:** Potential hazards associated with this task are primarily physical in nature including lifting, cuts and lacerations, pinches and compressions; flying projectiles; slips, trips, and falls; insect and animal bites.
- III. **Field Crew:** _____
- IV. **On-site Inspection conducted** Yes No Initials of Inspector _____ TtNUS
Equipment Inspection required Yes No Initials of Inspector _____ TtNUS

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

- V. **Protective equipment required** **Respiratory equipment required**
 Level D Level B Yes See Reverse
 Level C Level A No

Modifications/Exceptions: None anticipated

VI. Chemicals of Concern	Hazard Monitoring	Action Level(s)	Response Measures
<u>None anticipated</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Primary Route of Exposure/Hazard: <u>None</u>			

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

VII. Additional Safety Equipment/Procedures

- | | |
|--|---|
| <ul style="list-style-type: none"> Hard-hat <input type="checkbox"/> Yes <input type="checkbox"/> No Safety Glasses <input type="checkbox"/> Yes <input type="checkbox"/> No Chemical/splash goggles <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Splash Shield <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Splash suits/coveralls <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Impermeable apron <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Steel toe Work shoes or boots ... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No High Visibility vest <input type="checkbox"/> Yes <input type="checkbox"/> No First Aid Kit <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Safety Shower/Eyewash <input type="checkbox"/> Yes <input type="checkbox"/> No | <ul style="list-style-type: none"> Hearing Protection (Plugs/Muffs) <input type="checkbox"/> Yes <input type="checkbox"/> No Safety belt/harness <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Radio/Cellular Phone <input type="checkbox"/> Yes <input type="checkbox"/> No Barricades <input type="checkbox"/> Yes <input type="checkbox"/> No Gloves (Type – Leather/Cotton) <input 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 checked="" type="checkbox"/> No Tape up/use insect repellent <input type="checkbox"/> Yes <input type="checkbox"/> No Fire Extinguisher <input type="checkbox"/> Yes <input type="checkbox"/> No Other <input type="checkbox"/> Yes <input type="checkbox"/> No |
|--|---|

Modifications/Exceptions: If there are Flying projectiles– Safety glasses and/or splash shield (i.e., hammering, power tool operation); If you have to raise your voice to be heard by someone within 2-feet of you hearing protection is required (i.e., equipment/power tool operation); If overhead hazards or bump hazards or you are working near operating equipment hard hats will be employed. If you are working in or near traffic patterns then wear High Visibility Vests. Use insect repellent and tape up to protect against insects and insect bites. Wear snake chaps in high brush areas.

VIII. Site Preparation

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

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

- X. **Special instructions, precautions:** Suspend site activities in the event of inclement weather. Employ proper lifting techniques as described on Table 5-1 for this task. The potential for natural hazards including snakes may exist given the region.

Permit Issued by: _____ Permit Accepted by: _____

**SAFE WORK PERMIT
MULTI-MEDIA SAMPLING ACTIVITIES
NAVAL SUPPORT ACTIVITY PANAMA CITY, PANAMA CITY, 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
II. Primary Hazards: Potential hazards associated with this task include lifting, pinches and compressions opening Samplers (Split spoons) and handling containers; contact with contaminated media.

III. Field Crew: _____

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

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

- V. Protective equipment required** **Respiratory equipment required**
 Level D Level B Yes See Reverse
 Level C Level A No

Modifications/Exceptions: _____

VI. Chemicals of Concern	Hazard Monitoring	Action Level(s)	Response Measures
<u>BTEX and diesel,</u>	<u>FID/PID</u>	<u>>10 ppm above BG in</u> <u>BZ for >1 minute</u>	<u>Retreat upwind until levels</u> <u>return to background</u>

Primary Route of Exposure/Hazard: Inhalation, ingestion, skin and eye contact. Inhalation exposure concerns are not likely to be encountered. Wear PPE, follow good personal hygiene and decontamination practices, and good site work practices (e.g., no hand-to-mouth actions on site, etc.) to control ingestion and skin and eye contact routes of entry.

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

VII. Additional Safety Equipment/Procedures

- | | |
|---|--|
| Hard-hat <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/Cellular Phone <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Splash Shield <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Barricades <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Splash suits/coveralls <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Gloves (Type – heavy duty cotton,) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| Impermeable apron <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Work/rest regimen <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Steel toe Work shoes or boots ... <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Chemical Resistant Boot Covers <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| High Visibility vest <input type="checkbox"/> Yes <input type="checkbox"/> No | Tape up/use insect repellent <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| First Aid Kit <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Fire Extinguisher <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Safety Shower/Eyewash <input type="checkbox"/> Yes <input type="checkbox"/> No | Other <input type="checkbox"/> Yes <input type="checkbox"/> No |

Modifications/Exceptions: High Visibility Vests for high traffic areas; Tape up and use insect repellent; Spiders and bees prefer well protective casings as nesting areas; Open wells and allow to vent/off gas 3-5 minutes while preparing your equipment from an upwind position. Wear snake chaps in high brush areas. Tyveks, hardhats, hearing protection, and boot covers at SSO's discretion.

VIII. Site Preparation

- | | | | |
|---|--------------------------|--------------------------|--------------------------|
| | Yes | No | NA |
| Utility Locating and Excavation Clearance completed..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Vehicle and Foot Traffic Routes 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"/> |

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

X. Special instructions, precautions: Personal sampling at remote locations will bag contaminated PPE and reusable sampling tools. Use 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. Provisions for protection against the sun should be provided to site personnel including shade providing devices requirements for hats, sun block, wrap around sun glasses.

Permit Issued by: _____ Permit Accepted by: _____

SAFE WORK PERMIT
MONITORING WELL INSTALLATION/SOIL BORING
NAVAL SUPPORT ACTIVITY PANAMA CITY, PANAMA CITY, FLORIDA

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

SECTION I: General Job Scope

- I. **Work limited to the following (description, area, equipment used):** Soil boring will be accomplished using hollow stem auger methods. Subsurface soil and groundwater sampling also included.
- II. **Primary Hazards:** Potential hazards associated with this task include injury due to improper lifting and carrying, cuts and lacerations (cutting bags, well riser, etc.), cuts, pinches and compressions; burns handling split spoons; entanglement in rotating equipment; exposure to high pressure hydraulic and air lines; and contact with contaminated media.
- III. **Field Crew:** _____
- IV. **On-site Inspection conducted** Yes No Inspector Initials _____ TtNUS
Equipment Inspection required Yes No Inspector Initials _____ TtNUS

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

- V. **Protective equipment required** **Respiratory equipment required**
 Level D Level B Yes See Reverse
 Level C Level A No
 Modifications/Exceptions: _____

VI. Chemicals of Concern	Hazard Monitoring	Action Level(s)	Response Measures
<u>BTEX and diesel</u>	<u>FID/PID</u>	<u>>10 ppm above BG in</u> <u>BZ >1 minute</u>	<u>Retreat upwind until levels</u> <u>return to background levels</u>

Primary Route of Exposure/Hazard: Inhalation, ingestion, skin contact. Wear PPE, follow good personal hygiene and decontamination practices, and good site work practices (e.g., no hand-to-mouth actions on site, etc.) to control ingestion and skin contact routes of entry. To control dust emissions during operations insure the rig is equipped with a hood and swab and extension hose to remove dust emissions from the work area.

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

VII. Additional Safety Equipment/Procedures

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

Modifications/Exceptions: High Visibility Vests for high traffic areas; Tape up and use insect repellent to combat insect bites in forested or areas of heavy vegetation; Fire extinguisher for all vehicles in excess of 1-ton;

VIII. Site Preparation

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

- IX. **Additional Permits required** (Utility Locating and Excavation Clearance – Attachment V)... Yes No
If yes, SSO complete permit or contact Health Sciences, Pittsburgh Office (412) 921-7090

- X. **Special instructions, precautions:** Follow the safe work practices for drilling specified in Section 5.1 of this HASP. Use proper lifting techniques defined in Table 5-1. Test all emergency stop devices initially then periodically to ensure operational status. Identify a person on the field crew as the Emergency Stop Operator. Visually insure all persons are removed from rotating apparatus. Verbally alert all persons as to the activation of the drill rig. Remove jewelry, loose clothing and other entanglement hazards. Personnel decontamination will consist of disposing of single use PPE and washing hands and face prior to breaks or meals. The potential for exposure can occur only through mechanical dispersion (inhalation) or hand to mouth contact (ingestion) through poor work hygiene practices. Utility clearance will precede all subsurface installation. Locking clips or cable retention links will be used at all airline input connections.

Permit Issued by: _____ Permit Accepted by: _____

**SAFE WORK PERMIT
TOPOGRAPHIC SURVEYING
NAVAL SUPPORT ACTIVITY PANAMA CITY, PANAMA CITY, FLORIDA**

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

SECTION I: General Job Scope

- I. **Work limited to the following (description, area, equipment used):** Topographic surveying and associated activities such as site reconnaissance and site preparation including the layout of control station and shooting vertical and horizontal control lines and fixed features such as intersections
- II. **Primary Hazards:** Potential hazards associated with this task are primarily physical in nature including lifting, cuts and lacerations, pinches and compressions; flying projectiles; slips, trips, and falls; insect and animal bites
- IV. **Field Crew:** _____
- IV. **On-site Inspection conducted** Yes No Initials of Inspector _____ TtNUS
- Equipment Inspection required** Yes No Initials of Inspector _____ TtNUS

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

- V. **Protective equipment required** Level D Level B Level C Level A
- Respiratory equipment required** Yes See Reverse No
- Modifications/Exceptions: None anticipated

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

Primary Route of Exposure/Hazard: None

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

VII. Additional Safety Equipment/Procedures

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

Modifications/Exceptions: 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 insect repellants according to manufacturers recommendations. 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 may be a threat, wear snake chaps. Surveyors working along highways and traffic pathways shall wear high visibility vests to increase visual recognition. Safety glasses and Hard Hats should be worn when cutting sight lines; leather or cotton work gloves when cutting brush.

VIII. Site Preparation

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

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

- X. **Special instructions, precautions:** Suspend site activities in the event of inclement weather. Employ proper lifting techniques as described on Table 5-1 for this task. Employ sharp tools for cutting brush, when not in use keep the sheath on the blade.

Permit Issued by: _____ Permit Accepted by: _____

**SAFE WORK PERMIT
IDW MANAGEMENT ACTIVITIES
NAVAL SUPPORT ACTIVITY PANAMA CITY, PANAMA CITY, FLORIDA**

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

SECTION I: General Job Scope

- I. **Work limited to the following (description, area, equipment used):** IDW management activities includes containerization, staging, monitoring for leaks of IDW accumulated wastes. Waste types include soil cutting, purge and decontamination wash waters.
- II. **Primary Hazards:** Potential hazards associated with this task are primarily physical in nature including lifting, pinches and compressions; flying projectiles; slips, trips, and falls.
- III. **Field Crew:** _____
- IV. **On-site Inspection conducted** Yes No Initials of Inspector _____ TtNUS
Equipment Inspection required Yes No Initials of Inspector _____ TtNUS

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

- V. **Protective equipment required** **Respiratory equipment required**
 Level D Level B Yes See Reverse
 Level C Level A No
- Modifications/Exceptions: None anticipated

VI. Chemicals of Concern	Hazard Monitoring	Action Level(s)	Response Measures
<u>BTEX, diesel</u>	<u>PID or FID</u>	<u>>10 ppm in BZ above BG for >1 minute</u>	<u>Retreat upwind until levels return to background</u>

Primary Route of Exposure/Hazard: None

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

VII. Additional Safety Equipment/Procedures

Hard-hat	<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/Cellular Phone	<input type="checkbox"/> Yes <input type="checkbox"/> No
Splash Shield	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Barricades	<input type="checkbox"/> Yes <input type="checkbox"/> No
Splash suits/coveralls	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Gloves (Type - Leather/Cotton) ...	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Impermeable apron	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Work/rest regimen	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Steel toe Work shoes or boots ...	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Chemical Resistant Boot Covers...	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
High Visibility vest	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Tape up/use insect repellent	<input type="checkbox"/> Yes <input type="checkbox"/> No
First Aid Kit	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Fire Extinguisher	<input type="checkbox"/> Yes <input type="checkbox"/> No
Safety Shower/Eyewash	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Other	<input type="checkbox"/> Yes <input type="checkbox"/> No

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

VIII. Site Preparation

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

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

- X. **Special instructions, precautions:** Suspend site activities in the event of inclement weather. Employ proper lifting techniques as described on Table 5-1. When/where possible use heavy equipment to move and place containers. When placing drums - Place the label and retention ring nut on the outside where it is readily visible. Place 4-drums to a pallet. Maintain a minimum distance of 4-feet between pallet rows. An IDW inventory shall be generated to provide the number of drums, contents, and volumes. This inventory should be provided to the facility contact

Permit Issued by: _____ Permit Accepted by: _____

ATTACHMENT VI

HEARING CONSERVATION PROGRAM

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
½	110
¼ or less	115

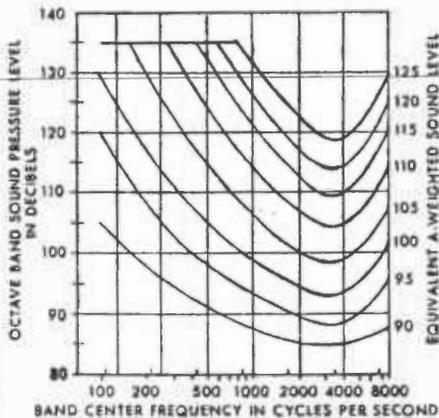


FIGURE G-9

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 G-16.

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_n indicates the total time of exposure at a specified noise level, and T_n 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

(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.

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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 wear 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.

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

(ii) 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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(ii) 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.

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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

$$T = \frac{8}{2^{(L-90)/15}}$$

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

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	89.8	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	91.8	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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(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 1/4 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	Reference 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 AUDIOGRAMS

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:

(1) 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.

(i) Subtract the values found in step (i)(B) from the value found in step (i)(A).

(ii) 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-

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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

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

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

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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.

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 6005, 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 Godsoe, 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, 1624 W. Adams, Phoenix, AZ 85005.	(602) 255-5795, Mr. Thomas Rameley, Manager.
Arkansas	OSHA Consultation, Arkansas Department of Labor, 1022 High St., Little Rock, Ark. 72202.	(501) 371-2992, 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, Wetherfield, Conn. 06109.	(203) 566-4550, Mr. Leo Altz, 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 Edmundson, 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) 281-3606, Mr. Allen J. Meier, Commissioner.
Indiana	Bureau of Safety, Education and Training, Indiana Division of Labor, 1013 State Office Building, Indianapolis, IN 46204.	(317) 633-5845, 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) 286-3331, 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) 322-1809, 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) 882-6315, 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, 815 Front Street, Helena, MT 59601.	(406) 449-3402, Mr. Ed Gatzmeier, 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) 842-3367, Mr. Albert M. Stevens, Project Manager.
New York	Division of Safety and Health, New York State Department of Labor, 2 World Trade Center, Room 6895, New York, NY 10047.	(212) 488-7746/7, Mr. Joseph Alleys, 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 43215.	(600) 282-1425 (Toll-free in State), (614) 466-7485, Mr. Andrew Doehvel, 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) 277-2436, Mr. James E. Hickey, Chief.

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OSHA ONSITE CONSULTATION PROJECT DIRECTORY—Continued

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-SDSO, Brookings, SD 57007.	(605) 688-4101, Mr. James Gaglian, Director.
Tennessee	OSHA Consultative Services, Tennessee Department of Labor, 2nd Floor, 501 Union Building, Nashville, TN 37218.	(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) 753-8500, 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. Morsland Blvd., Waukesha, WI 53186.	(414) 544-8686, Mr. Richard Michalski, 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. 76-120, 1975. NTIS-PB267461.	National Technical Information Service, Port Royal Road, Springfield, VA 22161.
Appendix D	"Specification for Sound Level Meters," S1.4-1971 (R1976).	American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.
§ 1910.95(a)(2), appendix E	"Specifications for Audiometers," S3.5-1968.	American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.

ATTACHMENT VII

OSHA POSTER

Job Safety and Health

It's the law!

OSHA

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

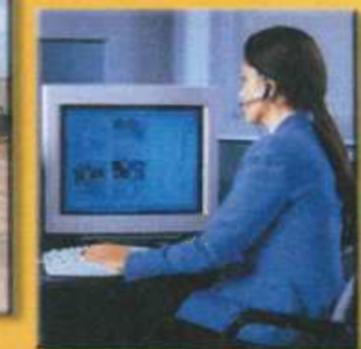
EMPLOYEES:

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

EMPLOYERS:

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

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

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