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HEALTH AND SAFETY PLAN FOR SITE ASSESSMENT AT SITES 245, 351, 413, 425, 1363,
1585, 1586 AND SATELLITE PARKING AREA 2 NS MAYPORT FL

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TETRA TECH NUS

Comprehensive Long-term Environmental Action Navy

CONTRACT NUMBER N62467-04-D-0055



Rev. 0
November 2006

Health and Safety Plan for Site Assessment at Sites 245, 351, 413, 425, 1363, 1585, 1586 and Satellite Parking Area # 2

**Naval Station Mayport
Mayport, Florida**

Contract Task Order 0050

November 2006



Southeast

2155 Eagle Drive

North Charleston, South Carolina 29406

**HEALTH AND SAFETY PLAN
FOR
SITE ASSESSMENT
AT
SITES 245, 351, 413, 425, 1585, 1343, 1363, 1586 AND
SATELLITE PARKING AREA # 2**

**NAVAL STATION MAYPORT
MAYPORT, FLORIDA**

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

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

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**CONTRACT NUMBER N62467-04-D-0055
CONTRACT TASK ORDER 0050**

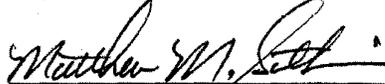
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1.0 INTRODUCTION

This Health and Safety Plan (HASP) has been written to encompass site activities that are to be conducted at various Underground Storage Tank (UST) sites at the Naval Station (NAVSTA) Mayport, Mayport, Florida as part of Contract Task Order (CTO) 0050. Specifically, this HASP addresses activities conducted as part of a Site Assessment at the Satellite Parking Area # 2 within NAVSTA Mayport. This HASP is being prepared for NAVSTA Mayport as part of an overall effort conducted under Comprehensive Long-Term Environmental Action Navy (CLEAN) IV contract administered through the United States Navy (Navy) Naval Facilities Engineering Command, Southeast (NAVFAC SE), as defined under Contract Number N62467-04-D-0055. In addition to the HASP, a copy of the Tetra Tech NUS, Inc. (TtNUS) Environmental Health and Safety Guidance Manual must be present at the site during the performance of site activities. The Guidance Manual provides detailed information pertaining to the HASP, as well as 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) Standard 29 Code of Federal Regulations (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 sites. The HASP will be modified if new information becomes available. Changes to the HASP will be made by the Project Health and Safety Officer (PHSO) and approved by the TtNUS Health and Safety Manager (HSM) and the Task Order Manager (TOM). The TOM will notify affected personnel of the changes.

The elements of this HASP are in compliance with the requirements established by OSHA 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response", and sections of 29 CFR 1926, "Safety and Health Regulations for Construction." The information contained in this plan, as well as policies on conducting on-site operations, has been obtained from the TtNUS Health and Safety Program.

1.1 KEY PROJECT PERSONNEL AND ORGANIZATION

This section defines responsibility for site safety and health for TtNUS and subcontractor employees engaged in on-site activities. Personnel assigned to these positions will exercise the primary responsibility for the 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 PHSO is responsible for developing this 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) based on task and potential hazards.
- iv. Determining emergency response procedures and emergency contacts.
- v. Stipulating training requirements and reviewing appropriate training and medical surveillance certificates.
- vi. Providing standard work practices to minimize potential injuries and exposures associated with hazardous waste work.
- vii. Modifying this HASP, as it becomes necessary.

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 the health and safety activities with the FOL.
- ii. Selecting, applying, inspecting, and maintaining PPE.
- 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, Respiratory Protection Programs, 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 as per site-specific requirements.

Compliance with the requirements stipulated in this HASP is monitored by the SSO and coordinated through the TtNUS CLEAN HSM.

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

1.2 SITE INFORMATION AND PERSONNEL ASSIGNMENTS

Site Name: NAVSTA Mayport **Address:** Mayport, Florida

Navy Engineer-in-Charge: Ms. Beverly Washington **Phone Number:** (843) 820-5581

Facility Contact: Ms. Diane Racine **Phone Number:** (904) 270-6730

Purpose of Site Visit: Soil boring and monitoring well installations, soil and groundwater sampling, excavation of soils, and free product recovery.

Proposed Dates of Work: November 2006 until completion

Project Team:

TtNUS Personnel:

Mark Peterson, P.G.

David Siefken

Matthew M. Soltis, CIH, CSP

James K. Laffey

David Siefken

Discipline/Tasks Assigned:

Task Order Manager (TOM)

Field Operations Leader (FOL)

CLEAN Health and Safety Manager (HSM)

Project Health and Safety Officer (PHSO)

Site Safety Officer (SSO)

Non-TtNUS Personnel:

Affiliation/Discipline/Tasks Assigned:

TBD

Excavation Contractor

TBD

Competent Person

Hazard Assessments (for purposes of 29 CFR 1910.132) and HASP preparation conducted by:
James K. Laffey

TBD - To be determined

2.0 EMERGENCY ACTION PLAN

2.1 INTRODUCTION

This section is part of a planning effort to direct and guide field personnel in the event of an emergency. The site activities will be coordinated with NAVSTA Mayport emergency services prior to commencement. In the event of an emergency, which cannot be mitigated using on-site resources, personnel will evacuate to a safe place of refuge and the FOL will contact "911" to report the emergency. Site personnel may transport ill workers or those who have non-serious injuries to medical facilities, provided that such transport can be done safely. 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. NAVSTA Mayport Emergency Dispatch will be notified anytime that outside response agencies are required. This Emergency Action Plan conforms to the requirements of 29 CFR 1910.38(a), as allowed in 29 CFR 1910.120(l)(1)(ii).

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

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

2.2 EMERGENCY PLANNING

Through the initial hazard/risk assessment effort, injury or illness resulting from exposure to chemical or physical hazards are the most probable emergencies that can be encountered during site activities. The SSO and/or the FOL are responsible for minimizing and eliminating these potential emergency situations, pre-emergency planning activities associated with this project include the following.

- Coordinating response actions with NAVSTA Mayport 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 includes the following:
 - Chemical Inventory (for substances used on site), with Material Safety Data Sheets (MSDS).
 - On-site personnel medical records (medical data sheets).
 - A logbook identifying personnel on site each day.
 - Emergency notification phone numbers in the site vehicles.

- Identifying a chain of command for emergency action.

- Educating site workers to the hazards and control measures associated with planned activities at the site, and providing early recognition and prevention, where possible.

It is the responsibility of the TtNUS FOL to ensure that this information is available and present at the site.

2.3 EMERGENCY RECOGNITION AND PREVENTION

2.3.1 Recognition

Foreseeable emergency situations that may be encountered during site activities will generally be recognizable by visual observation. A clear knowledge of the signs and symptoms of overexposure to contaminants of concern (COCs) may alert personnel of the potential hazards concerning themselves or their fellow workers. These potential hazards, the activities with which they have been associated, and the recommended control methods are discussed in detail in sections 5.0 and 6.0 of this document. Additionally, early recognition will be supported by periodic site surveys to eliminate any conditions that may predispose site personnel or properties to an emergency.

The FOL and the SSO will constitute the site evaluation committee responsible for these periodic surveys. A site survey will be conducted during the initiation of this effort. The survey will be documented.

2.3.2 Prevention

TtNUS and subcontractor personnel will minimize the potential for emergencies by ensuring compliance with the HASP, the Health and Safety Guidance Manual, applicable OSHA regulations, and by following directions given by those persons responsible for the health, safety, and welfare of personnel.

2.4 SAFE DISTANCES AND PLACES OF REFUGE

In the event that the site must be evacuated, personnel will immediately stop activities and report to a pre-determined safe place of refuge. The safe place of refuge may also serve as the telephone communication point, as communication with emergency response agencies may be necessary. Telephone communication points and safe places of refuge will be determined prior to the commencement of site activities and will be conveyed to personnel as part pre-site training. Upon reporting to the refuge location, personnel will remain there until directed otherwise by the TtNUS FOL or the On-Scene Incident Commander. The FOL will take a head count at this location to confirm the presence of site personnel. Emergency response agencies will be notified of any unaccounted for personnel.

2.5 EVACUATION ROUTES AND PROCEDURES

Once an evacuation is initiated, personnel will proceed immediately to the designated place of refuge, unless doing so would further jeopardize the welfare of workers. In such an event, personnel will proceed to a designated alternate location (to be identified) and remain there until further notification from the FOL. The use of these locations as assembly points provides communication and a direction point for emergency services, should they be needed.

Evacuation procedures will be discussed prior to the initiation of any work at the site. This shall include identifying primary and secondary evacuation routes and assembly points. Evacuation routes from the site are dependent upon the location at which work is being performed and the circumstances under which an evacuation is required. Additionally, site location and meteorological conditions (i.e., wind speed and direction) will influence the designation of evacuation routes. As a result, assembly points at NAVSTA Mayport will be selected, and in the event of an emergency, field personnel will proceed to these points by the most direct route possible without further endangering themselves.

2.6 EMERGENCY ALERTING AND ACTION/RESPONSE PROCEDURES

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

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

- Initiate incident alerting procedures (if needed) verbally, by air horn, or using two-way radios.
- Evacuate non-essential personnel.

- Initiate initial response procedures.
- Describe to the FOL (who will serve as the Incident Commander) what has occurred in as much detail as possible.

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

- Report the emergency to the NAVSTA Mayport Emergency Dispatch (see Table 2-1) by calling 911.
- Give the emergency operator the location of the emergency and a brief description of what has occurred.
- Stay on the phone; follow the instructions given by the operator.
- The appropriate agency will be notified and dispatched.
- Call the Navy On-Site Representative.
- Call the TOM.

If an incident occurs outside of our 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.
- Call the Navy On-Site Representative.
- Proceed to the assembly points as directed by NAVSTA Mayport or other 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 shall be available at the site. Table 2-1 provides a list of emergency contacts and their corresponding telephone numbers. These numbers will be used for the site to be visited during this project. This table must be readily available to personnel at the site.

TABLE 2-1
EMERGENCY CONTACTS
NAVSTA MAYPORT

AGENCY	TELEPHONE
NAVSTA Mayport - Emergency Dispatch	911
EMERGENCY (outside services) (Police, Fire, and Ambulance Services)	911 or (904) 270-5333
Base Security	(904) 270-5583 or (904) 270-5584
Base Medical Center (for life threatening emergencies only)	(904) 270-5444
Memorial Health Care Center (for other emergencies)	(904) 858-7500
Base Safety Department	(904) 270-5218
Site Point of Contact, Ms. Diane Racine	(904) 270-6730
Public Works Trouble Desk (for utility problems)	(904) 542-2122
Public Works Center (PWC) Dig Permits, Wayne Purifoy	(904) 270-5184
PWC Electrician, Walter Solomon	(904) 270-5580 (Ext. 309)
Sunshine State Utility One-Call of Florida	(800) 432-4770
Naval Station Operator (for information)	(904) 270-5011
Poison Control Center	(800) 222-1222
Chemtrec	(800) 424-9300
National Response Center	(800) 424-8802
TtNUS Jacksonville Office	(904) 636-6125
Task Order Manager Mark Peterson, P.G.	(904) 636-6125
CLEAN Health and Safety Manager Matthew M. Soltis, CIH, CSP	(412) 921-8912
Project Health and Safety Officer James K. Laffey	(412) 921-8678
WorkCare	(800)-455-6155 (enter Ext. 109)

Note: When calling base telephone numbers from within the base (i.e., from an on-base telephone), dial a zero (0) and the last four digits of the telephone number. For example, to contact the Base Medical Clinic dial 05444.

2.8 ROUTE TO HOSPITALS

For emergency care only, non-Navy personnel are permitted to go to the Base Medical Center.

Branch Medical Clinic
NAVSTA Mayport
Mayport, FL 32228

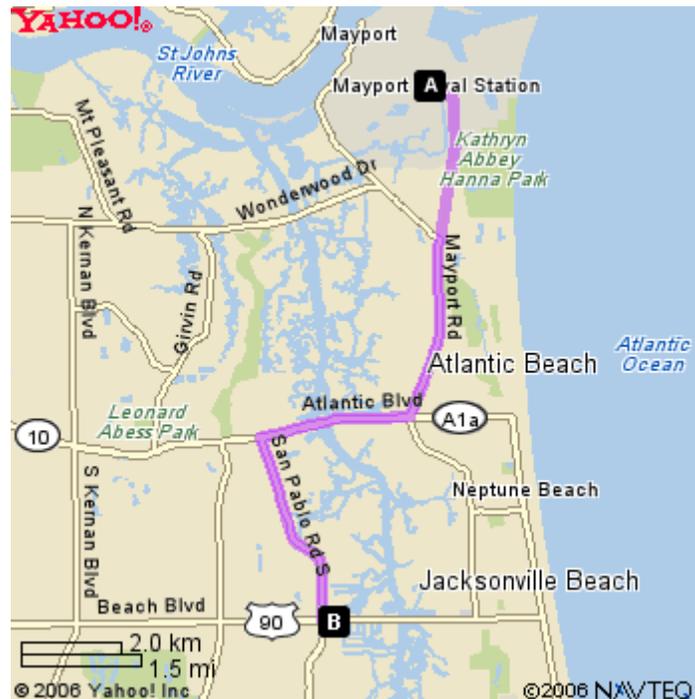
The Base Medical Clinic should be used for life-threatening emergencies only. It is located in Building 1363 on Massey Avenue.

For non-emergency care services:

Memorial Health Care Center
14444 Beach Boulevard
Jacksonville, Florida 32202
(904) 858-7500

Memorial Health Care Center will be used for medical care beyond basic first aid treatment. Directions to the Center: Exit base, take Mayport Road (A1A) to Atlantic Boulevard. Take a right onto Atlantic Boulevard across the Intercoastal Waterway. At the first intersection, take a left onto San Pablo Boulevard. The Medical Center is at the intersection of San Pablo Boulevard and Beach Boulevard (14444 Beach Boulevard). See Figure 2-1 "Route to Memorial Health Care Center."

Figure 2-1
Route to Memorial Health Care Center



2.9 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 evacuation would occur which would require workers to evacuate the site without first performing the necessary decontamination procedures.

TtNUS personnel will perform removal of personnel from emergency situations and may provide initial medical support for injury/illnesses requiring only first-aid level support. Medical attention above that level 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.**

2.10 INJURY/ILLNESS REPORTING

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

Any pertinent information regarding allergies to medications or other special conditions will be provided to medical service personnel. This information is listed on Medical Data Sheets (see Attachment II) 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.

FIGURE 2-2 POTENTIAL EXPOSURE PROTOCOL

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

In the event of a personnel exposure to a hazardous substance or agent:

- 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 exposed person is a TtNUS employee, call the medical facility and advise them that the patient(s) is/are being sent, and 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 (enter Extension 109) or follow the voice prompt for after hours and weekend notification and be prepared to provide:
 - Any known information about the nature of the exposure.
 - 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 exposed TtNUS employee(s).
 - Name and phone number of an informed site officer who will be responsible for further investigations.
 - Fax appropriate information (e.g., MSDS) to WorkCare at (714) 456-2154.
- Contact Corporate Health and Safety Department (Matt Soltis) at 1-800-245-2730.

As environmental data is gathered and the exposure 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 victim's medical file in addition to being distributed to appropriately designated company officials.

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

FIGURE 2-2 (continued)
POTENTIAL EXPOSURE REPORT

Name: _____ Date of Exposure: _____

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

Client Contact: _____ Phone No.: _____

Company Name: _____

I. Exposing Agent

Name of Product or Chemicals (if known): _____

Characteristics (if the name is not known)

Solid Liquid Gas Fume Mist Vapor

II. Dose Determinants

What was individual doing? _____

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

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

Was their skin contact? _____

Was the exposing agent inhaled? _____

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

III. Signs and Symptoms (check off appropriate symptoms)

Immediately With Exposure:

Burning of eyes, nose, or throat

Tearing

Headache

Cough

Shortness of Breath

Chest Tightness / Pressure

Nausea / Vomiting

Dizziness

Weakness

Delayed Symptoms:

Weakness

Nausea / Vomiting

Shortness of Breath

Cough

Loss of Appetite

Abdominal Pain

Headache

Numbness / Tingling

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

Burning of eyes, nose, or throat

Tearing

Headache

Cough

Shortness of Breath

Chest Tightness / Pressure

Cyanosis

Nausea / Vomiting

Dizziness

Weakness

Loss of Appetite

Abdominal Pain

Numbness / Tingling

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

Improved: _____ Worsened: _____ Remained Unchanged: _____

V. Treatment of Symptoms (check off appropriate response)

None: _____ Self-Medicating: _____ Physician Treated: _____

3.0 SITE BACKGROUND

3.1 NAVSTA MAYPORT

NAVSTA Mayport is located within the corporate limits of the City of Jacksonville, Duval County, Florida, and approximately 12 miles to the northeast of downtown Jacksonville and adjacent to the Town of Mayport. The station complex is located on the northern end of a peninsula bounded by the Atlantic Ocean to the east and the St. Johns River to the north and west.

3.2 SITE 245

Site 245 is the location of a former 2000-gallon fuel oil UST. During removal activities, contaminated soil was encountered resulting in subsequent removal activities. The result of the site investigation determined that one soil boring (SB-9) contained excessive contamination below 3 feet in depth. Groundwater was found to contain fuel constituents but at levels below Groundwater Cleanup Target Level (GCTL) values. A limited source removal in the vicinity of SB-9 may be required. Quarterly groundwater monitoring will also be conducted.

3.3 BUILDING 351

Building 351 is located at the Fleet Training Center on the northeastern edge of the base and is the former location of a 10,000 aboveground storage tank (AST) and a 500-gallon gasoline UST.

On July 1, 1999, a diesel fuel surface spill was reported at the Fleet Training Facility, Building 351. The cause of the discharge was reported to be a leaking 1.5-inch diameter, underground distribution pipe containing diesel fuel. The total quantity of the diesel fuel release was unknown. However, approximately 1,140 gallons of free product was recovered between July and August 1999. An excavation was conducted to remove grossly contaminated soils. The fuel impacted an area approximately 14 feet long by 8 feet wide. The horizontal extent of the excavation was limited due to the presence of permanent structures adjacent to the impacted areas. In total, approximately 7 tons of diesel contaminated soil was removed from the impacted area. Following the soil excavation a free phase product recovery effort was initiated, and a total of 1,140 gallons of fuel oil was recovered during the free product recovery effort.

3.4 BUILDING 413

Building 413 had a Closure Assessment for the underground piping and sumps associated with AST N413. The underground piping was closed in place and the sumps were removed in April 2001.

Closure results indicate that petroleum impacted soil and groundwater were encountered in the vicinity of the removed sump on the northern site of AST N413.

3.5 SITE 425

Building 425 is located at the Bachelors Officers Quarters on the eastern edge of the base and is the location of a 1,000-gallon AST used to store heating oil.

Two separate releases occurred involving this AST. The Area 2 release reportedly occurred when a faulty float valve in a day tank associated with a boiler malfunctioned causing the tank to overflow and fuel to travel through the vent pipe, which was connected to the 1000-gallon AST. The Area 2 release was located in a corner on the western side of Building 425. It was estimated that 700 gallons of heating oil was released at Area 2. After the release, approximately 60 cubic yards of hydrocarbon impacted soil was removed during an initial remedial action at Area 2. However, due to the close proximity to the foundation of the building, all impacted soil was not removed. Free product is still present and appears to emanate from beneath Building 425. A free product recovery system is anticipated to be installed and operated at Building 425.

3.6 SITE 1343

Site 1343 is the location of a 10,000-gallon UST that was closed in place in 1995. A subsequent site investigation revealed the presence of free product in a single monitoring well. However, no soil or groundwater contamination was detected above regulatory criteria. The site investigation recommended the installation of a free product recovery pump in the well containing the free product and subsequent quarterly monitoring of other site wells.

3.7 BUILDING 1363

Site 1363 is located south of Building 1363, the former Medical Dispensary. Two USTs were removed approximately 80 feet south of Building 1363.

As a result of the petroleum impacted soil discovered during the tank closures, a Contamination Assessment Report Addendum and Remedial Action Plan were conducted. The soil excavation was completed in September 2004. A round of groundwater monitoring well samples would be collected soon after the excavation was complete and analyzed for Gasoline Analytical Group and Kerosene Analytical Group constituents. No exceedances to the GCTLs were identified. To confirm these findings, additional monitoring was requested by Florida Department of Environmental Protection (FDEP).

3.8 BUILDING 1585

Building 1585 is the site of a failed gauge on the boiler fuel line inside the building doghouse in March 2004. The failure caused approximately 20 gallons of fuel to be lost. An estimated 12 gallons of free product was recovered and placed back into the boiler fuel tank. The remaining fuel was picked up with absorbent pads and placed in a drum.

3.9 SITE 1586

Tank Site 1586 has been the focus of an ongoing Site Assessment to evaluate the extent of petroleum hydrocarbons in soil and groundwater that resulted from a ruptured fuel line. This work included the installation of eight monitoring wells and numerous soil borings. The results of this investigation indicated that Tank Site 1586 was a candidate for natural attenuation. Subsequent monitoring of the site conducted in 1999 and 2000 indicated that petroleum constituents were below GCTLs and, therefore, the site was eligible for closure. However, on April 30, 2000, the contractor installing a new 5,000-gallon double-walled fiberglass UST in the same tank pit as the previously removed 4,000-gallon fuel oil UST, spilled 1,400 gallons of fuel oil. The release was reported to Mr. Jim Cason of the FDEP. The contractor installed free product recovery wells. However, free product extraction was not initiated.

Monitoring activities indicated that as much as 3 feet of free product was present in a well adjacent to the tank pit. As a result, the FDEP has required that a site investigation be conducted to determine the extent of free product occurrence and to determine the appropriate remedial technique.

3.10 SATELLITE PARKING AREA # 2

The satellite parking area was the focus of a source removal conducted by the Navy to address polynuclear aromatic hydrocarbon (PAH) and total recoverable petroleum hydrocarbon (TRPH) contamination that resulted from the release of a tar substance. Closure sampling conducted after the excavation of visually impacted soils indicated that PAH and TRPH constituents remain above FDEP Soil Cleanup Target Levels. As a result, the Navy has requested that TtNUS conduct a site assessment of this area to delineate the vertical and horizontal extent of contamination in soils and to verify if groundwater may have been impacted.

4.0 SCOPE OF WORK

The following activities are covered in this HASP include:

- Site mobilization/demobilization activities
- Soil boring and installation of monitoring wells using Direct Push Technology (DPT)
- Monitoring well development, purging, and installation of piezometers
- Multi-media sampling, including:
 - Surface and subsurface soil
 - Groundwater
 - Free product recovery
- Oversight of excavation activities
- Surveying
- Decontamination
- Investigative-Derived Waste (IDW) Management

Any tasks to be conducted outside of the elements listed here will be considered a change in scope requiring modification of this document. The requested modifications to this document will be submitted to the HSM by the TOM or a designated representative.

5.0 TASKS/HAZARDS/ASSOCIATED CONTROL MEASURES

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. This table will be modified and incorporated into this document as new or additional tasks are performed at the site. The anticipated hazards, recommended control measures, air-monitoring recommendations, PPE, and decontamination measures for each site task are discussed in detail. This table and the associated control measures shall be changed if the Scope of Work, COCs, or other conditions change.

Through using the table, site personnel can determine which hazards are associated with each task and 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 accompanies this table and HASP. The manual is designed to further explain supporting programs and elements for other site-specific aspects as required by 29 CFR 1910.120. The Guidance Manual 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 the Exclusion Zone activities (see Section 9.4 and Attachment III) will use elements defined in Table 5-1 as its primary reference. The FOL and/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. Partially completed Safe Work Permits are included in Attachment III of this HASP.

5.1 GENERAL SAFE WORK PRACTICES

In addition to the task-specific work practices identified on Table 5-1, the following safe work practices are to be followed when conducting work on site. These safe work practices address a pattern of general precautions and measures for reducing risks associated with site operations. This is a partial list and may be amended as necessary.

**TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES
NAVSTA MAYPORT, FLORIDA**

Task/Operation/ Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring - Types and Action Levels	Personal Protective Equipment <i>(Items in italics are deemed optional as conditions or the FOL or SSO require)</i>	Decontamination Procedures
<p>Mobilization/ Demobilization activities</p> <p>This activity includes, but 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 at Sites 245, 351, 413, 425, 1585, and Satellite Parking Area # 2. - Construct decontamination and IDW operation and storage facilities, as applicable. 	<p>Chemical hazards:</p> <p>1) Contact with chemicals brought on-site (fuels, preservatives, etc.)</p> <p>Physical hazards:</p> <p>2) Lifting (strain/muscle pulls)</p> <p>3) Pinches and compressions</p> <p>4) Slips, trips, and falls</p> <p>5) Vehicular and foot traffic</p> <p>Natural hazards:</p> <p>6) Ambient temperature extremes (heat/cold stress)</p> <p>7) Insect and animal bites</p> <p>8) Inclement weather</p>	<p>1) The on-site Hazard Communication Program (Section 5.0 TtNUS Health and Safety Guidance Manual) will be followed. All chemicals brought onto the site by TtNUS and subcontractor personnel will be inventoried with each applicable chemical having an MSDS on site, on file. This effort shall include:</p> <ul style="list-style-type: none"> - A Chemical Inventory list is generated for chemicals brought on site (complete Section 5.0 of the TtNUS Health and Safety Guidance Manual). - MSDS's must be available for chemicals brought on site. - Materials are stored in accordance with recommended practices and according to compatibility (see MSDS for storage and compatibility recommendations). The FOL and/or the SSO will preview work locations in an effort to identify, barricade, and/or remove physical and biological hazards prior to the commitment of any personnel, equipment, or other resources. - If transferring hazardous chemicals to portable containers from labeled containers, the portable container must be labeled with appropriate information unless it is intended for immediate (within that shift and day) use by the person who performs the transfer. - The following label information is required: (i) Identity of the hazardous chemical(s); (ii) appropriate hazard warnings; and (iii) name and address of the chemical manufacturer, importer, or other responsible party. <p>2) Use machinery or multiple personnel for heavy lifts, where possible.</p> <ul style="list-style-type: none"> - 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. - Area available to maneuver the lift. - Area of the lift – work place clutter, slippery surfaces. <p>3) Keep any machine guarding in place, avoid moving parts.</p> <ul style="list-style-type: none"> - Use tools or equipment where necessary to avoid placing hands in areas vulnerable to pinch points. - Adjust machine guarding as necessary to minimize access into the machine. - When staging equipment, insure all stacked loads, shelving are adequately secure to avoid creating a hazard from falling objects. <p>4) Preview work locations for unstable/uneven terrain.</p> <ul style="list-style-type: none"> - Cover, guard, and barricade all open pits, ditches, and floor opening as necessary. - Ruts, roots, tools, and other tripping hazards should be eliminated to minimize trips and falls. - Maintain a clutter free work area. - As part of site control efforts, construct fences or other means of demarcation (i.e., signs and postings) to control and isolate traffic in the work area. Means of demarcation shall also be constructed isolating resource and/or staging areas. <p>5) Establish safe zones of approach (i.e., boom or mast + 5 feet). See Table 5-1 Soil boring/Monitoring Well Installation for recommended distances.</p> <ul style="list-style-type: none"> - The mast will be lowered when moving the rig. - Foot and vehicular traffic routes shall be well defined. - Heavy equipment patterns shall be isolated using fences or other suitable barricades from pedestrian pathways. - Bumpers or other suitable traffic stops shall be placed in areas where it is desired for traffic approaching drop offs or unprotected banks. - All self-propelled equipment with restricted vision moving backwards shall be equipped with back up warning systems. - The FOL and/or the SSO, as a precautionary measure to remove or demarcate physical hazards, shall preview traffic routes (foot and vehicular) before the commitment of personnel and resources. <p>6) Wear appropriate clothing for weather conditions. Provide acceptable shelter and liquids for field crews. Additional information regarding heat and cold stress is provided in Section 4.0 of the TtNUS Health and Safety Guidance Manual.</p> <p>7) In high grass or brush covered areas:</p> <ul style="list-style-type: none"> - Wear light color clothes and, if necessary, tape pant legs to work boots to block direct access. - Use repellents containing DEET directly on exposed skin. Permethrin should be applied liberally to the clothing, but not the skin as it may cause irritation. Follow manufacturer's recommendations for application and re-application. - Avoid animal nesting areas. <p>8) Suspend or terminate operations until directed otherwise by SSO. See Section 4.0 of the TtNUS Health and Safety Guidance Manual for additional information concerning natural hazards.</p>	<p>Visual observation of work practices by the FOL and/or the SSO to minimize potential physical hazards (i.e., improper lifting, unsecured loads, cutting practices, etc.).</p> <p>Monitoring for chemical hazards is not required during this activity.</p>	<p>Level D - (Minimum Requirements)</p> <ul style="list-style-type: none"> - Standard field attire (sleeved shirt, long pants) - Steel toe safety shoes/boots - <i>Safety glasses</i> - <i>Hardhat (when overhead hazards exist 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> <p>As site conditions may change, the following equipment will be maintained during all on-site activities as prescribed in Section 2.0 of this HASP.</p> <ul style="list-style-type: none"> - Fire extinguishers - First-aid kit <p>Note: The FOL and/or the SSO will determine the number of fire extinguishers and first-aid kits to be made available based on the number of operations to be conducted at any given time.</p>	<p>Not required.</p> <p>Good personal hygiene practices should be employed prior to breaks lunch or other period when hand to mouth contact occurs. This will minimize potential ingestion exposures.</p> <p>Personnel should inspect themselves and one another for the presence of ticks when exiting wooded areas, grassy fields, etc. This action will be employed to assist in stopping the transfer of these insects into vehicles, homes, and offices.</p> <p>In a review of a number of tick bites reported over the past few years, the ticks that went undetected were located on the back and in the shoulder areas. Have your buddy examine this area carefully.</p>

**TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES
NAVSTA MAYPORT, FLORIDA**

Task/Operation/ Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring - Type and Action Levels	Personal Protective Equipment <i>(Items in italics are deemed optional as conditions or the FOL or SSO require)</i>	Decontamination Procedures
<p>Soil Boring and Monitoring Well Installation using DPT at Satellite Parking Area # 2.</p> <p>Subsurface soil sampling is also included in this task.</p>	<p>Chemical hazards:</p> <p>1) Historical information and previous analytical data indicate that petroleum products such as fuel oils, diesel fuel, and their associated constituents, volatile organic compounds (VOCs) and PAHs, may be present at each of the sites to be investigated.</p> <p>Further information on the primary COCs is presented in Section 6.1 and Table 6-1.</p> <p>2) Transfer of contamination into clean areas or onto persons</p> <p>Physical hazards:</p> <p>3) Heavy equipment hazards (pinch/compressions points, rotating equipment, hydraulic lines, etc.)</p> <p>4) Noise in excess of 85 dBA</p> <p>5) Energized systems (contact with underground or overhead utilities)</p> <p>6) Lifting (strain/muscle pulls)</p> <p>7) Slips, trips, and falls</p> <p>8) Cuts and lacerations</p> <p>9) Vehicular and foot traffic</p> <p>Natural hazards:</p> <p>10) Inclement weather</p> <p>11) Insect bites</p>	<p>1) Avoid contact with contaminated media (free product, air, water, soils, etc.) through safe work practices, PPE, and decontamination. Use photoionization detector (PID)/flame Ionization Detector (FID) to evaluate the presence of petroleum related VOCs at source areas and in worker breathing zones. The contaminants may be bound to particulates (dusts) generated during site activities; however, DPT activities are not anticipated to generate significant airborne dusts. Good work and personal hygiene measures will be used to control potential exposures through incidental ingestion. Avoid hand to mouth contact, wash hands and face or use hygienic wipes to remove potential contaminants prior to breaks or lunch or other hand to mouth activities.</p> <p>2) Restrict the cross use of equipment and supplies between locations and activities without first going through a suitable decontamination. Work practices including establishing a rigid decontamination procedure will be employed for all equipment between locations and between clean and potentially dirty work. This provision along with dedicated sampling equipment will ensure materials are not carried and deposited in unaffected areas.</p> <p>3) All equipment will be:</p> <ul style="list-style-type: none"> - Inspected using the Equipment Inspection Checklist found in Attachment V of this HASP. - Operated and supported by knowledgeable operators and ground crew. - Personnel not directly supporting this operation will remain at least 25 feet from the point of operation or the height of the mast plus 5 feet, whichever is greater. - All personnel will be instructed in the location and operations of the emergency shut-off device(s). This device will be tested initially (and then daily) to ensure its operational status. - One person will be designated as the Emergency Shut Off Device Operator. - Areas will be inspected prior to the movement of the direct push rig and support vehicles to eliminate any physical hazards. This will be the responsibility of the FOL and/or SSO. - See additional safe work procedures for soil boring/drilling in Section 5.2 of this HASP as well as in Section 4.0 of the Health and Safety Guidance Manual. <p>4) Excessive noise levels will be mitigated through the use of hearing protection. Any piece of equipment or operation that has the potential to generate excessive noise levels (i.e., you must raise your voice to speak to someone within 2 feet of where you are standing) will require hearing protection until sound level measurements and/or noise dosimetry may be conducted to quantify the associated noise levels.</p> <p>5) All soil boring/drilling activities will proceed in accordance with the Utility Locating and Excavation Clearance SOP in Attachment IV of this HASP. All utility clearances will be obtained in writing and locations identified and marked prior to activities.</p> <p>6) Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques as described in Table 5-1 for mobilization/demobilization. Drill stems, auger flights, and well construction supplies are some of the common material that are handled and, because of their weight, will present a lifting strain hazard associated with this activity.</p> <p>7) Preview work locations and site lines for uneven/unstable terrain. Clear necessary vegetation and establish temporary means for traversing hazardous terrain (e.g., rope ladders).</p> <p>8) Use the knife and acetate tube retention trough recommended by Geoprobe (Geoprobe Sampling Kit) to prevent potential cuts and lacerations when accessing samples within MacroCore acetate liners.</p> <ul style="list-style-type: none"> - Always cut away from yourself and others. - Do not place items to be cut in your hand or on your knee. - Maintain a sharp cutting edge. - Wear cut-resistant gloves (leather or heavy cotton). <p>9) Use traffic-warning signs, flag persons, and high visibility vests as determined by the SSO when work infringes traffic thoroughfares. Use physical barricades when working within or altering normal traffic flow patterns/traffic lanes.</p> <p>10) Wear appropriate clothing for weather conditions. Follow the provisions as specified in Section 4.0 of the TtNUS Health and Safety Guidance Manual regarding the identification and evaluation of heat/cold stress related conditions.</p> <p>11) Avoid potential nesting areas and suspicious vegetation. When feasible and necessary, use commercially available insect repellants. Report potential hazards to the SSO. Inspect clothing and persons for ticks and other vectors during and after work activities in wooded areas.</p>	<p>Given the physical characteristics of fuel oils and diesel fuel, it is not anticipated that significant airborne concentrations will be present in worker breathing zones. Furthermore, site activities are unlikely to generate airborne dusts.</p> <p>A direct reading instrument such as FID/PID will be used to detect VOCs associated with fuel oils and diesel fuel.</p> <p>The FID/PID will be used to screen potential source (sample locations, boreholes, etc.) areas to detect the presence of any VOCs. Positive readings at a source area will require that worker's breathing zone be monitored to determine exposure potentials.</p> <p>Any sustained readings greater than 25 parts per million (ppm) above background (> 1 minute in duration) in a worker's breathing zone, or observations of symptoms of exposure, will require that site activities be suspended until the readings subside to background levels or the source is determined.</p> <p>NOTE: Evidence of elevated FID/PID readings in worker breathing zones will require colorimetric tube sampling for benzene (using a 0.5/c benzene tube) be performed to evaluate the presence of benzene. Any evidence of benzene (a color change from white to brownish-yellow) will require site activities to be suspended and the PHSO to be contacted for further guidance see Section 7.1.2.</p> <p>Noise monitoring may be conducted at the discretion of the PHSO and/or the SSO.</p> <p>Action Level - >85 dBA Participation in the Project Hearing Conservation Program. Hearing protection is required for this operation.</p>	<p>Subsurface operations are to be initiated in Level D protection. Level D protection constitutes the following minimum protection:</p> <ul style="list-style-type: none"> - Standard field dress (long pants and sleeved shirts) - Surgical style nitrile gloves - Steel toe shoes or work boots - Disposable nitrile gloves - Safety glasses - Hearing protection for high noise areas - Hardhat (when approaching or working near the DPT rig) - <i>Tyvek coveralls and disposable boot covers if surface contamination is present or if the potential exists of soiling work attire.</i> - <i>Reflective vest for high traffic areas</i> <p>Note: The Safe Work Permit for this task (see Attachment III) will be issued at the beginning of the task to address planned activities. Additional PPE may be assigned to reflect site-specific conditions or special considerations.</p>	<p>Personnel Decontamination -This function will take place at an area adjacent to the work operations.</p> <p>This decontamination procedure for Level D protection will consist of</p> <ul style="list-style-type: none"> - Equipment drop - Soap/water wash and rinse of outer coveralls, gloves and boots, if applicable -Outer coverall and outer glove removal - Disposal of non-reusable PPE in doubly-lined bags/ and then into an industrial dumpster - Wash hands and face, leave contamination reduction zone <p>Equipment Decontamination – See Decontamination of heavy equipment. Heavy equipment decontamination will take place at a centralized decontamination pad utilizing steam or pressure washers. Heavy equipment such as drill rigs will have the wheels or tracks cleaned along with any loose debris removed, prior to transporting to the central decontamination area. All site vehicles will have restricted access to exclusion zones and also have their wheels/tires sprayed off as not to track mud onto the roadways servicing this installation. Roadways shall be cleared of any debris resulting from the on-site activity.</p> <p>All equipment used in the exclusion zone will require a complete decontamination between locations and prior to removal from the site.</p> <p>The FOL or the SSO will be responsible for evaluating equipment arriving on site and that which is to leave the site. No equipment will be authorized access or exit without this authorization.</p> <p>Soil cuttings shall be containerized in 55-gallon drums, labeled, and staged pending disposal characterization.</p>

**TABLE 5-1
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NAVSTA MAYPORT, FLORIDA**

Task/Operation/ Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring - Type and Action Levels	Personal Protective Equipment <i>(Items in italics are deemed optional as conditions or the FOL or SSO require)</i>	Decontamination Procedures
<p>Soil Excavation at Site 351-2.</p> <p>Remove approximately 90 cubic yards from an area of 20 feet by 20 feet.</p> <p>Soil sampling is also included in this task.</p>	<p>Chemical hazards:</p> <p>1) Historical information and previous analytical data indicate that petroleum products such as fuel oils, diesel fuel, and their associated constituents, VOCs and PAHs, may be present at each of the sites to be investigated.</p> <p>Further information on the primary COCs is presented in Section 6.1 and Table 6-1.</p> <p>2) Transfer of contamination into clean areas or onto persons</p> <p>Physical hazards:</p> <p>3) Heavy equipment hazards (pinch/compressions points, hydraulic lines, etc.)</p> <p>4) Excavation</p> <p>5) Noise in excess of 85 dBA</p> <p>6) Energized systems (contact with underground or overhead utilities)</p> <p>7) Lifting (strain/muscle pulls)</p> <p>8) Slips, trips, and falls</p> <p>9) Vehicular and foot traffic</p> <p>Natural hazards:</p> <p>10) Inclement weather</p> <p>11) Insect bites</p>	<p>1) Avoid contact with contaminated media (soils) through safe work practices, PPE, and decontamination. Use PID/FID to evaluate the presence of petroleum related VOCs at source areas and in worker breathing zones. The contaminants may be bound to particulates (dusts) generated during site activities. If airborne dusts are observed, area wetting methods will be used. Good work and personal hygiene measures will be used to control potential exposures through incidental ingestion. Avoid hand to mouth contact, wash hands and face or use hygienic wipes to remove potential contaminants prior to breaks or lunch or other hand to mouth activities.</p> <p>2) Restrict the cross use of equipment and supplies between locations and activities without first going through a suitable decontamination. Work practices including establishing a rigid decontamination procedure will be employed for all equipment between locations and between clean and potentially dirty work. This provision along with dedicated sampling equipment will ensure materials are not carried and deposited in unaffected areas.</p> <p>3) All equipment will be:</p> <ul style="list-style-type: none"> - Inspected using the Equipment Inspection Checklist found in Attachment V of this HASP. - Operated and supported by knowledgeable operators and ground crew. - Personnel not directly supporting this operation will remain at least 25 feet from the point of operation. - Areas will be inspected prior to the movement of heavy equipment and support vehicles to eliminate any physical hazards. This will be the responsibility of the FOL and/or SSO. - Heavy equipment will be equipped with back-up alarms. - A warning system shall be utilized such as barricades, hand or mechanical signals, or stop logs near excavations. <p>4) A competent person will be present during excavation entry activities (see Section 5-3 in the HASP).</p> <ul style="list-style-type: none"> - Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. <ul style="list-style-type: none"> - An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. - Inspections shall also be made after every rainstorm or other hazard increasing occurrence. - Stay at least 4 feet away from any excavation. - Establish a standardized set of hand signals to be used by the operator and signal person. - Ground personnel should wear high visibility vests to help the operator to locate workers quickly. - Ground personnel (including TiNUS personnel) will stay a safe distance from all operating heavy machinery. - Excavation boundaries will be marked with appropriated signs warning of construction activities in progress. - No employee shall be permitted underneath loads handled by lifting or digging equipment. - If possible, the grade should be away from the excavation. - Excavations to be left open and unattended shall be secured in the off hours. - An active effort to remove standing water from excavations will be conducted. <p>5) Excessive noise levels will be mitigated through the use of hearing protection. Any piece of equipment or operation that has the potential to generate excessive noise levels (i.e., you must raise your voice to speak to someone within 2 feet of where you are standing) will require hearing protection until sound level measurements and/or noise dosimetry may be conducted to quantify the associated noise levels.</p> <p>6) All excavation activities will proceed in accordance with the Utility Locating and Excavation Clearance SOP in Attachment IV of this HASP. All utility clearances will be obtained in writing and locations identified and marked prior to activities.</p> <p>7) Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques as described in Table 5-1 for mobilization/demobilization.</p> <p>8) Preview work locations and site lines for uneven/unstable terrain. Clear necessary vegetation and establish temporary means for traversing hazardous terrain (e.g., rope ladders).</p> <ul style="list-style-type: none"> - Site personnel will not be permitted to enter any excavation without protective systems (trench boxes, sloping/shoring, etc.). <p>9) Use traffic-warning signs, flag persons, and high visibility vests as determined by the SSO when work infringes traffic thoroughfares. Use physical barricades when working within or altering normal traffic flow patterns/traffic lanes. Traffic considerations include the following:</p> <ul style="list-style-type: none"> - Establishing safe zones of approach. - Ensuring all personnel working in high equipment traffic areas are wearing reflective vests for high visibility. - Following traffic rules and requirements established by NAVSTA Mayport. - Traffic patterns will be dictated in support of on-site activities. However, regulated patterns in and about the work zones will be established to safely control the flow patterns of mechanized vehicles and pedestrians. <p>10) Wear appropriate clothing for weather conditions. Follow the provisions as specified in Section 4.0 of the TiNUS Health and Safety Guidance Manual regarding the identification and evaluation of heat/cold stress related conditions.</p> <p>11) Wear appropriate clothing and PPE. Avoid potential nesting areas and suspicious vegetation. When feasible and necessary, use commercially available insect repellants. Report potential hazards to the SSO. Inspect clothing and persons for ticks and other vectors during and after work activities in wooded areas.</p>	<p>Given the physical characteristics of fuel oils and diesel fuel, it is not anticipated that significant airborne concentrations will be present in worker breathing zones.</p> <p>A direct reading instrument such as FID/PID will be used to detect VOCs associated with fuel oils and diesel fuel.</p> <p>The FID/PID will be used to screen potential source (sample locations, boreholes, etc.) areas to detect the presence of any VOCs. Positive readings at a source area will require that worker's breathing zone be monitored to determine exposure potentials.</p> <p>Any sustained readings greater than 25 ppm above background (> 1 minute in duration) in a worker's breathing zone, or observations of symptoms of exposure, will require that site activities be suspended until the readings subside to background levels or the source is determined.</p> <p>NOTE: Evidence of elevated FID/PID readings in worker breathing zones will require colorimetric tube sampling for benzene (using a 0.5/c benzene tube) be performed to evaluate the presence of benzene. Any evidence of benzene (a color change from white to brownish-yellow) will require site activities to be suspended and the PHSO to be contacted for further guidance see Section 7.1.2.</p> <p>Noise monitoring may be conducted at the discretion of the PHSO and/or the SSO.</p> <p>Action Level - >85 dBA Participation in the Project Hearing Conservation Program. Hearing protection is required for this operation.</p>	<p>Excavation operations are to be initiated in Level D protection. Level D protection constitutes the following minimum protection:</p> <ul style="list-style-type: none"> - Standard field dress (long pants and sleeved shirts) - Surgical style nitrile/work gloves - Steel toe shoes/boots - Disposable nitrile gloves - Safety glasses - Hearing protection for high noise areas - Hardhat - <i>Reflective vest for high traffic areas</i> - <i>Tyvek coveralls and disposable boot covers if surface contamination is present or if the potential exists of soiling work attire.</i> <p>Note: The Safe Work Permit for this task (see Attachment III) will be issued at the beginning of the task to address planned activities. Additional PPE may be assigned to reflect site-specific conditions or special considerations.</p>	<p>Personnel Decontamination -This function will take place at an area adjacent to the work operations.</p> <p>This decontamination procedure for Level D protection will consist of</p> <ul style="list-style-type: none"> - Equipment drop - Soap/water wash and rinse of outer coveralls, gloves and boots, if applicable - Outer coverall and outer glove removal - Disposal of non-reusable PPE in doubly-lined bags/ and then into an industrial dumpster - Wash hands and face, leave contamination reduction zone <p>Equipment Decontamination – See Decontamination of heavy equipment. Heavy equipment decontamination will take place at a centralized decontamination pad utilizing steam or pressure washers. Heavy equipment such as drill rigs will have the wheels or tracks cleaned along with any loose debris removed prior to transporting to the central decontamination area. All site vehicles will have restricted access to exclusion zones and also have their wheels/tires sprayed off as not to track mud onto the roadways servicing this installation. Roadways shall be cleared of any debris resulting from the on-site activity.</p> <p>All equipment used in the exclusion zone will require a complete decontamination between locations and prior to removal from the site.</p> <p>The FOL or the SSO will be responsible for evaluating equipment arriving on site and that which is to leave the site. No equipment will be authorized access or exit without this authorization.</p> <p>Soil cuttings shall be containerized in 55-gallon drums, labeled, and staged pending disposal characterization.</p>

**TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES
NAVSTA MAYPORT, FLORIDA**

Task/Operation/ Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring - Type and Action Levels	Personal Protective Equipment <i>(Items in italics are deemed optional as conditions or the FOL or SSO require)</i>	Decontamination Procedures
<p>Multi-media sampling at Sites 245, 351, 413, 1585, and Satellite Parking Area # 2 including</p> <ul style="list-style-type: none"> - Monitoring well development - Groundwater - Surface and subsurface soil - Free product recovery 	<p>Chemical hazards:</p> <p>1) Historical information and previous analytical data indicate that petroleum products such as fuel oils, diesel fuel, and their associated constituents, VOCs and PAHs, may be present at each of the sites to be investigated.</p> <p>Further information on the primary COCs is presented in Section 6.1 and Table 6-1.</p> <p>2) Transfer of contamination into clean areas.</p> <p>Physical hazards:</p> <p>3) Slip, trip, and fall hazards</p> <p>4) Strain/muscle pulls from manual lifting</p> <p>5) Ambient temperature extremes (heat/cold stress)</p> <p>Natural hazards:</p> <p>6) Animal and insect bites and encounters</p> <p>7) Inclement weather</p>	<p>1) Avoid contact with contaminated media (free product, air, water, soils, etc.) through safe work practices, PPE, and decontamination. Use PID/FID to evaluate the presence of petroleum related VOCs at source areas and in worker breathing zones. Good work and personal hygiene measures will be used to control potential exposures through incidental ingestion. Avoid hand to mouth contact, wash hands and face or use hygienic wipes to remove potential contaminants prior to breaks or lunch or other hand to mouth activities.</p> <p>2) Transfer of Contamination into Clean Areas - decontaminate all equipment and supplies between sampling locations and prior to leaving the site. See decontamination of heavy and sampling equipment for direction regarding this task. In addition, the bulk of sampling equipment such as tubing and trowels are disposable and, therefore, dedicated. This will aid in preventing cross contamination.</p> <p>3) Preview work locations and site lines for uneven/unstable terrain. Clear necessary vegetation and establish temporary means for traversing hazardous terrain (e.g., rope ladders).</p> <p>4) Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques (see Lifting Mobilization/Demobilization of this table).</p> <p>5) Wear appropriate clothing for weather conditions. Provide acceptable shelter and liquids for field crews. Additional information regarding heat/cold stress is provided in Section 4.0 of the Health and Safety Guidance Manual. Care should be exercised when working outdoors due to harmful effects of the sun.</p> <p>6) Wear light color clothes.</p> <ul style="list-style-type: none"> - When opening existing well heads be cautious of bees and spiders as these are preferred nesting locations. - Use repellents – Permanone should be applied liberally to the clothing, but not the skin as it may cause irritation. Concentrate on areas where ticks and other insects may access your body such as pant cuffs, shirt to pants, and collars. Products containing DEET can be applied directly to the skin. As always, follow manufacturer's recommendations for use. See Section 4.0 of the Health and Safety Guidance Manual Section 4.0 for more information concerning these natural hazards. <p>7) Suspend or terminate operations during electrical storms. Return to work when directed by the FOL and/or the SSO.</p>	<p>Given the physical characteristics of fuel oils and diesel fuel, it is not anticipated that significant airborne concentrations will be present in worker breathing zones. Furthermore, site activities are unlikely to generate airborne dusts.</p> <p>A direct reading instrument such as FID/PID will be used to detect VOCs associated with fuel oils and diesel fuel.</p> <p>The FID/PID will be used to screen potential source (sample locations, boreholes, etc.) areas to detect the presence of any VOCs. Positive readings at a source area will require that worker's breathing zone be monitored to determine exposure potentials.</p> <p>Any sustained readings greater than 25 ppm above background (> 1 minute in duration) in a worker's breathing zone, or observations of symptoms of exposure, will require that site activities be suspended until the readings subside to background levels or the source is determined.</p> <p>NOTE: Evidence of elevated FID/PID readings in worker breathing zones will require colorimetric tube sampling for benzene (using a 0.5/c benzene tube) be performed to evaluate the presence of benzene. Any evidence of benzene (a color change from white to brownish-yellow) will require site activities to be suspended and the PHSO to be contacted for further guidance see Section 7.1.2.</p>	<p>Level D protection constitutes the following for sampling activities</p> <p>Standard field dress (long pants, sleeved shirts) Steel toe safety shoes/boots Safety glasses Nitrile surgeon style inner gloves for sampling <i>Hard Hats</i> <i>Hearing protection</i> <i>Impermeable boot covers</i> <i>Reflective vest for traffic areas</i></p> <p>Protective Measures as specified for drilling and soil boring will be employed for all subsurface soil sampling at the DPT rig.</p> <p>Note: The Safe Work Permit(s) for this task (see Attachment III) will be issued at the beginning of each day to address the tasks planned for that day. As part of this task, additional PPE may be assigned to reflect site-specific conditions or special considerations or conditions associated with any identified task.</p>	<p>Personnel Decontamination</p> <p>Upon completion of the sampling</p> <ul style="list-style-type: none"> - Dedicated trowels, tubing, and PPE will be rinsed and 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>Decontamination of equipment (sampling and hand tools) will proceed as indicated in Table 5-1 of this HASP and/or the Work Plan.</p>

**TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES
NAVSTA MAYPORT, FLORIDA**

Tasks/Operation/ Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring - Type and Action Levels	Personal Protective Equipment (Items in italics are deemed optional as conditions or the FOL or SSO require)	Decontamination Procedures
<p>Decontamination of DPT and heavy equipment used for excavation activities using pressure washers.</p> <p>Decontamination of sampling equipment using 5-gallon buckets/scrub brushes, etc.</p> <p>It is anticipated that this activity will take place at a temporary centralized location.</p>	<p>Chemical hazards:</p> <p>1) Historical information and previous analytical data indicate that petroleum products such as fuel oils, diesel fuel, and their associated constituents, VOCs and PAHs, may be present at each of the sites to be investigated.</p> <p>Further information on the primary contaminants of concern is presented in Section 6.1 and Table 6-1</p> <p>2) Decontamination fluids - Liquinox (detergent); isopropanol (decontamination solvent)</p> <p>Physical hazards:</p> <p>3) Lifting (strain/muscle pulls)</p> <p>4) Noise in excess of 85 dBA</p> <p>5) Flying projectiles</p> <p>6) Falling hazards</p> <p>7) Slips, trips, and falls</p> <p>Natural hazards:</p> <p>8) Inclement weather</p>	<p>1) and 2) Employ protective equipment to minimize contact with site contaminants and hazardous decontamination fluids. Control potential non-occupational exposures through good work hygiene practices (i.e., avoid hand to mouth contact, wash hands and face before breaks and lunch, and minimize contact with contaminated media). Obtain and familiarize yourself with manufacturer's MSDS for any decontamination fluids used on-site. Solvents may only be used in well-ventilated areas, such as outdoors. Use appropriate PPE as identified on MSDS or within this HASP. All chemicals used must be listed on the Chemical Inventory for the site, and site activities must be consistent with the Hazard Communication Program provided in Section 5.0 of the TtNUS Health and Safety Guidance Manual.</p> <p>3) Use multiple persons where necessary for lifting and handling heavy equipment for decontamination purposes.</p> <ul style="list-style-type: none"> - Employ proper lifting techniques as described in Table 5-1, Mobilization/Demobilization. <p>4) Wear hearing protection when operating the pressure washer. Sound pressure levels measured during the operation of similar pieces of equipment indicate a range of 87 to 93 dBA.</p> <p>5) Use eye and face protective equipment when operating the pressure washer, 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. - Do not point the wand at persons or place against any part of your body. - Thermostat control will be in place and operational to control the temperature levels of the water where applicable. - Visual evaluations of hoses and fittings for structural defects. - Construct deflection screens as necessary to control overspray and to guard against dispersion of contaminants driven off by the spray. <p>6) Ensure that equipment is properly stored and rods are secured to prevent them from falling and striking someone during the decontamination process.</p> <p>7) The decontamination pad should be constructed to contain wash waters generated during decontamination procedures. Temporary decontamination pads are usually 10 to 30 mil polyethylene or polyvinyl chloride tarp construction. Although these items when used as a liner offer containment, they also present a slipping hazard. When these temporary liners are employed, it is recommended that a light coating of sand be spread over the walking surface to provide traction.</p> <ul style="list-style-type: none"> - In addition, adequate slope should be provided to the pad to permit drainage away from the object being cleaned. The collection point for wash waters should be of adequate distance that the decontamination workers do not have to walk through the wash waters while completing their tasks. - Hoses should be gathered when not in use to eliminate potential tripping hazards. <p>8) Suspend or terminate operations until directed otherwise by SSO.</p>	<p>Use visual observation and real-time monitoring instrumentation to ensure all equipment has been properly cleaned of contamination and dried.</p>	<p>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"> - Hard hat with splash shield - Standard field attire (long sleeve shirt, long pants) - Steel toe shoes/boots - Chemical resistant boot covers - Nitrile outer gloves over nitrile inner gloves - Safety glasses underneath a splash shield - Hearing protection (plugs or muffs) - <i>Hooded polyvinyl chloride (PVC) rainsuits or PVC coated Tyvek.</i> Impermeable aprons may be used instead of coveralls if they offer adequate protection against overspray and back splash. <p>For sampling equipment (trowels, split spoons, etc.), the following PPE is required:</p> <p>Note: Consult MSDS for additional PPE guidance. Otherwise, observe the following.</p> <p>Level D Minimum requirements -</p> <ul style="list-style-type: none"> - Standard field attire (long sleeve shirt, long pants) - Safety shoes (steel toe/shank) - Nitrile outer gloves over nitrile inner gloves - Safety glasses - <i>Impermeable apron</i> <p>Note: The Safe Work Permit(s) for this task (see Attachment III) will be issued at the beginning of each day to address the tasks planned for that day. As part of this task, additional PPE may be assigned to reflect site-specific conditions or special considerations or conditions associated with any identified task.</p>	<p>Personnel Decontamination will consist of a soap/water wash and rinse for reusable and non-reusable outer protective equipment (boots, gloves, PVC splash suits, as applicable).</p> <p>The sequential procedure is as follows:</p> <p>Stage 1: Equipment drop, remove outer protective wrapping; personnel will wash hand tools and pass hand equipment through as necessary.</p> <p>Stage 2: Soap/water wash and rinse of outer boots and gloves.</p> <p>Stage 3: Soap/water wash and rinse of the outer splash suit or apron as applicable.</p> <p>Stage 4: Disposable PPE will be removed and bagged.</p> <p>Stage 5: Wash face and hands.</p> <p>Equipment Decontamination</p> <ul style="list-style-type: none"> - Gross contamination will be removed to the extent possible at the site. Contaminated tooling then will be wrapped in polyethylene sheeting for transport to the centralized location for a full decontamination and evaluation. - All heavy equipment decontamination will take place at a centralized decontamination pad utilizing a steam cleaner or pressure washer. - Remove gross (visible) materials using scrapers, shovels as necessary (soils, etc.). - Use the pressure washer/steam cleaner remove remaining visible debris. - As necessary, follow up with scrub brushes with Alconox or Liquinox detergent wash. - Potable water rinse using pressure washer/steam cleaner as necessary. - DI water rinse. - Air dry. <p>Heavy equipment will have the wheels and tires cleaned along with any loose debris removed prior to transporting to the central decontamination area.</p> <p>Sampling Equipment Decontamination</p> <ul style="list-style-type: none"> - Remove heavy materials (soils, etc.) - Alconox or Liquinox detergent wash - Potable water rinse - Solvent rinse (Isopropanol) - DI water rinse - Air dry <p>All equipment used in the exclusion zone will require a complete decontamination between locations and prior to removal from the site.</p> <p>The FOL or the SSO will be responsible for evaluating equipment arriving on-site, leaving the site, and between locations. No equipment will be authorized access, exit, or movement to another location without this evaluation.</p>

**TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES
NAVSTA MAYPORT, FLORIDA**

Tasks/Operation/ Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring - Type And Action Levels	Personal Protective Equipment <i>(Items In Italics Are Deemed Optional As Conditions Or The FOL Or the SSO require)</i>	Decontamination Procedures
<p>IDW Management including storage of IDW in drums and roll-offs.</p>	<p>Chemical hazards:</p> <p>1) Historical information and previous analytical data indicate that petroleum products such as fuel oils, diesel fuel, and their associated constituents, VOCs and PAHs, may be present at each of the sites to be investigated.</p> <p>Further information on the primary contaminants of concern is presented in Section 6.1 and Table 6-1</p> <p>2) Transfer of contamination into clean areas or onto persons</p> <p>Physical hazards:</p> <p>3) Lifting (strain/muscle pulls)</p> <p>4) Heavy equipment hazards (pinch/compression points).</p> <p>5) Noise in excess of 85 dBA</p> <p>6) Slip, trip, and fall hazards (uneven or unstable terrain)</p> <p>7) Vehicular and foot traffic</p> <p>8) Ambient temperature extremes</p> <p>Natural hazards:</p> <p>9) Inclement weather</p>	<p>1) All staged IDW containers should be clearly labeled. Contact with the container's contents should be avoided whenever possible. Identify PPE to control exposures to potentially contaminated media, prior to drum movement.</p> <p>2) Decontaminate all equipment and supplies, if they have become contaminated.</p> <p>3) Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques. See Table 5-1 for details.</p> <p>4) Keep hands and fingers free of drum pinch/compression points. Use tools or equipment to avoid contacting pinch points. Whenever possible, use drum dollies to transport drums. Drums shall be staged as follows: - sealed with rings, bolts, and gaskets. - four drums to a pallet; labels must face outward. - stationed with a minimum of 4 feet between rows. - inventory must be available.</p> <p>5) Excessive noise levels will be mitigated through the use of hearing protection. Any piece of equipment or operation that has the potential to generate excessive noise levels (i.e., you must raise your voice to speak to someone within 2 feet of where you are standing) will require hearing protection until sound level measurements and/or noise dosimetry may be conducted to quantify the associated noise levels.</p> <p>6) Preview work locations for uneven/unstable terrain.</p> <p>7) Traffic and equipment considerations include the following: - Establishing safe zones of approach. - Checking that equipment is equipped with movement warning systems. - Ensuring all personnel working in high equipment traffic areas are wearing reflective vests for high visibility. - Following traffic rules and requirements established by NAVSTA Mayport. - Traffic patterns will be dictated in support of on-site activities. However, regulated patterns in and about the work zones will be established to safely control the flow patterns of mechanized vehicles and pedestrians.</p> <p>8) Wear appropriate clothing for the anticipated weather conditions while maintaining the required level of protection. Provide acceptable shelter and fluids for field crews. Refer to the TtNUS Health and Safety Guidance Manual for additional information regarding heat and cold stress.</p> <p>9) In the event of inclement weather suspend or terminate operations until directed by the SSO.</p>	<p>None required unless spill containment provisions are invoked. Then monitoring will proceed as described in the activity associated with the task when the materials were generated such as soil boring or well installation.</p>	<p>Level D - (Minimum Requirements)</p> <ul style="list-style-type: none"> - Standard field attire (sleeved shirt; long pants) - Steel toe shoes/boots - Leather or canvas work gloves - <i>Safety glasses (When utilizing cables or slings to move the containers)</i> - <i>Hardhat (when overhead hazards exists, or identified as a operation requirement)</i> <p>PPE changes may be made with the implementation of the Spill Containment Program. This represents the only anticipated modification to this level of protection.</p>	<p>Personnel Decontamination -This function will take place at an area adjacent to the site activities.</p> <p>This decontamination procedure for Level D protection will consist of</p> <ul style="list-style-type: none"> - Equipment drop - Soap/water wash and rinse of outer gloves and outer boots, as applicable - Soap/water wash and rinse of the outer splash suit, as applicable - Bag disposable PPE - Wash hands and face, leave contamination reduction zone

**TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES
NAVSTA MAYPORT, FLORIDA**

Tasks/Operation/ Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring - Type And Action Levels	Personal Protective Equipment <i>(Items In Italics Are Deemed Optional As Conditions Or The FOL Or the SSO Dictate.)</i>	Decontamination Procedures
Surveying activities	<p>Chemical hazards:</p> <p>1) Exposure to potential site contaminants during surveying activities is unlikely given the nature of surveying work and the limited contact with potentially contaminated media (i.e. soils, etc.).</p> <p>Refer to Section 6.0 for a list of potential and representative site contaminants. See individual Safe Work Permits contained in Attachment III for specific COCs associated with particular sites and site activities.</p> <p>Physical hazards:</p> <p>2) Slip, trip, and fall hazards (uneven or unstable terrain)</p> <p>3) Vehicular and foot traffic</p> <p>4) Ambient temperature extremes</p> <p>Natural hazards:</p> <p>5) Insect/animal bites or stings, poisonous plants, etc.)</p> <p>6) Inclement weather</p>	<p>1) To further reduce the potential for exposure, personnel performing surveying activities will minimize contact with potentially contaminated media and will avoid areas where chemical hazards may exist.</p> <p>2) Preview work locations and site lines for uneven/unstable terrain. Clear necessary vegetation and establish temporary means for traversing hazardous terrain (e.g., rope ladders).</p> <p>3) Traffic considerations include the following: <ul style="list-style-type: none"> - Establishing safe zones of approach. - Ensuring all personnel working in high equipment traffic areas are wearing reflective vests for high visibility. - Following traffic rules and requirements established by NAVSTA Mayport. - Traffic patterns will be dictated in support of on-site activities. However, regulated patterns in and about the work zones will be established to safely control the flow patterns of mechanized vehicles and pedestrians. </p> <p>4) Wear appropriate clothing for the anticipated weather conditions while maintaining the required level of protection. Provide acceptable shelter and fluids for field crews. Refer to the TtNUS Health and Safety Guidance Manual for additional information regarding heat and cold stress.</p> <p>5) Wear appropriate clothing and PPE. Avoid potential nesting areas and suspicious vegetation (poison oak and ivy, etc.). When feasible and necessary, use commercially available insect repellants. Report potential hazards to the SSO. Inspect clothing and persons for ticks and other vectors during and after work activities in wooded areas.</p> <p>6) All operations will be temporarily suspended during electrical storms.</p>	<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> <p>Note: The Safe Work Permit(s) for this task (see Attachment III) 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>

- Eating, drinking, chewing gum or tobacco, taking medication, or smoking is only permitted in the Support Zone.
- A thorough shower and washing must be conducted as soon as possible if excessive skin contamination occurs.
- Avoid contact with potentially contaminated substances. Avoid puddles, pools, mud, or other such areas. Avoid, whenever possible, kneeling on the ground or leaning or sitting on equipment. Keep monitoring equipment away from potentially contaminated surfaces.
- 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.
- Buddies should maintain visual or communicative contact with each other and with other on-site team members by remaining in close proximity to assist each other in case of emergency.
- Establish appropriate Safety Zones including Support, Contamination Reduction, and Exclusion Zones.
- Establish appropriate decontamination procedures for leaving the site.
- Immediately report injuries, illnesses, unsafe conditions, unsafe practices, defective equipment, and potential exposure incidents to the SSO.
- Observe coworkers for signs of exposure and heat or cold stress.
- Inform co-workers of potential symptoms of illness, such as headaches, dizziness, nausea, or blurred vision.

5.2 SOIL BORING/DRILLING SAFE WORK PRACTICES

The following safe work practices are to be followed when working in or around drill rig/DPT operations.

- Identify underground utilities and buried structures before drilling.
- Use the Utility Locating and Excavation Clearance SOP provided in Attachment IV.
- Drill rigs will be inspected by a competent person (the SSO or designee), prior to beginning of work, once every shift (either 5 or 10 days) or following repairs (see Equipment Inspection Checklist in Attachment V).
- Repairs or deficiencies identified will be corrected prior to use.
- The driller's helper will establish an equipment staging and lay down plan. The purpose of this is to keep the work area clear of clutter and slips, trips, and fall hazards. Mechanisms to secure heavy objects such as drill flights will be provided to avoid the collapse stacked equipment.
- Secure frayed or loose clothing, hair, and jewelry when working with rotating equipment.
- Minimize contact to the extent possible with contaminated tooling and environmental media.
- Support functions (sampling and screening stations) will be maintained a minimum distance from the drill rig of the height of the mast plus 5 feet to remove these activities from within physical hazard boundaries.
- Only qualified operators and knowledgeable ground crew personnel will participate in the operation of the drill rig.
- In order to minimize contact with potentially contaminated tooling and media and to minimize lifting hazards, multiple personnel should move auger flights and other heavy tooling.
- Only personnel absolutely essential to the work activity will be allowed in the exclusion zone.
- Equipment that comes into direct contact with potentially contaminated media will undergo a complete decontamination prior to moving to the next location, exiting the site, or prior to down time for maintenance.

- Whenever possible, motorized equipment will be fueled prior to the commencement of the day's activities.
- During fueling operations on site, equipment will be shutdown and bonded to the fuel provider to prevent the potential accumulation of static charges.
- When not in use, drill rigs will be shutdown, emergency brakes set, and wheels chocked where hilly terrain is present.
- Areas subjected to subsurface investigative methods will be restored to equal or better condition than original to the extent practical 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.

5.3 EXCAVATION SAFE WORK PRACTICES

Excavation cave-ins are a major source of fatalities within the construction industry. Trenching accidents on United States construction sites account for an estimated 100 fatalities per year, with at least 11 times as many workers injured. The fatalities account for nearly 1 percent of all work related deaths in the United States.

- The contractor will provide a competent person as identified by OSHA 29 CFR 1926 Subpart P. This person should be capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees and should have authorization to take prompt corrective measures to eliminate them.
 - A competent person will be present during all excavation entry activities and will perform appropriate hazard monitoring to ensure that acceptable entry conditions are maintained throughout the activity.
 - See competent person checklist in Appendix VI of this HASP.
- Operation of heavy equipment, such as excavators and back hoes, should always be done by highly skilled operators who have demonstrated the ability and necessary skills to operate safely.
 - Heavy equipment will be subjected to an equipment inspection upon arrival on-site and prior to leaving. (See Equipment Inspection Checklist in Attachment IV of this HASP.)
 - The equipment should have a functional back up warning alarm.

- Traffic patterns for heavy equipment will be constructed to maintain traffic flow a minimum of 2 feet from unsupported walls (excavation boundaries).
- Workers should be trained in how to work safely around the excavation site.
 - Stay at least 4 feet away from any excavation.
 - Establish a standardized set of hand signals to be used by the operator and signal person.
 - Operators should always know exactly where all workers are located.
 - Ground personnel should wear high visibility vests to help the operator to locate workers quickly.
 - Ground personnel (including TtNUS personnel) will stay a safe distance from all operating heavy machinery.
- Identify underground and overhead utilities and buried structures before the commencement of excavation activities.
- Excavation boundaries will be marked with appropriated signs warning of construction activities in progress.
- When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand or mechanical signals, or stop logs.
- No employee shall be permitted underneath loads handled by lifting or digging equipment.
 - Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials.
 - Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped to provide adequate protection for the operator during loading and unloading operations.
- Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted except when:
 - A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure
 - The excavation is in stable rock.
 - A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity.

- A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.
- Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protection of employees.
 - This support system must have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied to it.
 - Sidewalks, pavements, and appurtenant structure shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.
- All surface encumbrances that are located so as to create a hazard to employees shall be removed or supported, as necessary, to safeguard employees.
- If possible, the grade should be away from the excavation.
- Excavations to be left open and unattended shall be secured in the off hours.
- An active effort to remove standing water from excavations will be conducted.
- Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions.
 - An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift.
 - Inspections shall also be made after every rainstorm or other hazard increasing occurrence.
 - These inspections are only required when employee exposure can be reasonably anticipated.
- Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

6.0 HAZARD ASSESSMENT

The following section provides information regarding the chemical, physical, and natural hazards associated with the site to be investigated and the activities that are to be conducted as part of the Scope of Work. Table 6-1, which is included as part of this HASP, provides various information, exposure limits, symptoms of exposure, physical properties, and air monitoring and sampling data. Section 6.1 provides general information regarding the contaminants that may be present at the site.

6.1 CHEMICAL HAZARDS

The sites to be investigated as part of this CTO are sites with historical releases of petroleum products (fuel oil, diesel fuel, heating oil). Petroleum products and fuel oils are refined from crude petroleum and may be categorized as either a distillate fuel or a residual fuel depending on the method of production. Diesel fuels are approximately similar to fuel oils used for heating (fuel oils Number 1, Number 2, and Number 4). Fuel oils consist of complex mixtures of aliphatic and aromatic hydrocarbons. The aliphatic alkanes (paraffins) and cycloalkanes (naphthalenes) are hydrogen saturated and compose approximately 80 to 90 percent of the fuel oils. Aromatics such as benzene, toluene, ethylbenzene, and xylenes (BTEX) and olefins (e.g., styrene and indene) compose 10 to 20 percent and 1percent, respectively, of the fuel oils. Fuel oils have a low vapor pressure [e.g., the saturation concentration of kerosene in air is approximately 100 milligrams per cubed meter (mg/m^3)]. Due to the low volatility of fuel oil, human exposure to vapor concentrations above occupational exposure limits is unlikely. From an occupation exposure standpoint, exposures to constituents of fuel oils (e.g., BTEX) are of greater concern and are used as the basis for establishing action levels for air monitoring instrumentation. The greatest potential for exposure is anticipated to occur whenever free product is encountered or if soils that are saturated with free product are handled.

Table 6-1 provides information on petroleum products/fuel oils as well as BTEX and PAH constituents that may be contained in fuel oils. Included is information on the toxicological, chemical, and physical properties of these substances. Certain information on this table (such as glove selection) is based on clinical information regarding pure chemicals. Assessment of hazards and recommended control measures (such as nitrile surgeon's gloves) within this HASP, however, are based on the presence of free product (fuel oil) and the diluted nature of media (soils and groundwater).

**TABLE 6-1
CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA**

Substance	CAS Number	Air Monitoring	Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Diesel Fuel	68334-30-5 68476-30-2 68476-31-3 68476-34-6 77650-28-3	Components of this substance will be detected readily; however, no documentation exists as to the relative response ratio of either PID or FID.	OSHA none American Conference of Governmental Industrial Hygienists (ACGIH) 100 mg/m ³ National Institute for Occupational Safety and Health (NIOSH) 100 mg/m ³ United States Air Force 200 ppm	Kerosene odor Recommended Air Purifying cartridges: Organic vapor Recommended gloves: Nitrile	Boiling Point: <170-40 degrees Fahrenheit (0° F); 77-204 degrees Celsius (°C) Melting Point: Not available Solubility: Negligible Flash Point: 125°F; 52°C Lower Exposure Limit / Lower Flammable Limit (LEL/LFL): 0.6 percent Upper Exposure Limit / Upper Flammable Limit (UEL/UFL): 7.5 percent Vapor Density: >5 Vapor Pressure: <1 millimeter of mercury (mmHg) @ 70°F; 21°C Specific Gravity: 0.86 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. Due to 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 to unconsciousness. High concentrations in a confined space may adequately displace oxygen thereby resulting in suffocation.
Toluene	108-88-3	PID: I.P. 8.82 electron volts (eV), High response with PID and 10.2 eV lamp. FID: 110 percent response with FID.	OSHA: 200 ppm 300 ppm (Ceiling) ACGIH: 50 ppm (skin) NIOSH: 100 ppm 150 ppm STEL Immediate Dangerous to Life or Health (IDLH): 500 ppm	Adequate - Odor threshold 1.6 ppm is considered good. Can use air-purifying respirator with organic vapor cartridge up to 1,000 ppm. Recommended gloves: Teflon >15.00 hours; Viton >16.00 hours; silver shield >6.00 hours; supported nitrile (Useable time limit 0.5 hour, complete submersion for the nitrile selection); PV alcohol >25.00 hours	Boiling Point: 232°F; 111°C Melting Point: -139°F; -95°C Solubility: 0.05% (61°F; 16°C) Flash Point: 40°F; 4°C LEL/LFL: 1.2 percent UEL/UFL: 7.1 percent Vapor Density: 3.14 Vapor Pressure: 20 mmHg @ 65°F; 18°C Specific Gravity: 0.87 Incompatibilities: Strong oxidizers Appearance and odor: Colorless liquid with a sweet pungent aromatic odor	Overexposure to this substance may result in mild to moderate irritation at all points of contact, and central nervous system (CNS) changes including euphoria, confusion, nervousness, and possibly paresthesia characterized by an abnormal burning sensation, pricking, or numbness. At 200-500 ppm exposure has resulted in headaches, nausea, eye irritation, loss of appetite, bad taste, impair coordination, fatigue, and weariness. Chronically, toluene overexposure may result in dermatitis, liver, and kidney damage.
Xylenes All isomers o-, m-, p-	1330-20-7	PID: I.P. 8.56 eV, High response with PID and 10.2 eV lamp. FID: 110 percent response with FID.	ACGIH and NIOSH: 100 ppm, 150 ppm STEL OSHA: 100 ppm IDLH: 900 ppm	Adequate - Odor thresholds for the following isomers: 0.6 m-; 5.4 p-; 20 o- ppm. Can use air-purifying respirator with organic vapor cartridge up to 1,000 ppm concentrations. Recommended gloves: PV Alcohol >12.67 hours; Viton >8.00 hours; CPE >1.00 hour; Butyl 0.87 hour; Nitrile is acceptable for limited operations and contact (>0.20 hour)	Boiling Point: 269-281°F; 132-138°C Melting Point: -130/-54m/56p°F; -25o/-48m/13p °C Solubility: 0.02 percent Flash Point: 81-90°F; 27-32°C LEL/LFL: 0.9 percent UEL/UFL: 7.0 percent Vapor Density: 3.66 Vapor Pressure: 7 to 9 mmHg @ 70°F; 21°C Specific Gravity: 0.86 to 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.

TABLE 6-1 (Continued)
CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA

Substance	CAS No.	Air Monitoring	Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Benzene	71-43-2	PID: I.P 9.24 eV, 100 percent response with PID and 10.2 eV lamp. FID: 150 percent relative response ratio with FID.	OSHA: 1 ppm ACGIH: 0.5 ppm NIOSH: 0.1 ppm IDLH: 500 ppm	Inadequate - Odor threshold 34 to 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 hours; Silver shield as a liner - >8.00 hours; Viton - >8.00 hours	Boiling Point: 176°F; 80°C Melting Point: 42°F; 5.5°C Solubility: 0.07 percent Flash Point: 12°F; -11°C LEL/LFL: 1.3 percent UEL/UFL: 7.9 percent Vapor Density: 2.77 Vapor Pressure: 75 mmHg Specific Gravity: 0.88 Incompatibilities: Strong oxidizers, fluorides, perchlorates, and acids Appearance and Odor: Colorless to a light yellow liquid with an aromatic odor	Overexposure may result in irritation to the eyes, nose, throat, and respiratory system. CNS effects include giddiness, lightheadedness, headaches, staggered gait, fatigue, and lassitude and depression. Additional effects may include nausea. Long duration exposures may result in respiratory collapse. Regulated as an OSHA carcinogen. May cause damage to the blood forming organs and may cause a form of cancer called leukemia.
Ethylbenzene	100-41-4	PID: I.P 8.76, High response with PID and 10.2 eV lamp. FID: 100 percent response with FID.	ACGIH and NIOSH: 100 ppm; 125 ppm STEL OSHA: 100 ppm IDLH: 800 ppm	Adequate - Can use air-purifying respirator with organic vapor cartridge up to 1,000 ppm. Recommended gloves: Neoprene or nitrile w/ silver shield when potential for saturation; Teflon >3.00 hours	Boiling Point: 277°F; 136°C Melting Point: -139°F; -95°C Solubility: 0.01 percent Flash Point: 55°F; 13°C LEL/LFL: 1.0 percent UEL/UFL: 6.7 percent Vapor Density: 3.66 Vapor Pressure: 10 mmHg @ 79°F; 26°C Specific Gravity: 0.87 Incompatibilities: Strong oxidizers Appearance and odor: Colorless liquid with an aromatic odor. Odor Threshold of 0.092 to 0.60.	Regulated primarily because of its potential to irritate the eyes and respiratory system. In addition, effects of overexposure may include headaches, narcotic effects, CNS changes (i.e., coordination impairment, impaired reflexes, tremoring) difficulty in breathing, possible chemical pneumonia, and potentially respiratory failure or coma.
General PAHs (Fluoranthene, pyrene, benzo(a) anthracene, benzo(a) pyrene, benzo(f)fluoranthene, benzo(k)fluoranthene, etc.)	(CAS Numbers vary depending on specific compound)	PID: I.P. of 8.97 eV, relative response ratio unknown. FID: Response factor unknown but given the substances flammability, detection by FID can be anticipated.	General PAHs: Most PAHs have no established exposure limits. Other PAHs such as chrysene and benzo(a)pyrene have an exposure limit of : OSHA: 0.2 mg/m ³ ACGIH: Exposure by all routes should be carefully controlled to levels as low as possible. NIOSH: 0.1 mg/m ³	Adequate - Can use full-face air-purifying respirator with organic vapor / dust /mist cartridge up to 250 ppm. Cresol has an Odor Threshold of 0.00005 to 0.0079 ppm. Recommended gloves: Viton >96.00 hours; butyl rubber >90.00 hours; neoprene >4.50 hours	Properties of PAHs/Coal Tar Pitch Volatiles vary depending upon the specific compound. <i>For Creosote/Cresol:</i> Boiling Point: 376-397°F; 191-203°C Melting Point: 52-96°F; 10.9-35.5°C Solubility: Insoluble Flash Point: 178°F; 81°C LEL/LFL: Not available UEL/UFL: Not available Vapor Density: 3.72 Vapor Pressure: 1 mmHg @ 100-127°F; 38-53°C Specific Gravity: 1.030 to 1.038 Incompatibilities: Nitric acid, oleum, chlorosulfonic acid, oxidizers Appearance and Odor: Yellowish or colorless, flammable, oily liquid (often brownish because of impurities or oxidation)	Regulated based on effects on respiratory tract and skin irritation Other effects may include eye irritation and central nervous system, disturbances. Acute exposures may result in difficulty breathing, respiratory failure and skin and eye irritation and burns. Chronic exposure may damage the liver, kidneys, lungs and skin and cause photosensitivity. IARC, NTP, NIOSH, ACGIH, and the United States Environmental Protection Agency (USEPA) list some PAHs such as benzo(a)pyrene as a potential carcinogen (ARC 2A, NTP-2, ACGIH TLV-A2, NIOSH-X, EPA-B2).

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.

- Excavation
- Slip, trip, and fall hazards
- Strain/muscle pulls from manual lifting
- Entanglement or contact with moving or rotating equipment/machinery
- Contact with energized sources (aboveground and underground)
- Heat Stress
- Cuts and lacerations

6.2.1 Excavation

The primary hazard of trenching and excavation is employee injury from collapse. Soil analysis is important in order to determine appropriate sloping, benching, and shoring. Additional hazards include working with heavy machinery; manual handling of materials; working in proximity to traffic; electrical hazards from overhead and underground power-lines; and underground utilities, such as natural gas. See Section 5.3 of this HASP for additional information

6.2.2 Cuts and Lacerations

The potential exists for works to suffer cuts or lacerations given the use of heavy equipment, hand tools, knives, and the handling and assembly of sampling/drilling equipment. Keeping hands, fingers, and other body parts away from pinch points, moving parts, and other sharp surfaces is the primary control method to prevent cuts and lacerations. Leather work gloves and other protective equipment can also be used to prevent injuries. Injuries have resulted when workers use box cutters to cut acetate liners during DPT soil boring operations. The use of a Geoprobe macro core holder and cutting tool is required when working on DPT operations. Cuts or lacerations often occur while using box cutter or other cutting devices when slicing Teflon or silicon tubing used in groundwater sampling apparatus or when opening or sealing boxes and sampling coolers. In order to minimize injury, use the following precautions:

- Always cut away from the body and others.
- Never use your thumb to put pressure on tubing while cutting from the opposite side.
- Change the knife blades frequently. Many accidents result from struggling with dull cutting edge.
- Never rest an object to be cut on your knee or otherwise support material to be cut on parts of your body.

6.3 NATURAL HAZARDS

Most of the proposed sample areas appear to be in maintained areas often in grassy areas. Although not anticipated to be a significant problem, insect/animal bites and stings and inclement weather are natural hazards that may be present given the location of activities to be conducted. In general, avoidance of areas of known infestation or growth will be the preferred exposure control for insects/animals. Specific discussion on principle hazards of concern are discussed below.

6.3.1 Insect/Animal Bites and Stings

Various insects and animals may be present and should be considered. For example, fire ants present a unique situation when working outdoors in Florida. Their aggressive behavior and their ability to sting repeatedly can pose a unique health threat. The sting injects venom (formic acid) that causes an extreme burning sensation. Pustules form which can become infected if scratched. Allergic reactions of people sensitive to the venom include dizziness, swelling, shock, and, in extreme cases, unconsciousness and death. People exhibiting such symptoms should see a physician. Fire ants can be identified by their habitat. They build mounds in open sunny areas sometimes supported by a wall or shrub. The mound has no external opening. The size of the mound can range from a few inches across to some which are in excess of 2 feet or more in height and diameter. When disturbed, the ants defend it by swarming out and over the mound, even running up grass blades and sticks.

Also, areas to be investigated could be prime nesting and/or hiding locations for snakes and other insects. 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. Site personnel who are allergic to stinging insects such as bees, wasps, and hornets must be particularly careful since severe illness and death may result from allergic reactions. As with any medical condition or allergy, information regarding the condition must be listed on the Medical Data Sheet and the FOL and SSO notified.

6.3.2 Inclement Weather

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

6.3.3 Heat Stress

Given the geographic location of the site and the project schedule, overexposure to high ambient temperatures (heat stress) may exist during performance of this work depending on the project schedule. (Extremely cold temperatures are not expected to be encountered due to project location). Work performed when ambient temperatures exceed 70°F may result in varying levels of heat stress (heat rash, heat cramps, heat exhaustion, and/or heat stroke) depending on variables such as wind speed, humidity, and percent sunshine, as well as physiological factors such as metabolic rate and skin moisture content. Additionally, workload and level of protective equipment will affect the degree of exposure. Site personnel will be encouraged to drink plenty of fluids to replace those lost through perspiration. Additional information such as Work-Rest Regimens and personnel monitoring may be found in Section 4.0 of the Health and Safety Guidance Manual.

Many of these physical hazards are discussed in detail in Section 4.0 of the Health and Safety Guidance Manual. Additional information regarding physical hazards associated with the site is provided in Table 5-1 of this HASP.

7.0 AIR MONITORING

Direct reading instruments will be used at the site to detect and evaluate the presence of site contaminants and other potentially hazardous conditions. As a result, specific air monitoring measures and requirements are established in Table 5-1 pertaining to the specific hazards and tasks of an identified operation. 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 INSTRUMENT AND USE

A direct reading instrument will be used primarily to monitor source points (soil borings, monitoring wells, etc.) 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 PID or FID

In order to accurately monitor for any substances that may present an exposure potential to site personnel, a PID with a lamp energy of 10.6 eV or higher will be used. This instrument will be used to monitor potential source areas and to screen the breathing zones of employees during site activities. The PID with this lamp strength has been selected because it is capable of detecting the organic vapors of concern. A FID, which may be less susceptible to variations in humidity, may be used in place of a PID to detect VOCs.

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 Colorimetric Tube Sampling for Benzene

As a precautionary measure, colorimetric tubes for benzene will be available at the site to evaluate the presence of benzene whenever elevated airborne concentrations of VOCs are detected in worker breathing zones. Specifically, benzene 0.5 centimeter tubes (Dräger) will be used with a Dräger hand held bellows pump to detect the presence of benzene which may be a constituent of fuel oil, diesel fuels, and other petroleum products. These colorimetric tubes have a standard measuring range of 0.5 ppm to 10 ppm and indicate the presence of benzene when the white indicating scale turns a brownish-yellow

color. Any evidence of airborne concentrations of benzene will require site activities to be suspended and the PHSO to be contacted for additional guidance. The use of the 25 ppm action level discussed in Table 5-1 is appropriate if colorimetric tube sampling shows that benzene is not the COC. Detailed manufacturer instructions on the use, measurement, and interferences of this tube are provided in the shipping package.

7.1.3 Hazard Monitoring Frequency

Table 5-1 presents the frequencies that hazard monitoring will be performed as well as the action levels that will initiate the use of 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 TtNUS Equipment Manager. Operational checks and field calibration will be performed on the instruments each day prior to and after their use. Field calibration will be performed on instruments according to manufacturer's recommendations. 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 SOPs (copies of which can be found in the Health and Safety Guidance Manual which will be maintained on site for reference). The 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 number, source concentration, supplier).
- Any relevant comments or remarks.

7.3 DOCUMENTING INSTRUMENT READINGS

The SHSO is responsible for ensuring that air monitoring instruments are used in accordance with the specifications of this HASP and with manufacturer's specifications/recommendations. In addition, the SHSO 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 SHSO 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., LEL/O₂ meter, etc.).
- Personnel present at the area where the reading was noted.
- Other conditions that are considered relevant to the SHSO (such as weather conditions, possible instrument interferences, etc.).

8.0 TRAINING/MEDICAL SURVEILLANCE REQUIREMENTS

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

8.1 INTRODUCTORY/REFRESHER/SUPERVISORY TRAINING

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 Standard 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 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 and subcontractor personnel 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 that 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 and subcontractor 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 are in accordance with medical surveillance as determined by 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 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 Health and Safety Manager.

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. The exclusion zone for drilling/DPT work and associated sampling activities will be 5 feet greater than the height of the mast. For example, if the rig has a 25-foot mast the exclusion zone will include the area within 30 feet from the point of operation. A 10-foot exclusion zone will be used for other site activities conducted in areas where contaminated soil or groundwater may be present.

9.2 CONTAMINATION REDUCTION ZONE

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

9.3 SUPPORT ZONE

The support zone for this project will include a staging area where site vehicles will be parked, equipment will be unloaded, and where food and drink containers will be maintained. The support zones will be established at areas of the site where exposure to site contaminants would not be expected during normal working conditions or foreseeable emergencies.

9.4 SAFE WORK PERMITS

Exclusion zone activities conducted in support of this project will be done so using this HASP as a reference guide and Safe Work Permits to incorporate site-specific information to guide and direct field crews on a task by task basis. An example of the Safe Work Permit to be used during site activities is

illustrated in Figure 9-1. Permits will be issued by the SSO prior to the beginning of on-site activities. Partially completed Safe Work Permits are included in Attachment III of this HASP.

Safe Work Permits are to be completed in accordance with the specifications contained in Table 5-1 and the other sections of the HASP as appropriate.

9.5 SITE VISITORS

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

- Personnel invited to observe or participate in operations by TtNUS
- Regulatory personnel (i.e., Department of Defense (DoD), USEPA, OSHA, FDEP, etc.)
- NAVFAC SE and/or Navy personnel
- Other authorized visitors

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

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

- Site visitors will be routed to the FOL, who will sign them into the field logbook. Information to be recorded in the logbook will include the individual's name (proper identification required), the entity which they represent, and the purpose of the visit.
- Site visitors will be required to produce the necessary information supporting clearance to the site. This shall include information attesting to applicable training and medical surveillance as stipulated in Section 8.0 of this document. In addition, to enter the site operational zones during planned activities, visitors will be required to first go through site-specific training covering the topics stipulated in Section 8.2 of this HASP.

**FIGURE 9-1
SAFE WORK PERMIT**

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

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

V. Protective equipment required

Level D Level B

Level C Level A

Modifications/Exceptions: _____

Respiratory equipment required

Yes Specify on the reverse

No

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

Primary Route(s) of Exposure/Hazard: _____

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

VII. Additional Safety Equipment/Procedures

- | | | | |
|-----------------------------------|--|---------------------------------------|--|
| Hard-hat..... | <input type="checkbox"/> Yes <input 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 – Work)..... | <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: _____

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

9.6 SITE SECURITY

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

Prior to beginning work, a security clearance from for site personnel is required to be completed each site worker, signed by his/her supervisor, and submitted for approval by the NAVSTA Mayport Environmental Director.

9.7 SITE MAP

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

9.8 BUDDY SYSTEM

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

9.9 MSDS REQUIREMENTS

TtNUS and subcontractor personnel will provide MSDSs for the 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

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

External communication will be accomplished by using cellular telephones. External communication will primarily be used for the purpose of resource and emergency resource communications. Prior to the commencement of activities at NAVSTA Mayport, the FOL will determine and arrange for telephone communications.

10.0 SPILL CONTAINMENT PROGRAM

10.1 SCOPE AND APPLICATION

It is anticipated that quantities of bulk potentially hazardous materials (greater than 55-gallons) will not be handled during the site activities. It is possible, however, that as the job progresses, disposable PPE and other non-reusable items may be generated. As needed, 55-gallon drums will be used to contain unwanted items generated during sampling activities. The drum(s) will be labeled with the site name and address, the type of contents, and the date the container was filled as well as an identified contact person. As warranted, samples will be collected and analyzed to characterize the material and determine appropriate disposal measures. Once characterized the drum(s) will be removed from the staging area and disposed of in accordance with Federal, State, and local regulations. Given the likely solid nature of drum contents, a comprehensive Spill Containment Program is not necessary. The following discussion is provided as contingency information only.

10.2 POTENTIAL SPILL AREAS

Should drums contain liquid wastes, potential spill areas will be monitored in an ongoing attempt to prevent and control further potential contamination of the environment. Areas designated for handling, loading, and unloading of potentially contaminated waters and debris present limited potential for leaks or spills.

The drums/containers used for containing liquids will be sealed, labeled, and staged within a centralized area awaiting shipment or disposal.

10.3 LEAK AND SPILL DETECTION

To establish an early detection of potential spills or leaks, periodic inspections by the SSO will be conducted during working hours to visually determine that containers are not leaking. If a leak is detected, the first approach will be to transfer the container contents using a hand pump into a new container. Other provisions for the transfer of container contents will be made and appropriate emergency contacts will be notified, if necessary. In most instances, leaks will be collected and contained using absorbents such as Oil-dry, vermiculite, and/or sand, which may be stored at the staging area in a conspicuously marked drum. This material will be containerized for disposal pending analyses. The inspections will be documented in the Project Logbook.

10.4 PERSONNEL TRAINING AND SPILL PREVENTION

Personnel will be instructed on the procedures for spill prevention, containment, and collection of hazardous materials in the site-specific training. The FOL and/or the SSO will serve as the Spill Response Coordinator for this operation should the need arise.

10.5 SPILL PREVENTION AND CONTAINMENT EQUIPMENT

The following represents the types of equipment that may be maintained at the staging area for the purpose of supporting this Spill Containment Program (depending on the likelihood that drums and/or liquid wastes are generated):

- Sand, clean fill, vermiculite, or other noncombustible absorbent (oil-dry).
- Drums [55-gallon United States Department of Transportation (DOT) 17-E or 17-H].
- Shovels, rakes, and brooms.
- Labels.

10.6 SPILL CONTROL PLAN

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

- Notify the SSO or FOL immediately.
- Take immediate actions to stop the leak or spill by plugging or patching the drum or raising the leak to the highest point. Avoid contacting drum contents. Spread the absorbent material in the area of the spill covering completely.

It is not anticipated that a spill will occur in which the field crews cannot handle. Should this occur; however, the FOL or SSO will notify appropriate emergency response agencies.

11.0 CONFINED-SPACE ENTRY

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

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

A Permit-Required Confined Space is one that has the following characteristics:

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

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

12.0 MATERIALS AND DOCUMENTATION

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

- A complete copy of this HASP.
- Health and Safety Guidance Manual.
- Incident Reports.
- Medical Data Sheets.
- MSDS for the chemicals brought on-site, including decon solution, fuels, sample preservations, calibration gases, etc.
- A full size OSHA Job Safety and Health Poster.
- Training/Medical Surveillance Documentation Form (blank).
- Emergency Reference Form (Section 2.0, extra copy for posting).

12.1 MATERIALS TO BE POSTED OR MAINTAINED AT THE SITE

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

- **Chemical Inventory Listing (posted)** - This list represents the 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 the substances employed on-site. It is acceptable to have these documents within a central folder and the chemical inventory as the table of contents.

- **The OSHA Job Safety and Health Protection Poster (posted)** - This poster, as directed by 29 CFR 1903.2 (a)(1), should be conspicuously posted in places where notices to employees are normally posted. Each FOL shall ensure that this poster is not defaced, altered, or covered by other material.
- **Site Clearance (maintained)** - This list is found within the training section of the HASP (see Figure 8-1). This list identifies site personnel, dates of training (including site-specific training), and medical surveillance. The lists indicate not only clearance but also status. If personnel do not meet these requirements, they do not enter the site while personnel are engaged in activities.
- **Emergency Phone Numbers and Directions to the Hospital(s) (posted)** - This list of numbers and directions will be maintained at the phone communications points and in each site vehicle.
- **Medical Data Sheets/Cards (maintained)** - Medical Data Sheets will be filled out by 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 (29 CFR 1910.95) (posted)** - This standard will be posted anytime hearing protection or other noise abatement procedures are employed.
- **Personnel Monitoring (maintained)** - The results generated through personnel sampling (levels of airborne toxins, noise levels, etc.) will be posted to inform individuals of the results of that effort.
- **Placards and Labels (maintained)** - Where chemical inventories have been separated because of quantities and incompatibilities, these areas will be conspicuously marked using DOT placards and acceptable (Hazard Communication 29 CFR 1910.1200(f)) labels.

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

13.0 GLOSSARY

ACGIH	American Conference of Governmental Industrial Hygienists
AST	Aboveground Storage Tank
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CFR	Code of Federal Regulations
CLEAN	Comprehensive Long-term Environmental Action Navy
CNS	Central Nervous System
COCs	Contaminates of Concern
CTO	Contract Task Order
°C	Degrees Celsius
°F	Degrees Fahrenheit
DoD	Department of Defense
DOT	Department of Transportation
DPT	Direct Push Technology
eV	Electron Volts
FDEP	Florida Department of Environmental Protection
FID	Flame Ionization Detector
FOL	Field Operations Leader
GCTL	Groundwater Cleanup Target Level
HASP	Health and Safety Plan
HSM	Health and Safety Manager
IDLH	Immediate Dangerous to Life or Health
IDW	Investigative-Derived Waste
LEL/LFL	Lower Explosive Limit / Lower Flammable Limit
mg/m ³	Milligrams per Cubed Meter
mmHg	Millimeter of Mercury
MSDS	Material Safety Data Sheet
NAVFAC SE	Naval Facilities Engineering Command, Southeast
NAVSTA	Naval Station
Navy	United States Navy
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PAH	Polynuclear Aromatic Hydrocarbon
PHSO	Project Health and Safety Officer
PID	Photoionization Detector
PPE	Personal Protective Equipment

ppm	Parts-per-Million
PVC	Polyvinyl Chloride
PWC	Public Works Center
SAP	Sampling and Analyses Plan
SOPs	Standard Operating Procedures
SSO	Site Safety Officer
TBD	To Be Determined
TOM	Task Order Manager
TRPH	Total Recoverable Petroleum Hydrocarbon
TtNUS	Tetra Tech NUS, Inc.
UEL/UFL	Upper Exposure Limit / Upper Flammable Limit
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds

ATTACHMENT I

**INJURY/ILLNESS PROCEDURE
AND REPORT FORM**

TETRA TECHNUS, INC.

INJURY/ILLNESS PROCEDURE WORKER'S COMPENSATION PROGRAM

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

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

ADDITIONAL QUESTIONS REGARDING WORKER'S COMPENSATION:

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

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

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

WHO IS COVERED:

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

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

WHAT IS COVERED:

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



TETRA TECH, INC.

ACCIDENT AND ILLNESS INVESTIGATION REPORT

To: _____
Subsidiary Health and Safety Representative

Prepared by: _____

Position: _____

cc: _____
Workers Compensation Administrator

Office: _____

Project name: _____

Telephone number: _____

Project number: _____

Fax number: _____

Information Regarding Injured or Ill Employee

Name: _____

Office: _____

Home address: _____

Gender: M F No. of dependents: _____

Marital status: _____

Home telephone number: _____

Date of birth: _____

Occupation (regular job title): _____

Social security number: _____

Department: _____

Date of Accident: _____

Time of Accident: _____ a.m. p.m.

Time Employee Began Work: _____

Check if time cannot be determined

Location of Incident

Street address: _____

City, state, and zip code: _____

County: _____

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

Information About the Incident

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

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

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



TETRA TECH, INC.

ACCIDENT AND ILLNESS INVESTIGATION REPORT (Continued)

Information About the Incident (Continued)

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

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

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

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

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

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

Witness (Attach additional sheets for other witnesses.)

Name: _____

Company: _____

Street address: _____

City: _____ State: _____ Zip code: _____

Telephone number: _____

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

Name of physician or health care professional: _____

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

Facility name: _____

Street address: _____

City: _____ State: _____ Zip code: _____

Telephone number: _____

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

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

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



TETRA TECH, INC.

ACCIDENT AND ILLNESS INVESTIGATION REPORT (Continued)

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

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

Name of Tetra Tech employee the injury or illness was first reported to: _____

Date of Report: _____ **Time of Report:** _____

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

Printed Name of Injured Employee

Telephone Number

Signature of Injured Employee

Date

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

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

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



TETRA TECH, INC.

ACCIDENT AND ILLNESS INVESTIGATION REPORT (Continued)

To Be Completed by the Subsidiary Health and Safety Representative

Classification of Incident:
 Injury Illness

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

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

OSHA Recordable Case Number _____

To Be Completed by Human Resources

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

To Be Completed during Report to Workers Compensation Carrier

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

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

ATTACHMENT II

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 _____

Name of Next Kin _____

Drug or other Allergies _____

Particular Sensitivities _____

Do You Wear Contacts? _____

Provide a Checklist of Previous Illnesses or Exposure to Hazardous Chemicals _____

What medications are you presently using? _____

Do you have any medical restrictions? _____

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

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

Signature Date

ATTACHMENT III

SAFE WORK PERMITS

SAFE WORK PERMIT
MOBILIZATION AND DEMOBILIZATION
NAVAL STATION MAYPORT, FLORIDA

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

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

II. Primary Hazards: Lifting; pinches and compressions; slip, trip and falls; vehicular and foot traffic; ambient temperature extremes; insect and animal bites, and inclement weather

III. Field Crew: _____

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

V. Protective equipment required

Level D Level B
 Level C Level A

Respiratory equipment required

Yes Specify on the reverse
 No

Modifications/Exceptions: _____

VI. Chemicals of Concern	Hazard Monitoring	Action Level(s)	Response Measures
<u>None expected during this task</u>	_____	_____	_____
_____	_____	_____	_____

Primary Route(s) of Exposure/Hazard: NA

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

VII. Additional Safety Equipment/Procedures

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

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

VIII. Site Preparation

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

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

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

Permit Issued by: _____ Permit Accepted by: _____

SAFE WORK PERMIT
SOIL BORING AND MONITORING WELL INSTALLATION
NAVAL STATION MAYPORT, FLORIDA

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

I. Work limited to the following (description, area, equipment used): Soil boring and monitoring well installation using DPT at Satellite Parking Area # 2.

II. Primary Hazards: Contact with site contaminants; transfer of contamination; heavy equipment hazards; elevated noise; energized systems/utilities; heavy lifting; slip, trip and fall; cuts and lacerations; vehicular and foot traffic; ambient temperature extremes; insect/animal bites and stings, poisonous plants, inclement weather

III. Field Crew: _____

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

Equipment Inspection required Yes No Initials of Inspector _____ TtNUS

V. Protective equipment required

Level D Level B

Level C Level A

Modifications/Exceptions: _____

Respiratory equipment required

Yes Specify on the reverse

No

VI. Chemicals of Concern

Fuel oil, Diesel fuel, and Petroleum related

Contaminants (VOCs

Including BTEX; PAHs)

Hazard Monitoring

PID/FID

Colorimetric tube analysis

using Benzene 0.5/c tube

Action Level(s)

Sustained readings in worker breathing zone above 25 ppm

Any indication of benzene

Response Measures

Evacuate area until readings subside

Evacuate area - contact

the PHSO

Primary Route(s) of Exposure/Hazard: Inhalation of airborne vapors or dusts is most likely route of exposure – though unlikely to be present. Incidental ingestion and contact with contaminants will be prevented through the use of PPE and safe work practices.

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

VII. Additional Safety Equipment/Procedures

Hard-hat Yes No

Safety Glasses Yes No

Chemical/splash goggles Yes No

Splash shield Yes No

Splash suits/coveralls Yes No

Impermeable apron Yes No

Steel toe work shoes or boots Yes No

High visibility vest Yes No

First Aid Kit Yes No

Safety Shower/Eyewash Yes No

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

Hearing Protection (Plugs/Muffs) Yes No

Safety belt/harness Yes No

Radio/Cellular Phone Yes No

Barricades Yes No

Gloves (Type – nitrile/work) Yes No

Work/rest regimen Yes No

Chemical resistant boot covers Yes No

Tape up/use insect repellent Yes No

Fire extinguisher Yes No

Other Yes No

VIII. Site Preparation

Utility Locating and Excavation Clearance completed Yes No NA

Vehicle and Foot Traffic Routes Established/Traffic Control Barricades/Signs in Place Yes No NA

Physical Hazards Identified and Isolated (Splash and containment barriers) Yes No NA

Emergency Equipment Staged (Spill control, fire extinguishers, first aid kits, etc.) Yes No NA

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: Any sustained PID/FID readings in workers breathing zones will require that a colorimetric tube (0.5/c) be used to evaluate the presence of benzene. Any indication of benzene within worker breathing zones will require site activities to be suspended and the PHSO to be contacted. Use safe lifting/carrying techniques. Inspect equipment prior to use. Ensure emergency stop devices are functional and test daily.

Permit Issued by: _____ Permit Accepted by: _____

SAFE WORK PERMIT
SOIL EXCAVATION ACTIVITIES AT SITES 245 AND 1585
NAVAL STATION MAYPORT, FLORIDA

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

I. Work limited to the following (description, area, equipment used): Soil excavation activities at Site 351-2 remove approximately 90 cu/yds from an area of 20 ft. by 20 ft.

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

III. Field Crew: _____

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

V. Protective equipment required

Level D Level B
 Level C Level A

Respiratory equipment required

Yes Specify on the reverse
 No

Modifications/Exceptions: _____

VI. Chemicals of Concern

Fuel oil, Diesel fuel, and Petroleum related Contaminants (VOCs Including BTEX; PAHs)

Hazard Monitoring

PID/FID
Colorimetric tube analysis using Benzene 0.5/c tube

Action Level(s)

Sustained readings in worker breathing zone above 25 ppm
Any indication of benzene

Response Measures

Evacuate area until readings subside
Evacuate area - contact the PHSO

Primary Route(s) of Exposure/Hazard: Inhalation of airborne vapors or dusts is most likely route of exposure – though unlikely to be present. Incidental ingestion and contact with contaminants will be prevented through the use of PPE and safe work practices.

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

VII. Additional Safety Equipment/Procedures

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

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

VIII. Site Preparation

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

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

X. Special instructions, precautions: Any sustained PID/FID readings in workers breathing zones will require that a colorimetric tube (0.5/c) be used to evaluate the presence of benzene. Any indication of benzene within worker breathing zones will require site activities to be suspended and the PHSO to be contacted. Use safe lifting/carrying techniques. Inspect equipment prior to use. Ensure emergency stop devices are functional and test daily.

Permit Issued by: _____ Permit Accepted by: _____

SAFE WORK PERMIT
MULTI MEDIA SAMPLING AND WELL DEVELOPMENT
NAVAL STATION MAYPORT, FLORIDA

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

- I. Work limited to the following (description, area, equipment used):** Multimedia sampling including soils, Groundwater, and IDW sampling at Sites 245, 351, 413, 1585 and Satellite Parking Area #2
- II. Primary Hazards:** Contact with site contaminants; transfer of contamination; heavy lifting; slip, trip and fall; cuts and lacerations; vehicular and foot traffic; ambient temperature extremes; insect/animal bites and stings, poisonous plants, inclement weather.
- III. Field Crew:** _____
- IV. On-site Inspection conducted** Yes No Initials of Inspector TtNUS
Equipment Inspection required Yes No Initials of Inspector TtNUS

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

VI. Chemicals of Concern	Hazard Monitoring	Action Level(s)	Response Measures
<u>Fuel oil, Diesel fuel, and Petroleum related Contaminants (VOCs including BTEX; PAHs)</u>	<u>PID/FID</u>	<u>Sustained readings in worker breathing zone above 25 ppm</u>	<u>Evacuate area until readings subside</u>
	<u>Colorimetric tube analysis using Benzene 0.5/c tube</u>	<u>Any indication of benzene</u>	<u>Evacuate area - contact the PHSO</u>

Primary Route(s) of Exposure/Hazard: Inhalation, contact and incidental ingestion as a result of hand to mouth activities.

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

- VII. Additional Safety Equipment/Procedures**
- | | | | |
|------------------------------------|---|---------------------------------------|---|
| Hard-hat..... | <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 type="checkbox"/> No | Gloves (Type – Nitrile)..... | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| Impermeable Apron..... | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Work/rest regimen..... | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Steel Toe Work Shoes or Boots..... | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Chemical Resistant Boot Covers..... | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| High Visibility Vest..... | <input type="checkbox"/> Yes <input type="checkbox"/> No | Tape/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:** Any sustained PID.FID readings in workers breathing zones will require that a colorimetric tube (0.5/c) be used to evaluate the presence of benzene. Any indication of benzene within worker breathing zones will require site activities to be suspended and the PHSO to be contacted. Use safe lifting/carrying techniques. Assume media is contaminated and avoid contact through the use of safe work practices, PPE and decontamination.

SAFE WORK PERMIT
FREE PRODUCT RECOVERY AND RELATED TASKS
NAVAL STATION MAYPORT, FLORIDA

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

I. Work limited to the following (description, area, equipment used): Free product recovery and related tasks at Sites 425, 1343, and 1586.

II. Primary Hazards: Potential hazards associated with this task: contact with free product; transfer of contamination; heavy lifting; slip, trip and fall; cuts and lacerations; vehicular and foot traffic; hand/power tool hazards, ambient temperature extremes; insect/animal bites and stings, poisonous plants, inclement weather.

III. Field Crew: _____

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

V. Protective equipment required

Level D Level B
 Level C Level A

Respiratory equipment required

Yes Specify on the reverse
 No

Modifications/Exceptions: Use chemical resistant coveralls if potential contact with free product exists.

VI. Chemicals of Concern

Fuel oil, Diesel fuel, and Petroleum related Contaminants (VOCs including BTEX; PAHs)

Hazard Monitoring

PID/FID

Colorimetric tube analysis using Benzene 0.5/c tube

Action Level(s)

Sustained readings in worker breathing zone above 25 ppm

Any indication of benzene

Response Measures

Evacuate area until readings subside

Evacuate area - contact the PHSO

Primary Route(s) of Exposure/Hazard: Inhalation, contact and incidental ingestion as a result of hand to mouth activities.

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

VII. Additional Safety Equipment/Procedures

Hard-hat.....	<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 type="checkbox"/> No	Gloves (Type – Nitrile).....	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Impermeable Apron.....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Work/rest regimen.....	<input type="checkbox"/> Yes <input type="checkbox"/> No
Steel Toe Work Shoes or Boots.....	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Chemical Resistant Boot Covers.....	<input type="checkbox"/> Yes <input type="checkbox"/> No
High Visibility Vest.....	<input type="checkbox"/> Yes <input type="checkbox"/> No	Tape/Insect Repellent.....	<input type="checkbox"/> Yes <input type="checkbox"/> No
First Aid Kit.....	<input type="checkbox"/> Yes <input type="checkbox"/> No	Fire Extinguisher.....	<input type="checkbox"/> Yes <input type="checkbox"/> No
Safety Shower/Eyewash.....	<input type="checkbox"/> Yes <input type="checkbox"/> No	Other.....	<input type="checkbox"/> Yes <input type="checkbox"/> No

Modifications/Exceptions: _____

VIII. Site Preparation

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

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

X. Special instructions, precautions: Any sustained PID/FID readings in workers breathing zones will require that a colorimetric tube (0.5/c) be used to evaluate the presence of benzene. Any indication of benzene within worker breathing zones will require site activities to be suspended and the PHSO to be contacted. Use safe lifting/carrying techniques. Assume media is contaminated and avoid contact through the use of safe work practices, PPE and decontamination.

Permit Issued by: _____ Permit Accepted by: _____

**SAFE WORK PERMIT
DECONTAMINATION
NAVAL STATION MAYPORT, FLORIDA**

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

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

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

VI. Chemicals of Concern	Hazard Monitoring	Action Level(s)	Response Measures
<u>Fuel oil, Diesel fuel, and Petroleum related Contaminants (VOCs including BTEX; PAHs)</u>	<u>Visual observation of soil that may contain site contaminants</u>	<u>Noted presence of soil/debris</u>	<u>Repeat decon</u>
_____	_____	_____	_____
_____	_____	_____	_____

Primary Route(s) of Exposure/Hazard: absorption

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

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

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

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

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

Permit Issued by: _____ Permit Accepted by: _____

SAFE WORK PERMIT
SURVEYING ACTIVITIES
NAVAL STATION MAYPORT, FLORIDA

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

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

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

VI. Chemicals of Concern	Hazard Monitoring	Action Level(s)	Response Measures
<u>None expected during this task</u>	_____	_____	_____
_____	_____	_____	_____

Primary Route(s) of Exposure/Hazard: _____

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

- VII. Additional Safety Equipment/Procedures**
- | | |
|--|--|
| Hard-hat..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Hearing Protection (Plugs/Muffs) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Safety Glasses <input type="checkbox"/> Yes <input type="checkbox"/> No | Safety belt/harness <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Chemical/splash goggles <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Radio/Cellular Phone <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Splash Shield <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Barricades..... <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Splash suits/coveralls..... <input type="checkbox"/> Yes <input type="checkbox"/> No | Gloves (Type – Work) <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Impermeable apron <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Work/rest regimen..... <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Steel toe work shoes or boots <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Chemical Resistant Boot Covers <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| High Visibility vest <input type="checkbox"/> Yes <input type="checkbox"/> No | Tape up/use insect repellent <input type="checkbox"/> Yes <input type="checkbox"/> No |
| First Aid Kit..... <input type="checkbox"/> Yes <input type="checkbox"/> No | Fire Extinguisher <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Safety Shower/Eyewash <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Other..... <input type="checkbox"/> Yes <input type="checkbox"/> No |
- Modifications/Exceptions: 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 (Splash and containment barriers)..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Emergency Equipment Staged (Spill control, fire extinguishers, first aid kits, etc.) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

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

X. Special instructions, precautions: _____

Permit Issued by: _____ Permit Accepted by: _____

SAFE WORK PERMIT
IDW ACTIVITIES
NAVAL STATION MAYPORT, FLORIDA

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

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

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

III. Field Crew: _____

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

V. Protective equipment required

Level D Level B
 Level C Level A

Modifications/Exceptions: _____

Respiratory equipment required

Yes Specify on the reverse
 No

VI. Chemicals of Concern	Hazard Monitoring	Action Level(s)	Response Measures
<u>Fuel oil, Diesel fuel, and Petroleum related Contaminants (VOCs including BTEX; PAHs)</u>	<u>PID/FID</u>	<u>Sustained readings in worker breathing zone above 25 ppm</u>	<u>Evacuate area until readings subside</u>
	<u>Colorimetric tube analysis using Benzene 0.5/c tube</u>	<u>Any indication of benzene</u>	<u>Evacuate area - contact the PHSO</u>

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

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

VII. Additional Safety Equipment/Procedures

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

Modifications/Exceptions: _____

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

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

X. Special instructions, precautions: Inspect drums used to store IDW / free product prior to use. Cover IDW containers to prevent unauthorized entry and infiltration of precipitation. Use proper lifting practices and obtain assistance when handling heavy drums. Use equipment whenever possible to move heavy items.

Permit Issued by: _____ Permit Accepted by: _____

ATTACHMENT IV

**STANDARD OPERATING PROCEDURE
FOR
UTILITY LOCATING AND EXCAVATION CLEARANCE**



TETRA TECH NUS, INC.

STANDARD OPERATING PROCEDURES

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

Subject
UTILITY LOCATING AND EXCAVATION CLEARANCE

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Subject UTILITY LOCATING AND EXCAVATION CLEARANCE	Number HS-1.0	Page 2 of 15
	Revision 2	Effective Date 12/03

1.0 PURPOSE

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

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

2.0 SCOPE

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

3.0 GLOSSARY

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

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

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

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

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

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

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4.0 RESPONSIBILITIES

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

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

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

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

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

5.0 PROCEDURES

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

5.1 Buried Utilities

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

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

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

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

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

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

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5.2 Overhead Power Lines

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

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

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

6.0 UNDERGROUND LOCATING TECHNIQUES

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

6.1 Geophysical Methods

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

Electromagnetic Induction

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

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

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

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Magnetics

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

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

Ground Penetrating Radar

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

6.2 Passive Detection Surveys

Acoustic Surveys

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

Thermal Imaging

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

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

6.3 Intrusive Detection Surveys

Vacuum Excavation

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

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

Hand Excavation

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

Tile Probe Surveys

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

7.0 INTRUSIVE ACTIVITIES SUMMARY

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

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

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

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

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

8.0 REFERENCES

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

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



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

**ONE-CALL SYSTEMS INTERNATIONAL
CONDENSED DIRECTORY**

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

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ATTACHMENT 1 (Continued)

Texas

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

Utah

Blue Stakes of Utah
1-800-662-4111

Vermont

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

Virginia

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

Washington

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

West Virginia

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

Wisconsin

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

Wyoming

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

District of Columbia

Miss Utility
1-800-257-7777

Alberta

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

British Columbia

BC One Call
1-800-474-6886

Ontario

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

Quebec

Info-Excavation
1-800-663-9228

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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:
 _____ Date _____
 Site Manager/Field Operations Leader

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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ATTACHMENT 4 (Continued)

Hydro-vacuum excavation

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

Other technologies

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

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

Sincerely,

Russell B. Swanson, Director
Directorate of Construction

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

ATTACHMENT V

EQUIPMENT INSPECTION CHECKLIST

Heavy Equipment Inspection Checklist

Company: _____

Unit/Serial No#: _____

Inspection Date: ___ / ___ / ___ Time: ___ : ___ Equipment Type: _____
 (e.g., earthmoving equipment - tractors backhoes, bulldozers, etc.)

Project Name: _____

Project No#: _____

Yes	No	NA	Requirements	Comments
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Seat Belts <ul style="list-style-type: none"> • Are available for intended operator and passengers (where applicable) • Seat Belts are operational? 	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Roll-Over Protection (ROPS) <ul style="list-style-type: none"> • Roll-over protection structures (ROPS) are provided on vehicles and heavy equipment (including scrapers, tractors, loaders, bulldozers, carryalls, etc.) 	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Brakes <ul style="list-style-type: none"> • Brake systems capable of stopping and holding fully loaded equipment • Parking Brake functions properly • Wheel Chocks available (where and as applicable) 	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Access <ul style="list-style-type: none"> • Non-slip steps • Grab Handles (3-Point Grab/Step Mounting Points) 	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Audible Alarms <ul style="list-style-type: none"> • Audible alarms – All bidirectional machines, such as rollers, compacters, front-end loaders, bulldozers, and similar equipment, shall be equipped with a horn, distinguishable from the surrounding noise level, which shall be operated as needed when the machine is moving in either direction. - Back up Alarms – All self propelled equipment with an obstructed view to the rear will be equipped with a reverse gear signal alarm distinguishable from the surrounding noise level. • Horn functioning properly 	

Heavy Equipment Inspection checklist
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Yes	No	NA	Requirements	Comments
<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<p>Highway Use</p> <ul style="list-style-type: none"> • Fenders for equipment that can exceed 15mph • Fire Extinguisher • Are exhaust emissions directed away from the Operator? • Cab <ul style="list-style-type: none"> - Clean, free from debris, tools or equipment that can interfere with foot Control. - Free from storage of flammable material/solvents • Mirrors, • Safety glass <ul style="list-style-type: none"> - Equipped with defrosters - Windshield wipers • Turn signals, lights, brake lights, etc. (front/rear) for equipment approved for highway use? • Gauges functioning properly • Tires (Tread) or tracks • Steering (standard and emergency) • Are tools and material secured to prevent movement during transport? 	
<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"/>	<p>Fluid Levels:</p> <ul style="list-style-type: none"> • Engine oil • Transmission fluid • Brake fluid • Cooling system fluid • Hoses and belts • Hydraulic oil 	
<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"/>	<p>Fueling</p> <ul style="list-style-type: none"> • Fueling of vehicles and heavy equipment is done with the engine off. • No smoking is permitted at or near the fuel storage or refueling area. A sign is posted stating: NO SMOKING WITHIN 50 FEET. • No sources of ignition are present near the fuel storage or refueling area. • A dry chemical or carbon dioxide fire extinguisher (rated 6:BC or larger) is in a location accessible to the fueling area, no closer than 50-feet. • Safety cans available? 	

Heavy Equipment Inspection checklist
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Unit/Serial No#: _____

Inspection Date: ____ / ____ / ____

Yes	No	NA	Requirements	Comments
<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 are protected from accidental contact? • High pressure pneumatic lines have safety cable to prevent thrashing should it become disconnected? 	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Attachments <ul style="list-style-type: none"> • Have the attachments designed for use (as per manufacturer’s recommendation) with this equipment been inspected and are considered suitable for use? 	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Operator Qualifications <ul style="list-style-type: none"> • Does the operator have proper licensing where applicable, (e.g., CDL)? • Does the operator, understand the equipment’s operating instructions? • Is the operator experienced with this equipment? • Is the operator 21 years of age or more? 	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PPE Required <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"/>	Key(s)? Operating Manual?	
<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.) - MSDSs available? 	

Approved for Use Yes No See Comments

 Site Health and Safety Officer

 Operator

ATTACHMENT VI

EXCAVATION COMPETENT PERSON CHECKLIST

TRENCHING AND EXCAVATION COMPETENT PERSON CHECKLIST						
CTO Name and Number:			Subcontractor:			
FOL:			Location:			
SSO:			Date:			
Weather (circle one)	Dry	Raining	Previous Rain	Freezing		
COMPETENT PERSON INFORMATION				YES	NO	NA
Competent Persons Name:						
o Length of Experience:						
Does the designated individual have training and knowledge in:						
o Soil Analysis?						
o Use of protective systems?						
o Requirements of 29 CFR 1926. 650-652?						
List Training Experience:						
Does the designated individual have the authority to take prompt action and stop work?						
GENERAL						
Was an inspection done and documented prior to the start of work?						
Is the excavation deeper than 4 feet?						
Will entry into the excavation be allowed?						
Do structures (buildings, etc.) exist near the excavation?						
o Will the excavation proceed under the footing/foundation?						
o What is the method of stabilization?						
Have surface encumbrances been identified?						
Have subsurface encumbrances been identified?						
Is the excavation exposed to heavy equipment/vehicular traffic?						
o Have safe distances been marked?						
WATER CONDITIONS						
Has the excavation been subject to water accumulation?						
o Has the soil in the trench been adversely affected?						
o If yes has the competent person inspected the excavation and taken action?						

EGRESS	YES	NO	NA
Is a means of egress provided every 25 feet?			
Is a ramp used for access or egress to the excavation? <i>(if no skip to the next section)</i>			
○ Was the ramp designed by competent person for safe access and egress?			
○ Is the competent person who designed the ramp qualified?			
○ Does the ramp meet specifications?			
CONFINED SPACE			
Is there a potential for a hazardous atmosphere in the trench?			
Is air monitoring equipment on site?			
Has a qualified person been assigned to assess the hazards of confined space?			
Is emergency rescue equipment readily accessible to employees?			
Comments:			
	Signature		Date
TtNUS FOL/SSO			
Competent Person			