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NAS CECIL FIELD
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FINAL HEALTH AND SAFETY PLAN FOR PILOT STUDY SYSTEM INSTALLATION AT SITE 3
AND OPERABLE UNIT 8 (OU 8) WITH ADDITIONAL INVESTIGATIONS AND MONITORING
AT SITE 5 AND 21 NAS CECIL FIELD FL
4/1/2012
TETRA TECH

Comprehensive Long-term Environmental Action Navy

CONTRACT NUMBER N62470-08-D-1001



**Health and Safety Plan
for
Pilot Test System Installation at Site 3 and
Operable Unit 8
and
Additional Investigations and Monitoring
Well Installation at Site 5, Operable Unit 2,
Site 21 and Operable Unit 10**

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

Contract Task Order JM09

**Revision 0
April 2012**



BRAC Program Management Office Southeast
4130 Faber Place Drive, Suite 202
North Charleston, South Carolina 29405

**HEALTH AND SAFETY PLAN
FOR
PILOT TEST SYSTEM INSTALLATION AT SITE 3 AND OPERABLE UNIT 8
AND
ADDITIONAL INVESTIGATIONS AND MONITORING WELL INSTALLATION
AT
SITE 5, OPERABLE UNIT 2, SITE 21, AND OPERABLE UNIT 10
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

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

**Submitted to:
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**CONTRACT NO. N62470-08-D-1001
CONTRACT TASK ORDER JM09**

**Revision 0
April 2012**

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1.0 INTRODUCTION

This HASP has been prepared for the work being conducted at the Operable Unit 8 Site 3 at Cecil Field under the jurisdiction of Naval Air Station Cecil Field (NAS Cecil Field), Jacksonville, Florida as part of an overall effort conducted under Comprehensive Long-Term Environmental Action-Navy (CLEAN IV) administered through the Naval Facilities Engineering Command, Southeast (NAVFAC SE), as defined under Contract Number N62470-08-D-1001. In addition to the HASP, a copy of the Tetra Tech Health & 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 Tetra Tech Standard Operating Procedures (SOPs). Both documents must be present at the site to comply with the requirements 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 site. The HASP will be modified if new information becomes available. Changes to the HASP will be made by the Project Health & Safety Officer (PHSO) and approved by the Tetra Tech Health and Safety Manager (HSM) and the Project Manager (PM). The PM will notify affected personnel of the changes.

1.1 KEY PROJECT PERSONNEL AND ORGANIZATION

This section defines responsibilities for site safety and health for Tetra Tech employees engaged in onsite activities. Personnel assigned to participate in the field work have the primary responsibility for performing their work tasks in a manner that is consistent with the Tetra Tech Health and Safety Policy, the health and safety training that they have received, the contents of this HASP, and in an overall manner that protects their personal safety and health and that of their co-workers. The following persons are the primary point of contact and have the primary responsibility for observing and implementing this HASP and for overall on-site health and safety.

- The Tetra Tech PM 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:
 - Providing information regarding site contaminants and physical hazards associated with the site.
 - Establishing air monitoring and decontamination procedures.
 - Assigning personal protective equipment based on task and potential hazards.
 - Determining emergency response procedures and emergency contacts.

- Stipulating training requirements and reviewing appropriate training and medical surveillance certificates.
 - Providing standard work practices to minimize potential injuries and exposures associated with hazardous waste work.
 - Modify this HASP, as it becomes necessary.
- The Tetra Tech Field Operations Leader (FOL) is responsible for implementation of the HASP with the assistance of an appointed 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:
 - Coordinates health and safety activities with the FOL.
 - Selects, applies, inspects, and maintains personal protective equipment.
 - Establishes work zones and control points in areas of operation.
 - Implements air monitoring program for onsite activities.
 - Verifies training and medical clearance of onsite personnel status in relation to site activities.
 - Implements Hazard Communication, Respiratory Protection Programs, and other associated health and safety programs as they may apply to site activities.
 - Coordinates emergency services.
 - Provides site-specific training for onsite personnel.
 - Investigates accidents and injuries (see Attachment I – Incident Report Form)
 - Provides 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 Tetra Tech CLEAN HSM.

1.2 STOP WORK AUTHORITY

ALL employees are empowered, authorized, and responsible to STOP WORK at any time when an imminent and uncontrolled safety or health hazard is perceived. In a Stop Work event (immediately after the involved task has been shut down and the work area has been secured in a safe manner) the employee shall contact the Project Manager and the Corporate Health and Safety Manager. Through observations and communication, all parties involved shall then develop, communicate, and implement corrective actions necessary and appropriate to modify the task and to resume work.

Note: In some cases one person may be designated responsibilities for more than one position. This action will be performed only as credentials, experience, and availability permits.

1.3 SITE INFORMATION AND PERSONNEL ASSIGNMENTS

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

U.S. Navy Remedial Project Manager (RPM): Art Sanford **Phone Number:** (843) 743-2135

Tetra Tech NUS, Inc. Project Team:

Tetra Tech Management Personnel	Discipline/Tasks Assigned	Telephone
<u>Robert Simcik, P.E.</u>	<u>Project Manager (PM)</u>	<u>(412) 921-8163</u>
<u>Matthew M. Soltis, CIH, CSP</u>	<u>CLEAN Health and Safety Manager</u>	<u>(412) 921-8912</u>
<u>TBD</u>	<u>Field Operations Leader (FOL)</u>	<u></u>
<u>TBD</u>	<u>Site Safety Officer (SSO)</u>	<u></u>
<u>Clyde Snyder</u>	<u>Project Health and Safety Officer (PHSO)</u>	<u>(412) 921-8904</u>

Non-Tetra Tech Personnel	Telephone
Affiliation/Discipline/Tasks Assigned	
<u></u>	<u></u>
<u></u>	<u></u>
<u></u>	<u></u>

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

Clyde Snyder

2.0 EMERGENCY ACTION PLAN

2.1 INTRODUCTION

This section has been developed as part of a planning effort to direct and guide field personnel in the event of an emergency. In the event of an emergency, the field team will primarily evacuate and assemble to an area unaffected by the emergency and notify the appropriate local emergency response personnel/agencies. Workers who are ill or who have suffered a non-serious injury may be transported by site personnel to nearby medical facilities, provided that such transport does not aggravate or further endanger the welfare of the injured/ill person. The emergency response agencies listed in this plan are capable of providing the most effective response, and as such, will be designated as the primary responders. These agencies are located within a reasonable distance from the area of site operations, which ensures adequate emergency response time.

Tetra Tech personnel may participate in minor event response and emergency prevention activities 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 Jacksonville Airport Authority (JAA) personnel to ensure that Tetra Tech 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 Tetra Tech 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

Tetra Tech 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 EVACUATION ROUTES, PROCEDURES, AND PLACES OF REFUGE

An evacuation will be initiated whenever recommended hazard controls are insufficient to protect the health, safety or welfare of site workers. Specific examples of conditions that may initiate an evacuation include, but are not limited to the following: severe weather conditions; fire or explosion; monitoring instrumentation readings which indicate levels of contamination are greater than instituted action levels; and evidence of personnel overexposure to potential site contaminants.

In the event of an emergency requiring evacuation, personnel will immediately stop activities and report to the designated safe place of refuge unless doing so would pose additional risks. When evacuation to the primary place of refuge is not possible, personnel will proceed to a designated alternate location and remain until further notification from the Tetra Tech FOL. Safe places of refuge will be identified prior to the commencement of site activities by the SSO and will be conveyed to personnel as part of the pre-activities training session. This information will be reiterated during daily safety meetings. Whenever possible, the safe place of refuge will also serve as the telephone communications point for that area. During an evacuation, personnel will remain at the refuge location until directed otherwise by the Tetra Tech FOL or the on-site Incident Commander of the Emergency Response Team. The FOL or the SSO will perform a head count at this location to account for and to confirm the location of site personnel. Emergency response personnel will be immediately notified of any unaccounted personnel. The SSO will document the names of personnel onsite (on a daily basis) in the Site Health and Safety Logbook. This information will be utilized to perform the head count in the event of an emergency.

Evacuation procedures will be discussed during the pre-activities training session, prior to the initiation of project tasks. Evacuation routes from the site and safe places of refuge 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) may dictate evacuation routes. As a result, assembly points will be selected and communicated to the workers relative to the site location where work is being performed. Evacuation should always take place in an upwind direction from the site.

2.5 EMERGENCY CONTACTS

Prior to initiating field activities, personnel will be thoroughly briefed on the emergency procedures to be followed in the event of an accident. Table 2-1 provides a list of emergency contacts and their associated telephone numbers. This table must be posted where it is readily available to site personnel. Facility maps should also be posted showing potential evacuation routes and designated meeting areas.

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

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

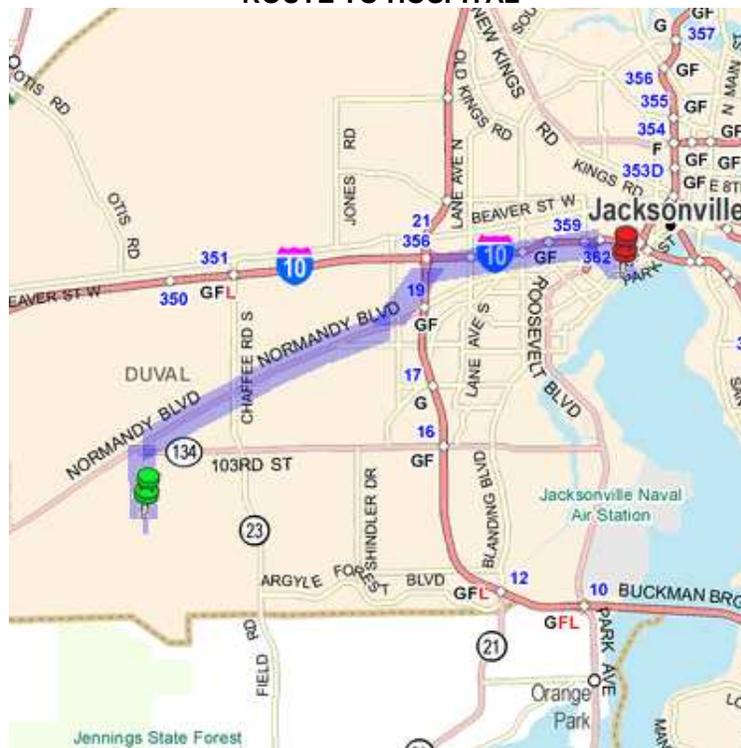
CONTACT	PHONE NUMBER
EMERGENCY (Police, Fire, Ambulance Service)	911
City of Jacksonville Sheriff's Office (non-emergency)	(904) 630-7600
St. Vincent Hospital	(904) 387-7300
Florida Poison Information Center - Jacksonville	(800) 222-1222
Chemtrec	(800) 424-9300
National Response Center	(800) 424-8802
NAS-Flight Line Area Contact Diane Stone	(904) 573-1604
NAS - Cecil Field (Point-of-Contact) Ralph Hogan	(904) 771-6397
Task Order Manager Robert F. Simcik, P.E.	(412) 921-8163
Health and Safety Manager Matthew M. Soltis, CIH, CSP	(412) 921-8912
Project Health and Safety Officer Clyde Snyder	(412) 921-8904 (724) 516-0907 cell
Public Works (utilities, gas, water, sewage, telephone, fiber optics) Jacksonville Airport Authority Portion Roy Crague - Facilities Coordinator City of Jacksonville Jacksonville Economic Development Commission (JEDC) Ed Randolph	(904) 573-1607 (904) 219-6703 (cell) (904) 779-9745 (fax) (904) 630-1185

2.6 EMERGENCY ROUTE TO HOSPITAL

Start: Cecil Field, 13365 Aeronautical Circle, Jacksonville, Florida
End: St. Vincent Hospital, 1800 Barrs Street, Jacksonville, Florida (904) 308-7494
Distance: 18.6 miles

West on Aeronautical Circle	0.1 miles
Right onto Cargo Hold Avenue	0.1 miles
Left onto Skillside Street	0.2 miles
Right onto New World Avenue	1.7 miles
Right to get on Normandy Boulevard East	7.6 miles
I-295 N on Left	0.8 miles
Exit # 21A on Right to get on I-10 E towards Jacksonville.	5 miles
Exit # 362 on Right towards Stockton Street	1 miles
Left onto Stockton Street	0.7 miles
Right onto Riverside Avenue	0.1 miles
Left onto Barrs Street	0.1 miles
Hospital on Right.	

**FIGURE 2-1
ROUTE TO HOSPITAL**



2.7 EMERGENCY ALERTING AND ACTION/RESPONSE PROCEDURES

Tetra Tech personnel will be working in close proximity to each other at Cecil Field. As a result, hand signals, voice commands, and line of site communication will be sufficient to alert site personnel of an emergency. When project tasks are performed simultaneously on different sites, vehicle horns will be used to communicate emergency situations.

If an emergency on Base warranting evacuation occurs, the following procedures are to be initiated:

- Initiate the evacuation via hand signals, voice commands, or line of site communication
- Report to the designated refuge point where the FOL will account for site personnel
- Once non-essential personnel are evacuated, appropriate response procedures will be enacted to control the situation.
- Describe to the FOL (FOL will serve as the Incident Coordinator) pertinent incident details.

In the event that site personnel cannot mitigate the hazardous situation, the FOL and SSO will enact emergency notification procedures to secure additional assistance in the following manner:

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

- On Base, call 911 and other appropriate emergency contacts (Table 2-1) and report the emergency.
- Give the emergency operator the location of the emergency, the type of emergency, the number of injured, and a brief description of what occurred.
- Stay on the phone and follow the instructions given by the operator.
- The operator will then notify and dispatch the proper emergency response agencies.

2.8 PPE AND EMERGENCY EQUIPMENT

A first-aid kit, eye wash units (or bottles of disposable eyewash solution) and fire extinguishers (strategically placed) will be maintained onsite and shall be immediately available for use in the event of an emergency. This equipment will be located in the field office as well as in each site vehicle. At least one first aid kit supplied with equipment to protect against bloodborne pathogens will also be available on site. Personnel identified within the field crew with bloodborne pathogen and first-aid training will be the only personnel permitted to offer first-aid assistance. Since the nearest hospital/medical center is less than 4

minutes away, a CPR/First Aid trained personnel is not required to be on-site during the time when work is being conducted.

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 and will be conducted as soon as possible out of harm's way. However, it is unlikely that an evacuation would occur which would require workers to evacuate the site without first performing the necessary decontamination procedures.

Tetra Tech personnel will perform rescue operations from emergency situations and may provide initial medical support for injury/illnesses requiring only "Basic First-Aid" level support, and only within the limits of training obtained by site personnel. Basic First-Aid is considered treatment that can be rendered by a trained first aid provider at the injury location and not requiring follow-up treatment or examination by a physician (for example; minor cuts, bruises, stings, scrapes, and burns). Not included as Basic First-Aid are second or third degree burns, cuts, lacerations requiring stitches or butterfly bandaging, heat exhaustion, severe poisonous plant or insect bite reactions. Personnel providing medical assistance are required to be trained in First-Aid and in the requirements of OSHA's Bloodborne Pathogen Standard (29 CFR 1910.1030). Medical attention above First-Aid level support will require assistance from the designated emergency response agencies. Attachment I provides the procedure to follow when reporting an injury/illness, and the form to be used for this purpose.

2.10 INJURY/ILLNESS REPORTING

If any Tetra Tech personnel are injured or develop an illness as a result of working on site, the Tetra Tech "Incident Report Form" (Attachment I) must be followed. Following this procedure is necessary for documenting of the information obtained at the time of the incident.

2.10.1 TOTAL Incident Reporting System

TOTAL is Tetra Tech's new online incident reporting system. Site employees can use TOTAL to directly report health and safety incidents, notify key personnel, and initiate the process for properly investigating and addressing the causes of incidents, including near-miss events.

An incident is considered any unplanned event. It may include several types of near misses, events where no loss was incurred, or incidents that resulted in injuries or illness, property or equipment damage, chemical spills, fires, or damage to motor vehicles. Some examples of incidents are as follows:

- Work-related injury or illness
- Suspected hazardous substance exposure over the allowable exposure limit
- Automobile or vehicle-related incidents
- Significant property or equipment damage
- An unplanned fire or explosion
- An unplanned spill or release (including air releases) to the environment
- A permit or permit equivalent exceedance
- Unexpected contact with damage to aboveground or below ground utilities

A near miss incident is described as an undesired event or workplace condition which under slightly different circumstances had a reasonable probability of resulting in one of the outcomes described above. Some examples of near miss incidents are as follows:

- Tools falling from overhead work near workers below
- Unexpected contact without damage to aboveground or below ground utilities
- Discovery of an unknown and potentially hazardous material, or anomaly
- Discovery of confirmed or potential Munitions and Explosives of Concern or Recovered Chemical Warfare Materiel (RCWM) that may present a hazard

Incidents including near-miss incidents involving Tetra Tech personnel or Tetra Tech subcontractors under Tetra Tech's immediate direction shall be reported and investigated.

TOTAL looks like the incident reporting form in Attachment I. TOTAL is an intuitive system that will guide you through the necessary steps to report an incident within 24 hours of its occurrence. Behind the scenes, TOTAL is a tool for Tetra Tech to better track incidents, analyze root causes, implement corrective action plans, and share lessons learned.

TOTAL is maintained on the Tetra Tech Intranet site at <https://my.tetrattech.com/>.

Once on the "My Tetrattech" site, TOTAL can be found under the Health and Safety tab, Incident Reporting section, select "Report an Incident (TOTAL)". This will connect you directly to TOTAL. TOTAL can also be accessed directly from the internet using the following web address: <http://totalhs.tetrattech.com/>.

Note: When using the system outside the Tetra Tech intranet system or when operating in a wireless mode, a VPN connection will be required. The speed of the application may be affected dependent upon outside factors such as connection, signal strength, etc. Enter the system using your network user name and password. The user name should be in the following format - TT\nickname.lastname.

2.11 DRILL/INCIDENT AFTER ACTION CRITIQUE

The FOL will conduct a drill or exercise to test the Emergency Action Plan. A critique with the site personnel after each drill or incident will be conducted. This critique provides a mechanism to review the incidents and exercises or drills to determine where improvements can be made. For incidents recorded in TOTAL, the FOL will utilize the Lessons Learned component for the critique.

3.0 SITE BACKGROUND

3.1 SITE HISTORY

Naval Air Station (NAS) Cecil Field is approximately 14 miles southwest of Jacksonville in northeastern Florida. NAS Cecil Field was in operation (except for brief periods) from 1941 to September 30, 1999. The base property occupied more than 31,000 acres, primarily in Duval County with the southern portion of the base extending into Clay County. Approximately 17,200 acres will be transferred to the private sector (non-military) and the remainder will be transferred to NAS Jacksonville. The ownership of these areas will be the city of Jacksonville (10,560 acres), the Jacksonville Port Authority (6,000 acres), and Clay County (641 acres). To date, more than 95% of the property designated for the private sector use has been transferred.

Historically the mission of the base was to provide facilities, services, and material support for the operation and maintenance of naval weapons and aircraft. NAS Cecil Field was listed on the U.S. Environmental Protection Agency (EPA) National Priorities List (Superfund List) in 1989, based on indications that there was shallow groundwater, surface water, and soils contamination. Twelve "operable units" consisting of twenty-four separate areas of contamination have been identified as well as other potential sources of contamination. Environmental investigations at NAS Cecil Field are in varying stages of completion. Less than 800 acres of the 17,200 acres have been determined to be contaminated and require additional investigation or remediation. The majority of contaminated sites are located on the Main Base primarily to the west of the north-south runways.

3.2 CURRENT STATUS

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

3.3 SITE DESCRIPTIONS

Work will be conducted at the following IR locations within NAS Cecil Field.

3.3.1 Site 3

Site 3, Oil/Sludge Disposal Pit is located in the southwestern portion of the Main Base area of NAS Cecil Field about 3,500 feet west of the east-west runways. Site 3 occupies about 0.5 acres. There are no potable wells in the vicinity of the site that tap the surficial aquifer. A pit on the western side of Site 3 was used to dispose of liquid wastes and sludge from as early as the mid-1950s until 1975. Liquid wastes were

taken to the site in bowsers or 55-gallon drums, drained into the pit, and allowed to seep into the soil or evaporate. When the liquid level in the pit neared the ground surface level, the Station's fire department burned the wastes. About 200 to 300 gallons of waste oil, fuel, and tank sludge from the fuel farm were disposed weekly at the site, and a total of approximately 210,000 to 310,000 gallons were disposed throughout the 20-year lifetime of the site. Wastes were generated by the squadrons, Aircraft Intermediate Maintenance Department (AIMD), and the public works department and were composed of fuels, oils, solvents, paint, and paint strippers. Following closure of the site in 1975, the pit was filled and covered with soil. In 1992, a Navy helicopter crashed into a wooded area east of the site. The helicopter had a fuel capacity of between 1,800 and 2,000 gallons and ignited on impact. Site 3 is located near the western perimeter of NAS Cecil Field, in the flight path of landing aircraft. It is a vacant, relatively featureless area with no residential, commercial, or industrial functions. Human activity is generally limited to security patrols or joggers on the Lake Fretwell access road and Perimeter Road. Vegetative cover consists of thick brush and briars. The disposal pit (source area), estimated to be approximately 100 feet in diameter and 3 to 5 feet deep, is located immediately northeast of the intersection of Perimeter Road and the Lake Fretwell access road, both of which are unpaved. There is a relatively uniform gentle slope toward Rowell Creek and Lake Fretwell over the length of the site. A 6.7-acre wetland is located approximately 800 feet east of the disposal pit, adjacent to Rowell Creek. Rowell Creek is classified by the State of Florida as Class III freshwater. The Pilot Study will be conducted adjacent to Rowell Creek, but will not impact any wetlands.

3.3.2 Site 5

Previous investigations at OU 2, Site 5 indicate the presence of VOC, SVOC, and vanadium groundwater contamination from past operating practices in groundwater at and downgradient of Site 5. Long-term monitoring (LTM) consisting of annual collection and analysis of groundwater samples is being conducted to verify whether contaminants are migrating offsite at unacceptable concentrations and whether NA is occurring, and LTM must continue. During recent sampling events, contamination in the upgradient well (CEF-005-LTM01) has been detected, indicating that the original conceptual site model (CSM) has changed. Additional investigation is needed to determine the extent of contamination upgradient of Site 5 so the Project Team can update the conceptual site model (CSM), that will provide the basis for determining whether and how the LTM program could be modified.

3.3.3 Site 21

Site 21 is primarily unpaved and covers an area of approximately 1.5 acres. Site 21 is located at the northern end of an access road (formerly I Avenue) in the center of the golf course at NAS Cecil Field. Building 398, the golf course storage building, is a Quonset hut with an earthen floor that is used to store

maintenance equipment and vehicles. Access within the Quonset hut will be organized by the Engineer prior to the field effort.

Previous investigations at OU 10, Site 21 indicate the presence of groundwater chlordane contamination from past operating practices. LTM consisting of annual collection and analysis of groundwater samples must be conducted to verify whether contaminants are migrating offsite at unacceptable concentrations, and LTM must continue. During recent sampling events, exceedances of the chlordane GCTL continue to be detected in CEF-P21-05S, and the concentrations do not exhibit a decreasing trend, indicating that the original conceptual site model (CSM) has changed. Additional sampling investigation is needed to determine the extent of contamination in the area around CEF-P21-05S so the Cecil Field Project Team can update the CSM, this will provide the basis for determining the future course of action.

4.0 SCOPE OF WORK

This section of the HASP addresses the proposed site activities that are to be conducted at NAS Cecil Field. The methods and activities to be conducted include soil investigation activities for Sites 3, 5, 21 at Cecil Field:

- Mobilization/demobilization activities
- Permanent and temporary Monitoring well installation via DPT
- Air Sparging System Installation*
- Monitoring Well Abandonment
- Multimedia sampling
 - Groundwater
 - Soil
- Decontamination activities
- IDW Management

* Air sparging is an in situ remedial technology that reduces concentrations of volatile constituents via volatilization and anaerobic biological processes. This technology, which is also known as "in situ air stripping" and "in situ volatilization," involves the injection of contaminant-free air into the subsurface saturated zone, enabling a phase transfer of volatile compounds from a dissolved state to a vapor phase.

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

5.0 IDENTIFYING AND COMMUNICATING TASK-SPECIFIC HAZARDS AND GENERAL SAFE WORK PRACTICES

The purpose of this section is to identify the anticipated hazards and appropriate hazard prevention/hazard control measures that are to be observed for each planned task or operation. These topics have been summarized for each planned task through the use of task-specific Activity Hazard Analysis (AHA), which are to be reviewed in the field by the SSO with all task participants prior to initiating any task. Additionally, potential hazard and hazard control matters that are relevant but are not necessarily task-specific are addressed in the following portions of this section.

5.1 GENERAL SAFE WORK PRACTICES

In addition to the task-specific work practices and restrictions identified in the Activity Hazard Analyses (Attachment III) the following general safe work practices are to be followed when conducting work on-site.

- Eating, drinking, chewing gum or tobacco, taking medication, or smoking in contaminated or potentially contaminated areas or where the possibility for the transfer of contamination exists is prohibited.
- Wash hands and face thoroughly upon leaving a contaminated or suspected contaminated area. If a source of potable water is not available at the work site that can be used for hands-washing, the use of waterless hands cleaning products will be used, followed by actual hands-washing as soon as practicable upon exiting the site.
- Avoid contact with potentially contaminated substances including puddles, pools, mud, or other such areas. Avoid, kneeling on the ground or leaning or sitting on equipment. Keep monitoring equipment away from potentially contaminated surfaces.
- Plan and mark entrance, exit, and emergency evacuation routes.
- Rehearse unfamiliar operations prior to implementation.
- Buddies should maintain visual contact with each other and with other on-site team members by remaining in close proximity to assist each other in case of emergency.
- Establish appropriate safety zones including support, contamination reduction, and exclusion zones.

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

5.2 DPT SAFE WORK PRACTICES

The following Safe Work Practices are to be followed when working in or around the DPT Operations (HSGM, Section 7.0).

- Identify underground utilities and buried structures before commencing any DPT operations. Follow the Tetra Tech Utility Locating and Excavation Clearance Standard Operating Procedure.
- DPT rigs will be inspected by the SSO or designee, prior to the acceptance of the equipment at the site and prior to the use of the equipment. Repairs or deficiencies identified will be corrected prior to use. The inspection will be accomplished using the Equipment Inspection Checklist for DPT rigs provided in Attachment IV. After the initial inspection and release for use on site, additional inspections will be performed at least at the beginning of every 5 or 10-day shift, or following any repairs or significant maintenance activities.
- Ensure that all machine guarding is in place and properly adjusted.
- Block the DPT rig and use levelers to prevent inadvertent movement.
- The work area around the point of operation will be cleared to the extent possible to remove any trip hazards near or surrounding operating equipment.
- Minimize contact to the extent possible with contaminated tooling and environmental media. Potentially contaminated tooling will be placed on polyethylene sheeting for storage and wrapped for transport to the centrally located equipment decontamination area

- Support functions (sampling and screening stations) will be maintained a minimum distance from the DPT rig of the height of the mast plus five feet, but not less than 25 feet around the rig.
- Only qualified operators and knowledgeable ground crew personnel will participate in the operation of the DPT rig.
- During maintenance, use only manufacturer provided/approved equipment (i.e. auger flight connectors, etc.)
- Only personnel absolutely essential to the work activity will be allowed in the exclusion zone.
- Equipment used within the exclusion zone will undergo a complete decontamination and evaluation by the FOL and/or the SHSO to determine cleanliness prior to moving to the next location, exiting the site, or prior to down time for maintenance.
- Motorized equipment will be fueled prior to the commencement of the day's activities.
- When not in use DPT rig will be shutdown, and emergency brakes set and wheels will be chocked to prevent movement.
- Investigative areas will be restored to equal or better condition than original to remove any contamination brought to the surface and to remove any physical hazards. In situations where these hazards cannot be immediately removed, the area will be barricaded to limit access.

6.0 HAZARD ASSESSMENT AND CONTROLS

This section provides reference information regarding the chemical and physical hazards which may be associated with activities that are to be conducted as part of the scope of work.

6.1 CHEMICAL HAZARDS

Analytical data from previous site investigations have indicated the presence of VOCs and insecticide Chlordane in groundwater. Based on an evaluation of previous site data collected from each site, in combination with historical information about the sites, the primary contaminants of concern (COCs) are VOCs and chlordane. Table 6-1 below shows the specific COCs and a comparison of potential worst case air concentrations with current OELs.

**TABLE 6-1
COMPARISON OF WORST-CASE AIR CONCENTRATIONS
WITH CURRENT OCCUPATIONAL EXPOSURE LIMITS**

Contaminant of Concern	Highest Concentration Previously Detected	Worst-Case Air Concentration That Could Be Encountered	OELs
Site 3			
Benzene	2.1 ug/l in water	0.15 ppm	OSHA: 1 ppm TWA ₈ ACGIH: 0.5 ppm TWA ₈
Carbon Tetrachloride	45.7 ug/l in water	8.2 ppm	OSHA: 10 ppm TWA ₈ ACGIH: 5 ppm TWA ₈
1,1 Dichloroethene	321 ug/l in water	86.43 ppm	ACGIH: 5 ppm TWA ₈
Trichloroethylene	916 ug/l in water	68.87 ppm	OSHA: 100 ppm TWA ₈ ACGIH: 10 ppm TWA ₈
Vinyl Chloride	48 ug/l in water	21.35 ppm	OSHA: 1 ppm TWA ₈ ACGIH: 1 ppm TWA ₈
Site 5			
Benzene	11.3 ug/l in water	0.78 ppm	OSHA: 1 ppm TWA ₈ ACGIH: 0.5 ppm TWA ₈
Site 21			
Chlordane	45 ug/l in water	Not Available	OSHA: 0.5 ppm TWA ₈ ACGIH: 0.5 ppm TWA

Table Notes:

TWA₈: Average air concentration over an 8-hour work period that is not to be exceeded

Ceiling: Concentration in air that is not to be exceeded

STEL: Concentration in air that is not be exceeded for more than 15 minutes more than 4 times per day

Short-term exposure to VOCs can cause irritation of the nose and throat and central nervous system (CNS) depression, with symptoms such as drowsiness, dizziness, giddiness, headache, loss of coordination. High concentrations have caused numbness and facial pain, reduced eyesight, unconsciousness, irregular heartbeat and death. Very high concentrations have produced death due to CNS effects, and, in rare cases, irregular heart beat. Permanent nervous system damage and/or liver injury have resulted from severe overexposure.

6.1.1 Volatile Organic Compounds

Volatile organic compounds (VOCs) refers to organic chemical compounds which have significant vapor pressures and which can affect the environment and human health. VOCs are numerous, varied, and ubiquitous. Although VOCs include both man-made and naturally occurring chemical compounds, it is the anthropogenic VOCs that are regulated, especially for indoors where concentrations can be highest. VOCs are typically not acutely toxic but have chronic effects. Because the concentrations are usually low and the symptoms slow to develop, analysis of VOCs and their effects is a demanding area.

Health effects include: Eye, nose, and throat irritation; headaches, loss of coordination, nausea; damage to liver, kidney, and central nervous system. Some organics can cause cancer in animals; some are suspected or known to cause cancer in humans. Key signs or symptoms associated with exposure to VOCs include conjunctival irritation, nose and throat discomfort, headache, allergic skin reaction, dyspnea, declines in serum cholinesterase levels, nausea, emesis, epistaxis, fatigue, dizziness.

The ability of organic chemicals to cause health effects varies greatly from those that are highly toxic, to those with no known health effect. As with other pollutants, the extent and nature of the health effect will depend on many factors including level of exposure and length of time exposed. Eye and respiratory tract irritation, headaches, dizziness, visual disorders, and memory impairment are among the immediate symptoms that some people have experienced soon after exposure to some organics. At present, not much is known about what health effects occur from the levels of organics usually found in homes. Many organic compounds are known to cause cancer in animals; some are suspected of causing, or are known to cause, cancer in humans.

6.1.2 Chlordane

Chlordane may be toxic by inhalation, ingestion, and dermal or eye exposure. It is a persistent CNS stimulant. Technical grade chlordane is irritating to the skin and mucous membranes; however, this may be more true for the early formulations that contained the contaminant hexachlorocyclopentadiene. General symptoms of chlordane poisoning may include nausea, vomiting, diarrhea, anorexia, gastritis, abdominal pain, anuria, headache, coughing, excitability, irritability, confusion, delirium, muscle spasms, dizziness, paresthesia, weakness, ataxia, loss of coordination, tremor, violent clonic/tonic convulsions or

epileptiform seizures, and pulmonary edema, followed by CNS depression, coma and death with respiratory arrest. The agent (mixture) is possibly carcinogenic to humans. The exposure circumstance entails exposures that are possibly carcinogenic to humans. This category is used for agents, mixtures and exposure circumstances for which there is limited evidence of carcinogenicity in humans and less than sufficient evidence of carcinogenicity in experimental animals. Chlordane's was used as an insecticide resulted in its direct release to the environment. If released into water, chlordane is expected to adsorb to suspended solids and sediment. Biodegradation is not an important fate process in water as indicated by 0% biodegradation after 28 days incubation with a sludge inoculum. Estimated volatilization half-lives for a model river and model lake are 42 hrs and 19 days, respectively. However, volatilization from water surfaces is expected to be attenuated by adsorption to suspended solids and sediment in the water column. The estimated volatilization half-life from a model pond is 100 yrs if adsorption is considered. Occupational exposure and general population exposure should be low or non-existent since chlordane is no longer produced or used. In the past, chlordane was applied directly to the soil as a spray and exposure to this compound was primarily by ingestion of food.

6.1.3 Exposure Pathways

Inhalation: In a worst-case scenario, the COC's concentrations immediately above a captured air phase above contaminated groundwater (such as in the head space of a monitoring well) could potentially reach concentrations that exceed the OELs. However, in regarding the results of this data evaluation, it is important to recognize the following:

- the planned work area is outdoors, with ample natural ventilation that will reduce any airborne VOCs through dilution and dispersion,
- the groundwater value used in this evaluation was the *highest* concentration detected during the two most recent groundwater monitoring events,

As a result of these factors, it is unlikely that workers participating in this activity will encounter any airborne concentrations of COCs that would represent an occupational exposure concern. To monitor this route, real-time direct reading monitoring instruments will be used (as described in Section 7.0). This will be performed during the intrusive tasks of groundwater sampling and IDW management activities, as these tasks are the most likely to involve encountering/releasing any VOCs into the airphase.

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

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

6.2 PHYSICAL HAZARDS

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

- Vehicular and equipment traffic
- Heavy equipment hazards
- Slips, trips, and falls
- Heat stress
- Pinch/compression points
- Natural hazards (snakes, ticks, poisonous plants, etc.)
- Inclement weather

6.2.1 Slips, Trips, and Falls

During various site activities there is a potential for slip, trip, and fall hazards associated with wet, steep, or unstable work surfaces. To minimize hazards of this nature, personnel required to work in and along areas prone to these types of hazards will be required to exercise caution, and use appropriate precautions (restrict access, guardrails, life lines and/or safety harnesses) and other means suitable for the task at hand. Site activities will be performed using the buddy system.

6.2.2 Heat Stress

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

6.2.3 Pinch/Compression Points

Handling of tools, machinery, and other equipment on site may expose personnel to pinch/compression point hazards during normal work activities. Where applicable, equipment will have intact and functional

guarding to prevent personnel contact with hazards. Personnel will exercise caution when working around pinch/compression points, using additional tools or devices (e.g., pinch bars) to assist in completing activities.

6.2.4 Vehicular and Equipment Traffic

Hazards associated with vehicular and equipment traffic are likely to exist during various site activities and whenever site personnel performed work on or near roadways. Tetra Tech personnel will be present to implement the traffic control plan through the use of warning signs, traffic cones, and flagmen. Additionally, site personnel will be instructed to maintain awareness of traffic and moving equipment when performing site activities. When working near roadways, site personnel will wear high visibility vests.

6.3 NATURAL HAZARDS

Dressing properly provides your best protection against pests, insects, bugs, mosquitoes, etc. Wear long-sleeved shirts and tuck your pant legs inside heavy wool socks or boot tops to protect your ankles. A hat provides excellent protection from the summer deerflies and horseflies. Wear light-colored clothing and avoid dark colors, especially in the blue and green range, as they tend to attract insects more than other colors. Insect repellents also are very useful.

6.3.1 Insect/Animal/Snake Bites and Stings

Various insects and animals may be present on site and should be considered when conducting site activities in the area.

Fire Ants

Fire ants present a unique situation when working outdoors in Florida. Their aggressive behavior and their ability to sting repeatedly can pose a unique health threat. The sting injects venom (formic acid) that causes an extreme burning sensation. Pustules form which can become infected if scratched.

Allergic reactions of people sensitive to the venom include dizziness, swelling, shock and in extreme cases unconsciousness and death. People exhibiting such symptoms should see a physician. Fire ants can be identified by their habitat. They build mounds in open sunny areas sometimes supported by a wall or shrub. The mound has no external opening. The size of the mound can range from a few inches across to some which are in excess of two feet or more in height and diameter. When disturbed, they defend it by swarming out and over the mound, even running up grass blades and sticks.

Site personnel who are allergic to stinging insects such as bees, wasps, hornets, and ants must be particularly careful since severe illness and death may result from allergic reactions. As with any medical

condition or allergy, information regarding the condition must be listed on the Medical Data Sheet and the FOL and SHSO notified.

Tick Borne Illnesses

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

Prevention is typically facilitated through taping pants to boots and using insect repellent as well as performing frequent body checks to prevent long term attachment. Site first aid kits should be equipped with medical forceps and rubbing alcohol to assist in tick removal.

If you find a tick attached, it should be removed immediately. The longer an infected tick is attached, the greater the chance that it will transmit the pathogen. Ticks should be removed with a pair of fine-tipped tweezers. Grasp the tick as close to the skin's surface as possible. Pull upward with a steady, even motion. Do not jerk or twist the tick. Doing so may cause the mouthparts of the tick break off, or stay attached to the skin. If this happens, remove the mouthparts with the tweezers. Be careful not to squeeze or crush the tick. The tick's fluids may contain infectious organisms. Do not handle ticks with bare hands or remove ticks from pets without gloves or tweezers. After removing the tick, disinfect the bite site and wash hands thoroughly with soap and water. You may wish to save the tick for identification in case you become ill 2-3 weeks after the bite. To do so, place the tick in a sealed plastic bag, write the date of the bite on a piece of paper in pencil and place it in the bag. Place the bag in the freezer.



Graphics courtesy of Center for Disease Control

Mosquito-Borne Illness

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

Mosquitoes become infected after biting infected birds. The symptoms for mosquito-borne illnesses may include headache, moderate to high fever, stiff neck and confusion. In serious cases coma, seizures or

paralysis can result. Symptoms usually appear between 5 to 15 days after exposure to infected mosquitoes. Mosquito-borne illnesses may be mild or serious and can lead to death.

West Nile Virus - Encephalitis is an inflammation of the brain and can be caused by bacteria and viruses. West Nile encephalitis is caused by a virus transmitted to humans by mosquitoes. The mosquito becomes infected by feeding on birds infected with the West Nile virus. Infected mosquitoes then transmit the West Nile virus to humans and animals when biting (or taking a blood-meal).

West Nile encephalitis is NOT transmitted from person-to-person. There is no evidence that a person can get the virus from handling live or dead infected birds. However, avoid bare-handed contact when handling any dead animals, including dead birds. Ticks have not been implicated as vectors of West Nile-like virus. Mild infections are common and include fever, headache, and body aches, often with skin rash and swollen lymph glands. More severe infection is marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, occasional convulsions, paralysis and, rarely, and death (especially in the elderly and very young). The incubation period of West Nile encephalitis is usually 3 to 12 days.

Eastern Equine Encephalitis (EEE) - Eastern Equine Encephalitis is spread to horses and humans through the bite of an infected mosquito. The mosquito becomes infected after biting an infected bird. EEE can cause severe complications and even death. Symptoms for EEE in humans begin with high fever, chills, soar throat, nausea and vomiting. The illness can affect the central nervous system, cause sudden fever, severe headache, mental confusion, seizures and coma. Symptoms usually appear between 5 to 15 days after exposure to infected mosquitoes. There is no cure for EEE in humans.

Precautions include:

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

6.3.2 Ambient Temperature Extremes (Heat Stress)

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

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

- Watch for signs of heat stress/exhaustion,
- Provide fluid replacement
- Provide adequate number of breaks within a cooler environment.

Sunburn

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

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

6.3.3 Inclement Weather

Project tasks under this Scope of Work will be performed outdoors. As a result, inclement weather may be encountered. In the event that adverse weather conditions arise (electrical storms, hurricanes, etc.),

the FOL and/or the SHSO will be responsible for temporarily suspending or terminating activities until hazardous conditions no longer exist.

Tropical Storms and Hurricanes

As Florida is a tropical storm, hurricane prone area, the following information is supplied to explain the potential severity of these natural hazards. The decision to curtail operations and evacuate the area should be made by the FOL, PM, and the HSM.

During the early summer to late fall months, typically from the first of June through the end of November, disturbances migrating off the West Coast of Africa move into the Atlantic Ocean and develop into tropical cyclones known as tropical storms and hurricanes. Many of these cyclones become strong enough to threaten life and property along the Eastern Seaboard and Gulf Coast. There are three main threats associated with tropical storms and hurricanes:

- High winds
- Excessive rainfall
- Storm surge

The impacts of high winds and excessive rainfall occur hours, maybe days, before the tropical storm or hurricane makes landfall. However, the storm surge accompanies the storm or hurricane at the time that landfall occurs.

High Winds

Sustained winds vary greatly from storm to storm, but can range from 39 to 73 miles per hour (wind speeds associated with a tropical storm) to greater than 74 miles per hour (minimal wind speed for a Category 1 hurricane). Table 6-2 compares the type of storm or hurricane and the corresponding wind speed.

**TABLE 6-2
 TROPICAL STORM/HURRICANE RATING SCALE**

TYPE	CATEGORY*	WINDS (MPH)
Tropical Depression	NA	>35-38
Tropical Storm	NA	39 – 73
Hurricane	1	74 – 95
Hurricane	2	96 – 110
Hurricane	3	111 – 130
Hurricane	4	131 – 155
Hurricane	5	>155

Based on the Saffir-Simpson scale

NA – Not Applicable

In addition to strong winds, there is the threat of debris (i.e. building material, trees, etc.) becoming airborne projectiles as they are carried by the high winds. Thunderstorms and tornadoes embedded within the tropical storm or hurricane can further increase the wind speeds on a localized level.

In preparation for high winds and storms – Secure loose articles. Lash empty drums or associated containers together contained within storage areas. During electrical storms/high winds lower mast evacuate to a safe refuge location.

Excessive Rainfall

Heavy rains associated with tropical storms and hurricanes also vary greatly from storm to storm. On average, an inch of rainfall an hour is not uncommon with major hurricanes, somewhat lesser amounts with tropical storms. However, the primary threat is not the intensity of rain, but the duration of rainfall. Since many tropical storms and hurricanes are slow-movers, they are capable of producing sustained heavy rainfall over a long period of time. It is not uncommon for an area to receive nearly 20 inches of rain in 24 hours. Under these conditions, street; stream and creek flooding is inevitable only to be exacerbated by locally heavier rains from thunderstorms.

Storm Surge

The storm surge is an abnormal rise in sea level accompanying a hurricane or tropical storm. The height of the storm surge (usually measured in feet) is the difference in sea level from the observed level (during the storm) and the level that would have occurred in the absence of the storm or hurricane. The more intense the storm or hurricane the higher the storm surge. Storm surges become even higher if they occur during periods of high tide. Table 6-3 defines some of the terminology and possible calls to action regarding tropical cyclones:

TABLE 6-3
TROPICAL STORM/HURRICANE
WATCH AND WARNING

STORM DESCRIPTION	DEFINITION	CALL TO ACTION
Tropical Storm Watch	Tropical storm conditions are possible in the specified area of the watch, usually within 36 hours	Weather conditions should be monitored for further advisories. Prepare for possible evacuation by local officials
Tropical Storm Warning	Tropical storm conditions are expected in the specified area of the warning, usually within 24 hours.	Work should be suspended in areas where lightning, high winds and rainfall could pose a threat to life. Mandatory evacuations may be enforced by local officials.
Hurricane Watch	Hurricane conditions are possible in the specified area of the watch, usually within 36 hours.	Weather conditions should be monitored for further advisories. Prepare for possible evacuation by local officials
Hurricane Warning	Hurricane conditions are expected in the specified area of the warning, usually within 24 hours.	Mandatory evacuations will most likely be enforced by local officials.

A NOAA Weather Radio is the best means to receive watches and warnings from the National Weather Service. The National Weather Service continuously broadcasts updated hurricane advisories that can be received by widely available NOAA Weather Radios.

7.0 AIR MONITORING

The primary COCs are unlikely to be present in concentrations that could present an inhalation hazard during planned site activities. To assure that such exposures are avoided and documented, a direct reading instrument will be used to monitor worker exposures to chemical hazards present at the site. A Flame Ionization Detector (FID) may be used to monitor the air during intrusive and sampling work.

7.1 INSTRUMENTS AND USE

Instruments will be used primarily to monitor source points and worker breathing zone areas, while observing instrument action levels. The SSO shall obtain and document the daily background (BG) reading at an upwind, unaffected area and observe for readings above that BG level. The SSO shall monitor source areas (e.g., monitoring wells) for the presence of any reading above the daily-established BG level. If elevated readings are observed, the SSO shall monitor the workers breathing zone (BZ) areas with the FID. If the appropriate instrument Action Level is exceeded (see below), the following process will be followed:

- The SSO shall order all personnel to stop work and retreat upwind to a safe, unaffected area, where they will remain until further directed by the SSO.
- The SSO shall allow at least 5 minutes to pass so that the work area can ventilate, and will then re-approach the work area while continuously monitoring the BZ areas.
- Only when BG levels are regained in BZ areas will work be permitted to resume.
- If BG levels are not regained, the SSO will contact the HSM for additional direction.

The use of an FID is an acceptable instrument for detection of the known contaminants on this site.

Instrument Action Level:

Site	Action Level	Exposures
Site 3	1.25 ppm	no more than 4 exposures of 5 minutes in any one work day
Site 5	2.75 ppm	no more than 4 exposures of 5 minutes in any one work day
Site 21	10 ppm	no more than 4 exposures of 5 minutes in any one work day

7.2 INSTRUMENT MAINTENANCE AND CALIBRATION

Hazard monitoring instruments will be maintained and pre-field calibrated by the equipment provider (i.e., rental agency used). Operational checks and field calibration will be performed on site instruments each day prior to 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 standard operating procedure (which the SSO must assure are included with the instrument upon its receipt onsite). Field calibration efforts must be documented. Figure 7-1 is provided for documenting these calibration efforts. This information may instead be recorded in a field operations logbook, provided that the information specified in Figure 7-1 is recorded. This required information includes the following:

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

7.3 DOCUMENTING INSTRUMENT READINGS

The 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 all 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., FID, 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

8.1 INTRODUCTORY/REFRESHER/SUPERVISORY TRAINING

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

8.1.1 Requirements for Field Personnel

Tetra Tech 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 by OSHA.
- 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, if their assigned function will involve the supervision of subordinate personnel.

Documentation of introductory training or equivalent work experience, supervisory, and refresher training, as well as, site-specific training will be maintained at the site. Copies of certificates or other official documentation will be used to fulfill this requirement and to track site personnel's training status. The SHSO shall be responsible for insuring training qualifications through review of training documentation and for monitoring the status of on-site personnel to 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

Tetra Tech SHSO will provide site-specific training to Tetra Tech 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.

Tetra Tech will conduct a pre-activities training session prior to initiating site work. Additionally, a brief meeting may be held daily to discuss operations planned for that day as well as, a short meeting may be held at the end of the day to discuss the operations completed and any problems encountered. This activity will be supported through the use of a Safe Work Permit System (See Section 9.10) and/or documented in the Project Logbook.

8.3 MEDICAL SURVEILLANCE

Tetra Tech and subcontractor personnel participating in project field activities will have had a physical examination. 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 clearances provided are in accordance with medical surveillance as determined by OSHA.

The SHSO shall be responsible for ensuring that personnel participating in this project provide documentation regarding their medical qualifications. Personnel associated with this project will maintain a current status regarding medical surveillance as determined by OSHA 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 Tetra Tech Health and Safety Manager.

9.0 SITE CONTROL

This section outlines the general means by which Tetra Tech will delineate work zones and use these work zones in conjunction with decontamination procedures to prevent the spread of contaminants into previously unaffected areas of the site. It is anticipated that a fractured three-zone approach will be used during work at this site. This three zone approach will utilize an exclusion zone, a contamination reduction zone, and a support zone. It is also anticipated that this control measure will be used to control access to site work areas. Use of such controls will restrict the general public, minimize the potential for the spread of contaminants, and protect individuals who are not cleared to enter work areas.

9.1 EXCLUSION ZONE

The exclusion zone will be considered the areas of the site of known or suspected contamination. It is anticipated that the areas around wells will have the potential for contaminants brought to the surface. These areas will be marked and personnel will maintain safe distances. Once intrusive activities have been completed, the potential for exposure is again diminished and the area can then be reclassified as part of the contamination reduction zone. The exclusion zones for this project are those areas of the site where the intrusive activities are being performed plus a designated area of at least 25 feet surrounding the work area.

9.2 CONTAMINATION REDUCTION ZONE

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

9.3 SUPPORT ZONE

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

9.4 ACTIVITY HAZARD ANALYSIS

The work conducted in support of this project will be performed using AHAs (see Attachment III) to guide and direct field crews on a task by task basis. It is the FOL/SSO responsibility to review the AHAs with the task participants as part of a pre-task tail gate briefing session. This ensures that site-specific considerations and changing conditions are appropriately incorporated into the AHA, provide the SSO with a structured format for conducting the tail gate sessions, as well will also give personnel an opportunity to ask questions and make suggestions.

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 Tetra Tech
- Regulatory personnel (DOD, OSHA, FDEP, etc.)
- NAVFAC Southeast personnel
- Other authorized visitors

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

- Site visitors will be routed to the FOL, who will sign them in to the field logbook. Information to be recorded in the logbook will include the individual's name (proper identification required), who they represent, and purpose for the visit.
- Site visitors will be required to produce the necessary information supporting clearance onto the site. This includes information attesting to applicable training (40-hours of HAZWOPER training required for the NAVFAC Southeast personnel) and medical surveillance, as stipulated in Section 8.0 of this document. In addition, to enter the site's operational zones during planned activities, the visitors will be required to first go through site-specific training covering the topics stipulated in Section 8.2 of this document.

Site visitors will be escorted while on site. Visitors are required to observe the protective equipment and site restrictions in effect at the area of their visit. Only the visitors meeting these requirements for site clearance will be permitted to enter the site operational zones during planned activities. Any incidence of unauthorized site visitation will cause the onsite activities to be terminated until that visitor can be

removed. Removal of unauthorized visitors will be accomplished with support from the Base Contact, if necessary. At a minimum, the Navy On-site Representative will be notified of any unauthorized visitors.

9.6 SITE SECURITY

Site security will be accomplished using Tetra Tech field personnel. Tetra Tech will retain complete control over active operational areas. As this activity takes place at an area open to public access, and along public highways, the first line of security will take place using traffic permit restrictions, Exclusion Zone barriers, 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 FOL or designee. The FOL will serve as a focal point for non-project interested parties, and serve as the final line of security and the primary enforcement contact.

9.7 BUDDY SYSTEM

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

9.8 CHEMICAL INVENTORY/MATERIAL SAFETY DATA SHEET (MSDS) REQUIREMENTS

The FOL and/or the SHSO will develop a chemical inventory list of the chemicals used on site. A sample is provided in the HSGM. For each chemical listed on the inventory list, Tetra Tech and subcontractor personnel will provide MSDSs for the chemicals brought on the sites. The contents of these documents will be reviewed by the SHSO to insure these documents are complete, accurate, and current. Users of the chemical substances will be required to review the MSDSs prior to any actual use or application of the substances on site, if they are unfamiliar with the hazards of the chemical substances and/or the recommended control measures. The MSDSs will then be maintained in a central location (i.e., temporary office) and will be available for anyone to review upon request.

9.9 COMMUNICATION

As personnel may not always be working in proximity to one another during field activities, a supported means of communication between field crews will be used as necessary. External communication will be accomplished by using cell phones at the site but only in approved areas. External communication will primarily be used for the purpose of resource and emergency resource communications. It is strongly recommended that cell phones be programmed with pertinent numbers prior to proposed site activities.

10.0 SPILL CONTAINMENT PROGRAM

10.1 SCOPE AND APPLICATION

It is not anticipated that bulk hazardous materials (over 55-gallons) will be handled at any given time as part of this scope of work. It is also not anticipated that such spillage of Investigative Derived Wastes (IDW) would constitute a danger to human health or the environment. However, as the job progresses, the potential may exist for accumulating (IDW) such as decontamination fluids, and purge and well development waters, in a central staging area. Once these fluids and other materials have been characterized, they can be removed from this area and properly disposed.

10.2 POTENTIAL SPILL AREAS

Potential spill areas will be periodically monitored in an ongoing attempt to prevent and control further potential contamination of the environment.

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

10.3 LEAK AND SPILL DETECTION

To establish an early detection of potential spills or leaks, a periodic walk-around by the personnel staging or disposing of drums or in the resource deployment area will be conducted during working hours to visually determine that storage vessels are not leaking. If a leak is detected, the contents will be transferred, using a hand pump, into a new vessel. The leak will be collected and contained using absorbents such as Oil-Dry, vermiculite, or sand, which are stored at the vulnerable areas in a conspicuously marked drum. This used material, too, will be containerized for disposal pending analysis. Inspections will be documented in the project logbook.

It is not anticipated that any cylinders or containers will be unearthed during site activities. Should a cylinder or container be uncovered, however, work will immediately be stopped and personnel will retreat to a safe area until directed by the FOL or SSO.

10.4 PERSONNEL TRAINING AND SPILL PREVENTION

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

10.5 SPILL PREVENTION AND CONTAINMENT EQUIPMENT

The following represents the minimum equipment that may be maintained (depending on anticipated need) at the staging areas for the purpose of supporting this Spill Prevention/Containment Program.

- Sand; clean fill, vermiculite, or other non-combustible absorbent (Oil-dry)
- Drums (55-gallon U.S. DOT 1A1 or 1A2)
- Shovels, rakes, and brooms
- Absorbent Socks (for water containment during coring operations)

10.6 SPILL CONTROL PLAN

This section describes the procedures the Tetra Tech field crewmembers will use upon the detection of a spill or leak.

- Notify the SSO or FOL immediately upon detection of a leak or spill. Activate emergency alerting procedures for that area to remove non-essential personnel.
- Employ the personal protective equipment stored at the staging area. Take immediate actions to stop the leak or spill by plugging or patching the container or raising the leak to the highest point in the vessel. Spread the absorbent material in the area of the spill, covering it completely.
- Transfer the material to a new vessel; collect and containerize the absorbent material. Label the new container appropriately. Await analyses for treatment and disposal options.
- Re-containerize spills, including top cover impacted by the spill. Await test results for treatment or disposal options.

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

11.0 CONFINED-SPACE ENTRY

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

A confined space means a space that:

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

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

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

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

12.0 MATERIALS AND DOCUMENTATION

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

- A complete copy of this HASP
- Health and Safety Guidance Manual
- Incident Reports
- Medical Data Sheets
- Material Safety Data Sheets for 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)
- First-Aid Supply Usage Form
- Emergency Reference Form (Section 2.0, extra copy for posting)
- Directions to the Hospital

12.1 MATERIALS TO BE POSTED OR MAINTAINED AT THE SITE

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

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

Material Safety Data Sheets (MSDS) (maintained) - The MSDSs should also be in a central area accessible to 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 & Health Protection Poster (posted) - this poster, as directed by 29 CFR 1903.2 (a) (1), should be conspicuously posted in places where notices to employees are normally posted. Each FOL shall ensure that this poster is not defaced, altered, or covered by other material. See Attachment V of this HASP.

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 site personnel are engaged in activities.

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

Medical Data Sheets (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 may be given to site personnel to be carried on their person.

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

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

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

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

13.0 ACRONYMS/ABBREVIATIONS

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

ATTACHMENT I
INCIDENT REPORT FORM

Report Date	Report Prepared By	Incident Report Number
INSTRUCTIONS:		
<p>All incidents (including those involving subcontractors under direct supervision of Tetra Tech personnel) must be documented on the IR Form.</p> <p>Complete any additional parts to this form as indicated below for the type of incident selected.</p>		
TYPE OF INCIDENT (Check all that apply)	Additional Form(s) Required for this type of incident	
Near Miss (No losses, but could have resulted in injury, illness, or damage)	<input type="checkbox"/>	Complete IR Form Only
Injury or Illness	<input type="checkbox"/>	Complete Form IR-A; Injury or Illness
Property or Equipment Damage, Fire, Spill or Release	<input type="checkbox"/>	Complete Form IR-B; Damage, Fire, Spill or Release
Motor Vehicle	<input type="checkbox"/>	Complete Form IR-C; Motor Vehicle
INFORMATION ABOUT THE INCIDENT		
Description of Incident		
Date of Incident	Time of Incident	
	_____ AM <input type="checkbox"/> PM <input type="checkbox"/> <i>or</i> Cannot be determined <input type="checkbox"/>	
Weather conditions at the time of the incident	Was there adequate lighting?	
	_____ Yes <input type="checkbox"/> No <input type="checkbox"/>	
Location of Incident		
_____ Was location of incident within the employer's work environment? Yes <input type="checkbox"/> No <input type="checkbox"/>		
Street Address	City, State, Zip Code and Country	
Project Name	Client:	
Tt Supervisor or Project Manager	Was supervisor on the scene?	
	Yes <input type="checkbox"/> No <input type="checkbox"/>	
WITNESS INFORMATION (attach additional sheets if necessary)		
Name	Company	
Street Address	City, State and Zip Code	
Telephone Number(s)		

CORRECTIVE ACTIONS				
Corrective action(s) immediately taken by unit reporting the incident:				
<hr/> <hr/> <hr/> <hr/>				
Corrective action(s) still to be taken (by whom and when):				
<hr/> <hr/> <hr/> <hr/>				
ROOT CAUSE ANALYSIS LEVEL REQUIRED				
Root Cause Analysis Level Required: Level - 1 <input type="checkbox"/> Level - 2 <input type="checkbox"/> None <input type="checkbox"/>				
Root Cause Analysis Level Definitions				
Level - 1	<p>Definition: A Level 1 RCA is conducted by an individual(s) with experience or training in root cause analysis techniques and will conduct or direct documentation reviews, site investigation, witness and affected employee interviews, and identify corrective actions. Activating a Level 1 RCA and identifying RCA team members will be at the discretion of the Corporate Administration office.</p> <p>The following events may trigger a Level 1 RCA:</p> <ul style="list-style-type: none"> ▪ Work related fatality ▪ Hospitalization of one or more employee where injuries result in total or partial permanent disability ▪ Property damage in excess of \$75,000 ▪ When requested by senior management 			
Level - 2	<p>Definition: A Level 2 RCA is self performed within the operating unit by supervisory personnel with assistance of the operating unit HSR. Level 2 RCA will utilize the 5 Why RCA methodology and document the findings on the tools provided.</p> <p>The following events will require a Level 2 RCA:</p> <ul style="list-style-type: none"> ▪ OSHA recordable lost time incident ▪ Near miss incident that could have triggered a Level 1 RCA ▪ When requested by senior management 			
Complete the Root Cause Analysis Worksheet and Corrective Action form. Identify a corrective action(s) for each root cause identified within each area of inquiry.				
NOTIFICATIONS				
Title	Printed Name	Signature	Telephone Number	Date
Project Manager or Supervisor				
Site Safety Coordinator or Office H&S Representative				
Operating Unit H&S Representative				
Other: _____				

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



INSTRUCTIONS:

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

Incident Report Number: (From the IR Form)

EMPLOYEE INFORMATION

Company Affiliation

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

Full Name

Company (if not Tt employee)

Street Address, City, State and Zip Code

Address Type

[]
[]

Home address (for Tt employees) []
Business address (for subcontractors) []

Telephone Numbers

Work: [] Home: [] Cell: []

Occupation (regular job title)

Department

Was the individual performing regular job duties?

Yes [] No []

Time individual began work

[] AM [] PM [] or Cannot be determined []

Safety equipment

Provided? Yes [] No []

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

Used? Yes [] No [] If no, explain why

[]
[]
[]

NOTIFICATIONS

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

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

Yes [] No []

Date of report

H&S Personnel Notified

Time of report

Time of Report

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

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



INJURY / ILLNESS DETAILS

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

Blank lines for describing the activity before the incident.

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

Blank lines for describing how the injury occurred.

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

Blank lines for describing the object or substance that harmed the individual.

MEDICAL CARE PROVIDED

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

Blank line for describing first aid provided at the site.

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

Name of physician or health care professional Facility Name

Street Address, City State and Zip Code Type of Care?

Form section for medical care details including questions about emergency room treatment, hospitalization, and compensation claims.

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

SIGNATURES

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

Table with 4 columns: Affected individual (print), Affected individual (signature), Telephone Number, Date.

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



INSTRUCTIONS:

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

Incident Report Number: (From the IR Form)

TYPE OF INCIDENT (Check all that apply)

Property Damage [] Equipment Damage [] Fire or Explosion [] Spill or Release []

INCIDENT DETAILS

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

Response Actions Taken:

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

Agency(s) Contact Name(s)

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

Table with 3 columns: Item, Extent of damage, Estimated repair cost

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

Table with 3 columns: Substance, Estimated quantity and duration, Specify Reportable Quantity (RQ)

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

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

NOTIFICATIONS

Table with 4 columns: Required notifications, Name of person notified, By whom, Date / Time

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

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



INSTRUCTIONS:

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

Incident Report Number: (From the IR Form)

INCIDENT DETAILS

Name of road, street, highway or location where accident occurred Name of intersecting road, street or highway if applicable

County City State

Did police respond to the accident? Did ambulance respond to the accident? Yes No Yes No

Name and location of responding police department Ambulance company name and location

Officer's name/badge #

Did police complete an incident report? Yes No If yes, police report number: Request a copy of completed investigation report and attach to this form.

VEHICLE INFORMATION

How many vehicles were involved in the accident? (Attach additional sheets as applicable for accidents involving more than 2 vehicles.)

Vehicle Number 1 - Tetra Tech Vehicle Vehicle Number 2 - Other Vehicle

Vehicle Owner / Contact Information Color Make Model Year License Plate # Identification #

Describe damage to vehicle number 1 Describe damage to vehicle number 2

Insurance Company Name and Address Insurance Company Name and Address

Agent Name Agent Phone No. Policy Number



DRIVER INFORMATION
Vehicle Number 1 - Tetra Tech Vehicle
Vehicle Number 2 - Other Vehicle
Driver's Name, Address, Phone Number, Date of Birth, License #, State, Gender
Was traffic citation issued to Tetra Tech driver? Yes No
Citation #, Description
PASSENGERS IN VEHICLES (NON-INJURED)
List all non-injured passengers (excluding driver) in each vehicle.
Information related to persons injured in the accident (non-Tt employees) is captured in the section below on this form.
Injured Tt employee information is captured on FORM IR-A
Vehicle Number 1 - Tetra Tech Vehicle
Vehicle Number 2 - Other Vehicle
How many passengers (excluding driver) in the vehicle?
Non-Injured Passenger Name and Address
INJURIES TO NON-TETRATECH EMPLOYEES
Name of injured person 1, Address of injured person 1
Age, Gender, Car No., Location in Car, Seat Belt Used?, Ejected from car?, Injury or Fatality?
Name of injured person 2, Address of injured person 2
Age, Gender, Car No., Location in Car, Seat Belt Used?, Ejected from car?, Injury or Fatality?
OTHER PROPERTY DAMAGE
Describe damage to property other than motor vehicles
Property Owner's Name, Property Owner's Address



TETRA TECH, INC.

Safety Excellence

TETRA TECH, INC.
INCIDENT FORM IR-C

COMPLETE AND SUBMIT DIAGRAM DEPICTING WHAT HAPPENED

A large, empty rectangular area with a thin black border, intended for drawing a diagram depicting an incident. The area is currently blank.

ATTACHMENT II
MEDICAL DATA SHEET

MEDICAL DATA SHEET

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

Project _____

Name _____ Home Telephone _____

Address _____

Age _____ Height _____ Weight _____

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

Phone: _____

Drug or other Allergies: _____

Particular Sensitivities: _____

Do You Wear Contacts? _____

What medications are you presently using? _____

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

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

HIPAA took effect in 1996 and was amended April 14, 2003. Loosely interpreted, HIPAA regulates the disclosure of Protected Health Information (PHI) by the entity collecting that information. PHI is any information about health status (such as that you may report on this Medical Data Sheet), provision of health care, or other information. HIPAA also requires Tetra Tech to ensure the confidentiality of PHI. This Act can affect the ability of the Medical Data Sheet to contain and convey information you would want a Doctor to know if you were incapacitated. So before you complete the Medical Data Sheet understand that this form will not be maintained in a secure location. It will be maintained in a file box or binder accessible to other members of the field crew so that the can accompany an injured party to the hospital.

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

Name (Print clearly)

Signature

Date

ATTACHMENT III
ACTIVITY HAZARD ANALYSIS



ACTIVITY HAZARD ANALYSIS (AHA)

Activity/Work Task: Soil boring with DPT, including groundwater sampling	Overall Risk Assessment Code (RAC) (Use highest code)				L
Project Location: Naval Air Station Cecil Field					
Site: Site 3, 5, And Site 21					
Date Prepared: April 2012					
Prepared by: Clyde Snyder					
Reviewed by: Jennifer Carothers, PhD.					
FOL:					
SSO:					
Notes: (Field Notes, Review Comments, etc.)	Step 1: Review each “Hazard” with identified safety “Controls” and determine RAC (See above)				
	“Probability” is the likelihood to cause an incident, near miss, or accident and Identified as: Frequent, Likely, Occasional, Seldom, or Unlikely.			RAC Chart	
	“Severity” is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible			E= Extremely High Risk	
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each “Hazard” on AHA. Annotate the overall highest RAC at the top of AHA.			H= High Risk	
				M= Moderate Risk	
				L= Low Risk	
JOB STEPS	HAZARDS	CONTROLS			RAC
Drill/DPT Rig set up and operation	1. Struck By	1. Hard hats and high visibility vests for all personnel in work area. 2. Control work area (use flaggers, signage, barricades, and/or other means) and restrict all non-essential personnel from the area. 3. Inspect rig and ensure that all equipment, augers, rods and tools will be properly secured during transport.			M
	2. Tip Over	1. Do not permit rig to attempt to traverse severely sloping terrain. 2. Use a ground guide along with a functioning back-up alarm during equipment backing. 3. Once rig is sited, deploy outriggers to properly block and level the rig and secure parking brake.			L
	3. Slips, Trips, Falls	1. Clear trees, roots, weeds, limbs and other ground hazards from the Drill/DPT location.			L

ACTIVITY HAZARD ANALYSIS

Soil Boring with DPT, including groundwater sampling

JOB STEPS	HAZARDS	CONTROLS	RAC
		<ol style="list-style-type: none"> 2. Practice good housekeeping to keep the ground around the Drill/DPT site clear of obstructions, equipment and other tripping hazards. 3. Wear appropriate foot protection to prevent slips and trips. Use caution when working on uneven and wet ground surfaces. 	
	4. Minor cuts, or abrasions	<ol style="list-style-type: none"> 1. When handling equipment and tools wear cut-resistant gloves when handling items with sharp or rough edges. 	L
	5. Heavy lifting (muscle strains and pulls)	<ol style="list-style-type: none"> 1. Practice safe lifting techniques (use mechanical lifting devices such as a dolly whenever possible). 2. Ensure clear path of travel, good grasp on object, perform "test lift" to gauge ability to safely make the lift 3. Lift with legs, obtain help to lift large, bulky, or heavy items. 	L
	6. Insect bites	<ol style="list-style-type: none"> 1. Shake out boots before donning. 2. Use insect repellants (products containing DEET should be applied to exposed skin, products containing Permethrin should be applied to clothing only. Follow manufacturer's recommendations for application). 3. Tape up pants leg to work boot joints with duct tape. Wear light-colored clothing to better see and remove any insects. Perform close body inspections at least daily upon leaving the site. 	L
	7. Inclement weather	<ol style="list-style-type: none"> 1. The FOL and/or the SSHO will temporarily suspend outside activities in the event of electrical storms or high winds. 2. It is preferred that supported systems such as lightning detection devices or emergency weather broadcasts are employed. 3. However, when this is not possible field personnel should use the 30/30 Rule: <i>"If there is less than 30 seconds between thunder and lightning go inside and stay inside for at least 30 minutes after the last thunder."</i> 	L
Drill/DPT Operations	1. Intermittent high noise levels	<ol style="list-style-type: none"> 1. Operators/nearby personnel are to wear hearing protection if noise levels are such that they must raise their voice in order to communicate with someone who is within arm's reach (approx. 2') of them. 2. SSO responsible for determining and designating when hearing protection is required. 3. Hearing protection is to consist of either ear muffs or ear plugs that have an NRR of at least 25 dB. 	L
	2. Contact with equipment moving parts	<ol style="list-style-type: none"> 1. Ensure that workers are thoroughly trained and competent to perform their assigned task with the equipment used in investigation. 2. Ensure that back-up alarms are functional on equipment. 	M

ACTIVITY HAZARD ANALYSIS

Soil Boring with DPT, including groundwater sampling

JOB STEPS	HAZARDS	CONTROLS	RAC
		3. The equipment operators and Site Supervisors are responsible to ensure that the equipment is properly inspected prior to being permitted onsite. (see Equipment Inspection Checklist) 4. Ensure that all moving parts are guarded if such parts are exposed. Check/test all emergency stop controls.	
	3. Contact/striking underground or overhead utilities	1. Movement of rig with mast raised will be strictly prohibited. 2. Inspect for buried and overhead utilities in the vicinity of the Drill/DPT location. Verify the location of utility lines in accordance with the Tetra Tech SOP Utility Location and Excavation Clearance. Plan the move with the local utility companies if utility lines must be moved. 3. Pre-survey the height of equipment and height of utility lines to determine which lines must be removed or raised. Equipment should not come within 20 feet of existing overhead utility lines.	L
	4. Pressurized hydraulic lines could rupture, causing release of hot hydraulic fluid.	1. Inspect all hydraulic lines before placing rig in service. Any damaged hoses or connections must be replaced before unit is used. 2. Immediately shut down equipment if lines rupture. If rupture occurs, as quickly as possible, berm the liquid to minimize the area over which the liquid spreads. 3. Ensure that all pressurized lines have whip checks.	L
	5. Workers could trip or fall by the borehole	1. Cap and flag open boreholes. If left unattended, protect all open boreholes as any open excavation.	L
	Handling drill rods and augers	1. Struck by/entanglement	1. Be prepared for sudden shifting when removing rod sections. 2. Restrict non-essential personnel from approaching working area.
2. Overhead hazards		1. All personnel within the radius of the Drill/DPT rig must wear ANSI approved hard hats.	L
3. Slips, Trips, Falls		1. Clear trees, roots, weeds, limbs and other ground hazards from the location. 2. Practice good housekeeping to keep the ground around the site clear of obstructions, equipment and other tripping hazards. 3. Wear appropriate foot protection to prevent slips and trips. Use caution when working on uneven and wet ground surfaces. Keep a wide base and assure secure footing while attempting to handle auger flights and tooling.	L
4. Contusions, cuts, or abrasions		1. When handling auger flights and tools, wear cut-resistant heavy cotton or leather work gloves when handling items with sharp or rough edges.	L
5. Heavy lifting (muscle		1. Practice safe lifting techniques by using mechanical lifting devices such as a	L

ACTIVITY HAZARD ANALYSIS

Soil Boring with DPT, including groundwater sampling

JOB STEPS	HAZARDS	CONTROLS	RAC
	strains and pulls).	dolly whenever possible. 2. Ensure clear path of travel 3. Have a good grasp on object. Perform "test lift" to gauge ability to safely make the lift. 4. Lift with legs not back. Obtain help when needed to lift large, bulky, or heavy items	
DPT Drilling and Soil/groundwater sampling	1. Chemical exposure	1. Chemicals expected to be encountered are VOC's and Chlordane. As a precaution use the FID to check for borehole and background levels in the breathing zone. If following action levels will be observed: 2. Site 3 1.25 ppm above background in breathing zone (BZ) area for _4_ exposures of _5 minutes each in any one work day. 3. Site 5 2.75 ppm above background in breathing zone (BZ) area for _4_ exposures of _5 minutes each in any one work day. 4. Site 21 10 ppm above background in breathing zone (BZ) area for _4_ exposures of _5 minutes each in any one work day. 5. Wear surgeons' gloves when handling potentially-contaminated media and samples. Avoid contact with potentially-contaminated media to the extent possible. 6. Practice good personal hygiene (hands and face washing) when exiting work area. Hand-to-mouth activities in the work area are prohibited (eating, drinking, smoking, etc.). 7. Exposure via dermal contact and ingestion represent some limited concern during this task. 8. Periodically screen sample with monitoring equipment. If readings above daily-established background levels (BGLs) are noted in borehole, monitor worker breathing zone (BZ) areas. If readings in worker BZ areas exceed the action level: 9. After at least 5 minutes, SSO will approach from upwind direction screening BZ areas. 10. Work may resume when readings in the BZ return to BGLs.	L
	2. Cuts and lacerations – when cutting acetate liners without the proper material handling devices.	1. Always cut away from yourself and others. Do not place items to be cut in your hand or on your knee. 2. Change blades as necessary to maintain a sharp cutting edge as many accidents result dull cutting attachments. 3. Wear cut-resistant gloves (leather or heavy cotton) at least on the non-knife/saw hand, where possible. When cutting acetate liners use the tubing retention tub to secure the tube.	L

ACTIVITY HAZARD ANALYSIS

Soil Boring with DPT, including groundwater sampling

Page 5 of 6

JOB STEPS	HAZARDS	CONTROLS		RAC
		4. Use the knife intended for that purpose. Geoprobe® makes a kit for this purpose.		
EQUIPMENT TO BE USED		INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS	
DPT Rig, bore rods, auger flights, acetate cutting device and sharp knives, hand tools (dollies, hand carts, etc.) Safety Equipment: 1. A 20-pound dry chemical ABC fire extinguisher readily available. 2. Spill-control kit available at drilling location. 3. First-aid kit, eyewash (meeting the ANSI Z358.1 criteria), and an emergency air horn nearby. Monitoring Instruments:		Visual inspection prior to use by user. FID must be calibrated as per the manufacturer's recommendations and documented on each use.	1. Review of AHA during pre-task tailgate safety briefing with all intended task participants. 2. Personnel must be trained in use of drilling equipment. 3. The Drill/DPT operator must have current certifications to operate the equipment.	
Personal Protective Equipment: <u>Minimum</u>: Safety toe boots, safety glasses. <u>Optional items</u>: Hardhat, hearing protection Nitrile surgeon's style gloves and Tyvek if there is a change to soil clothing. <u>HTRW</u>:		Initial PPE inspection performed by SSO. Ongoing (prior to each use) inspections responsibilities of PPE users.	PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees' 40 hour HAZWOPER training, which is to be verified by the SSO through initial training documentation and review prior to permitting personnel to participate in any onsite activities, and will be confirmed by visual observations of worker activities.	

I have read and understand this AHA:

Name (Printed)	Signature	Date



ACTIVITY HAZARD ANALYSIS (JHA)

Activity/Work Task: Site Mobilization/Demobilization		Overall Risk Assessment Code (RAC) (Use highest code)			L			
Project Location: Naval Air Station Cecil Field		Risk Assessment Code (RAC) Matrix						
Site 3, 5, And Site 21		Severity	Probability					
Date Prepared: April 2012			Frequent	Likely	Occasional	Seldom	Unlikely	
Prepared by: Clyde Snyder			Catastrophic	E	E	H	H	M
Reviewed by: Jennifer Carothers, PhD.			Critical	E	H	H	M	L
			Marginal	H	M	M	L	L
		Negligible	M	L	L	L	L	
Notes: (Field Notes, Review Comments, etc.)		Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above)						
		"Probability" is the likelihood to cause an incident, near miss, or accident and Identified as: Frequent, Likely, Occasional, Seldom, or Unlikely.					RAC Chart	
		"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible					E= Extremely High Risk	
		Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.					H= High Risk	
		M= Moderate Risk						
		L = Low Risk						
ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS			RAC			
1. All vehicle operation conducted while performing duties associated with the project or in a motor vehicle rented for such purpose.	1. Vehicle Accident - <ul style="list-style-type: none"> Unauthorized drivers Vehicle/equipment failure Distracted driving Struck by motor vehicles Speeding Unsecured loads 	1. The following measures will be employed to minimize the potential for an accident Before Driving <ul style="list-style-type: none"> Ensure driver is "authorized" per the Tetra Tech Vehicle Safety Program Prior to use, walk around your vehicle make sure you have adequate tire pressure, no lights are broken, etc. Examine gauges to ensure operational fluids are at desired levels. Preset radio stations, secure wires for auxiliary iPod or similar devices so this is not attempted while driving. Attach hands free devices to cell phones, place devices where they are easily accessed. Set address for GPS or similar devices so this does not have to occur while driving. Driving <ul style="list-style-type: none"> Do not use cell phones, eat, play with the radio or engage in any 			L			

ACTIVITY HAZARD ANALYSIS
Site Mobilization/Demobilization
Page 2 of 6

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
		<p>activities that would distract you from your primary task of driving. Cell phone use while driving is only permitted when a hands-free device is used. If you receive a call, let it go to voice mail or pull over and answer it.</p> <ul style="list-style-type: none"> • Ensure you have an Orange Vest and a Reflective Triangle in your vehicle at all times, a disposable camera, Tetra Tech Incident Form (IR-C). • Practice defensive driving whenever traveling in a vehicle. Always permit adequate room between you and the driver in front of your vehicle. Use the 4-second rule. • Follow the direction of posted signs (speed limits, etc.). You will be responsible for all moving and parking violations. • Exercise extra caution when moving through school and work zones. • All items in and on your vehicle should be secured to prevent movement or loss from the vehicle potential causing an accident. <p>If you are in an accident</p> <ul style="list-style-type: none"> • Move you vehicle if possible from the travel lanes. • Turn on your emergency flashers. • Do not step into traffic when exiting your vehicle. • Place your warning triangle (100-feet behind your vehicle) and put on your Orange vest. • Contact the FOL and the SSO. • Be respectful to the Local authorities. • Do NOT attempt to argue whose fault. • Secure all valuables. Take the keys from the ignition if you leave your vehicle for any reason. (Be aware there will be a fee for towing, traffic citations, etc.). • Complete the IR-C form to make sure you have gathered all pertinent information 	
<p>2. Preparatory tasks, such as: Assembling, packing, unpacking equipment and supplies.</p>	<p>2. Minor cuts, abrasions or contusions handling equipment and tools</p>	<p>2. Wear cut-resistant gloves when handling items with sharp or rough edges or when using knives to cut open packages. A cut resistant glove should at least be worn on the non-knife hand.</p> <ul style="list-style-type: none"> • Exercise caution when unpacking boxes. Make sure you can see clearly into the box and do not reach in and contact broken glass (possibly damaged in shipment) or sharp articles. • Always cut away from yourself and others. • Do not place items to be cut on your hand and/or knee • Always use a sharp cutting instrument. Many accidents result from struggling with dull cutting implements. 	<p>L</p>

ACTIVITY HAZARD ANALYSIS
Site Mobilization/Demobilization
Page 3 of 6

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
		<ul style="list-style-type: none"> • Secure work pieces to be cut. • Carry and transport glassware in a hard sided container. That way if you fall, you will not fall on broken glass. • If there is broken glass, place it in a hardsided container for disposal. Placement in a soft sided container may result in cuts and lacerations if the bag is penetrated by shards of glass. <p>See Section 4.13 of the HSGM for additional safe work practices as it pertains cuts/lacerations.</p>	
3. Unpacking; assembling; inspecting equipment before use	3. Strains or sprains during manual lifting and carrying activities	<p>3. Practice safe lifting techniques (use mechanical lifting devices such as a dolly whenever possible), and plan each lift:</p> <ul style="list-style-type: none"> • Inspect/clear the intended path of travel and areas where loads will be deposited, • test lift each object to ensure you can without injuring yourself, • ensure good grasp is obtainable on object, • keep back straight and lift with legs not back, • obtain help when needed to lift large, bulky, or heavy items. <p>Remember: Your muscles, tendons, and ligaments are not as flexible in the early morning hours. Stretch before physical taxing activities. In the later afternoon, your muscles, tendons, and ligaments maybe stressed from fatigue. Take breaks as necessary to avoid injury. See Section 4.4 of the HSGM for additional safe lifting practices.</p>	L
4. Receiving chemicals, storing chemicals, preparing to use chemicals, collecting Material Safety Data Sheets completing chemical Inventory;	4. Chemical Exposure Gathering, providing and maintaining hazard awareness information.	<p>4. Chemical hazards – It is not anticipated that site personnel will encounter chemical hazards as it pertains to mobilization as no direct encounter is planned. However, it will be the responsibility of the FOL and/or the SSO to implement the Onsite Hazard Communication Program (See Section 5.0 of the HSGM). In this effort all chemicals brought onsite (compressed gases (calibration gases), decontamination fluids; sample preservatives, well construction supplies, etc.) will</p> <ul style="list-style-type: none"> • All chemicals will have an accompanying Materials Safety Data Sheet (MSDS) that has been reviewed and approved for use by the SSO. <ul style="list-style-type: none"> ○ The SSO will review the HASP to ensure emergency equipment and/or associated PPE necessary to ensure the safety of the workers are equal or better than that listed in the MSDS. • All incoming containers will be properly labeled, will be in English and not defaced. If the materials will be transferred to temporary 	L

ACTIVITY HAZARD ANALYSIS
Site Mobilization/Demobilization
Page 4 of 6

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
		<p>containers, these too will be appropriately labeled by the SSO or the person using the materials.</p> <ul style="list-style-type: none"> • All materials received onsite will be added to the Chemical Inventory List. Included in this information is the volume and location stored and primary hazards. • All materials will be stored as prescribed with compatible chemicals. • As necessary employ spill prevention pans or like equipment to capture or contain spills within the storage area. 	
<p>5. Initial Site Surveys - Access/egress into Controlled areas</p> <p>Initial site survey of the intended work areas</p>	<p>5. Coordinate efforts with facility personnel</p> <ul style="list-style-type: none"> • Inherent hazards or restrictions <p>Emergency Prevention – This component will be critical in identifying potential emergencies that may be task associated. These are as follows:</p> <ul style="list-style-type: none"> • Physical hazards – Steep embankments, sink holes; poisonous vegetation. 	<p>5. In order to address the potential hazards associated with the initial entry</p> <ul style="list-style-type: none"> • The FOL and/or the SSO will meet with the restricted area personnel/operators to ensure they are aware of planned activities. • As part of these discussions, inquire of the potential hazard in the area and areas to avoid. • Inquire as to what the facilities Emergency Action Requirements are should there be an emergency and where you should go as an assembly point. • What security measures are required • PPE requirements for location (such as flame retardant clothing) • Restriction boundaries • If persons must enter the restricted area local requirements will prevail. These include <ul style="list-style-type: none"> ○ Signing in ○ PPE minimum requirements for the location • The FOL and/or the SSO will survey the area to ensure areas prone to slip, trip, and fall hazards are flagged or removed. <ul style="list-style-type: none"> ○ Entry/access routes will be determined as well as schedules. <p>All workers are to wear sturdy work shoes that are outfitted with slip resistant aggressive tread.</p> <p>All exits and selected access pathways will be maintained free of obstructions to allow free movement of site personnel, equipment, and if necessary emergency equipment.</p> <p>The Emergency Evacuation point will be selected as part of the initial site survey. Tentatively this location is at _____</p>	<p>L</p>

ACTIVITY HAZARD ANALYSIS
Site Mobilization/Demobilization
Page 5 of 6

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
		Dependent on the location of the hazard escape may have to occur in the opposite direction. A secondary point will be determined in the field and communicated as part of the Daily Tail Gate meeting. See Section 8.2 for additional information.	
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS	
Hand tools (dollies, hand carts, hand knives, carpenter tools, fixed and portable ladders, etc.)	Visual inspection of hand and power tools will be performed by the SSO. Tools will be tagged with colored electrical tape. Green tape ok for use. Red tape do not use. All red taped items should be repaired or removed from the site. Each time a tool is used it will undergo a cursory inspection by the user. Noted damage (mushroomed head, splintered handle, etc.) will require removal from service. FOL and SSO to perform regular (e.g., daily) inspections for housekeeping issues. The results of these efforts will be documented in the Field Logbook	All personnel <ul style="list-style-type: none"> • 40-Hour General Site Worker Training [OSHA 29 CFR 1910.120 (e)] • 8-Hour General Site Worker Refresher Training [OSHA 29 CFR 1910.120 (e)(8)] • Site Specific Training – All personnel shall review this Abbreviated Health and Safety Plan prior to the commencement of on-site activity. • Participate in a Medical Clearance/Surveillance Program as described in OSHA 29 CFR 1910.120 (f). • Complete a Medical Data Sheet • Review applicable MSDSs if you are unaware of the hazards and recommended control measures for diesel fuel and grout. Supervisory personnel: 8-Hour General Site Worker Supervisory Training [OSHA 29 CFR 1910.120 (e)(4)]	
Personal Protective Equipment: <u>Minimum:</u> Steel toed work boots; hardhats, safety glasses, flame retardant protective clothing; work gloves. <u>Optional items:</u> High visibility vest, Hearing protection HTRW: None anticipated for this task.	Initial PPE inspection performed by SSO. Ongoing (prior to each use) inspections responsibilities of PPE users.	PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees 40 hour HAZWOPER training, which is to be verified by the SSO through initial training documentation and review prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities. The SSO will be responsible for the implementation of the following Site Specific Health and Safety Programs: <ul style="list-style-type: none"> • Hazard Communication AHA Assessment - During the initial walk through the FOL and/or the SSO shall review the AHA to determine applicability or information that will need added given site specific conditions.	



ACTIVITY HAZARD ANALYSIS (AHA)

Activity/Work Task: Remedial activities including installation and operation of air sparging remediation system

Overall Risk Assessment Code (RAC) (Use highest code)

M

Project Location: Naval Air Station Cecil Field

Site 3, 5, And Site 21

Date Prepared: April 2012

Prepared by: Clyde Snyder

Reviewed by: Jennifer Carothers, PhD.

Severity

Probability

Catastrophic

Frequent

Likely

Occasional

Seldom

Unlikely

E

E

H

H

M

Critical

E

H

H

M

L

Marginal

H

M

M

L

L

Negligible

M

L

L

L

L

FOL:

SSO:

Notes: (Field Notes, Review Comments, etc.)

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and Identified as: Frequent, Likely, Occasional, Seldom, or Unlikely.

RAC Chart

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

E= Extremely High Risk

H= High Risk

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each **"Hazard"** on AHA. Annotate the overall highest RAC at the top of AHA.

M= Moderate Risk

L= Low Risk

JOB STEPS

HAZARDS

CONTROLS

RAC

Unloading equipment and installation preparation.

1. Slips, Trips, Falls
2. Insect bites, snake bites, and contact with poisonous plants.

1. Clear intended work areas and walking paths of roots, weeds, limbs and other ground hazards. Practice good housekeeping to keep the site clear of obstructions, materials, equipment and other tripping hazards. Ensure that work boots have adequately-aggressive sole design. Use caution when working on uneven and wet ground.

Shake out boots before donning. Use insect repellants (products containing DEET should be applied to exposed skin, products containing Permethrin should be applied to clothing only. Follow manufacturer's recommendations. Tape up pants leg to work boot joints with duct tape. Wear light-colored clothing to better see and remove any insects. Perform close body inspections at least daily upon leaving the site. Avoid potential nesting areas (brush, deadfall, etc.) where insects or snakes may be present. Review Natural

L

ACTIVITY HAZARD ANALYSIS

Installation and Operation of Air Sparging Remediation System

Page 2 of 7

JOB STEPS	HAZARDS	CONTROLS	RAC
	3. Chemical contaminants	<p>Hazards information in section 4.0 of the Tetra Tech H&S Guidance Manual with field team as appropriate based on site observations and conditions.</p> <ol style="list-style-type: none">1. Chemicals expected to be encountered are VOC's and Chlordane. As a precaution use the FID to check for borehole and background levels in the breathing zone. If following action levels will be observed:2. Site 3 1.25 ppm above background in breathing zone (BZ) area for _4_ exposures of _5 minutes each in any one work day.3. Site 5 2.75 ppm above background in breathing zone (BZ) area for _4_ exposures of _5 minutes each in any one work day.4. Site 21 10 ppm above background in breathing zone (BZ) area for _4_ exposures of _5 minutes each in any one work day.	
Excavation	4. Utilities Traffic Encumbrance	<ol style="list-style-type: none">1. Utility clearances must be in place prior to the beginning of excavation (in accordance with the Tetra Tech Utility Locating SOP).2. Excavation boundaries must be demarcated with appropriate warning signs (e.g., construction activities in progress).3. Traffic patterns for equipment and the loading of trucks must be established. This pattern should form a loop to minimize backing, an activity which causes many accidents.4. Traffic patterns for foot and small vehicular traffic must keep workers away from heavy equipment.5. Traffic patterns for heavy equipment must be constructed to maintain traffic flow a minimum of 10 feet from unsupported walls or excavation boundaries.6. Excavation along thoroughfares will require the use of warning signs, barricades and flag-persons for alteration of traffic patterns, as necessary.7. Ground personnel should be provided with reflective vests to increase visibility and air horns to signal loud trucks and heavy equipment.8. Ground activities with heavy equipment must be supported with a ground spotter. The operators should be instructed that they are to follow the instructions provided by the ground spotter unless another party is otherwise authorized.9. Surface encumbrances within the intended work area of the excavation will be removed or supported, as necessary, in accordance with OSHA 1926.651(a).10. Prior to being put into service at the site, the excavator will be inspected by the SSO, and this inspection will be documented using the applicable equipment inspection forms in Attachment IV.11. Heavy equipment will be positioned and operated so that it never	M

ACTIVITY HAZARD ANALYSIS

Installation and Operation of Air Sparging Remediation System

Page 3 of 7

JOB STEPS	HAZARDS	CONTROLS	RAC
		<p>approaches closer than 4 feet from the edge of an open excavation (other than the boom and bucket portion of the excavator).</p> <p>12. A decontamination station should be established at the loading and off-loading areas to flush mud and dirt from the wheels and tires as well as any areas of the vehicle impacted during the loading operation.</p> <p>13. Tetra Tech personnel WILL NOT enter a trench past 4 feet deep</p>	
Positioning the DPT and installation equipment including sparging system	1. Physical hazards associated with manual lifting and carrying of machinery parts.	<p>1. Site personnel will assist each other when positioning the unit.</p> <p>2. Wear leather gloves. Lift heavy objects using the legs and not the back.</p> <p>3. Use wheeled transport equipment for heavy loads.</p> <p>4. Keep hands away from potential pinch points during handling.</p> <p>5. Wear steel toe shoes/boots.</p> <p>6. Ensure that influent supply and discharge hoses and electrical outlet are within reaching distance.</p>	M
Start Up	1. Leak from pipes	<p>1. Attach inlet pipe to threaded union verify pipe connections are secure</p> <p>2. Connect supply pipe to source using a hose clamp if necessary.</p>	L
	1. Pipe leak check	<p>1. Turn-on and set the flow-meter to the mid-point range.</p> <p>2. Use the 10% soap solution to check each connection by placing a few drops, or by using the hand held sprayer on each connection and look for bubbles.</p> <p>3. If bubbles form, there is a gas leak.</p> <p>4. Tighten the connection and re-apply soap solution to look for bubble formation.</p> <p>5. Make a note on the set-up check sheet that there are no leaks.</p>	L
Treatment System Operation	1. Electrical	1. Plug the system electrical plug into a grounded receptacle.	M
	2. Pump	1. Ensure the pump is grounded and properly installed.	L
	3. Treatment System	<p>1. Have the client operator turn the pump "ON" and set the required flow-rate, if required, turn the system switch to the "ON" position.</p> <p>2. Open the valve to the full open position, turn the handle counter-clockwise to open and clockwise to close the valve.</p> <p>3. Slightly crack open the gate valve to allow air to enter the system.</p> <p>4. Slowly continue to open the gate valve, over a period of time, until the recommended flow-rate is achieved.</p> <p>5. Re-check the flow-rate setting to ensure that the float ball is at the correct position.</p> <p>6. Open the valve to allow treatment material to the flow-meter.</p> <p>7. Set the flow-meter to the correct scale value for the desired flow-rate of ml/min.</p>	M

ACTIVITY HAZARD ANALYSIS

Installation and Operation of Air Sparging Remediation System

Page 4 of 7

JOB STEPS	HAZARDS	CONTROLS	RAC
Treatment Shutdown	1. System shutdown	<ol style="list-style-type: none"> 1. Close the line valve. 2. Once the air has stopped flowing, close all valves, and turn-off the pressure gauge valve. 3. The treatment system is shut down. 	M
	2. Pump	<ol style="list-style-type: none"> 1. Slowly close the valve until it is completely closed. 2. Turn the treatment operating switch to the "OFF" position to stop the pump. 3. Close the valve, turning in the clockwise direction. 	L
	3. System Demobilization	<ol style="list-style-type: none"> 1. Disconnect the electrical plug from the source and wrap-up electrical cord and the extension cord if it was required. 2. Remove the regulator and store in a safe place in the storage box. 3. Disconnect the pipes from the treatment system, 4. Secure the pipe and or lines. 5. Remove elbows and piping, if used, from client's piping using the pipe wrenches in pairs. 6. Place the removed supply hose and other components in storage box. Wrap-up hoses. Decontaminate if required. 7. Disconnect lines from treatment system. 8. Remove tools, equipment notebooks, other items in the area. . 	
Cylinder storage	Leaks and explosion	<ol style="list-style-type: none"> 1. Cylinders shall be kept away from radiators and other sources of heat. 2. If stored inside of buildings, cylinders shall be in a well-protected, well ventilated, dry location, at least 20 feet from highly combustible materials. 3. Cylinders should be stored in definitely assigned places away from elevators, stairs, or gangways. 4. Assigned storage places shall be located where cylinders will not be knocked over or damaged by passing or falling objects, or subject to tampering by unauthorized persons. 5. Cylinders shall not be kept in unventilated such as lockers and cupboards. 6. Empty cylinders shall have their valves closed and marked "MT". 7. Valve protection caps, where cylinder is designed to accept a cap, shall always be in place, hand-tight, except when cylinders are in use or connected for use. 8. Cylinders must be secured at all times cylinders will not be brought on site till the system is in place and hydrogen cylinders can be properly secured. 	9.
Pressurized cylinder operation	Leaks and explosion	<ol style="list-style-type: none"> 1. Cylinders, cylinder valves, couplings, regulators, hose, and apparatus shall be kept free from oily or greasy substances. 2. Cylinders or apparatus shall not be handled with oily hands or gloves.. 3. Cylinders shall not be dropped or struck or permitted to strike each other violently. 	20.

ACTIVITY HAZARD ANALYSIS

Installation and Operation of Air Sparging Remediation System

Page 5 of 7

JOB STEPS	HAZARDS	CONTROLS	RAC
		<ol style="list-style-type: none"> 4. Cylinders not having fixed hand wheels shall have keys, handles, or non-adjustable wrenches on valves stems while these cylinders are in service. In multiple cylinder installations, only one key or handle is required for each manifold. 5. Cylinder valves shall be closed when work is finished. 6. Empty cylinders shall be closed and placed in appropriate designated storage locations as part of the change-out procedure. 7. Cylinders shall be kept far enough away from welding or cutting operations so that sparks, hot slag, or flame will not reach them, or fire-resistance shields shall be provided. 8. Cylinders shall not be placed where they might become part of an electric circuit. 9. Cylinders shall be kept away from radiators, piping systems, layout tables, etc., that may be used for grounding electric circuits such as for arc welding machines. 10. Any practice, such as the tapping of an electrode against a cylinder to strike an arc, shall be prohibited. 11. Cylinders shall never be used as rollers or supports, whether full or empty. 12. Stamped numbers and markings cylinders shall not be tampered with. 13. No one shall tamper with safety devices on cylinders or valves. 14. A hammer or wrench shall not be used to open cylinder valves. If valves cannot be opened by hand, the supplier shall be notified. 15. Cylinder valves shall not be tampered with, nor should any attempt be made to repair them. If trouble is experienced, the supplier should be sent a report promptly. 16. Cylinders shall be handled carefully. 17. Rough handling, knocks, or falls may damage the cylinders, valve, or safety devices and cause leakage. 18. Cylinders and operating equipment must be secured and protected from accidents. 19. Use barricades to prevent accidental damage from motor vehicle accidents 	
Handling Gas Cylinders	Leaks and explosion	<ol style="list-style-type: none"> 1. Wear PPE: gloves, protective footwear, eye protection 2. Correct way to move cylinders is to keep upright, secure and with valves uppermost 3. Use mechanical aids such as a trolley where reasonably practicable(do a risk assessment) 4. Use suitable cradles, slings, clamps or other effective means when lifting with a hoist or crane 5. For short distances on even ground the practice of 'milk-churning' 	11.

ACTIVITY HAZARD ANALYSIS

Installation and Operation of Air Sparging Remediation System

Page 6 of 7

JOB STEPS	HAZARDS	CONTROLS	RAC
		<p>(manually moving cylinders) can be used only by trained personnel and never for longer distances, in uneven ground, wet or icy conditions, poor lighting, or at speed a trolley should be used</p> <ol style="list-style-type: none"> 6. All personnel involved should have completed manual handling training 7. Never roll cylinders along the ground 8. Never transport cylinder with valve and pressure regulator attached or with the valve open 9. Never attempt to catch a falling cylinder just get out of the way 10. Never lift a cylinder by its cap, valve or guard/shroud 	
Periodic site inspection	Leaks and chemicals hazards	<ol style="list-style-type: none"> 1. After a prolonged absence from the site and prior to opening the door to the portable shed, check the hydrogen cylinder pressure gage. 2. If the pressure is lower than anticipated then assume a leak has occurred. 3. Check the area with the FID. 	4.
EQUIPMENT	INSPECTION	TRAINING	
<ul style="list-style-type: none"> • Peristaltic pump, plastic tubing • Retractable safety blade knife • pH meter • Water level indicator • Sample jars • First Aid Kit 	Visual inspection prior to use by user.	Training/experience in proper sample collection, handling and chain of custody requirements.	
<p>PPE: <u>Minimum:</u> Level D PPE, leather or cotton work gloves, nitrile surgeon's type gloves, safety toe boots, safety glasses</p> <p><u>Optional items:</u> Hardhat, hearing protection. Reflective safety vest if in areas of vehicle traffic</p> <p><u>Monitoring Instruments:</u> FID meter</p> <p><u>HTRW:</u> VOCs and chlordane</p>	Initial PPE inspection performed by SSO. Ongoing (prior to each use) inspections responsibilities of PPE users.	OSHA 40 Hazardous Waste Operations and Emergency Response (HAZWOPER) training, plus appropriate 8-hour annual refresher training for the task participants. Supervisors must have completed additional 8 hours of HAZWOPER training. ALSO: Review of AHA during pre-task tailgate safety briefing with the intended task participants.	

ACTIVITY HAZARD ANALYSIS

Installation and Operation of Air Sparging Remediation System

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I have read and understand this AHA:

Name (Printed)	Signature	Date



ACTIVITY HAZARD ANALYSIS (AHA)

Activity/Work Task: Decontamination – DPT, Hand tools and associated equipment.	Overall Risk Assessment Code (RAC) (Use highest code)	L	
Project Location: Naval Air Station Cecil Field	Risk Assessment Code (RAC) Matrix		
Site 3, 5, And Site 21	Severity	Probability	
Date Prepared: April 2012		Frequent Likely Occasional Seldom Unlikely	
Prepared by: Clyde Snyder	Catastrophic	E E H H M	
Reviewed by: Jennifer Carothers, PhD.	Critical	E H H M L	
	Marginal	H M M L L	
Notes: (Field Notes, Review Comments, etc.)	Negligible	M L L L L	
	<p>Step 1: Review each “Hazard” with identified safety “Controls” and determine RAC (See above)</p> <p>“Probability” is the likelihood to cause an incident, near miss, or accident and Identified as: Frequent, Likely, Occasional, Seldom, or Unlikely.</p> <p>“Severity” is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible</p> <p>Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each “Hazard” on AHA. Annotate the overall highest RAC at the top of AHA.</p>		
		RAC Chart	
		E= Extremely High Risk	
		H= High Risk	
		M= Moderate Risk	
		L = Low Risk	
ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
1. Site set up Decontamination of non-dedicated hand tools DPT and equipment can take place onsite (most likely at the sample location) or at a centralized location. When this activity is conducted onsite, a bucket of soapy water and an empty bucket along with a portable sprayer is carried to each sample location.	1. Slips trips and fall	1. Slips trips and falls – To prevent these types of hazards the following measures will be incorporated: <ul style="list-style-type: none"> • Station placement – Keep the decon station far enough back from the operation to allow room to work. • Practice Good housekeeping – Keep tools gathered and organized to prevent a tripping hazard. • Do not lay items around on potentially contaminated media or where someone could step on them and go down. • Clear other obstructions in the area that may present trip hazards. 	L
2. Washing and rinsing process – This will include placing the hand auger bucket or reusable spatulas or trowels into soapy water. These items will be washed until visibly clean. The rinsed in a second bucket. The buckets are placed in mortar tubs to control potential incidental spills.	2. Contaminant accumulation - Contaminant exposure.	2. The contaminant levels are not anticipated to be extremely elevated. To minimize exposure <ul style="list-style-type: none"> • Wear nitrile gloves, safety glasses, and an impermeable apron if there is a potential for the saturation of clothing. • Change out the wash water frequently to ensure adequate decontamination but also protect from overloading contaminants. • Keep decon areas orderly, maintain good housekeeping. • Bag buckets once cleaned, to prevent contamination until next use. 	L

ACTIVITY HAZARD ANALYSIS

Decontamination

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
3. Decon procedure	3. Hazard Communication	3. The SSO will complete the Site Specific Hazard Communication Program. This includes <ul style="list-style-type: none"> • Recording chemicals employed onsite for decontamination onto a Chemical Inventory List • MSDSs are available to all personnel and they are aware of the hazards associated with each. • The SSO has reviewed the documents for completeness and have also determined if there are additional equipment (PPE and/or Emergency equipment) that is needed. 	L
EQUIPMENT TO BE USED		INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Hand tools (hand brushes, garden sprayers, hoses, etc.); toilet brushes for inside the auger bucket; sponges		When decontaminating equipment check equipment for deficiencies report to the SSO.	All personnel participating in this activity must be current with HAZWOPER training requirements as specified in Mobilization/Demobilization.
Personal Protective Equipment: <u>Minimum</u>: <ul style="list-style-type: none"> • Nitrile gloves. • Safety glasses • Rain suit or moisture-repellant disposable coveralls or impermeable apron, when there is a potential for the saturation of work clothing. <u>Optional items</u>: As determined by the SSO based on site specific conditions.		Initial PPE inspection performed by SSO. Ongoing (prior to each use) inspections responsibilities of PPE users.	PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees 40 hour HAZWOPER training, which is to be verified by the SSO through initial training documentation and review prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities.

All persons working within the operational will sign this AHA indicating that they have reviewed the document and are aware of their responsibilities as stated in the AHA.

Name (Printed)	Signature	Occupation	Date Reviewed/Training



ACTIVITY HAZARD ANALYSIS (AHA)

Activity/Work Task: IDW Management		Overall Risk Assessment Code (RAC) (Use highest code)			M		
Project Location: Naval Air Station Cecil Field		Risk Assessment Code (RAC) Matrix					
Site: 3, 5, and Site 21		Severity	Probability				
Date Prepared: April 2012			Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by: Clyde Snyder		Catastrophic	E	E	H	H	M
Reviewed by: Jennifer Carothers, PhD.		Critical	E	H	H	M	L
		Marginal	H	M	M	L	L
Notes: (Field Notes, Review Comments, etc.)		Negligible	M	L	L	L	L
		Step 1: Review each “Hazard” with identified safety “Controls” and determine RAC (See above) “Probability” is the likelihood to cause an incident, near miss, or accident and Identified as: Frequent, Likely, Occasional, Seldom, or Unlikely.					RAC Chart
		“Severity” is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible					E= Extremely High Risk
		Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each “Hazard” on AHA. Annotate the overall highest RAC at the top of AHA.					H= High Risk
							M= Moderate Risk
							L = Low Risk
ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS					RAC
1. Storage Area set up	1. Traffic hazards; Material handling hazards	1. Traffic hazards/Material Handling hazards – This area should be easily accessible in order to place and remove the drums accumulated. To further reduce material handling hazards, support spill containment and control, and sampling when necessary, the IDW storage area should be structured as follows: <ul style="list-style-type: none"> • Maximum 4-drums to a pallet with retaining ring bolt and label on the outside for easy access/reference. • Maintain a minimum of 4-feet between each row of pallets. This is the minimum distance necessary to wheel drums on a drum dolly. • If the site is not secured, the satellite storage area shall be fenced and signs placed indicating the following: <ol style="list-style-type: none"> a. Primary Point of Contact (make sure they know they been identified as the primary point of contact). b. Phone Number c. Emergency Contact (If different from the primary) • Provide a Drum/Container Inventory to the Primary Point of Contact and to Emergency Services, if they deem it necessary. The inventory should contain: <ol style="list-style-type: none"> a. Each drum shall be assigned a unique identification number. This number shall be placed on the label and drum shell using a paint marker (Note: Do not paint the number on the lid as these have a tendency to get exchanged from time to time.) 					L

ACTIVITY HAZARD ANALYSIS

IDW Management

ACTIVITY / PHASE	POTENTIAL HAZARDS	RECOMMENDED ACTIONS / CONTROLS	RAC
		b. Types of waste materials (decontamination waters; purge waters, etc.) c. Volumes (Full or level associated with the container after completion of the project location) d. Where it was derived from (The site and/or wells) e. Dates (When filling began) f. Contact – For more information Ensure all lids are secured.	
2. Material Handling	2. Lifting (strain/muscle pulls)	2. Lifting (strain/muscle pulls) <ul style="list-style-type: none"> • Use mechanical means (i.e. dollies, etc.) to move and handle containers. Use proper lifting techniques described in Section 4.4 of the Health and Safety Guidance Manual (HSGM). • Fill drums and buckets only to 80% to minimize some of the weight and incidental spill issues. • Use help to move and place drums Reminder: The drums you are attempting to move, lift and/or relocate may weigh on the average of <ul style="list-style-type: none"> • 55-Gallon container of purge or decontamination waters = ~500 lbs. (including the container) 	M
3. Placing the drums	3. Pinches and compressions	3. Pinches and compressions – During placement of drums/containers on pallets use machinery or assistance from another person where possible. Keeps hand out of the area between drums during placement. <ul style="list-style-type: none"> • It is best to place the drums and pallets then transport buckets to fill the drums already placed. • Wear steel toed shoes with adequate lug to support traction when moving heavy containers. • If drums are used at the wells, Whale pumps may be used to transfer contents to a drum in the pick up and then again at the storage area. • If necessary buckets can also be used to transfer materials. 	M
4. Spill prevention and protection • Staging and Labeling Containers.	4. Chemical contaminants exposure	4) Chemical hazards – Generally encountering contaminants during this activity is low unless the contents of a container must be transferred due to a faulty container [leak(s)]. The outside of containers should be cleaned of residual waters (e.g. splashes, etc.) to avoid potentially exposing all who come in contact. The FOL and/or the SSO will <ul style="list-style-type: none"> • Ensure the outsides of all drums moved to the staging area are washed/wiped clean. 	L
<p>Spill Containment - The primary area of concern regarding spills and/or releases are:</p> <ul style="list-style-type: none"> • Collection point –Use mortar tubs as secondary containment. In addition, keep the buckets in the mortar tubs during transport in your vehicle. • Keep the buckets closed during transport. • Avoid leaving containers open that may off gas during transport. • Moving/Handling the drums/containers of waste materials. Minimize handling drums as much as possible and: <ul style="list-style-type: none"> ○ Use proper lifting appliances such as drum grapplers, drum dollies, etc.,. Secure containers for movement over long distances. ○ Exercise care when using a backhoe or similar device to lift the drums. This could result in a bucket tooth puncturing the drum resulting in a release. ○ Place the drums onto a lift gate and flat bed with removable sides for transport to the staging area. 			

ACTIVITY HAZARD ANALYSIS

IDW Management

<p>This section describes the procedures the Tetra Tech field personnel will institute when a spill or leak is detected:</p> <ul style="list-style-type: none"> • Initiate incidental response measures, including: <ul style="list-style-type: none"> ○ Employ personal protective equipment (see below). Take actions to stop the leak or spill by plugging or patching the container or raising the leak to the highest point in the vessel (for containers). Spread the absorbent material in the area of the spill, covering it completely. ○ Transfer material to a new vessel; collect and containerize the absorbent material. Label the new container appropriately. Await analyses for treatment and disposal options. • Re-containerize spills, including 2-inch of top cover (if over soils) impacted by the spill. Await test results for treatment or disposal options. • Notify the SSO or FOL immediately upon detection of a leak or spill and actions taken or employed. <ul style="list-style-type: none"> • Personal Protective Equipment <ul style="list-style-type: none"> - Nitrile outer gloves - Splash Shield - Impermeable over-boots - Rain suits 		
<p>Hazard Monitoring Required: Visual observation of work practices by the FOL and/or the SSO to minimize potential physical hazards (i.e., improper lifting, unsecured loads, cutting practices, etc.). Monitoring will only be employed if Spill Containment is implemented. Periodic visual inspection for leaks when filling drums or those at the staging area.</p>	<p>Decontamination Procedures: Not required, unless spill containment protocol is implemented. Then the following will apply</p> <ul style="list-style-type: none"> • Once the spill is secured and all of the spill equipment has been through a soap and water wash and rinse. • Personnel will wash/rinse outer protective garment with soap and water. • Remove outer protective garments. • Wash hands and face. 	<p>Permits/Requirements:</p> <ul style="list-style-type: none"> • Complete IDW Inventory List
<p>Training Required</p> <ul style="list-style-type: none"> • 29 CFR 1910.120 (e) Site Specific Training, See Figure 8-1 <p>Medical Clearance/Surveillance Required</p> <ul style="list-style-type: none"> • Completed a Medical Data Sheet 	<p>Emergency Equipment</p> <ul style="list-style-type: none"> - First Aid Kit - Fire Extinguisher - Map to Hospital and Emergency Contact List (Posted and a copy placed in your First-Aid Kit. - Spill Kit (Oil dry, wood shavings, or other absorbent materials, Shovels, brooms, Oil absorbent pads 	<p>H&S Supporting Program Requirements</p> <p>None required.</p>

All persons upon review will sign off on this AHA prior to participating in these activities.

Name (Printed)	Signature	Occupation	Date of Review or Training

ATTACHMENT IV
DPT/DRILL RIG INSPECTION
CHECKLIST

Equipment Inspection Checklist for Drill/DPT Rigs

Company: _____

Unit/Serial No#: _____

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

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

Project Name: _____

Project No#: _____

Yes	No	NA	Requirement	Comments
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Emergency Stop Devices <ul style="list-style-type: none"> • Emergency Stop Devices (At points of operation) • Have all emergency shut offs identified been communicated to the field crew? • Has a person been designated as the Emergency Stop Device Operator? 	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Highway Use <ul style="list-style-type: none"> • Cab, mirrors, safety glass? • Turn signals, lights, brake lights, etc. (front/rear) for equipment approved for highway use? • Seat Belts? • Is the equipment equipped with audible back-up alarms and back-up lights? • Horn and gauges • Brake condition (dynamic, park, etc.) • Tires (Tread) or tracks • Windshield wipers • Exhaust system • Steering (standard and emergency) • Wheel Chocks? • Are tools and material secured to prevent movement during transport? Especially those within the cab? • Are there flammables or solvents or other prohibited substances stored within the cab? • Are tools or debris in the cab that may adversely influence operation of the vehicle (in and around brakes, clutch, gas pedals) 	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fluid Levels: <ul style="list-style-type: none"> • Engine oil • Transmission fluid 	

Equipment Inspection Checklist for Drill Rigs

Page 2

Unit/Serial No#: _____

Inspection Date: ____ / ____ / ____

Yes	No	NA	Requirement	Comments
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> • Brake fluid • Cooling system fluid • Hoses and belts • Hydraulic oil 	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	High Pressure Hydraulic Lines <ul style="list-style-type: none"> • Obvious damage • Operator protected from accidental release • Coupling devices, connectors, retention cables/pins are in good condition and in place 	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Mast Condition <ul style="list-style-type: none"> • Structural components/tubing • Connection points • Pins • Welds • Outriggers • Operational • Plumb (when raised) 	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hooks <ul style="list-style-type: none"> • Are the hooks equipped with Safety Latches? • Does it appear that the hook is showing signs of wear in excess of 10% original dimension? • Is there a bend or twist exceeding 10% from the plane of an unbent hook? • Increase in throat opening exceeding 15% from new condition • Excessive nicks and/or gouges • Clips • Number of U-Type (Crosby) Clips (cable size 5/16 - 5/8 = 3 clips minimum) (cable size 3/4 - 1 inch = 4 clips minimum) (cable size 1 1/8 - 1 3/8 inch = 5 clips minimum) 	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Power cable and/or hoist cable <ul style="list-style-type: none"> • Reduction in Rope diameter π (5/16 wire rope > 1/64 reduction nominal size -replace) (3/8 to 1/2 wire rope > 1/32 reduction nominal size-replace) (9/16 to 3/4 wire rope > 3/64 reduction nominal size-replace) • Number of broken wires (6 randomly broken wires in one rope lay) 	

Equipment Inspection Checklist for Drill Rigs

Page 3

Unit/Serial No#: _____

Inspection Date: ____ / ____ / ____

Yes	No	NA	Requirement	Comments
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	(3 broken wires in one strand) <ul style="list-style-type: none"> • Number of wire rope wraps left on the Running Drum at nominal use (≥ 3 required) - Lead (primary) sheave is centered on the running drum • Lubrication of wire rope (adequate?) • Kinks, bends - Flattened to $> 50\%$ diameter 	
<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	Hemp/Fiber rope (Cathead/Split Spoon Hammer) <ul style="list-style-type: none"> • Minimum $\frac{3}{4}$; maximum 1 inch rope diameter (Inspect for physical damage) • Rope to hammer is securely fastened 	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <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"/>	Safety Guards - <ul style="list-style-type: none"> • Around rotating apparatus (belts, pulleys, sprockets, spindles, drums, flywheels, chains) all points of operations protected from accidental contact? • Hot pipes and surfaces exposed to accidental contact? • High pressure lines • Nip/pinch points 	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <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"/>	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"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	PPE Required for Drill Rig Exclusion Zone <ul style="list-style-type: none"> • Hardhat • Safety glasses • Work gloves • Chemical resistant gloves _____ • Steel toed Work Boots • Chemical resistant Boot Covers • Apron • Coveralls Tyvek, Saranex, cotton) _____ 	
<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	Other Hazards <ul style="list-style-type: none"> • Excessive Noise Levels? _____ dBA • Chemical hazards (Drilling supplies - Sand, bentonite, grout, fuel, etc.) 	

Equipment Inspection Checklist for Drill Rigs

Page 4

Unit/Serial No#: _____

Inspection Date: ____ / ____ / ____

Yes	No	NA	Requirement	Comments
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- MSDSs available?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	• Will On-site fueling occur	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Safety cans available?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Fire extinguisher (Type/Rating - _____)	

Approved for Use Yes No See Comments

Site Health and Safety Officer

Operator

ATTACHMENT V
OSHA POSTER

Job Safety and Health

It's the law!

OSHA

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

EMPLOYEES:

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

EMPLOYERS:

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

This free poster available from OSHA –
The Best Resource for Safety and Health



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

1-800-321-OSHA
www.osha.gov

OSHA 3165-12-06R

